SUNRISE ENGINEERING

Enoch City Stormwater IFFP & IFA

ENOCH CITY
STORMWATER MASTER PLAN AND IMPACT FEE FACILITIES PLAN

JULY 2024

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EXECUTIVE SUMMARY

INTRODUCTION

Enoch City commissioned Sunrise Engineering to create an Impact Fee Facilities Plan and Impact Fee Analysis for the stormwater utility. This plan evaluates the existing system and recommends improvements for a 10-year planning horizon and a 20-year planning horizon.

GROWTH AND USER ANALYSIS

Enoch City's projected growth rate is expected to increase gradually over the next several years. Supporting data is available in Appendix C.

- Growth Rate of 3.5%
    - Population
        - 2020 Census population: 7,374
        - 2024 estimated population: 8,177
        - 10-year planning horizon estimated population: 11,151
        - 20-year planning horizon estimated population: 15,735
    - Connections
        - Total 2024 Estimated Connections: 2,667 (29 commercial, 2,638 residential)
        - 10-year estimated connections: 3,634 (38 commercial, 3,596 residential)
        - 20-year estimated connections: 5,126 (53 commercial, 5,073 residential)

EXISTING FACILITIES

Several different types of existing facilities contribute to stormwater control and conveyance. Approximate quantities of facilities are given as:

- 27 miles of curb and gutter
- 4.7 miles of storm drain pipe
- 5.5 miles of roadside ditches
- 225 culverts (including driveway crossings)
- 152 cross gutters

HYDROLOGIC AND HYDRAULIC ANAYLSIS

Sunrise Engineering collected field data for the storm drain system to provide required data for the hydraulic system model. Watershed subbasins were delineated with publicly available LIDAR data and topographical map data. Soil type data was collected from the Soil Conservation Survey (SCS) database. Land use data was collected from a national database and local zoning designations. Composite curve numbers representing the runoff potential of a basin were calculated from the soil and land use types in each subbasin. The design storm for the stormwater runoff analysis was the 100-year, 3-hour storm, and the design storm for detention facility sizing was the 100-year, 24-hour storm. The runoff from the East Bench Watershed Environmental Analysis (Plan EA) detention basins was also considering in the hyraulic analysis of the stormwater facilities.

RECOMMENDED IMPROVEMENTS

Various extensive improvements are required to mitigate flows from in town subbasin runoff and the Plan EA detention outflows. The 10-year planning horizon recommended improvements include:

- 1 channel
- 1 46.6 acre-ft detention basin
- 4 storm drain pipe projects
- 11 curb and gutter projects

The recommended improvements also include the upsizing of a Plan EA proposed ditch to accommodate in-town flow.

SYSTEM FINANCIALS

The Engineer's Opinion of Probable Cost for all 10-year planning window improvements shows that construction related costs could total $21,849,000.00 in 2024 dollars, with another $116,000.00 for an Impact Fee Facilities Plan update.

A city utility must be able to sustain itself financially through user rates and impact fees. User rates cover operations and maintenance as well as debt service not covered by impact fees. Impact fees pay for improvements that are needed because of growth. A user rate based on FY 2024 audit numbers and engineering judgment was calculated. Engineer's Opinion of Probable Cost values are reflected in the maximum allowable impact fee.

- Existing User Rate - $2.00 per month for residential, $4.00 per month for commercial connections
- Existing Impact Fee - $1,593.14 per connection
- Proposed User Rate - $20.87 per month for residential, $41.75 per month for commercial connections
- Maximum Allowable Impact Fee – By zoning, see table:

Zoning Description	Impact Fee/Acre	Impact Fee/ 0.25 Acre
Mobile Home Park (MHP)	$39,240.00	$9,810.00
Mixed Residential (MXR_18)	$30,090.00	$7,530.00
Rural Residential 5 (R-R-5)	$18,060.00	$4,520.00
Professional Office (P-O)	$42,130.00	$10,540.00
Research Industrial Park (R/I-P)	$48,140.00	$12,040.00
Multiple Residential (M-R-2)	$39,240.00	$9,810.00
Community Commercial (C-C)	$48,140.00	$12,040.00
Neighborhood Commercial (N-C)	$36,110.00	$9,030.00
Regional Commercial (R-C)	$54,160.00	$13,540.00
RV Park (RVP)	$39,240.00	$9,810.00
Residential 18 (R-1-18)	$21,190.00	$5,300.00
Residential 11 (R-1-11)	$24,070.00	$6,020.00
Rural Residential 1 (R-R-1)	$18,060.00	$4,520.00

A cash flow analysis showing the system's financial viability for the next 20 years is available in Appendix E.

1 INTRODUCTION

1.1 PURPOSE AND SCOPE

Enoch City (City) has contracted with Sunrise Engineering, Inc. to prepare this Stormwater Master Plan and Impact Fee Facilities Plan (Plan, IFFPA) to provide an approach for the planning and implementation of stormwater control facilities and infrastructure for the City. This plan also provides information regarding existing stormwater infrastructure, analyzes facilities for adequacy, and makes recommendations for improvements.

This Plan includes general requirements for the sizing, maintenance, and configuration of a storm water management system in Enoch City. The Plan also makes recommendations for addressing specific problem areas in the City. In addition, this Plan provides operation and maintenance recommendations for existing and future storm water improvements.

It is intended that this 2024 Storm Water Master Plan will help Enoch City manage current and future storm water routing scenarios.

1.2 BACKGROUND INFORMATION

Enoch City is a growing rural community in Iron County, Utah, just north of Cedar City. Its current and future economic status benefits heavily from I-15 bordering the City to the east. Enoch City embraces its foundation and pioneer heritage from the 1800's as evident from the City's seal.

The terrain surrounding Enoch City is characterized by generally flat to mild slopes. The topology of the City changes slope from the mountains in the east to the valley floor to the west. The Dixie National Forest, Brian Head Ski Resort and Cedar Breaks National Monument are all situated east of Enoch City.

The City is characterized by its semi-arid climate which is typically warm in the summer months and cold in the winter months. The average annual rainfall is approximately 12.5 inches, which is much less than one-third the national average of 38.1 inches. The average annual snowfall in Enoch City is approximately 52.1 inches, which is almost double the national average of 27.8 inches. The variable weather in Enoch City over the last few years has caused substantial periodic flooding throughout the City.

The current drainage system in Enoch City is minimal, with most streets relying on roadside swales for stormwater conveyance. Where storm conveyance infrastructure has been installed, it is primarily comprised of High-Density Polyethylene Pipe and streets with curb and gutter.

1.3 ANALYSIS AREA

The plan area is contained within the existing Enoch City limits; see Map 1 in Appendix A. Enoch City is surrounded on the northern, western, and southern sides by farmland, and the east side is bound by the I-15 corridor. The City is centrally located within Iron County.

1.4 DESIGN CRITERIA

1.4.1 EAST BENCH EA

The East Bench Watershed Environmental Analysis (Plan EA) has analyzed the hydrology and hydraulics for the East Bench watershed on the east side of the Interstate-15 corridor. Hydrologic and hydraulic analysis for the East Bench Watershed are not detailed here and can be found in the Plan EA. The Plan EA has recommended the construction of eight detention basins on the east side of Interstate-15 to reduce flood volumes within Enoch City. The detention basins would release through existing stormwater infrastructure at a controlled rate. A map detailing the location of these basins is given in Appendix: G. Hydrographs for each basin's release are given in Appendix G. A summary of the peak flows released by each basin is given in Table 1.

Table 1: East Bench Detention Basin Release Flows

Name	Peak Outflow (cfs)
DP-1	43.0
DP-2	11.4
DP-3	66.3
DP-5	34.5
DP-6	25.5
DP-7	32.6
DP-8	32.6
DP-9	76.9

For the purpose of this plan, it was assumed these basins will be constructed. It was also assumed that the outflow of these basins will occur at the same time as the design storm. Therefore, the detention release volumes were included in the analysis of the City stormwater system and recommendations for improvements.

2 GROWTH AND USER ANALYSIS

2.1 GROWTH RATE

Enoch City has experienced relatively consistent growth rates over the past twenty years. In order for this impact fee facilities plan to prepare for the future stormwater infrastructure requirements, this plan will assess the future population growth within the analysis area. This plan uses several resources including census figures and connection data from the City's billing summaries to evaluate past growth and estimate future growth. Table 2 summarizes periods of growth from official census data obtained from 1970 to 2020 (US Census Bureau). The City's average annual growth rate from the year 2000 to 2020 was 3.85%.

Table 2: Recent Growth Rate

Year	Census Population	Growth Rate
1970	120	-
1980	678	18.91%
1990	1947	11.13%
2000	3467	5.94%
2010	5803	5.29%
2020	7374	2.42%
Past 20-Year Growth Rate		3.85%

For the purposes of this analysis, the projected average annual growth rate was rounded to 3.5%. This growth rate corresponds with the estimated growth rates for the City's current impact fee facilities plans and impact fee analyses for its other utility and services systems.

2.2 LENGTH OF PLANNING HORIZON

It is typical for an impact fee facilities plan to use a 10- or 20-year planning horizon or period. This plan will assume a 20-year planning horizon, noting the following points:

- The City must expend or encumber collected impact fees for a permissible use within six years of their receipt.
- Assumptions, objectives, goals, etc. can change within a 20-year period. This change in conditions may especially be realized if dramatic population changes take place within the 20-year planning horizon.
- If actual growth rates are greater than anticipated, both revenues and expenditures advance forward in time, so the net effect on cash flow remains relatively constant. Similarly, if actual growth rates are lower than anticipated, impact fee revenues and demand for improvements are simultaneously delayed and remain relatively constant.

2.3 POPULATION PROJECTION

An essential element in the development of this plan is the projection of the City's assumed growth rate to an anticipated planning horizon. The future population for each year is calculated using the compound interest formula and inserting the projected growth rate, the existing population, and the length of the planning horizon. The compound growth formula is given in Equation 1.

Equation 1: Compound Growth Formula

$$F = P(1 + i)^n$$

where:

F = Future Population
P = Present Population
i = Projected Growth Rate
n = Years

Using the previously determined 3.5% growth rate and the past census data, the estimated population over the planning horizon can be calculated. The projected 20-year population growth is provided in Table 3. Figure 1 shows how quickly growth may occur.

Table 3: 20-Year Growth Projections

Year	Est. Growth Rate	Estimated Population
2024	3.5%	8,177
2033	3.5%	11,151
2043	3.5%	15,735

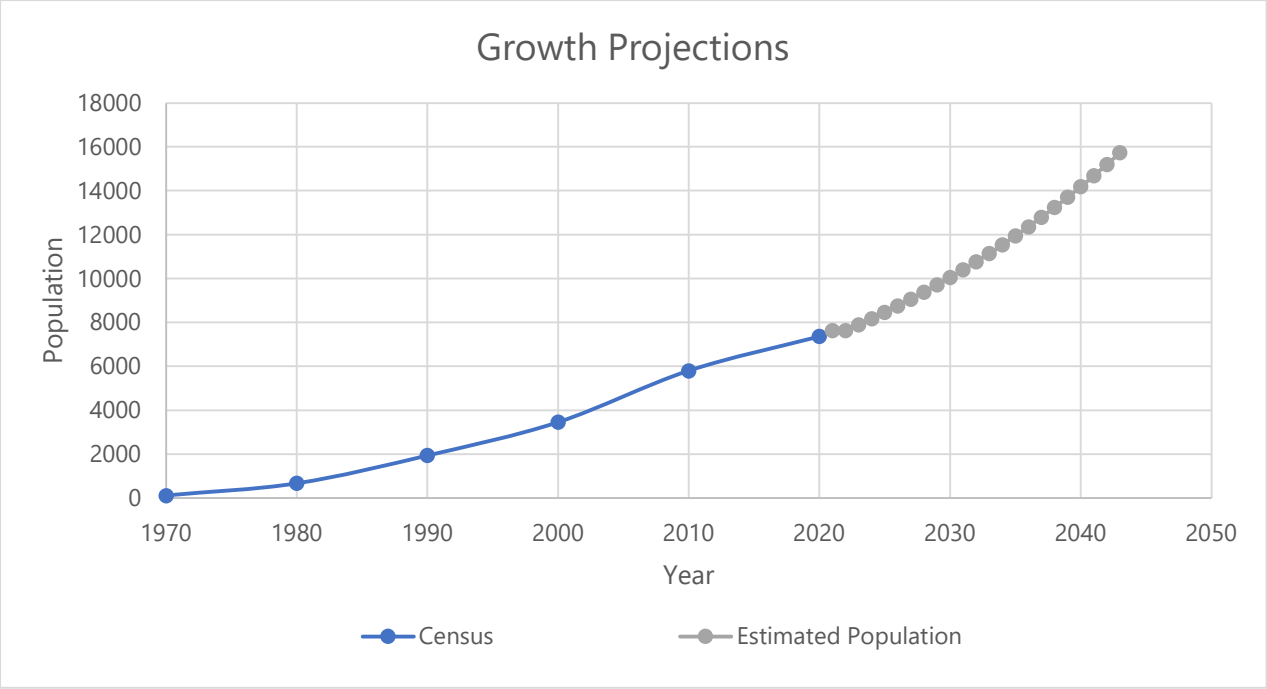

Figure 1: Growth Projection

For the purpose of assessing user rates, connections anticipated over the planning horizon will need to be evaluated. Existing connection data was gathered from the City's billing records for 2023. The same growth rate of 3.5% used for population growth was applied to calculate the projected number of connections over the 20-year planning period. The projected connection growth is given in Table 4.

Table 4: 20-Year Connection Growth

Year	Est. Growth Rate	Estimated Commercial Connections	Estimated Residential Connections	Estimated Total Connections
2024	3.5%	29	2,638	2,667
2025	3.5%	30	2,730	2,760
2026	3.5%	31	2,826	2,857
2027	3.5%	32	2,925	2,957
2028	3.5%	33	3,027	3,060
2029	3.5%	34	3,133	3,167
2030	3.5%	35	3,243	3,278
2031	3.5%	36	3,357	3,393
2032	3.5%	37	3,474	3,511
2033	3.5%	38	3,596	3,634
2034	3.5%	39	3,722	3,761
2035	3.5%	40	3,852	3,892
2036	3.5%	41	3,987	4,028
2037	3.5%	42	4,127	4,169
2038	3.5%	43	4,271	4,314
2039	3.5%	45	4,420	4,465
2040	3.5%	47	4,575	4,622
2041	3.5%	49	4,735	4,784
2042	3.5%	51	4,901	4,952
2043	3.5%	53	5,073	5,126

2.4 BUILDOUT PROJECTIONS

While population growth is essential to determining stormwater needs over a specific planning period, eventually the available lots in the existing subdivisions will reach maximum capacity. If the maximum number of developable lots is reached earlier or later than projected, future improvements to support growth may either come earlier or later. Because of this, buildout area will need to be considered. Buildout area is split into developed and undeveloped acreage. These acres by zone can only be subdivided into a minimum lot size, given by the code for their respective zoning. The total developed and undeveloped area by zone and projected maximum possible connections by zone at buildout are given in Table 5. This does not include any areas that may be annexed into the City boundary in the future.

Table 5: City Acres and Buildout Connections by Zone

Zoning Description	Zone Total Acres	Zone Developed Acres	Zone Undeveloped Acres	Existing Connections	Future Connections	Total Possible Connections
Mobile Home Park (MHP)	9	9	0	41	0	41
Mixed Residential (MXR_18)	46	40.5	5.5	45	6	51
Rural Residential 5 (R-R-5)	190	92	98	11	27	38
Professional Office (P-O)	4	4	0	4	0	4
Research Industrial Park (R/I-P)	505	373	132	60	22	82
Multiple Residential (M-R-2)	77	24	53	31	69	100
Community Commercial (C-C)	440	113	327	195	565	760
Neighborhood Commercial (N-C)	8	4	4	2	2	4
Regional Commercial (R-C)	4	4	0	1	0	1
RV Park (RVP)	5	3.5	1.5	1	1	2
Residential 18 (R-1-18)	2670	1893	777	2326	955	3281
Residential 11 (R-1-11)	678	114	564	262	1296	1558
Rural Residential 1 (R-R-1)	490	170	320	71	134	205
Total All Zones	5126	2844	2282	3050	3077	6127

2.5 EQUIVALENT RESIDENTIAL AREA

Impact fee revenue is directly related to the assumed growth rates. However, since impact fees are not assessed per person, equivalent residential acreage must be established. Equivalent residential units (ERUs) are traditionally tied to residential water connections. However, due to the impact of stormwater runoff increasing with increasing impervious area and not water usage, a runoff coefficient ratio will be established for each zoned area. The coefficients used are based off commonly accepted runoff coefficients used for land cover runoff using the rational method (Lindeburg). A higher coefficient establishes that, for example, commercial lots with large parking lots are assumed to produce more surface runoff than single family residential lots and will therefore have a higher impact to the stormwater system. A summary of selected coefficients by zone are given in Table 6.

Table 6: Runoff Coefficients by Zone

Zoning Description	Runoff Coefficient
Mobile Home Park (MHP)	0.65
Mixed Residential (MXR_18)	0.5
Rural Residential 5 (R-R-5)	0.3
Professional Office (P-O)	0.7
Research Industrial Park (R/I-P)	0.8
Multiple Residential (M-R-2)	0.65
Community Commercial (C-C)	0.8
Neighborhood Commercial (N-C)	0.6
Regional Commercial (R-C)	0.9
RV Park (RVP)	0.65
Residential 18 (R-1-18)	0.35
Residential 11 (R-1-11)	0.4
Rural Residential 1 (R-R-1)	0.3

This plan will assume a base runoff coefficient for residential development of 0.4. Where stormwater runoff is directly related to area, stormwater impact must also consider lot area. A standard residential lot of R-1-11 zoning with a runoff coefficient of 0.4 will be considered as the basis for the runoff coefficient ratio as it pertains to impact fees and user rates. The number of equivalent residential acres by zone determines the fair share of excess runoff attributed to a larger lot with more impervious area. The corresponding runoff coefficient ratios for each zone are given in Table 7.

Table 7: Runoff Coefficient Ratio by Zone

Zoning Description	Runoff Coefficient	Runoff Coefficient Ratio
Mobile Home Park (MHP)	0.65	1.63
Mixed Residential (MXR_18)	0.5	1.25
Rural Residential 5 (R-R-5)	0.3	0.75
Professional Office (P-O)	0.7	1.75
Research Industrial Park (R/I-P)	0.8	2
Multiple Residential (M-R-2)	0.65	1.63
Community Commercial (C-C)	0.8	2
Neighborhood Commercial (N-C)	0.6	1.5
Regional Commercial (R-C)	0.9	2.25
RV Park (RVP)	0.65	1.63
Residential 18 (R-1-18)	0.35	0.88
Residential 11 (R-1-11)	0.4	1
Rural Residential 1 (R-R-1)	0.3	0.75

In order to establish equivalent residential acres, developable acres within the City's current zoned boundary were analyzed. For the purposes of impact fees, the buildout acreage by zone was reduced to anticipated developed acreage at the end of the 10-year planning horizon rather than buildout acreage. This developed acreage was estimated by taking the projected growth of total connections by 2033 and distributing it between the zones, assuming an average lot size. The runoff coefficient ratio was then applied to the developed areas over 10 years to establish an equivalent residential acreage over the next 10 years. Table 8 establishes the estimated equivalent residential acres in the year 2033.

Table 8: 2033 Equivalent Residential Acres

Zoning Description	2033 Projected Connections	Developed Acres Anticipated by 2033	Equivalent Residential Acres
Mobile Home Park (MHP)	0	0	0
Mixed Residential (MXR_18)	1	0.9	1.2
Rural Residential 5 (R-R-5)	10	36.3	27.3
Professional Office (P-O)	0	0	0
Research Industrial Park (R/I-P)	1	6	12
Multiple Residential (M-R-2)	20	15.4	25.2
Community Commercial (C-C)	7	4.1	8.2
Neighborhood Commercial (N-C)	1	2	3
Regional Commercial (R-C)	0	0	0
RV Park (RVP)	0	0	0
Residential 18 (R-1-18)	130	105.3	92.7
Residential 11 (R-1-11)	777	342	342
Rural Residential 1 (R-R-1)	20	47.8	35.9
Total All Zones	967	559.8	547.5

All new development is required to retain any additional flow volume that results from the increase in impervious area from development. However, current deficiencies in the system will be exacerbated by the increase in stormwater flow rate across newly installed impervious area, and for a development to have no impact to the system all upstream flow must be maintained as well. The equivalent residential acreage data will be used to inform stormwater impact fees and billing rates.

3 BASIN DESCRIPTION & DATA COLLECTION

3.1 FIELD INVESTIGATION

Enoch City is located in the southeast Great Basin at the base of Cedar Mountain in south-central Utah, Iron County. Enoch City lies in a semi-arid part of the state at an elevation of 5,551 feet above sea level, with 10,000-foot mountains to the east and a vast desert area to the west.

The community can be classified as rural and suburban due to varied land uses within the City. These land uses range from pasture and farmland to moderate and high-density residential housing and light commercial use. Development in the City has had a direct impact on the natural drainage patterns and native ground cover historically found in the area. These changes in ground cover and drainage patterns contribute to storm water problems and potential flooding in the City.

To assist with preparation of this Plan, Sunrise Engineering's staff conducted a detailed field investigation of the City. The overall purpose of the field investigation was to collect information regarding existing drainage improvements, drainage patterns, and existing problematic areas in the study area. The field investigation was further supplemented by GIS data, obtained from the City. An accurate hydraulic model for Enoch City's storm water system was then developed. The gathered information was then used in a hydrologic analysis of the study area to determine the amount of runoff generated by specific precipitation events and to evaluate the ability for existing infrastructure to convey the runoff flows.

3.2 EXISTING DRAINAGE FACILITIES

Multiple forms of stormwater facilities exist throughout Enoch City. A summary of existing facilities, their locations and size are shown in Appendix A (Map 1).

3.2.1 ROADWAY CONVEYANCE

Roadway conveyance is the ability to carry stormwater within the street right-of-way. Typically curb and gutter can increase the volume of stormwater a roadway can convey. In areas lacking curb and gutter, flooding can occur from relatively minor storm events. Enoch City has approximately 27 linear miles of curb and gutter. Some streets in the City have sloped sides to create a natural road-side swale. Curb and gutter locations in Enoch City are shown in Appendix A (Map 1).

3.2.2 STORM DRAIN PIPE SYSTEM

Storm drain pipes are an underground pipe network that collects stormwater through surface catch basins and conveys the stormwater underground. While storm drain systems can be efficient in conveying stormwater, it is necessary to properly maintain the system to convey stormwater. For example, during or after a storm event, it may be necessary to clear debris and sediment from catch basins and pipes to maximize the efficiency of the storm drain system.

Enoch City has a major storm drain trunk line that was recently installed under Stagecoach Lane and Half Mile Road and several smaller networks to convey surface water away from developed areas of the City. There are approximately 4.7 linear miles of storm drain pipe and 97 storm drain inlet structures. Appendix A (Map 1) shows the storm drain network in Enoch.

3.2.3 DETENTION FACILITIES

Detention and retention facilities are used to decrease or eliminate the downstream flow to the stormwater conveyance facilities, thus reducing or eliminating the burden of stormwater runoff. Several small detention basins exist in Enoch, primarily near new development because post-development flows should not exceed pre-development flows for an area.

3.2.4 NATURAL DRAINAGE CHANNELS

A drainage channel is a natural or man-made waterway. For major drainages, these natural channels are the flow line of the basin. Not only do natural open channels typically provide greater capacity for conveying stormwater, but they also provide pleasing aesthetics and opportunities for alternate uses. These alternate uses can include linear parks, trails, etc. Additional benefits of natural drainage channels also include slow flow characteristics, are wide and shallow, and they function and appear natural.

Enoch has roadside swales or shallow ditches to convey stormwater where there is no curb and gutter. There are approximately 5.5 linear miles of roadside ditches. Constructed channels are shown in Appendix A (Map 1).

3.2.5 DRAINAGE CROSSINGS

A drainage crossing is a structure that conveys stormwater under, through and otherwise across a barrier, usually a roadway. Examples of drainage crossings are culverts and cross gutters.

Enoch has numerous culvert crossings for both minor and major drainage channels. There are approximately 225 culverts, including driveway crossings, and 152 cross gutters have been identified in Enoch. There are also several major concrete box culverts to convey stormwater under I-15. Culverts must be properly maintained and cleared of brush or debris blocking the inlet or outlet to function as intended.

3.3 WATERSHED INFORMATION

Work performed during the data collection and field investigation phase of this study included a detailed review of how storm water runoff within the City is routed to the primary drainage channels and pipe systems previously described. The direction of storm water flow was established for local developments and existing storm-water conveyance facilities were reviewed to understand how they route storm water to the major drainage channels. After these patterns were determined, watershed drainage basins and sub-basins were delineated.

A drainage basin is a portion of a greater watershed area that has specific, well-defined boundaries and produces runoff at a downstream point location. A sub-basin is a sub-area within a drainage basin that is characterized by drainage features and homogeneous land use and contributes runoff to the drainage basin. Dividing larger watershed areas into individual drainage basins and sub-basins allows more detailed and accurate analyses of the individual areas. These individual analyses can then be combined to generate data for the large basins and the watershed as a whole. This process was followed for this Plan. An exhibit showing the drainage sub-basins as analyzed has been included as Map 2 in Appendix A.

3.4 SOIL TYPE INFORMATION

The soil type within a watershed area has a significant impact on how much excess stormwater is available for runoff because the soil type determines the precipitation infiltration rate. This infiltration rate is the rate at which water moves from the ground surface into subsurface soil layers. If the infiltration rate is very high, stormwater runoff generated by precipitation events is lower because a greater volume of moisture is absorbed by the soil. Conversely, if the infiltration rate is low, higher volumes of runoff are generated because minimal absorption occurs in the subsurface soil layers. The Soil Conservation Service (SCS) has studied soil types throughout the United States and has grouped soils according to their type and infiltration rates. These groups are described in the list below:

- Group A: These soils have a high infiltration rate. They are chiefly deep, well drained sands or gravel, deep loess, or aggregated silts. They have low runoff potential.
- Group B: These soils have a moderate infiltration rate when thoroughly wet. They are moderately deep and well drained and of moderately fine to moderately coarse texture. Examples are shallow loess and sand loam.
- Group C: These soils have a slow infiltration rate when wet. They are soils with a layer that impedes downward movement of water and typically have moderately fine to fine texture. Examples are clay loams or shallow sandy loams. These soils are typically low in organic content and high in clay content.
- Group D: These soils have a very slow infiltration rate. They are chiefly clay soils with high swelling potential. A high water table is often permanent. Clay pan is often found at or near the surface. A shallow layer of soil may cover a nearly impervious material. Examples include heavy plastic clays and certain saline soils. They have high runoff potential.

The United States Department of Agriculture, National Resource Conservation Service (NRCS) has performed several studies of soils throughout the United States including those in Enoch City and the surrounding area. These studies reveal that the soil types located in the study area are primarily of groups B, C, and D. Soil data used for the study area consisted primarily of data from the SSURGO database which was obtained from the NRCS Web Soil Survey website. The data collected was used in the watershed analysis described by this Plan. A map of the SCS soil types in the study area is included as Map 3 in Appendix A.

3.5 LAND USE PATTERNS

The type of land use in a given watershed area is a factor that significantly affects the magnitude of stormwater flow and runoff volume generated by precipitation events. Land uses that have relatively higher percentages of impervious surfaces such as parking lots, shopping areas, storage yards and high-density residential housing tracts generate more stormwater runoff than areas with lower percentages of impervious surfaces such as parks and grasslands.

A review of the national land cover database (NLCD), current aerial photographs, and information collected during the field investigation were used to determine the current land use categories used in this Plan. These land uses include the following:

- Developed
  - Developed, Open Space: Areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
  - Developed, Low Intensity: areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas most commonly include single-family housing units.
  - Developed, Medium Intensity: areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units.
  - Developed, High Intensity: highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80% to 100% of the total cover.
- Barren
  - Barren Land (Rock/Sand/Clay): areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.
- Forest
  - Deciduous Forest: areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
  - Evergreen Forest: areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
  - Mixed Forest: areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.

- Shrubland
  - Shrub/Scrub: areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage or trees stunted from environmental conditions.
- Herbaceous
  - Grassland/Herbaceous: areas dominated by graminoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling but can be utilized for grazing.
- Planted/Cultivated
  - Pasture/Hay: areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.
  - Cultivated Crops: areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.
- Wetlands
  - Woody Wetlands: areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.
  - Emergent Herbaceous Wetlands: Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

A map showing the current land uses used in this study has been included as Map 4 in Appendix A.

Development in the City has been governed by and has generally followed guidelines established by adopted zoning ordinances. It was assumed, for the purposes of this study and for predicting future land use patterns within the City, that development and land use will follow the Enoch City Zoning Map. The current zoning map has been included as Map 5 in Appendix A.

3.6 HISTORY OF FLOODING & COMPLAINTS

Enoch City has frequently experienced heavy rainfall events and subsequent flooding. The flooding experienced by the City has triggered multiple stormwater improvement projects, including projects funded by the NRCS. On August 17th, 2012, Enoch was inundated by a storm that dropped 2.5" of rain in 45 minutes ("Storm Drainage"). This event was considered a 500 year event, with a 0.2% probability of occurring in a given year. This triggered funding from the NRCS and design for a storm drain system in the affected area.

Enoch City experienced another historic flood event in 2021. This storm concentrated in a similar area as the 2012 storm and dropped an approximated 5-6" of rainwater in 45 minutes. The City declared a state of emergency as around 200 homes experienced flooding. Some homes experienced up to 6 feet of basement flooding. Several homes also experienced sewage along with the stormwater flooding due to the excess stormwater infiltrating the sanitary sewer system. The areas that were most affected include the eastern portions of the city south of Midvalley Road and near Half Mile Road, in the Homestead area.

Frequent flooding has occurred in older areas of the city, including the Garden Park and Cottonwood subdivisions. Subdivisions such as Pioneer Valley Estates and others with similar topography experience ponding as the adjacent roads are higher than the properties. In general, these areas do not have any existing stormwater infrastructure, such as curb and gutter or driveway culverts. Where driveway culverts have been installed, many are insufficient to convey the stormwater experienced by the town, resulting in ponding and flooding. The eastern portion of the city is more severely affected by flooding due to its proximity to the runoff from the East Bench.

4 HYDROLOGIC ANALYSIS

4.1 INTRODUCTION

After the field investigation and data collection process was performed, a hydrologic analysis of the drainage basins was created for Enoch City.

EPA SWMM® was used in this analysis to determine peak and total volume flows generated in the drainage basins and sub-basins. The main purpose of this analysis is to provide a hydraulic model that accurately represents the current storm drain system and will be used for future development. The main purpose of the analysis is to provide reference information for future analyses, basic data for future designs, and to ensure than no current systems within Enoch City are largely undersized or under designed.

Certain assumptions and modeling parameters that mathematically describe precipitation and runoff characteristics of the study area were required for development of the computer model. These parameters include:

- Method of Analysis
- Sub-basin Delineation
- Rainfall Data
- Design Storm
- Soil Type and Land Use Characteristics
- Basin Equivalent Width
- Impervious Area (%)

A discussion of these input parameters and the process of creating the hydrologic model is given in Section 5.2 below. Results generated by the computer model are discussed in Section 5.3.

4.2 HYDROLOGIC MODEL

4.2.1 METHOD OF ANALYSIS

Numerous methods have been developed for performing hydrologic analyses for given watersheds. Each of the methods has its strengths and weaknesses; therefore, particular methods are better suited to specific watershed characteristics and configurations. The EPA SWMM model will use slope & Froude for normal flowing pipes, and Hazen Williams for pressurized pipe. The EPA SWMM model also will use the SCS method to calculate infiltration. Data required for input includes rainfall intensities, predominant soil types, land use patterns, basin width for individual basins, and infiltration curve numbers (CN) for individual basins. Output results are runoff hydrographs from which peak flows and volumes can be determined.

Typically, storms have different intensities and will rain harder at certain times during a storm event. These patterns have been analyzed throughout the US and a few standard patterns otherwise known as storm distributions have been developed. The model will use two standard storm distributions 1) SCS Type II distribution and 2) Farmer Fletcher Curve.

In the Unit Hydrograph Method, input data is used to create an output hydrograph. Different design storms for Enoch City will be used for the analysis (i.e. 10-year 3-hour, 100-year 3-hour, and 100-year 24-hour) based on the theory that individual hydrographs resulting from successive increments of rainfall excess that occur throughout a storm period will be proportional in discharge throughout their length. The EPA SWMM® software package has the ability to run a dynamic model method to generate stormwater discharge hydrographs based on the required input data. Hence, this package was appropriately suited for analysis of the Enoch City watershed.

4.2.2 SUB-BASIN DELINEATION

In order to effectively model precipitation and runoff scenarios for the Enoch City watershed, the study area was divided into drainage subbasins. These subbasins were delineated on a block-by-block basis within the City to more accurately analyze the total runoff flow within the City. Map 2 included in Appendix A illustrates the subbasin delineations. These subbasins were delineated using a manual analysis of LiDAR data and represent the current storm runoff configuration for the City.

4.2.3 RAINFALL DATA

Rainfall data necessary for input into the computer model was taken from the National Oceanic Atmospheric Administration (NOAA) website ATLAS 14. Information regarding design storm depth-duration-frequency (DDF) of rainfall depths is provided in Table III.B.1 in Appendix B. The precipitation data given in a DDF table can be used to create a DDF curve which is a relationship between the depth, duration, and frequency or return period of a given storm event. This, in turn, can be used to produce a storm temporal distribution. This distribution is a relationship between the percentage of rain produced and the amount of time that has elapsed. These distributions are related to the design storm duration and the distribution used in this study can be found in Table III.B.2 in Appendix B.

4.2.4 DESIGN STORM

The design storm for a hydrologic analysis is normally chosen based upon data observations that reveal the type of precipitation event that produces the highest peak flows and volumes for a given watershed under realistic rainfall event conditions. In the western United States and especially arid areas, storms that generally produce the highest levels of runoff are thunderstorms. Historically, the rainfall event frequency used to size storm drain pipes in southern Utah has been the 10-year 3-hour storm, 100-year 3-hour storm, and 100-year 24-hour storms. The existing drainage system should be designed so that a 10-year 3-hour storm will be conveyed within the drainage network. The existing drainage system including roadway flow should be designed to convey the 100-year 3-hour storm. The 100-year 24-hour storm has generally been used to size detention facilities. These design storms are consistent with local standards and have consequently been selected for use by this Plan.

4.2.5 SOIL TYPE & LAND USE CHARACTERISTICS

One factor that significantly affects the amount of runoff generated by a particular watershed is the soil type within the watershed. Different soils have different infiltration rates, or rates at which water can move through the surface to subsurface layers and thus be held from flowing off the watershed via surface drainage. If the infiltration rate is high, the runoff generated from storms is decreased. If the infiltration rate is comparatively low, precipitation will flow off the watershed rather than being absorbed.

Another important factor that affects the amount of runoff generated by a watershed is land use. Developed areas have a higher percentage of impervious surfaces like streets, driveways, parking lots and roofs while undeveloped areas are typified by pervious surfaces and plant features that are more efficient at absorbing precipitation, preventing it from leaving the watershed as runoff. The result is that higher rates are expected with increased development than are typically observed from a watershed in its natural condition.

The effect of soil types and land uses on watershed runoff flows and volumes is accounted for within the SCS Unit Hydrograph method for hydrologic analysis by the runoff curve number (CN). The Soil Conservation Service has calculated CN values for each soil group based on particular land uses. The CN is used to estimate infiltration (SWMM, Section 3.4.1). Representative curve numbers were calculated by the computer model according to soil maps and land use maps imported into the model under existing and build-out conditions. These soil type maps and land use maps are shown in Maps 3 & 4 in Appendix A. Each sub-basin was assigned by the model a composite CN value based on a weighted average of the different soil and land use types located within each sub-basin. In addition, the curve number values assigned to each of the sub-basins is shown in tabular form with other drainage basin parameters listed in the hydrologic model data, which is included in Table III.B.5 in Appendix B.

4.2.6 IMPERVIOUS AREA (%)

One factor that significantly affects the amount of runoff generated by a particular watershed is the amount of impervious area in the subbasin. This correlates directly to the amount of water able to infiltrate into the soil. This parameter is given as a percentage of water that is able to produce surface run off rather than infiltrate the soil, where 100% would indicate a fully impervious surface. LiDAR data and engineering judgement were used to determine the percent impervious for each subbasin. The different values used in the EPA SWMM model for each subbasin are given in Table III.B.3 in Appendix B.

4.2.7 BASIN WIDTH

The final input parameter required for the hydrologic model is the basin width (W) which is generally defined as the width of the overland flow path for sheet flow runoff. An initial estimate of the characteristic width is given by the subcatchment area divided by the average maximum overland flow length. The maximum overland flow length is the length of the flow path from the furthest drainage point of the subcatchment before the flow becomes channelized. Maximum lengths from several different possible flow paths should be averaged. These paths should reflect slow flow, such as over pervious surfaces, more than rapid flow over pavement, for example. Adjustments should be made to the width parameter to produce good fits to measured runoff hydrographs.

4.3 HYDROLOGIC MODEL RESULTS

Information regarding sub-basins, rainfall data, design storms, land uses, soil types and lag times were compiled. Following the compilation of the watershed and rainfall information, an analysis using EPA SWMM® storm water management modeling software was run which generated runoff hydrographs for each sub-basin in the watershed area. The runoff hydrographs provided values on peak flows and total runoff volumes for each sub-basin. Peak flows and volumes resulting from the 100-year 3-hour storm event under future conditions are summarized in Table III.B.3 and Table III.B.4 in Appendix B.

5 RECOMMENDED IMPROVEMENTS

5.1 SYSTEM IMPROVEMENTS

Based on the findings of the field investigation (including the known problem areas) and the results of the hydrologic and hydraulic analyses (see Appendix B) the following list of recommended improvements has been provided.

A map showing the recommended improvements has also been included as Map 7 in Appendix A.

5.1.1 RECOMMENDED IMPROVEMENTS

Multiple improvements are necessary to manage the stormwater flow within Enoch City. This section will detail the recommended improvements by type. This plan does not provide costs for the NRCS projects planned to convey flow from the East Bench Watershed. Cost savings, though not accounted for in this Plan, are anticipated by installing any adjacent NRCS projects concurrently with the recommended improvements. A full Engineer's Opinion of Probable Cost for each improvement can be found in Appendix D. The total estimated cost of all recommended improvements is $101,619,000.00.

5.1.1.1 Drainage Channel and Crossing Projects

1. Ravine Channel
   A channel has recently been installed at the northeast border of the City. This plan recommends installation of a channel that connects to the existing channel and runs along the natural ravine adjacent to Ravine Rd to Enoch Rd. This also includes a portion of ditch at the inlet of the proposed pipe given in Item 20 of Section 5.1.1.2.
2. Jones Rd Ditch Upsizing
   A stormwater ditch currently runs east-to-west along Jones Rd from Veterans Memorial Dr to Tomahawk Dr. This plan recommends upsizing this ditch to a 8' bottom width, 2' deep trapezoidal channel.
3. Hatch Property Ditch
   Future development is expected to the Hatch property near Covered Wagon Dr. This plan proposes a ditch along the west side of the property to convey future stormwater flow.
4. Cottonwood Heights Ditch
   A ditch is proposed to convey stormwater from the Cottonwood Heights subdivision and adjacent field to proposed Detention Basin 2 detailed in Section 5.1.1.4. This ditch would be an 8' bottom width, 1' deep trapezoidal channel.
5. West Enoch Ditch
   A ditch is necessary to drain stormwater on the west side of Minersville Hwy to a proposed regional proposed Detention Basin 3 detailed in Section 5.1.1.4. This ditch would be a trapezoidal channel with varying width and depth running south-to-north starting at Midvalley Rd and 100 W, with a portion of east-to-west ditch from 5600 N.

5.1.1.2 Increase Conveyance - Storm Drain Pipe

1. Westward Dr to 3380 N
   Construct HDPE storm drain pipe of varying size from 24" to 48" to proposed Detention Basin 1 detailed in Section 5.1.1.4.
2. 3600 N through Bulldog Rd
   Construct HDPE storm drain pipe of varying size from 30" to 60" to proposed Detention Basin 2 detailed in Section 5.1.1.4. This also includes a length of 24" pipe through the Cottonwood Heights subdivision.
3. Driftwood Ln to Midvalley Rd
   Construct HDPE storm drain pipe of varying size from 24" to dual 36".
4. Palomino Dr to Midvalley Rd
   Construct HDPE storm drain pipe of varying size from 36" to 42" with an outlet at the proposed West Enoch Ditch given in Section 5.1.1.1. This also includes laterals along 4600 N and 1725 N.
5. Sarah Ave to West Enoch Ditch
   Construct 30" HDPE storm drain pipe to drain the Sagewood subdivision to the West Enoch Ditch given in Section 5.1.1.1.
6. Minersville Hwy – 3000 N to 5600 N
   Construct HDPE storm drain pipe of varying size from 18" to dual 48" with an outlet at the proposed West Enoch Ditch given in Section 5.1.1.1.
7. Grimshaw Ln – Churchfield Rd to 6400N
   Construct HDPE storm drain pipe of varying size from dual 36" to 48" with an outlet at the proposed Detention Basin 5 given in Section 5.1.1.1.
8. Garden Park
   Construct HDPE storm drain pipe of varying size from 18" to 48" within the Garden Park Estates subdivision to tie into the proposed Midvalley Rd storm drain line given in Item 9 of this section.
9. Midvalley Rd – Minersville Hwy to Horseshoe Trail
   Construct HDPE storm drain pipe of varying size from 24" to dual 48". This includes laterals along Quickdraw Ln and Old Scout Trl.
10. Half Mile Rd
    Construct 60" HDPE storm drain pipe to parallel the proposed 60" Plan EA pipe 4-C, with an outlet at proposed Detention Basin 4 given in Section 5.1.1.4.
11. 4200 N
    Construct HDPE storm drain pipe of varying size from 36" to 42" to tie into the proposed 60" NRCS pipe 8-D.
12. Rose Ln – Maple Ln to Half Mile Rd
    Construct dual 60" HDPE storm drain pipe.
13. Hideaway Rd
    Construct HDPE storm drain pipe of varying size from 24" to 36" to tie into the Iron Mountain subdivision detention basin.

14. Homestead Blvd & Sunshine Ln
    Construct 60" HDPE storm drain pipe to connect to the dual 60" Plan EA pipe 8-D. This also includes a 24" lateral along Sunshine Ln.
15. Stagecoach Ln – Upsize Existing
    Upsize the existing 36" HDPE storm drain pipe in Stagecoach lane to 60" HDPE pipe from Half Mile Rd to Old Scout Trl.
16. Southern Homestead Blvd – Connect to Existing
    Extend the existing 30" HDPE storm drain pipe to the east to Pioneer Dr. Upsize the Sunview Estates detention basin outlet pipe from 18" to 24".
17. Rachel Ln/Sunset Rd/Tomahawk Dr
    Construct HDPE storm drain pipe of varying size from 18" to 48" as well as laterals to tie into the proposed Detention Basin 6 given in Section 5.1.1.4.
18. Enoch Rd – Heritage Dr to Jones Rd
    Construct a section of 24" HDPE storm drain pipe to tie in to the existing system.
19. Mountain View Loop to Ravine Dr
    Construct HDPE storm drain pipe of varying size from 24" to 36" to connect to Plan EA pipe 2-C.
20. North Enoch Rd
    Construct 42" HDPE storm drain pipe to parallel 60" Plan EA pipe 2-D. Includes an outlet pipe to the Grimshaw property.
21. Enoch Rd – Culvert
    Construct 18" HDPE culvert to convey stormwater across the road near 5400 N Enoch Rd.

5.1.1.3 Increase Conveyance - Curb and Gutter

1. Cross Gutters
    a. Install new cross gutters as shown in Map 7 in Appendix A.
    b. Increase conveyance by ensuring all existing cross gutters are installed properly with positive drainage and no low spots.
    c. This plan also recommends a global change to the cross gutter cross section to increase conveyance capacity. Any change should still consider vehicle traffic clearances.
2. Curb and Gutter
    Install curb and gutter for the following streets/subdivisions:
    a. 3600 N
    b. Bulldog Rd
    c. Cotton Wood Heights Subdivision
    d. Driftwood Ln
    e. Palomino Dr
    f. Minersville Hwy
    g. 4200 N
    h. Garden Park Subdivision
    i. Corner of California and Homestead Blvd
    j. Maple Ln
    k. Stagecoach Ln
    l. Quick Draw Ln

m. Homestead Blvd
n. Wagon Wheel to 1365E - Southern Homestead Blvd
o. Southern Homestead Blvd
p. Half Mile Rd East
q. Half Mile Rd West
r. Old Scout Trl
s. Mule Train Dr
t. Pioneer Dr
u. Grimshaw Ln (600E)
v. Midvalley Rd
w. 5600 N
x. Sunset Rd
y. Ravine Road (Pomeroy Green Rd)
z. Village Green Rd
aa. Veterans Memorial Dr
bb. Jones Rd (5250N)
cc. Tomahawk Dr
dd. Horseshoe Dr

5.1.1.4 Detention Basins

1. Detention Basin 1
   Construct a 1.7 acre-ft detention basin at the outlet of the pipe given in Item 1 of Section 5.1.1.2. This includes a 12" outlet pipe to tie into the 3600N to Bulldog storm drain system. The bottom area of this basin should be a minimum of 12,500 SF to be adequately sized for estimated infiltration.
2. Detention Basin 2
   Construct a 16.2 acre-ft detention basin at the outlet of the pipe given in Item 2 of Section 5.1.1.2. This includes an 18" outlet pipe and outlet ditch to convey detained water downstream in a controlled manner. The bottom area of this basin should be a minimum of 150,000 SF to be adequately sized for estimated infiltration.
3. Detention Basin 3
   Construct a 69.8 acre-ft detention basin at the outlet of the West Enoch Ditch given in Section 5.1.1.1. This includes a 24" outlet pipe and outlet ditch to convey detained water downstream and out of the system. The bottom area of this basin should be a minimum of 450,000 SF to be adequately sized for estimated infiltration.
4. Detention Basin 4
   Construct a 39.0 acre-ft detention basin at the outlet of the pipe given in Item 10 of Section 5.1.1.2. This includes a 24" outlet pipe to the proposed Plan EA ditch 8-D (3) to convey detained water downstream and out of the system. The bottom area of this basin should be a minimum of 270,000 SF to be adequately sized for estimated infiltration.
5. Detention Basin 5
   Construct a 18.4 acre-ft detention basin at the outlet of the pipe given in Item 7 of Section 5.1.1.2. This includes a 24" outlet pipe and outlet ditch to convey detained water downstream and out of

the system. The bottom area of this basin should be a minimum of 125,000 SF to be adequately sized for estimated infiltration.

6. Detention Basin 6
   Construct a 31.7 acre-ft detention basin at the outlet of the pipe given in Item 20 of Section 5.1.1.2. This includes an 18" outlet pipe to convey detained water downstream and out of the system. The bottom area of this basin should be a minimum of 250,000 SF to be adequately sized for estimated infiltration.

5.1.1.5 NRCS Projects

1. Midvalley Rd to 5200 N Ditch Upsizing
   A stormwater ditch currently is installed west of the Valley Gates Estates subdivision. This ditch is insufficient to carry the planned stormwater flow that will output to this ditch. The Plan EA has planned a ditch in this location. This plan proposes to upsize the ditch to a 25' bottom width, 4' deep trapezoidal channel. This channel size has been coordinated with the Plan EA team to ensure both East Bench and local flows will be conveyed adequately. The estimated cost for this project in this plan will only consider the additional cost of earthwork needed to convey local flows above and beyond the Plan EA ditch sizing from East Bench outflows.

5.2 MAINTENANCE & MISCELLANEOUS IMPROVEMENTS

There are several improvements and practices that will enhance the ability for Enoch City to manage stormwater runoff. These improvements include both structural and non-structural items. They are:

1. Reshape Existing Roads: Some of the roads in Enoch lack the ideal 2% cross slope. Without a proper crown in the roadway, the ability of the roadway to convey stormwater and drain properly is diminished. It is recommended that as roadways are resurfaced, care be taken to ensure that the proper cross slope is established.
2. Install Curb and Gutter and Cross Gutters: Many of the streets in Enoch do not have complete curb and gutter systems which control runoff from the street. The City should pave these roads whenever possible and require curb and gutter and cross gutters on all future street improvements.
3. Complete Regular Street Sweeping: A comprehensive street sweeping and cleanup program should be developed to remove sediment and trash from the streets and gutters so debris is not washed to downstream storm drain control facilities. It is anticipated that this simple maintenance procedure will greatly reduce future costs for maintenance of the storm drain system.
4. Complete Regular Facility Cleaning: A comprehensive facility maintenance program should be established to clean inlet boxes, manholes, pipe systems, and any future pollution control structures. Regular maintenance will ensure the proper functionality of these structures, prolong life expectancy and reduce future maintenance costs.
5. Ensure Proper Grate Orientation: Ensure that the catch basins in the Enoch storm drain system that are fitted with directional grates have the directional grates installed in the correct orientation to function at maximum efficiency. Maintenance of the storm drain system should include a procedure to ensure that the grates on every catch basin are oriented properly.

6. Establish Standard Maintenance Program: It is recommended that the City develop a regular storm drain system maintenance program with proper tracking and record keeping. This process is most easily accomplished using current computer technology including mapping and record keeping software. Implementing such a system will allow the City to maintain the storm drain system at the highest level of efficiency.
7. Update this IFFPA: A Plan update should occur every five years or as growth dictates to maintain current impact fees and update the impact fee facilities plan.

5.3 WATER QUALITY IMPROVEMENTS MEASUREMENTS

One of the primary goals of a stormwater management plan is to enhance the quality of water discharged to downstream stormwater conveyance facilities. Runoff generated from urban and suburban areas often contains pollutants such as sediments, road salts, oils, greases, solvents, pesticides, fertilizers, detergents, trash and many other forms of pollutants which may be discharged to downstream rivers and lakes. The Environmental Protection Agency (EPA) requires that these pollutants be controlled, mitigated, and otherwise eliminated before they are discharged.

The first line of defense against pollution discharges are detention basin facilities installed near low segments of storm drain systems. Detention basins control peak flows that would otherwise be routed directly to receiving discharge facilities. As stormwater runoff is held in the detention basin, flow velocity of the water is minimized and many of the suspended pollutants are able to settle out. Some of the pollutants are broken down organically while the physical debris, such as trash and sediment, can be manually cleaned from the detention basin and disposed of properly. This study recommends installation of local detention basin facilities in future developments in the City. These would be implemented by individual developers.

The second line of defense against pollution discharges are Best Management Practice (BMP) improvements such as oil and grease separation structures, vegetated outlet channels, and storm drain inlet filters. These improvements are designed to remove oils, greases, excess sediments, debris, and other similar materials from stormwater before it is discharged to downstream receiving facilities. It is recommended that improvements of this type be installed on all future major storm drain lines to ensure that these pollutant types are removed from stormwater before it is discharged from the storm drain system into the downstream rivers and lakes. It should be noted that these facilities require regular maintenance. If not cleaned and maintained properly, these devices cease to function, and no pollutants are removed from the discharge flows.

5.4 COST ESTIMATES & PROJECT PRIORITY LIST

After establishing the list of recommended improvements, the City was consulted on the phasing for feasibly installing the projects. A priority list was created using this input, as well as considering necessary infrastructure to install the storm drain system from downstream to upstream.

This priority list also considers that Enoch City will have a 25% cost share of the total Plan EA project cost. As stated previously, this plan will not estimate the costs for the Plan EA projects. However, a preliminary estimate of the project costs was obtained from the Plan EA team and can be found in Appendix G. This cost share will be considered in the cost estimates for use in the impact fee and user rate analyses.

The 0-10 year priority improvements along with the Plan EA cost share are estimated to cost $21,849,000.00 in 2024 dollars and are given in Table 9. The full list of priority projects can be found in Appendix D.

Table 9: 0-10 Year Priority Improvements

Project	Cost	Est. Year of Installation	Estimated Costs with 3% Inflation
Drainage Channel and Crossing Projects			
Ravine Channel	$297,000.00	2026	$316,000.00
Detention Facilities Projects			
Detention Basin 4	$1,637,000.00	2025	$1,687,000.00
Storm Drain Pipe System Projects			
Enoch Rd – Culvert	$30,000.00	2025	$31,000.00
Half Mile Rd	$5,148,000.00	2026	$5,462,000.00
North Enoch Rd	$649,000.00	2027	$710,000.00
Homestead Blvd & Sunshine Ln	$1,156,000.00	2028	$1,302,000.00
Roadway Conveyance Projects			
Half Mile Rd West	$143,000.00	2025	$148,000.00
Ravine Road (Pomeroy Green Rd)	$153,000.00	2026	$163,000.00
Village Green Rd	$478,000.00	2026	$508,000.00
Half Mile Rd East	$256,000.00	2027	$280,000.00
4200 N	$1,078,000.00	2027	$1,178,000.00
Corner of California and Homestead Blvd	$111,000.00	2028	$125,000.00
Homestead Blvd	$447,000.00	2028	$504,000.00
Grimshaw Ln (600E)	$200,000.00	2029	$232,000.00
Wagon Wheel to 1365E - Southern Homestead Blvd	$166,000.00	2031	$205,000.00
Jones Rd (5250N)	$316,000.00	2032	$401,000.00
Veterans Memorial Dr	$176,000.00	2033	$230,000.00
NRCS Projects			
Midvalley Rd to 5200 N Ditch Upsizing	$504,000.00	2025	$520,000.00
East Bench EA Projects - 25% Cost Share	$6,571,000.00	2030	$7,847,000.00
Total	**$ 19,516,000.00**		**$21,849,000.00**

5.5 FURTHER CONSIDERATIONS

Stormwater facilities include a wide assortment of constructed practices designed to manage and control the stormwater runoff from a certain area of land. The best stormwater management facility design cannot preclude the need for long term maintenance and repair of these facilities to keep the facility functioning as originally designed. The lack of proper operation and maintenance is often cited as the number one reason for failure of facilities or damage to property from flooding events. Routine maintenance addresses the expected activities required to keep the stormwater facilities in proper condition.

Routine maintenance may include mowing, vegetation maintenance, and removal of accumulated debris and sediment. The party responsible for the stormwater facilities shall keep accurate and complete records. Typical records include a log of all inspections, repairs and maintenance performed at the site, copies of inspection reports, invoices for work performed, photographs of the facilities, etc. These records, along with establishing an ongoing operation maintenance program, are the key to successful stormwater maintenance.

The stormwater utility fund was established in 2015. The fund should provide for costs associated with routine maintenance, property management, inspections and record keeping, as well as providing for remedial maintenance that can be anticipated over the life of the stormwater facilities. User rates should be adopted that cover these costs.

6 USER RATE ANALYSIS

6.1 EXISTING USER RATE

In general, revenues generated must be sufficient to cover the expenses incurred by the construction, maintenance, operation, and administration of the storm water system. Expected expenses include debt services, insurance, personnel salaries, legal and professional fees, and other miscellaneous items. Enoch City currently charges a stormwater user rate of $2.00/month for residential and $4.00/month for commercial to each metered culinary water connection.

6.2 FINANCING PLAN

It is recommended that Enoch seek a loan for the full amount of the 10-year improvements projects, as wells as the cost of a future stormwater Impact Fees Facilities Plan update. The anticipated financing plan is given in Figure 2. However, the City should seek grants to fund the projects and reduce the financial burden upon the City wherever possible.

ENOCH CITY				
FY 2026 FINANCING PLAN				
TOTAL 10-YR PROJECTS COST			**$**	**21,965,000**
FY 2026 EXPENSES				
Proposed Funding:	**Rate**	**Term in Yrs.**		**Principal**
Self Participation				$0
2026 Loan	2.75%	30	$	21,965,000
TOTAL PROJECT FUNDING:			**$**	**21,965,000**

Figure 2: Financing Plan

6.3 USER RATE ANALYSIS

A user rate analysis was performed to determine what average user rate would be required to cover the storm water system expenses. The IFFPA recommended improvements are assumed to be paid for with impact fees, as well as 100% debt service. The new user rates were calculated by summing annual operating expenses to the system and new debt service then dividing the total expenses amount by the number of connections currently serviced by the system. Values from the FY2024 City audit were used with engineering judgment to achieve final values for salaries, materials, and capital expenses shown in the user rate analysis. Due to the large number of recommended projects, the 20-year projects have been left out of the user rate analysis. It is recommended that user rates be re-evaluated between the construction of the 10-year and 20-year improvements projects. The recommended user rate is $20.87 per month for residential connections and $41.75 per month for commercial connections, for an average rate of $21.10 when weighing the number of residential connections versus commercial connections.

ENOCH CITY	
FY 2026 USER RATE ANALYSIS	
EXPENSES: (First Year)	
Salaries & Wages	$13,219
Employee Benefits	$752
Supplies and Materials	$10,300
Professional Services	$448,050
Collection Fees	$0
Depreciation	$29,870
Capital Outlay	$109,651
Increase to Fund Balance	$143,914
Other Expenses	$0
Projects Expenses Fund	
Subtotal Expenses:	**$755,756**
EXISTING DEBT SERVICE	
Subtotal Existing Annual Debt Service:	**$0**
NEW DEBT SERVICE	
2026 Loan	$1,084,729
Loan Reserve (Payment/10)	$108,473
Subtotal New Annual Debt Service:	**$1,193,202**
Renewal and Replacement Fund (5% of Annual Expenses)	$37,788
GRAND TOTAL EXPENSES:	**$1,986,745**
ANNUAL INCOME	
Projected Yearly Impact Fees Received	$1,287,932
Total Number Of Connections	2,760
Average Monthly Storm Sewer User Rate/ERU	**$21.10**
TOTAL ANNUAL INCOME:	**$1,986,745**

Figure 3: User Rate Analysis for FY 2026

6.4 CASH FLOW ANALYSIS

The cash flow analysis projects the City's funds. The City does not have any existing debt service for stormwater. Stormwater revenue from impact fees and user rates, operating expenses, and new debt service for the recommended projects was analyzed for a 20-year period. The full cash flow analysis can be found in Appendix E.

7 IMPACT FEE ANALYSIS

This report also constitutes an Impact Fee Facilities Plan to determine the public facilities required to serve growth from new development.

7.1 EXISTING IMPACT FEE

Enoch City currently charges a stormwater system impact fee of $1,593.14 per ERU. The City does not currently charge a different rate between residential and commercial connections.

7.2 PROPOSED IMPACT FEE

As detailed throughout this report, the City is in need of additional storm drain system infrastructure to meet the needs of current and future drainage scenarios. The City is responsible for the current deficiencies in the storm drain system, but future development that occurs within the drainage area analyzed will further add to the deficiencies in the system. Because of this, an appropriate share of the costs associated with the recommended improvements should be the responsibility of future developments.

7.2.1 IMPACT FEE ELIGIBILITY

To determine the maximum allowable impact fee, an eligibility percentage was established for each project within the 10-year planning window. This percentage was determined by creating large basins for the City within the future zoned boundary that will drain the different areas within the town. The percentage of that basin that is undeveloped was considered as the percent impact fee eligible for a project within that basin. Projects that span multiple basins were analyzed with a weighted average. The percent developable per by basin is given in Table 10. An exhibit showing the large basins is given in Map 8 in Appendix A.

Table 10: Developable Percentage by Basin

Basin Name	Developed Acres	Total Acres	% Developable
Basin 1	165.6	1487.5	88.9%
Basin 2	204.2	543.2	62.4%
Basin 3	226.3	1035	78.1%
Basin 4	282.5	1567.6	82.0%
Basin 5	243.4	293.6	17.1%
Basin 6	932	2543.7	63.4%
Basin 7	384.5	872.1	55.9%
Total	2438.5	8342.7	70.8%

For the Plan EA projects, these were considered to benefit the entire city and therefore a total percent-eligible of 70.8% was used. A stormwater Impact Fees Facilities Plan update was also included in the costs as 100% impact fee eligible. Using this analysis, the total impact fee eligible amount for the 10-year planning period is $14.965,100. out of the total projects cost of $21,965,000.00. The impact fee eligibility by project and total impact fee eligible amount is given in Figure 4.

Impact Fee Projects & Impact Fee Eligibility

Drainage Channel and Crossing Projects	Current Costs	Year	Costs w/ Inflation*	% IF El.	IF El. Cost
Ravine Channel	$ 297,000.00	2026	$ 316,000.00	82.0%	$ 259,200.00
		Sub total	$ 316,000.00		
Detention Facilities Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Detention Basin 4	$ 1,637,000.00	2025	$ 1,687,000.00	67.7%	$ 1,141,300.00
		Sub total	$ 1,687,000.00		
Storm Drain Pipe System Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Enoch Rd – Culvert	$ 30,000.00	2025	$ 31,000.00	82.0%	$ 25,500.00
Half Mile Rd	$ 5,148,000.00	2026	$ 5,462,000.00	67.7%	$ 3,695,200.00
North Enoch Rd	$ 649,000.00	2027	$ 710,000.00	82.0%	$ 582,200.00
Homestead Blvd & Sunshine Ln	$ 1,156,000.00	2028	$ 1,302,000.00	63.4%	$ 825,500.00
		Sub total	$ 7,505,000.00		
Roadway Conveyance Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Half Mile Rd West	$ 143,000.00	2025	$ 148,000.00	63.4%	$ 93,900.00
Ravine Road (Pomeroy Green Rd)	$ 153,000.00	2026	$ 163,000.00	88.9%	$ 145,000.00
Village Green Rd	$ 478,000.00	2026	$ 508,000.00	88.9%	$ 451,700.00
Half Mile Rd East	$ 256,000.00	2027	$ 280,000.00	63.4%	$ 177,600.00
4200 N	$ 1,078,000.00	2027	$ 1,178,000.00	63.4%	$ 746,900.00
Corner of California and Homestead Blvd	$ 111,000.00	2028	$ 125,000.00	63.4%	$ 79,300.00
Homestead Blvd	$ 447,000.00	2028	$ 504,000.00	63.4%	$ 319,600.00
Grimshaw Ln (600E)	$ 200,000.00	2029	$ 232,000.00	63.2%	$ 146,700.00
Wagon Wheel to 1365E - Southern Homestead Blvd	$ 166,000.00	2031	$ 205,000.00	63.4%	$ 130,000.00
Jones Rd (5250N)	$ 316,000.00	2032	$ 401,000.00	17.1%	$ 68,600.00
Veterans Memorial Dr	$ 176,000.00	2033	$ 230,000.00	17.1%	$ 39,400.00
		Sub total	$ 3,974,000		
NRCS Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Midvalley Rd to 5200 N Ditch Upsizing	$ 504,000.00	2025	$ 520,000.00	70.8%	$ 368,100.00
East Bench EA Projects - 25% Cost Share	$ 6,571,000.00	2030	$ 7,847,000.00	70.8%	$ 5,553,400.00
		Sub total	$ 8,367,000.00		
Future Planning Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Stormwater IFFP & IFA Update	$ 100,000	2029	$ 116,000.00	100.0%	$ 116,000.00
		Sub total	$ 116,000.00	**Impact Fee Amount**	**$ 14,965,100.00**
	Total		**$ 21,965,000.00**		

* Inflation is assumed at 3%

Figure 4: Impact Fee Projects and Impact Fee Eligibility

7.2.2 PROPOSED IMPACT FEE BY ZONE

The new connections that result in equivalent residential acres that are projected to be added to the City in the 10-year planning horizon following FY 2026 (1094 connections, 613 equivalent acres) should pay for their portion of the improvements. The number of equivalent acres added to the City in the 10-year planning horizon is divided by the impact fee eligible project cost to determine an average impact fee per acre, then weighted by acreage to determine the base R-1-11 impact fee. This base impact fee is then multiplied by the runoff coefficient ratios established in Section 2.5 to determine the impact fee for each zone. Table 11 shows the maximum allowable impact fee per acre and quarter-acre by zone. Further detail on this calculation can be found in Appendix F.

Table 11: Impact Fee By Zone

Zoning Description	Impact Fee/Acre	Impact Fee/ 0.25 Acre
Mobile Home Park (MHP)	$39,240.00	$9,810.00
Mixed Residential (MXR_18)	$30,090.00	$7,530.00
Rural Residential 5 (R-R-5)	$18,060.00	$4,520.00
Professional Office (P-O)	$42,130.00	$10,540.00
Research Industrial Park (R/I-P)	$48,140.00	$12,040.00
Multiple Residential (M-R-2)	$39,240.00	$9,810.00
Community Commercial (C-C)	$48,140.00	$12,040.00
Neighborhood Commercial (N-C)	$36,110.00	$9,030.00
Regional Commercial (R-C)	$54,160.00	$13,540.00
RV Park (RVP)	$39,240.00	$9,810.00
Residential 18 (R-1-18)	$21,190.00	$5,300.00
Residential 11 (R-1-11)	$24,070.00	**$6,020.00**
Rural Residential 1 (R-R-1)	$18,060.00	$4,520.00

7.3 IMPACT FEE RELATED ITEMS

In general, it is beneficial to update this impact fee facilities plan and impact fee analysis at least every five years, or more frequently if unexpected growth or changes affect the assumptions and data in this plan. It is assumed that this plan will be updated as recommended.

There are several items relating to impact fees that Enoch City should consider when planning for, collecting, and expending impact fees in accordance with Utah Code 11-36a. First, the City can only expend impact fees for system improvements that are identified in the impact fee facilities plan and that are for the specific facility type for which the fee was collected. Second, impact fees must be expended or encumbered for a permissible use within six years of their receipt unless 11-36a-602(2)(b) applies. Third, impact fees must be properly accounted for (collections and expenditures documented) in accordance with Utah Code 11-36a-601. The other provisions of Utah Code 11-36a also apply.

In accordance with Utah Code 11-36a-306, a certification of impact fee analysis is in Appendix F.

The impact fee ordinance adopted by Enoch City will be attached as Appendix H following enactment of an impact fee amount by the City Council.

7.4 RECOMMENDATIONS AND CONCLUSION

Enoch City has steadily grown over its history as a community, and continual growth is to be expected. The City has experienced severe flooding and should seek to construct improvement projects to begin improving the storm drain system. This impact fee analysis will help the City appropriate the costs of system improvements and expansion to the new growth that the improvements will serve.

8 REFERENCES

Lindeburg, Michael R. *PE Civil Reference Manual*. 16th ed., Belmont, California, Professional Publications, Inc, 2018, Appendix 20.A.

"Storm Drainage". *Enoch City.* www.cityofenoch.org/new---storm-drainage.html. Accessed 28 June 2024.

United States Census Bureau. *Decennial Tables.* data.census.gov/table/DECENNIALPL2020.P1?q=enoch%20ut. Accessed 28 June 2024.

United States Environmental Protection Agency (EPA). *Storm Water Management Model (SWMM) User's Manual Version 5.2,* EPA-600/R-22/030. Revised February 2022.

APPENDIX A : MAPS

DATE: 7/10/2024

APPENDIX A - Map 1: Existing Facilities

Legend

- Junction Chamber
- Pump Station
- Stormwater Outfall
- Stormwater Inlets
- Stormwater Manholes
- Stormwater Curb & Gutter
- Stormwater Cross Gutters
- Stormwater Culverts
- Stormwater Ditch
- Existing Pipe Unknown
- Existing Pipe 18"
- Existing Pipe 24"
- Existing Pipe 30"
- Existing Pipe 36"
- Existing Pipe 48"
- Existing Pipe 60"
- Stormwater Detention Basins
- Enoch City Tier II Boundary
- Municipal Boundary

0 0.5 1 1in = .5mi

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DATE: 7/10/2024

APPENDIX A - Map 2: Stormwater Subbasins

Legend

- Stormwater Subbasins
- Enoch City Tier II Boundary
- Municipal Boundary

0 0.5 1 1in = .5mi

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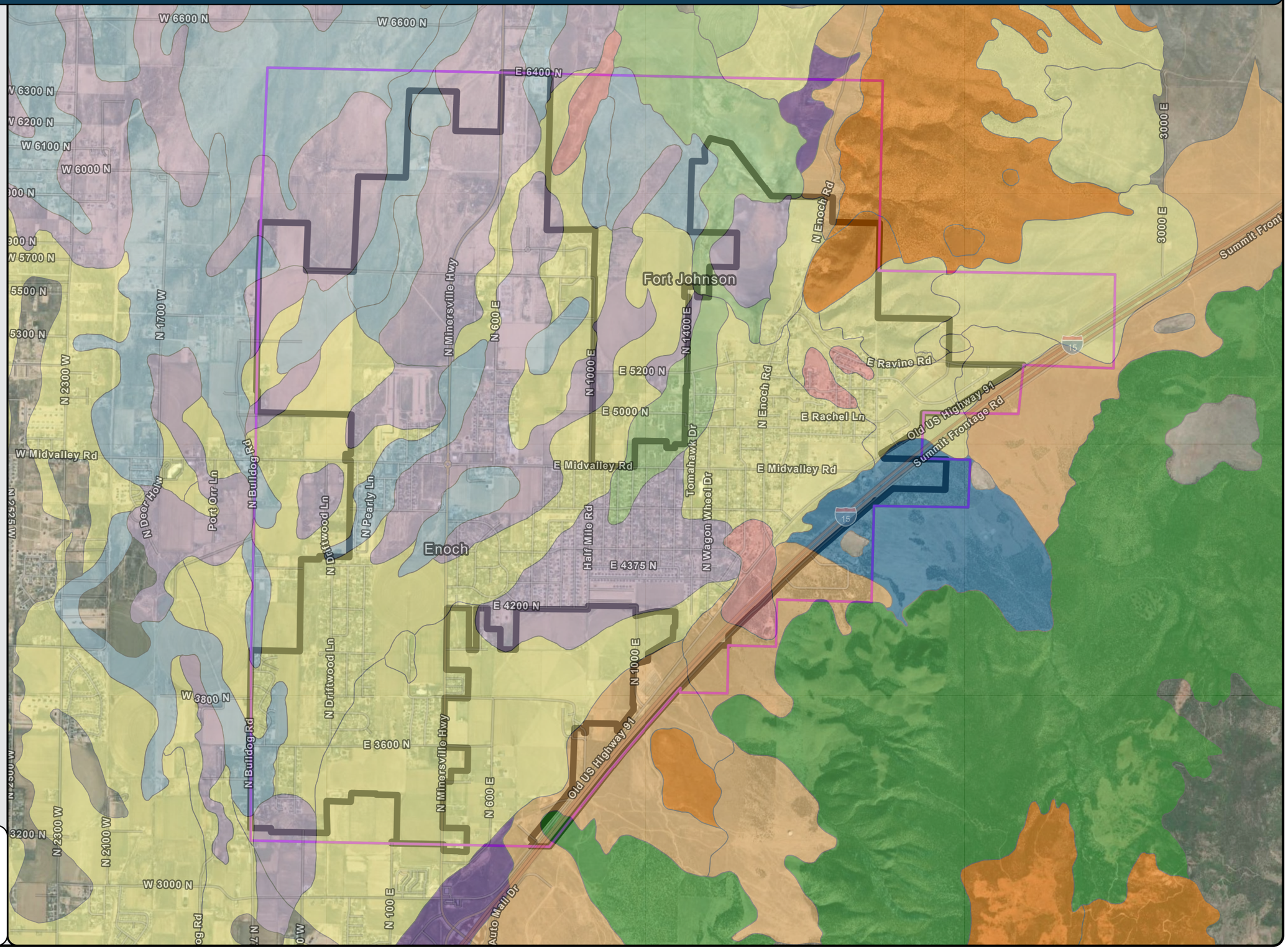
DATE: 7/10/2024

APPENDIX A - Map 3: SCS Soil Types

Legend

- cobbly loam
- extremely cobbly loam
- fine sandy loam
- gravelly loam
- gravelly sandy loam
- loam
- sandy loam
- silt loam
- silty clay loam
- very gravelly loam
- Enoch City Tier II Boundary
- Municipal Boundary



0 0.5 1 1in = .5mi

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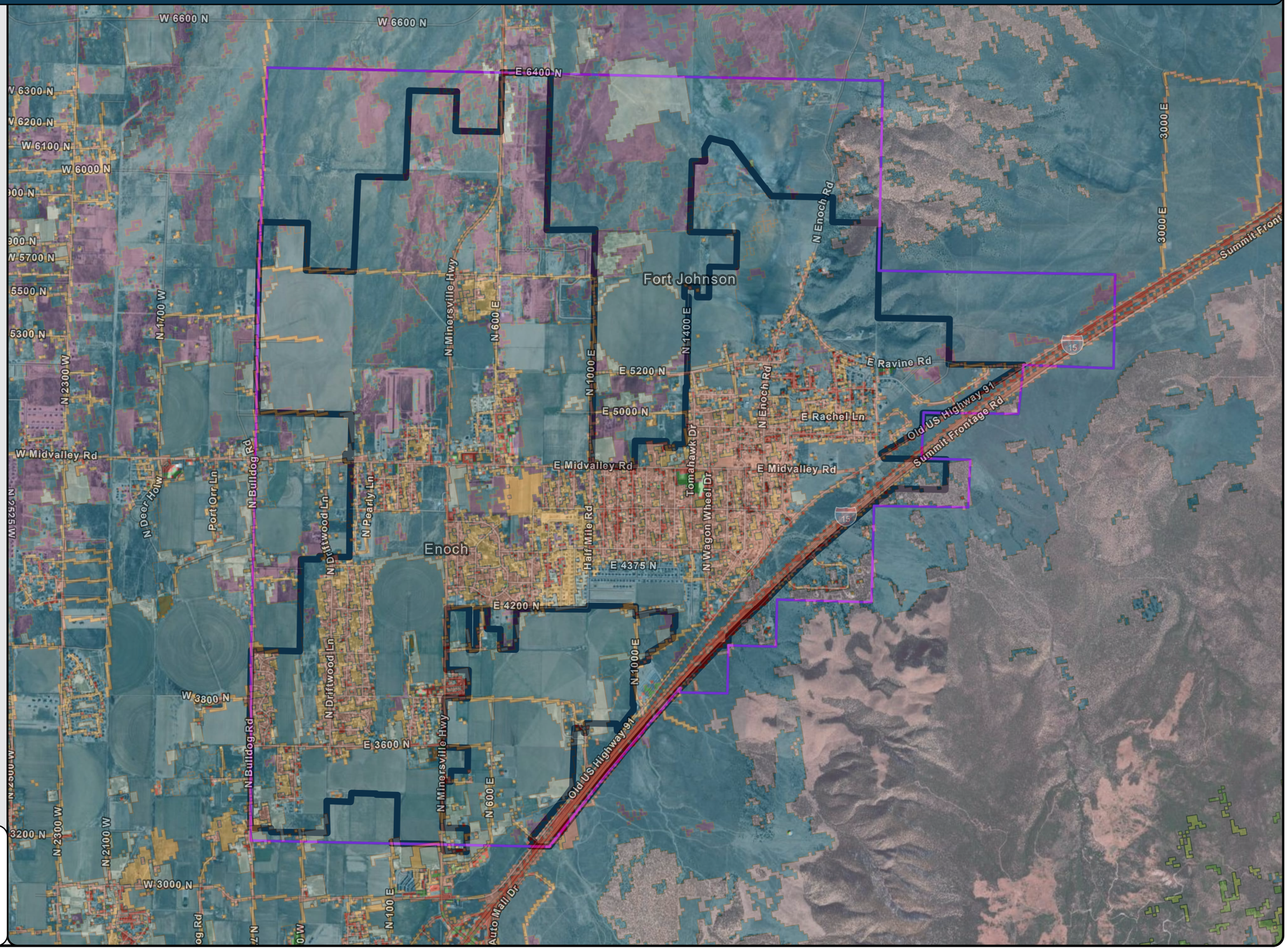
DATE: 7/10/2024

APPENDIX A - Map 4: NLCD Land Use

Legend

- Barren Land (Rock/Sand/ Clay)
- Cultivated Crops
- Deciduous Forest
- Developed High Intensity
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, Open Space
- Emergent Herbaceous Wetlands
- Evergreen Forest
- Grassland/Herbaceous
- Mixed Forest
- Open Water
- Pasture/Hay
- Shrub/Scrub
- Woody Wetlands
- Enoch City Tier II Boundary
- Municipal Boundary



0 0.5 1 1in = .5mi

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DATE: 7/10/2024

APPENDIX A - Map 5: Zoning

Legend

- C-C - Community Commercial
- M-R-2 - Multiple Residential
- MHP - Mobil Home Park
- RVP - RV Park
- MXR-18 - Mixed Residential
- N-C - Neighborhood Commercial
- P-O - Professional Office
- R-1-11 - Residential 11
- R-1-18 - Residential 18
- R-C - Regional Commercial
- R-R-1 - Rural Residential 1
- R-R-2 - Rural Residential 2
- R-R-5 - Rural Residential 5
- R/I-P -Research Industrial Park
- Enoch City Tier II Boundary
- Municipal Boundary

0 0.5 1 1in = .5mi

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DATE: 7/10/2024

APPENDIX A - Map 6: Impervious Area

Legend

- Impervious Area
- Enoch City Tier II Boundary
- Municipal Boundary

0 0.5 1 1in = .5mi

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DATE: 7/10/2024

APPENDIX A - Map 7: Recommended Improvements

Legend

- Proposed Ponds
- Proposed 1.5ft Pipe
- Proposed 2ft Pipe
- Proposed 2.5ft Pipe
- Proposed 3ft Pipe
- Proposed 3.5ft Pipe
- Proposed 4ft Pipe
- Proposed 5ft Pipe
- Proposed Culverts
- Proposed Cross Gutter
- Proposed Curb and Gutter
- Proposed Channels
- Proposed NRCS Pipes
- Proposed NRCS Channels
- Recommended Drainage Channel and Crossing Projects (5.1.1.1)
- Recommended Increase Conveyance - Storm Drain Pipe (5.1.1.2)
- Recommended Increase Conveyance - Curb and Gutter (5.1.1.3-2)
- Recommended Increase Conveyance - Cross Gutter (5.1.1.3-1)
- Enoch City Tier II Boundary
- Municipal Boundary

0 0.5 1 1in = .5mi

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DATE: 7/10/2024

APPENDIX A - Map 7a: Recommended Improvements

Legend

- Proposed Ponds
- Proposed 1.5ft Pipe
- Proposed 2ft Pipe
- Proposed 2.5ft Pipe
- Proposed 3ft Pipe
- Proposed 3.5ft Pipe
- Proposed 4ft Pipe
- Proposed 5ft Pipe
- Proposed Culverts
- Proposed Cross Gutter
- Proposed Curb and Gutter
- Proposed Channels
- Proposed NRCS Pipes
- Proposed NRCS Channels
- Recommended Drainage Channel and Crossing Projects (5.1.1.1)
- Recommended Increase Conveyance - Storm Drain Pipe (5.1.1.2)
- Recommended Increase Conveyance - Curb and Gutter (5.1.1.3-2)
- Recommended Increase Conveyance - Cross Gutter (5.1.1.3-1)
- Enoch City Tier II Boundary
- Municipal Boundary

0 0.2 0.4 1in = .2mi

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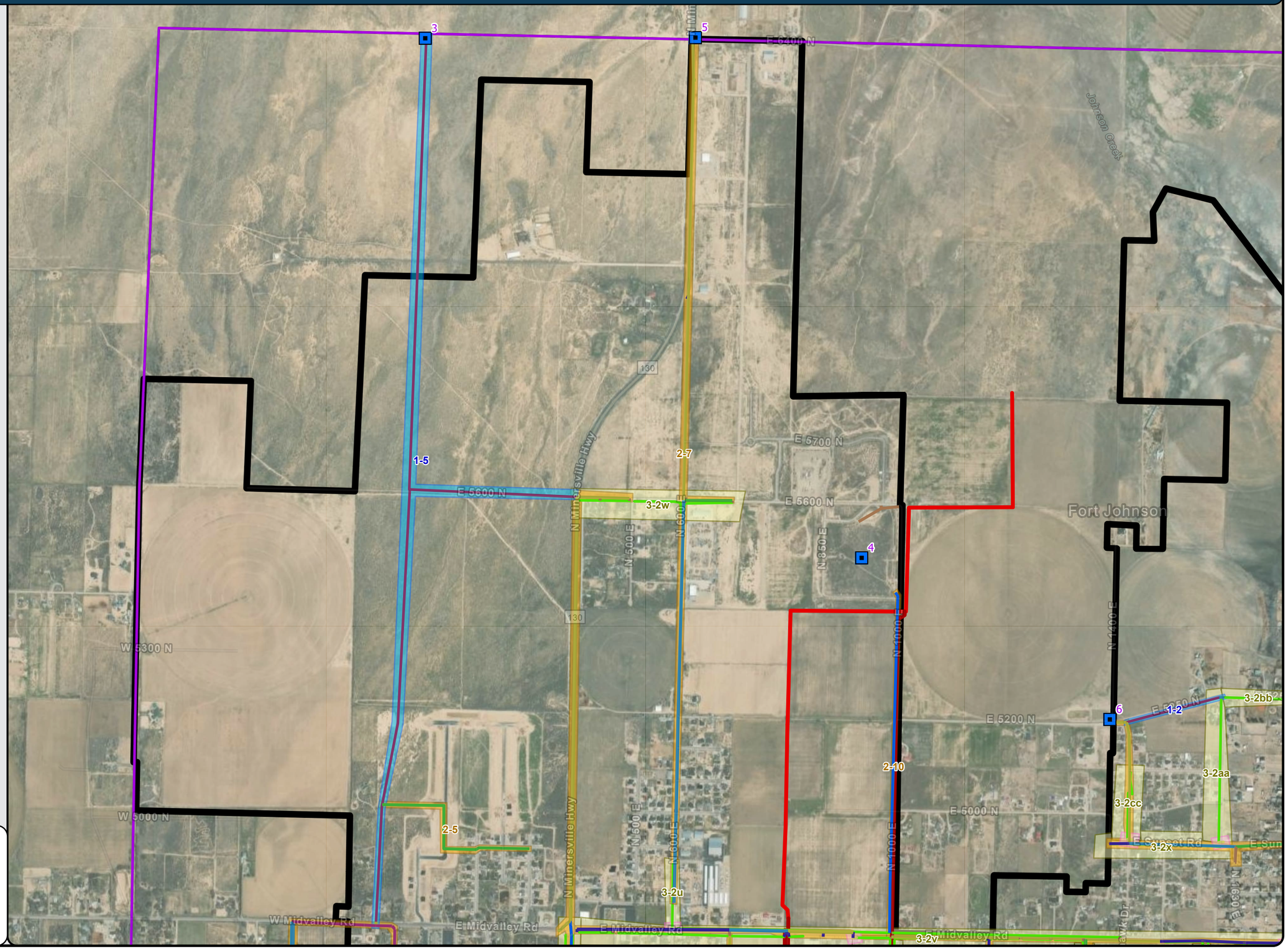


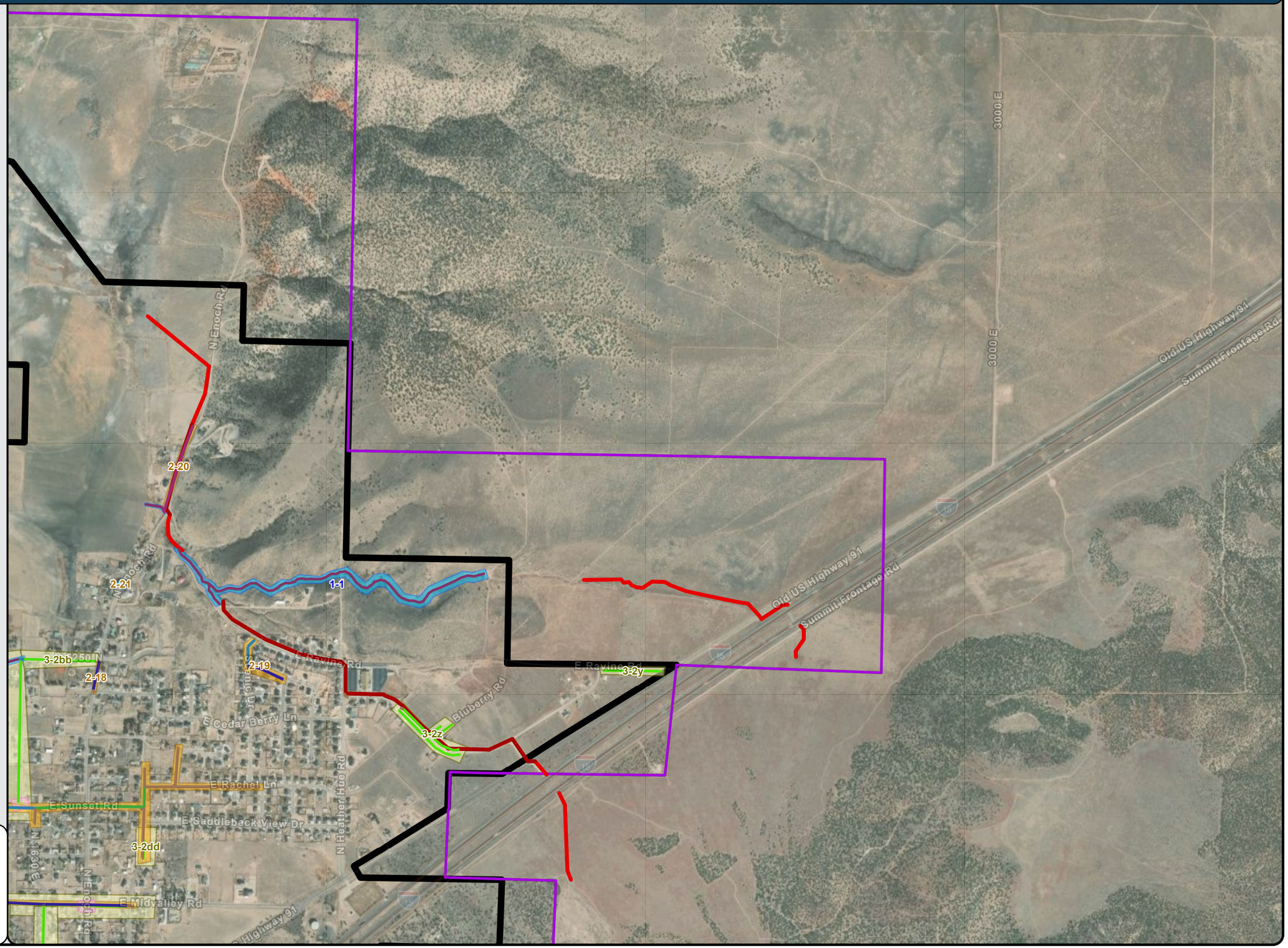
DATE: 7/10/2024

APPENDIX A - Map 7b: Recommended Improvements

Legend

- Proposed Ponds
- Proposed 1.5ft Pipe
- Proposed 2ft Pipe
- Proposed 2.5ft Pipe
- Proposed 3ft Pipe
- Proposed 3.5ft Pipe
- Proposed 4ft Pipe
- Proposed 5ft Pipe
- Proposed Culverts
- Proposed Cross Gutter
- Proposed Curb and Gutter
- Proposed Channels
- Proposed NRCS Pipes
- Proposed NRCS Channels
- Recommended Drainage Channel and Crossing Projects (5.1.1.1)
- Recommended Increase Conveyance - Storm Drain Pipe (5.1.1.2)
- Recommended Increase Conveyance - Curb and Gutter (5.1.1.3-2)
- Recommended Increase Conveyance - Cross Gutter (5.1.1.3-1)
- Enoch City Tier II Boundary
- Municipal Boundary

0 0.2 0.4 1in = .2mi



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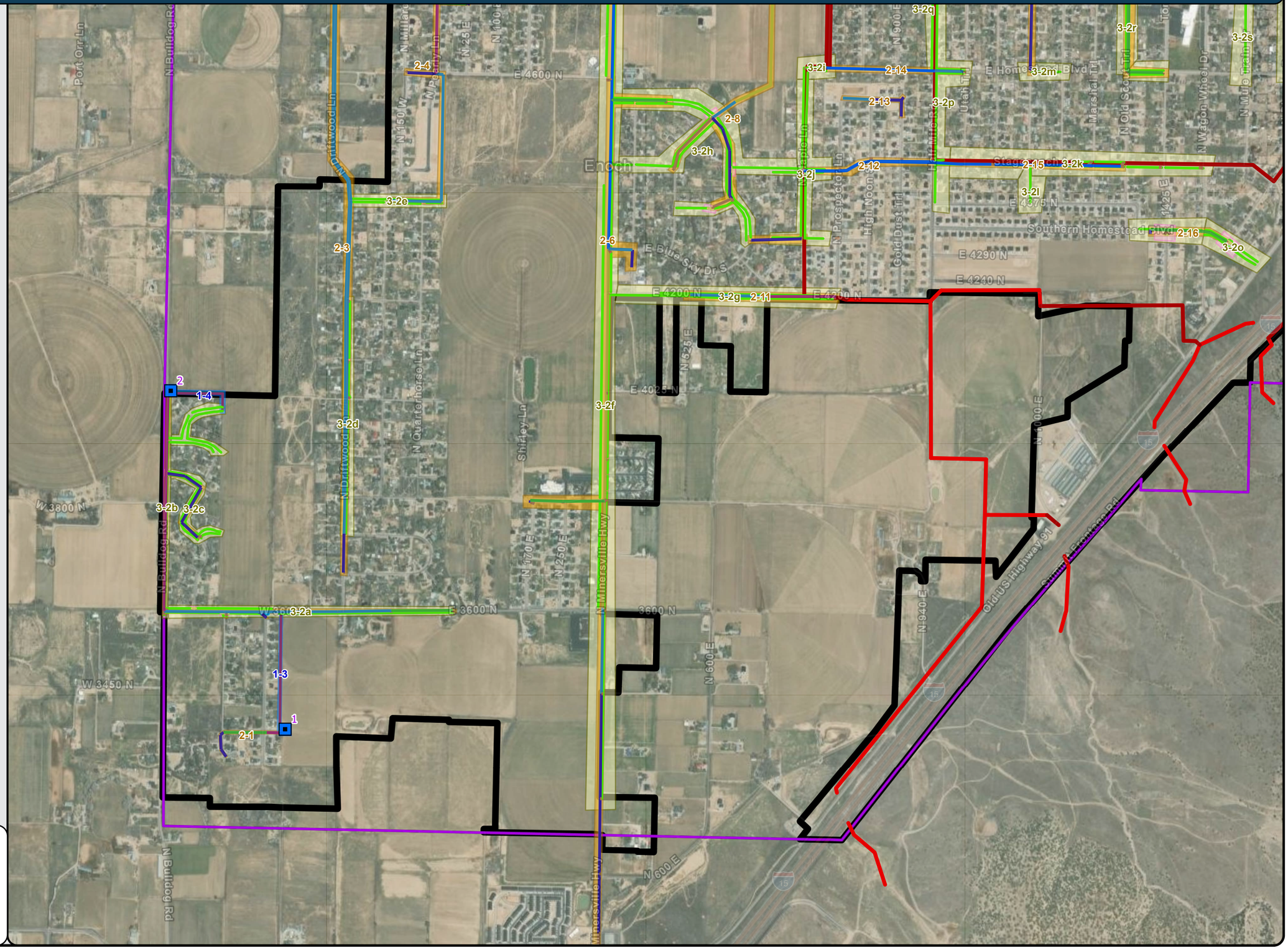
DATE: 7/10/2024

APPENDIX A - Map 7c: Recommended Improvements

Legend

- Proposed Ponds
- Proposed 1.5ft Pipe
- Proposed 2ft Pipe
- Proposed 2.5ft Pipe
- Proposed 3ft Pipe
- Proposed 3.5ft Pipe
- Proposed 4ft Pipe
- Proposed 5ft Pipe
- Proposed Culverts
- Proposed Cross Gutter
- Proposed Curb and Gutter
- Proposed Channels
- Proposed NRCS Pipes
- Proposed NRCS Channels
- Recommended Drainage Channel and Crossing Projects (5.1.1.1)
- Recommended Increase Conveyance - Storm Drain Pipe (5.1.1.2)
- Recommended Increase Conveyance - Curb and Gutter (5.1.1.3-2)
- Recommended Increase Conveyance - Cross Gutter (5.1.1.3-1)
- Enoch City Tier II Boundary
- Municipal Boundary

0 0.2 0.4 1in = .2mi



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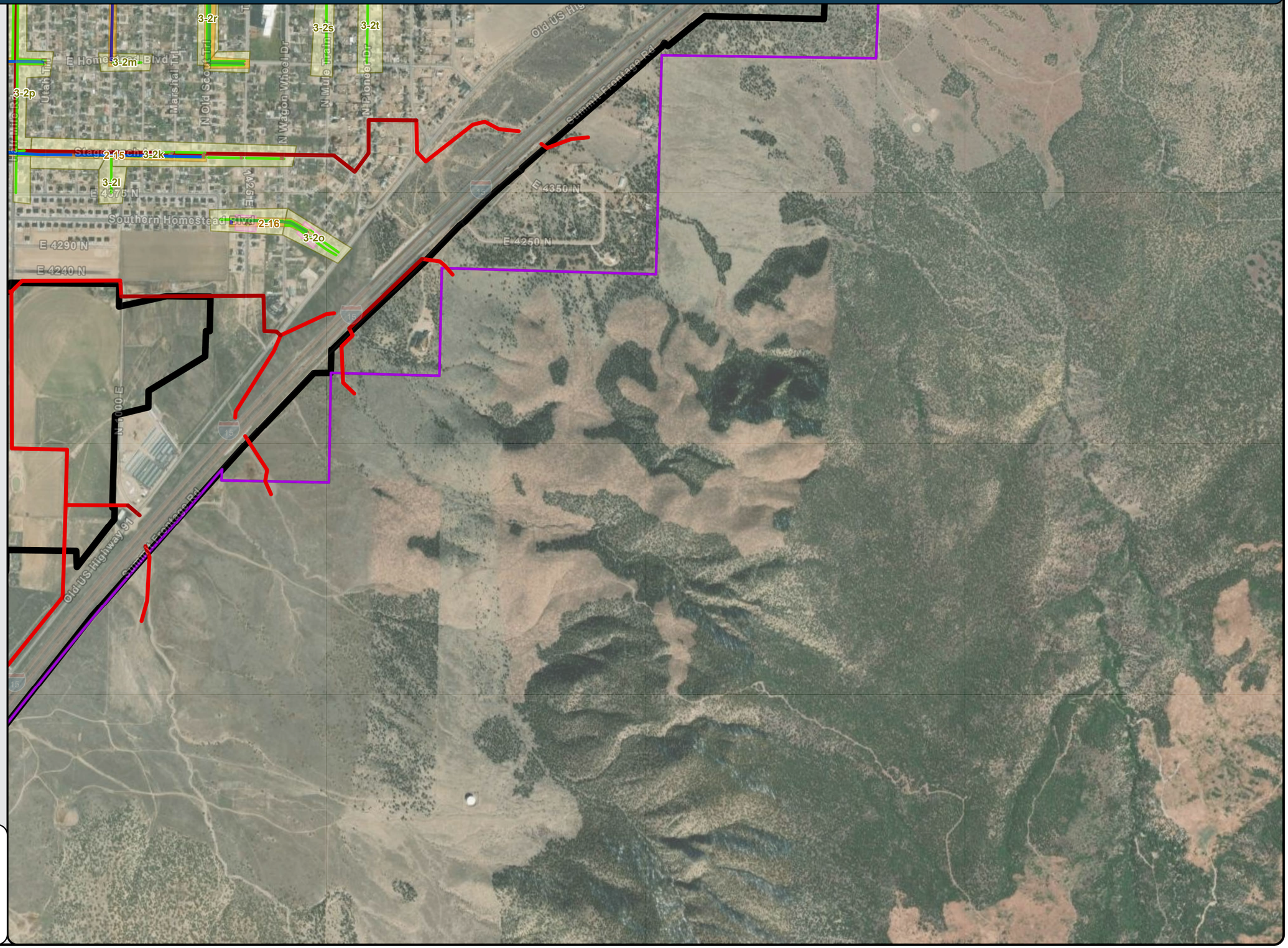
DATE: 7/10/2024

APPENDIX A - Map 7d: Recommended Improvements

Legend

- Proposed Ponds
- Proposed 1.5ft Pipe
- Proposed 2ft Pipe
- Proposed 2.5ft Pipe
- Proposed 3ft Pipe
- Proposed 3.5ft Pipe
- Proposed 4ft Pipe
- Proposed 5ft Pipe
- Proposed Culverts
- Proposed Cross Gutter
- Proposed Curb and Gutter
- Proposed Channels
- Proposed NRCS Pipes
- Proposed NRCS Channels
- Recommended Drainage Channel and Crossing Projects (5.1.1.1)
- Recommended Increase Conveyance - Storm Drain Pipe (5.1.1.2)
- Recommended Increase Conveyance - Curb and Gutter (5.1.1.3-2)
- Recommended Increase Conveyance - Cross Gutter (5.1.1.3-1)
- Enoch City Tier II Boundary
- Municipal Boundary



0 0.2 0.4 1in = .2mi

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Creating solutions that work and relationships that last.

DATE: 7/10/2024

APPENDIX A - Map 8: Large Basins

Legend

- Large Basin 1
- Large Basin 2
- Large Basin 3
- Large Basin 4
- Large Basin 5
- Large Basin 6
- Large Basin 7
- Enoch City Tier II Boundary
- Municipal Boundary

0 0.5 1 1in = .5mi

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Creating solutions that work and relationships that last.

APPENDIX B : RAINFALL DATA AND HYDROLOGIC MODEL OUTPUT

NOAA Atlas 14, Volume 1, Version 5
Location name: Cedar City, Utah, USA*
Latitude: 37.7659°, Longitude: -113.0293°
Elevation: 5548 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.143** (0.125-0.166)	**0.186** (0.162-0.216)	**0.259** (0.224-0.299)	**0.323** (0.278-0.373)	**0.422** (0.356-0.488)	**0.510** (0.423-0.591)	**0.610** (0.495-0.713)	**0.728** (0.575-0.859)	**0.911** (0.691-1.09)	**1.08** (0.787-1.31)
10-min	**0.218** (0.191-0.253)	**0.283** (0.247-0.329)	**0.394** (0.341-0.456)	**0.492** (0.423-0.567)	**0.642** (0.542-0.744)	**0.775** (0.643-0.899)	**0.928** (0.753-1.09)	**1.11** (0.875-1.31)	**1.39** (1.05-1.66)	**1.64** (1.20-1.99)
15-min	**0.271** (0.236-0.314)	**0.350** (0.306-0.407)	**0.488** (0.424-0.565)	**0.610** (0.524-0.704)	**0.795** (0.672-0.922)	**0.961** (0.797-1.11)	**1.15** (0.934-1.35)	**1.37** (1.08-1.62)	**1.72** (1.30-2.06)	**2.03** (1.48-2.46)
30-min	**0.365** (0.318-0.423)	**0.472** (0.413-0.549)	**0.657** (0.570-0.761)	**0.821** (0.705-0.947)	**1.07** (0.905-1.24)	**1.29** (1.07-1.50)	**1.55** (1.26-1.81)	**1.85** (1.46-2.18)	**2.32** (1.76-2.78)	**2.73** (2.00-3.32)
60-min	**0.451** (0.394-0.523)	**0.584** (0.511-0.679)	**0.813** (0.706-0.942)	**1.02** (0.873-1.17)	**1.33** (1.12-1.54)	**1.60** (1.33-1.86)	**1.92** (1.56-2.24)	**2.29** (1.81-2.70)	**2.87** (2.17-3.44)	**3.38** (2.47-4.11)
2-hr	**0.546** (0.482-0.618)	**0.694** (0.610-0.785)	**0.927** (0.814-1.05)	**1.14** (0.991-1.28)	**1.46** (1.25-1.65)	**1.75** (1.47-1.98)	**2.09** (1.73-2.39)	**2.48** (1.99-2.87)	**3.10** (2.39-3.64)	**3.65** (2.72-4.35)
3-hr	**0.605** (0.547-0.680)	**0.767** (0.691-0.857)	**0.995** (0.897-1.11)	**1.20** (1.07-1.33)	**1.50** (1.32-1.67)	**1.78** (1.54-1.99)	**2.11** (1.80-2.42)	**2.49** (2.07-2.90)	**3.13** (2.49-3.68)	**3.69** (2.84-4.39)
6-hr	**0.786** (0.714-0.870)	**0.980** (0.892-1.08)	**1.23** (1.12-1.36)	**1.44** (1.31-1.60)	**1.75** (1.57-1.94)	**2.01** (1.78-2.23)	**2.30** (2.01-2.57)	**2.63** (2.26-2.97)	**3.25** (2.72-3.73)	**3.80** (3.11-4.42)
12-hr	**1.00** (0.906-1.11)	**1.24** (1.12-1.38)	**1.54** (1.38-1.71)	**1.78** (1.60-1.98)	**2.12** (1.88-2.36)	**2.39** (2.10-2.67)	**2.67** (2.33-2.99)	**2.98** (2.58-3.36)	**3.44** (2.92-3.93)	**3.98** (3.32-4.59)
24-hr	**1.11** (1.02-1.21)	**1.37** (1.26-1.50)	**1.68** (1.55-1.84)	**1.94** (1.78-2.11)	**2.29** (2.10-2.49)	**2.56** (2.34-2.79)	**2.85** (2.59-3.11)	**3.14** (2.84-3.44)	**3.54** (3.17-3.97)	**4.02** (3.42-4.64)
2-day	**1.21** (1.12-1.32)	**1.50** (1.38-1.63)	**1.83** (1.69-1.98)	**2.10** (1.94-2.28)	**2.48** (2.28-2.70)	**2.78** (2.55-3.02)	**3.10** (2.82-3.36)	**3.42** (3.10-3.72)	**3.86** (3.47-4.22)	**4.21** (3.75-4.69)
3-day	**1.30** (1.20-1.42)	**1.60** (1.48-1.76)	**1.96** (1.80-2.14)	**2.25** (2.07-2.46)	**2.66** (2.44-2.91)	**2.99** (2.72-3.27)	**3.34** (3.02-3.65)	**3.70** (3.32-4.05)	**4.19** (3.73-4.61)	**4.58** (4.03-5.10)
4-day	**1.39** (1.28-1.53)	**1.71** (1.57-1.88)	**2.08** (1.91-2.29)	**2.40** (2.20-2.63)	**2.84** (2.59-3.12)	**3.20** (2.90-3.52)	**3.57** (3.22-3.94)	**3.97** (3.55-4.38)	**4.51** (3.99-5.01)	**4.94** (4.32-5.52)
7-day	**1.62** (1.48-1.76)	**2.00** (1.84-2.18)	**2.43** (2.24-2.64)	**2.78** (2.55-3.02)	**3.25** (2.98-3.52)	**3.61** (3.30-3.92)	**3.98** (3.62-4.32)	**4.34** (3.93-4.72)	**4.82** (4.34-5.28)	**5.20** (4.65-5.72)
10-day	**1.78** (1.64-1.94)	**2.20** (2.03-2.40)	**2.68** (2.47-2.91)	**3.06** (2.82-3.32)	**3.57** (3.27-3.87)	**3.95** (3.62-4.29)	**4.34** (3.95-4.72)	**4.72** (4.28-5.16)	**5.23** (4.70-5.73)	**5.62** (5.03-6.19)
20-day	**2.28** (2.11-2.46)	**2.81** (2.60-3.04)	**3.40** (3.14-3.66)	**3.85** (3.56-4.14)	**4.42** (4.08-4.76)	**4.84** (4.46-5.21)	**5.25** (4.83-5.66)	**5.64** (5.17-6.09)	**6.12** (5.59-6.64)	**6.47** (5.89-7.04)
30-day	**2.73** (2.54-2.94)	**3.38** (3.14-3.63)	**4.06** (3.78-4.36)	**4.58** (4.26-4.91)	**5.24** (4.87-5.61)	**5.71** (5.30-6.12)	**6.16** (5.71-6.62)	**6.59** (6.08-7.08)	**7.12** (6.54-7.68)	**7.49** (6.86-8.10)
45-day	**3.32** (3.08-3.59)	**4.12** (3.81-4.44)	**4.96** (4.59-5.34)	**5.59** (5.17-6.01)	**6.38** (5.90-6.86)	**6.94** (6.42-7.46)	**7.47** (6.90-8.03)	**7.97** (7.34-8.59)	**8.56** (7.86-9.24)	**8.95** (8.20-9.68)
60-day	**3.83** (3.54-4.15)	**4.75** (4.40-5.14)	**5.73** (5.30-6.20)	**6.46** (5.97-6.97)	**7.36** (6.81-7.95)	**8.01** (7.40-8.64)	**8.62** (7.95-9.31)	**9.19** (8.45-9.94)	**9.86** (9.04-10.7)	**10.3** (9.44-11.2)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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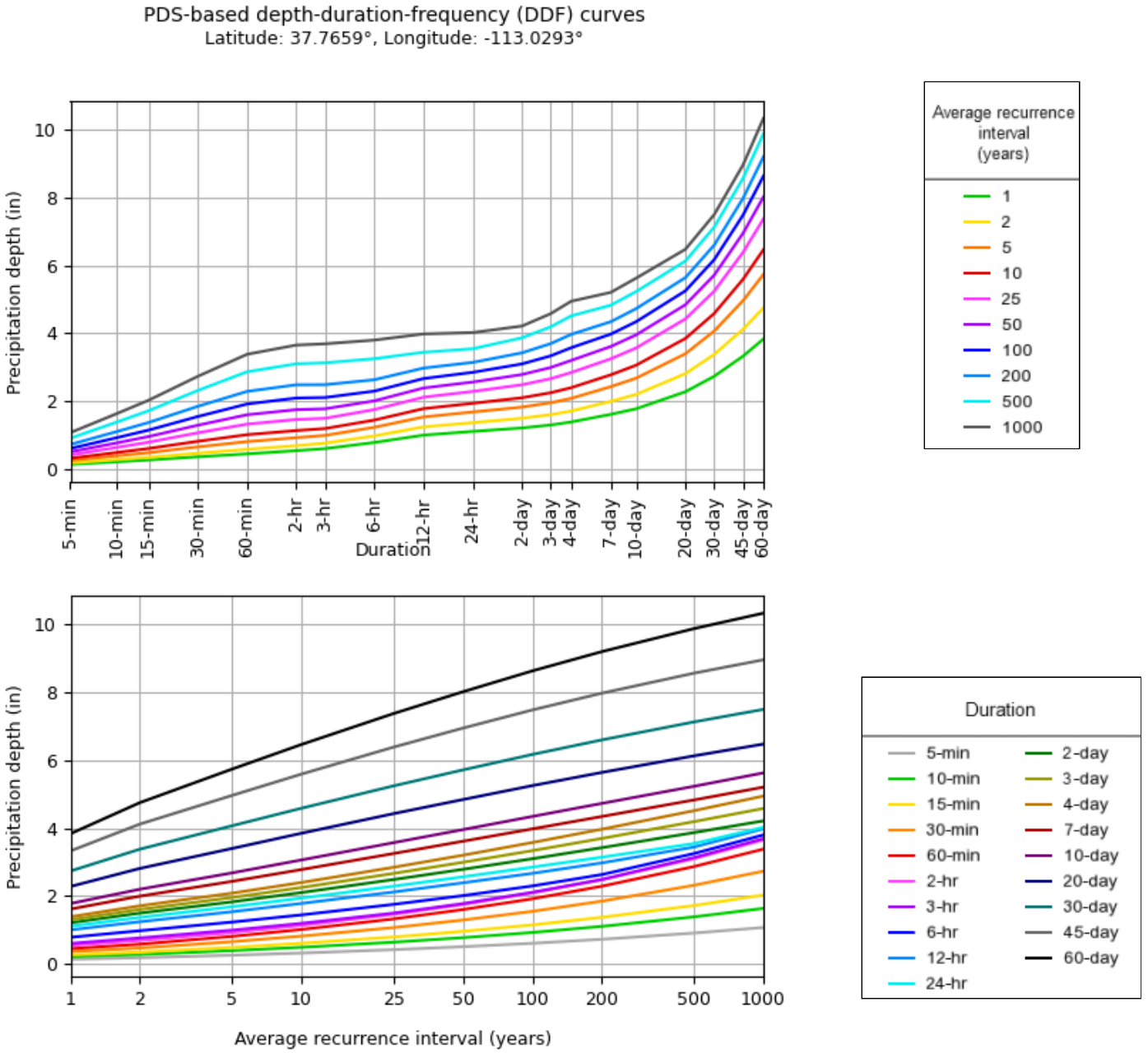
PF graphical



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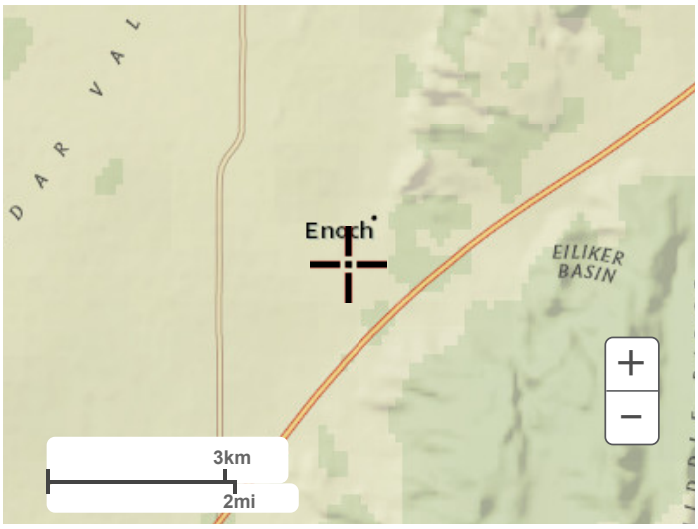
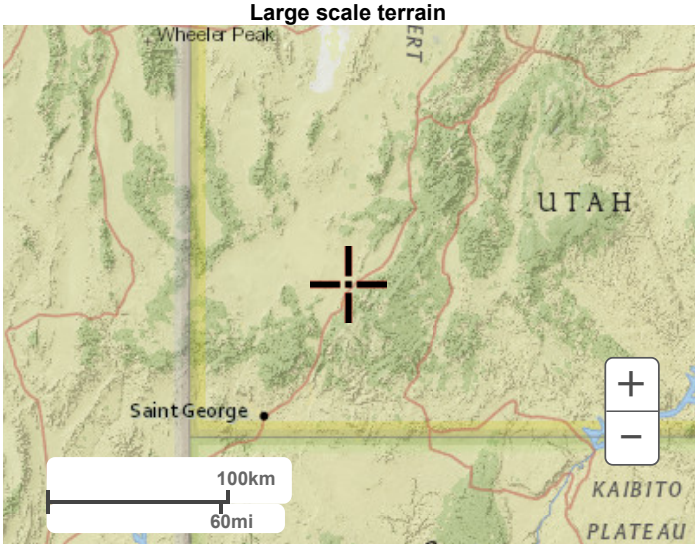
Maps & aerials

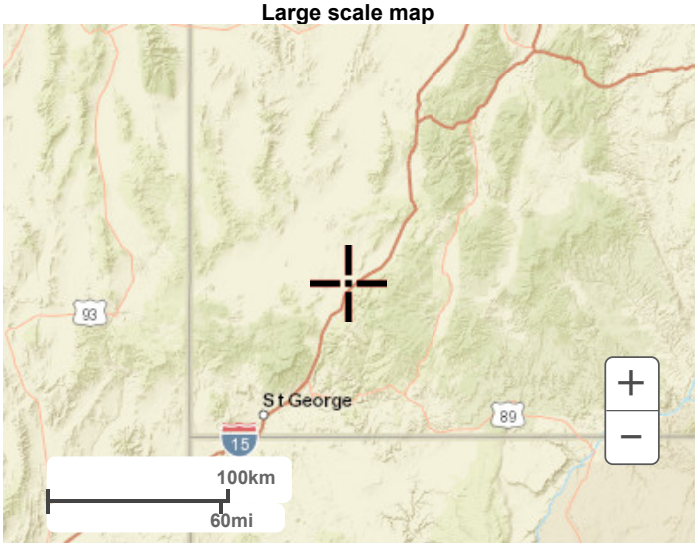
Small scale terrain



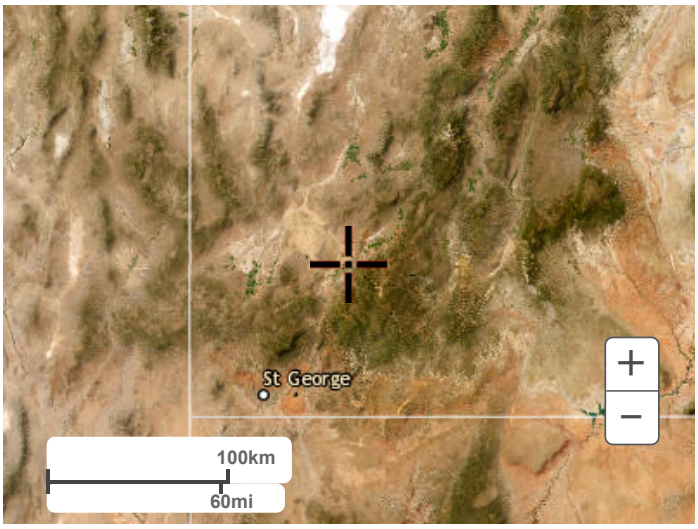
Large scale terrain



Large scale map



Large scale aerial



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National Weather Service
National Water Center
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Disclaimer

Table III.B.1.a

	Time (min)	Precipitation (inches)	Cumulative (inches)	Paste Values
0:0	0	0.000000	0.000000	0.000000
0:5	5	0.007500	0.007500	0.008042
0:10	10	0.007500	0.015000	0.008042
0:15	15	0.007500	0.022500	0.008042
0:20	20	0.007500	0.030000	0.008042
0:25	25	0.007500	0.037500	0.008042
0:30	30	0.007500	0.045000	0.008042
0:35	35	0.290700	0.335700	0.258495
0:40	40	0.229500	0.565200	0.204075
0:45	45	0.160140	0.725340	0.142399
0:50	50	0.102000	0.827340	0.090700
0:55	55	0.061200	0.888540	0.054420
1:0	60	0.046920	0.935460	0.041722
1:5	65	0.034680	0.970140	0.030838
1:10	70	0.026520	0.996660	0.023582
1:15	75	0.020400	1.017060	0.018140
1:20	80	0.018360	1.035420	0.016326
1:25	85	0.016320	1.051740	0.014512
1:30	90	0.013260	1.065000	0.011791
1:35	95	0.007500	1.072500	0.008042
1:40	100	0.007500	1.080000	0.008042
1:45	105	0.007500	1.087500	0.008042
1:50	110	0.007500	1.095000	0.008042
1:55	115	0.007500	1.102500	0.008042
2:0	120	0.007500	1.110000	0.008042
2:5	125	0.007500	1.117500	0.008042
2:10	130	0.007500	1.125000	0.008042
2:15	135	0.007500	1.132500	0.008042
2:20	140	0.007500	1.140000	0.008042
2:25	145	0.007500	1.147500	0.008042
2:30	150	0.007500	1.155000	0.008042
2:35	155	0.007500	1.162500	0.008042
2:40	160	0.007500	1.170000	0.008042
2:45	165	0.007500	1.177500	0.008042
2:50	170	0.007500	1.185000	0.008042
2:55	175	0.007500	1.192500	0.008042
3:0	180	0.007500	1.200000	0.008042
				1.100000

Storm	Total Depth (inches)
1 - Hr	1.02
3 - Hr	1.200

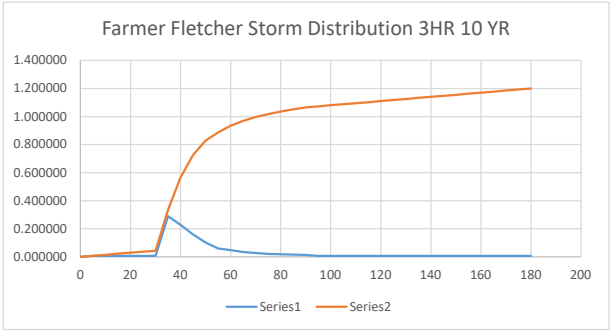

Table III.B.1.b

	Time (min)	Precipitation (inches)	Cumulative (inches)	Paste Values
0:00	0	0.000000	0.000000	0.000000
0:05	5	0.007500	0.007500	0.008042
0:10	10	0.007500	0.015000	0.008042
0:15	15	0.007500	0.022500	0.008042
0:20	20	0.007500	0.030000	0.008042
0:25	25	0.007500	0.037500	0.008042
0:30	30	0.007500	0.045000	0.008042
0:35	35	0.547200	0.592200	0.258495
0:40	40	0.432000	1.024200	0.204075
0:45	45	0.301440	1.325640	0.142399
0:50	50	0.192000	1.517640	0.090700
0:55	55	0.115200	1.632840	0.054420
1:00	60	0.088320	1.721160	0.041722
1:05	65	0.065280	1.786440	0.030838
1:10	70	0.049920	1.836360	0.023582
1:15	75	0.038400	1.874760	0.018140
1:20	80	0.034560	1.909320	0.016326
1:25	85	0.030720	1.940040	0.014512
1:30	90	0.024960	1.965000	0.011791
1:35	95	0.007500	1.972500	0.008042
1:40	100	0.007500	1.980000	0.008042
1:45	105	0.007500	1.987500	0.008042
1:50	110	0.007500	1.995000	0.008042
1:55	115	0.007500	2.002500	0.008042
2:00	120	0.007500	2.010000	0.008042
2:05	125	0.007500	2.017500	0.008042
2:10	130	0.007500	2.025000	0.008042
2:15	135	0.007500	2.032500	0.008042
2:20	140	0.007500	2.040000	0.008042
2:25	145	0.007500	2.047500	0.008042
2:30	150	0.007500	2.055000	0.008042
2:35	155	0.007500	2.062500	0.008042
2:40	160	0.007500	2.070000	0.008042
2:45	165	0.007500	2.077500	0.008042
2:50	170	0.007500	2.085000	0.008042
2:55	175	0.007500	2.092500	0.008042
3:00	180	0.007500	2.100000	0.008042

Storm	Total Depth (inches)
1 - Hr	1.92
3 - Hr	2.100

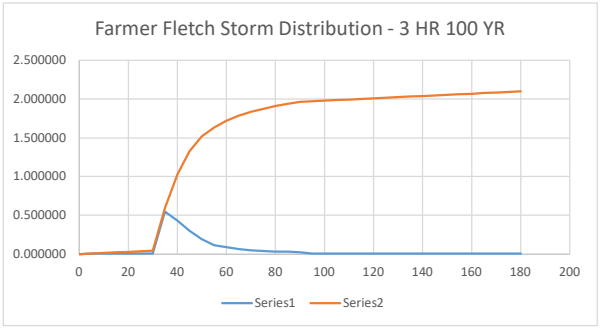

Table III.B.2
Rainfall Distribution - 100 Year

	Time	Inches (incremental)	* Inches (cumulative)	Difference	Distributed	Cumulative	Percentage
0	0	0.0000	0.000	0.000	0.000	0.000	0.00
1	60	0.0320	1.920	1.920	0.015	0.015	0.53
2	120	0.0174	2.090	0.170	0.020	0.035	1.23
3	180	0.0117	2.110	0.020	0.015	0.050	1.75
4	240	0.0091	2.173	0.063	0.015	0.065	2.28
5	300	0.0075	2.237	0.063	0.015	0.080	2.81
6	360	0.0064	2.300	0.063	0.015	0.095	3.33
7	420	0.0056	2.362	0.062	0.062	0.157	5.50
8	480	0.0050	2.423	0.062	0.062	0.218	7.66
9	540	0.0046	2.485	0.062	0.062	0.280	9.82
10	600	0.0042	2.547	0.062	0.062	0.342	11.99
11	660	0.0040	2.608	0.062	0.062	0.403	14.15
12	720	0.004	2.670	0.062	1.920	2.323	81.52
13	780	0.0034	2.685	0.015	0.170	2.493	87.49
14	840	0.0032	2.700	0.015	0.063	2.557	89.71
15	900	0.0030	2.715	0.015	0.063	2.620	91.93
16	960	0.0028	2.730	0.015	0.063	2.683	94.15
17	1020	0.0027	2.745	0.015	0.062	2.745	96.32
18	1080	0.0026	2.760	0.015	0.015	2.760	96.84
19	1140	0.0024	2.775	0.015	0.015	2.775	97.37
20	1200	0.0023	2.790	0.015	0.015	2.790	97.89
21	1260	0.0022	2.805	0.015	0.015	2.805	98.42
22	1320	0.0021	2.820	0.015	0.015	2.820	98.95
23	1380	0.0021	2.835	0.015	0.015	2.835	99.47
24	1440	0.0020	2.850	0.015	0.015	2.850	100.00

* Taken from the NOAA Atlas 14 data and interpolated for unknown points.

Actual data from Atlas 14
Interpolated data from Atlas 14

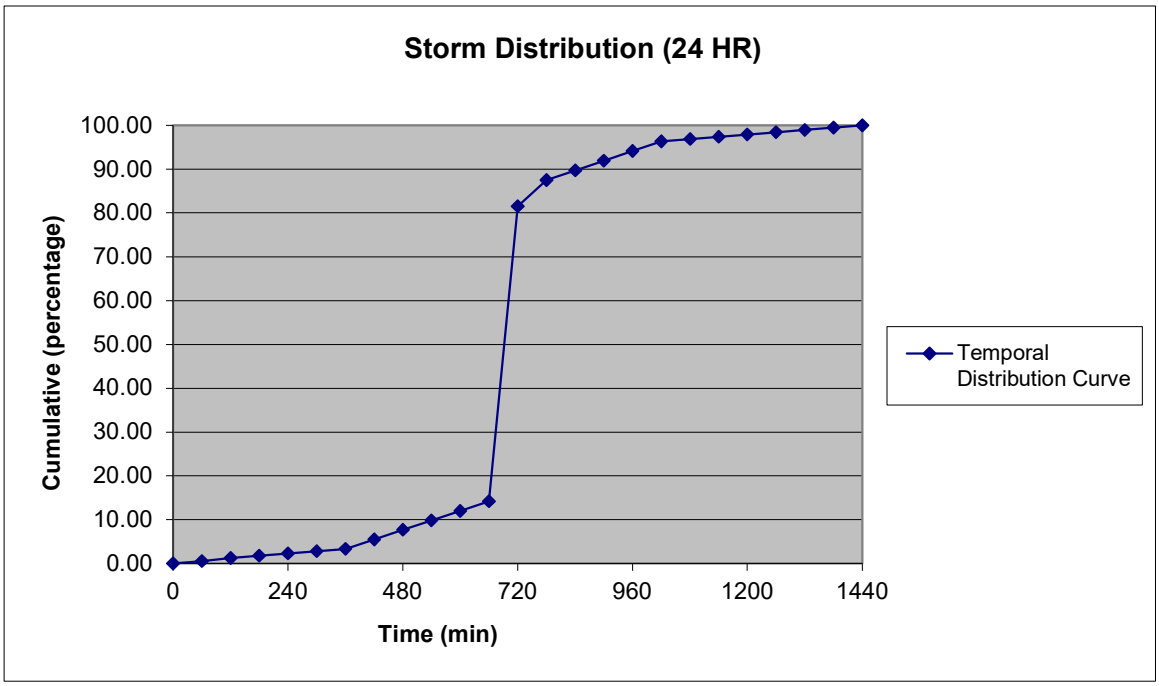

Table III.B.3

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Subcatchment Summary

****

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
1	80.51	1000.00	4.50	1.5000	RG1	JN_10
2	16.44	250.00	3.60	0.6000	RG1	142
3	44.29	600.00	6.20	1.6000	RG1	JN_121
4	72.10	1180.70	1.30	2.8000	RG1	DN_22
5	32.02	800.00	0.10	3.1000	RG1	JN_277
80	63.10	1045.00	3.10	1.0000	RG1	DN_42
81	7.25	500.00	30.90	0.8000	RG1	JN_1464
SB_1	36.22	500.00	4.50	1.5000	RG1	JN_2900
SB_10	35.40	635.60	7.60	3.1000	RG1	DN_10
SB_100	4.00	275.60	27.50	1.6000	RG1	JN_887
SB_101	4.50	309.00	35.60	1.4000	RG1	DN_101
SB_102	4.50	305.00	37.80	1.7000	RG1	DN_102
SB_103	22.30	890.00	19.70	5.0000	RG1	JN_1379
SB_104	6.00	294.60	26.70	0.9000	RG1	DN_104
SB_105	13.70	552.10	16.80	0.7000	RG1	DN_105
SB_106	91.70	1545.00	8.30	0.5000	RG1	DN_106
SB_107	19.20	636.20	26.00	1.1000	RG1	DN_107
SB_108	7.00	362.90	38.60	0.8000	RG1	DN_108
SB_109	6.80	351.30	39.70	0.9000	RG1	DN_109
SB_11	6.80	272.10	14.70	2.8000	RG1	DN_11
SB_110	10.20	374.60	33.30	0.8000	RG1	DN_110
SB_111	10.00	365.30	30.00	0.8000	RG1	DN_111
SB_112	10.20	379.20	9.80	1.3000	RG1	DN_112
SB_113	10.40	381.20	7.70	1.0000	RG1	DN_113
SB_114	10.40	374.10	9.60	1.0000	RG1	DN_114
SB_115	10.50	378.60	8.60	0.9000	RG1	DN_115
SB_116	10.40	383.50	9.60	1.1000	RG1	DN_116
SB_117	7.40	390.40	8.10	1.9000	RG1	DN_117
SB_118	13.30	715.10	8.30	2.6000	RG1	DN_118
SB_119	13.20	465.80	5.30	2.0000	RG1	DN_119
SB_12	64.60	974.90	2.80	2.8000	RG1	DN_12
SB_120	13.90	892.00	6.50	3.5000	RG1	DN_120
SB_121	10.40	562.20	21.20	4.0000	RG1	DN_121
SB_122	22.60	558.10	14.60	0.6000	RG1	JN_540
SB_123	4.80	328.10	6.30	2.7000	RG1	DN_123
SB_124	35.70	1167.60	11.50	6.5000	RG1	JN_1412
SB_125	64.80	1394.20	0.30	3.9000	RG1	DN_125
SB_126	12.80	524.80	10.20	0.8000	RG1	DN_126
SB_127	11.40	360.50	29.80	0.7000	RG1	DN_127
SB_128	7.40	342.10	36.50	0.8000	RG1	DN_128
SB_129	7.60	345.60	34.20	0.6000	RG1	DN_129
SB_13	55.60	955.30	0.00	2.4000	RG1	DN_13
SB_130	11.70	370.60	30.80	0.5000	RG1	DN_130
SB_131	31.10	810.30	19.60	0.7000	RG1	UDOTP18-2
SB_132	5.90	329.90	15.30	0.5000	RG1	DN_132
SB_133	7.90	401.70	19.00	0.6000	RG1	JN_431
SB_134	7.80	589.10	62.80	1.4000	RG1	DN_134
SB_135	12.50	440.70	37.60	0.6000	RG1	JN_803
SB_136	11.20	393.20	38.40	0.6000	RG1	DN_136
SB_137	12.40	431.10	22.60	0.6000	RG1	DN_137
SB_138	10.50	369.00	32.40	0.6000	RG1	JN_1058
SB_139	10.60	376.70	31.10	0.8000	RG1	DN_139
SB_14	14.20	465.80	7.30	1.7000	RG1	JN_47
SB_140	10.60	409.00	28.30	1.0000	RG1	DN_140
SB_141	10.40	403.30	8.70	1.1000	RG1	DN_141
SB_142	10.60	399.50	9.40	1.2000	RG1	DN_142
SB_143	10.50	374.80	7.60	1.3000	RG1	DN_143
SB_144	12.10	576.00	47.10	2.2000	RG1	JN_1141
SB_145	13.10	777.70	49.60	3.3000	RG1	DN_145
SB_146	13.10	455.40	6.10	2.5000	RG1	DN_146

SB_147	13.30	464.80	7.50	2.7000 RG1	DN_147
SB_148	13.40	463.50	7.50	2.5000 RG1	DN_148
SB_149	13.80	472.20	7.20	2.7000 RG1	DN_149
SB_15	3.80	254.00	42.00	0.8000 RG1	JN_27
SB_150	239.30	1820.20	0.70	0.3000 RG1	DN_150
SB_151	43.20	966.90	3.20	0.5000 RG1	DN_151
SB_152	82.19	1216.63	3.60	0.6000 RG1	JN_1499
SB_153	17.20	279.80	22.10	0.6000 RG1	134
SB_154	6.10	228.10	32.80	0.8000 RG1	JN_1466
SB_155	7.58	621.80	30.90	0.8000 RG1	DN_155
SB_156	11.50	448.30	19.10	0.8000 RG1	DN_156
SB_157	54.50	881.60	12.50	0.4000 RG1	DN_157
SB_158	8.50	385.90	31.80	1.4000 RG1	DN_158
SB_159	135.90	1562.90	4.70	0.4000 RG1	DN_159
SB_16	25.30	666.70	5.50	0.6000 RG1	DN_16
SB_160	97.50	1316.60	4.50	1.6000 RG1	DN_160
SB_161	2.50	193.00	16.00	2.7000 RG1	DN_161
SB_162	12.20	414.80	26.20	2.2000 RG1	JN_1751
SB_163	16.70	577.40	15.60	4.5000 RG1	JN_1756
SB_164	8.00	385.00	25.00	3.5000 RG1	DN_164
SB_165	7.80	429.60	7.70	4.1000 RG1	DN_165
SB_166	17.50	592.30	18.30	3.3000 RG1	DN_166
SB_167	19.90	673.20	12.60	4.1000 RG1	DN_167
SB_168	32.40	545.70	11.70	3.9000 RG1	DN_168
SB_169	9.70	505.10	55.70	1.1000 RG1	DN_169
SB_17	17.00	477.30	25.90	0.5000 RG1	DN_17
SB_170	4.20	251.70	31.00	4.8000 RG1	DN_170
SB_171	4.60	275.70	34.80	4.3000 RG1	DN_171
SB_172	4.20	279.10	31.00	5.0000 RG1	DN_172
SB_173	60.00	1360.80	10.90	3.9000 RG1	DN_173
SB_174	19.90	489.50	13.10	0.5000 RG1	JN_1508
SB_175	32.80	756.10	8.20	0.6000 RG1	JN_1517
SB_176	4.60	315.00	47.80	1.9000 RG1	DN_176
SB_177	9.50	454.10	53.70	1.1000 RG1	DN_177
SB_178	2.70	219.20	48.10	0.9000 RG1	DN_178
SB_179	6.40	368.60	42.20	1.1000 RG1	DN_179
SB_18	31.08	547.80	6.20	1.6000 RG1	DN_18
SB_180	74.90	1008.10	4.70	1.3000 RG1	DN_180
SB_181	11.60	420.50	16.40	3.1000 RG1	DN_181
SB_182	16.10	594.00	19.90	4.5000 RG1	Jun-29
SB_183	11.60	342.80	31.90	3.7000 RG1	DN_183
SB_184	4.30	299.90	39.50	3.2000 RG1	DN_184
SB_185	6.50	375.70	32.30	3.9000 RG1	DN_185
SB_186	5.30	297.00	32.10	5.8000 RG1	DN_186
SB_187	1.60	213.50	50.00	3.9000 RG1	DN_187
SB_188	2.20	264.60	40.90	4.5000 RG1	DN_188
SB_189	11.90	436.20	24.40	2.9000 RG1	DN_189
SB_19	57.80	1105.00	9.90	2.1000 RG1	DN_19
SB_190	15.30	532.50	15.00	5.6000 RG1	JN_1851
SB_191	8.00	386.30	33.80	3.5000 RG1	DN_191
SB_192	8.20	372.10	39.00	2.9000 RG1	DN_192
SB_193	8.10	322.60	34.60	3.5000 RG1	DN_193
SB_194	6.00	282.80	38.30	3.3000 RG1	DN_194
SB_195	6.00	326.20	36.70	0.8000 RG1	DN_195
SB_196	6.20	342.80	27.40	1.3000 RG1	DN_196
SB_197	21.30	677.50	13.10	2.4000 RG1	DN_197
SB_198	19.20	659.80	12.00	4.3000 RG1	DN_198
SB_199	18.50	398.50	25.40	5.1000 RG1	DN_199
SB_2	55.00	936.60	0.00	2.7000 RG1	DN_2
SB_20	55.30	782.80	4.00	2.8000 RG1	DN_20
SB_200	51.10	714.30	12.90	2.4000 RG1	DN_200
SB_201	18.00	1096.40	11.70	3.5000 RG1	JN_2117
SB_202	5.00	325.00	38.00	6.7000 RG1	JN_1874
SB_203	13.70	431.30	24.80	7.6000 RG1	DN_203
SB_204	46.80	880.70	10.90	3.5000 RG1	DN_204
SB_205	6.00	352.30	48.10	2.8000 RG1	JN_1971

SB_206	3.80	295.40	44.70	3.0000 RG1	DN_206
SB_207	12.10	406.70	45.50	3.7000 RG1	DN_1070
SB_208	55.20	1015.00	1.30	1.8000 RG1	DN_208
SB_209	64.40	988.30	4.00	2.8000 RG1	DN_209
SB_21	159.40	1059.10	1.30	2.6000 RG1	DN_21
SB_210	27.20	573.30	10.30	7.0000 RG1	DN_210
SB_211	28.00	1942.10	5.00	11.8000 RG1	DN_211
SB_212	381.10	1671.10	0.00	2.0000 RG1	DN_212
SB_213	38.00	458.00	1.60	2.5000 RG1	DN_213
SB_214	225.90	1904.40	0.40	1.9000 RG1	DN_214
SB_215	49.40	1435.20	0.00	20.5000 RG1	JN_2183
SB_216	6.10	316.50	0.00	32.2000 RG1	DN_216
SB_217	18.50	677.90	2.20	25.6000 RG1	JN_2085
SB_218	11.10	524.80	1.80	27.1000 RG1	DN_218
SB_219	78.20	905.20	0.00	8.1000 RG1	JN_2068
SB_22	56.84	1180.70	1.30	2.8000 RG1	JN_256
SB_220	8.20	712.60	0.00	15.5000 RG1	JN_2092
SB_221	139.80	2188.90	1.40	0.5000 RG1	DN_221
SB_222	57.60	854.40	2.80	0.5000 RG1	DN_222
SB_223	51.00	849.80	1.20	0.2000 RG1	DN_223
SB_224	23.40	385.00	0.00	0.2000 RG1	DN_224
SB_225	92.90	1243.60	0.00	0.4000 RG1	DN_225
SB_226	89.20	1043.20	0.00	0.3000 RG1	DN_226
SB_227	20.60	531.30	2.90	1.0000 RG1	DN_227
SB_228	23.10	825.50	10.40	1.0000 RG1	PROPDET3-4MILCF
SB_229	2.20	341.70	31.80	2.5000 RG1	DN_229
SB_23	57.90	629.70	2.60	0.4000 RG1	JN_367
SB_230	11.90	563.50	10.90	0.8000 RG1	DN_230
SB_231	13.90	448.80	7.20	0.8000 RG1	DN_231
SB_232	11.20	593.40	8.90	1.3000 RG1	DN_232
SB_233	8.50	433.50	7.10	0.8000 RG1	DN_233
SB_234	10.80	614.40	0.00	0.7000 RG1	DN_234
SB_235	42.70	689.80	2.60	0.3000 RG1	DN_235
SB_236	57.20	875.40	1.90	0.4000 RG1	DN_236
SB_237	28.40	426.90	0.00	0.2000 RG1	DN_237
SB_238	44.40	690.00	0.00	0.4000 RG1	DN_238
SB_239	41.60	965.60	0.00	0.3000 RG1	DN_239
SB_24	28.10	643.90	4.30	2.4000 RG1	DN_24
SB_240	43.70	632.00	1.10	0.4000 RG1	DN_240
SB_241	54.00	813.30	1.30	0.3000 RG1	DN_241
SB_242	62.80	1251.40	1.80	0.5000 RG1	DN_242
SB_243	118.50	1575.80	1.90	0.3000 RG1	DN_243
SB_244	138.20	1240.10	0.10	0.2000 RG1	DN_244
SB_25	15.80	484.40	29.70	2.1000 RG1	DN_25
SB_26	12.10	382.80	38.00	1.9000 RG1	DN_26
SB_27	47.40	1228.30	12.90	2.4000 RG1	DN_27
SB_28	13.70	360.00	24.10	1.6000 RG1	DN_28
SB_29	22.10	364.50	14.50	0.4000 RG1	DN_29
SB_3	37.90	781.80	63.00	3.3000 RG1	DN_3
SB_30	59.20	638.80	3.90	0.6000 RG1	DN_30
SB_31	46.10	753.70	5.40	0.3000 RG1	JN_309
SB_32	5.40	230.40	29.60	0.7000 RG1	DN_32
SB_33	14.50	362.80	22.80	0.5000 RG1	JN_138
SB_34	5.90	353.80	35.60	0.5000 RG1	DN_34
SB_35	11.20	449.60	29.50	1.4000 RG1	DN_35
SB_36	4.30	119.40	20.90	2.8000 RG1	DN_36
SB_37	37.08	700.50	0.10	3.1000 RG1	DN_37
SB_38	13.10	377.10	10.70	2.0000 RG1	DN_38
SB_39	1.80	307.80	33.30	3.8000 RG1	DN_39
SB_40	4.80	346.80	35.40	2.0000 RG1	DN_40
SB_41	5.00	280.10	70.00	1.7000 RG1	GATEWAYDN_41
SB_42	132.42	1626.30	3.10	1.0000 RG1	100
SB_44	43.80	717.40	0.00	1.2000 RG1	125
SB_45	2.00	197.50	30.00	1.8000 RG1	DN_45
SB_46	12.20	413.20	20.50	1.0000 RG1	DN_46
SB_47	12.70	429.20	25.20	0.7000 RG1	DN_47

SB_48	4.20	315.30	35.70	0.7000	RG1	JN_308
SB_49	3.00	206.10	33.30	0.6000	RG1	DN_49
SB_5	5.60	915.00	16.10	10.5000	RG1	DN_5
SB_50	2.70	399.50	29.60	1.0000	RG1	DN_50
SB_51	3.80	250.50	21.10	1.4000	RG1	DN_51
SB_52	41.50	854.70	19.50	1.1000	RG1	DN_52
SB_53	32.70	538.10	0.60	2.8000	RG1	JN_632
SB_54	4.00	290.90	20.00	0.7000	RG1	DN_54
SB_55	17.90	298.60	20.10	0.5000	RG1	DN_550
SB_56	6.10	211.40	21.30	0.9000	RG1	DN_56
SB_57	46.20	802.00	4.30	3.3000	RG1	DN_57
SB_58	7.60	382.70	22.40	0.6000	RG1	DN_58
SB_59	11.00	231.70	10.90	3.0000	RG1	TOMAHAWKDN_59
SB_6	75.00	200.00	15.70	1.2000	RG1	DN_6
SB_60	17.10	402.60	23.40	3.0000	RG1	DN_60
SB_61	25.40	816.30	6.30	0.6000	RG1	DN_61
SB_62	12.60	417.50	17.50	0.6000	RG1	DN_62
SB_63	12.80	424.40	18.70	0.7000	RG1	DN_63
SB_64	6.50	220.50	14.30	0.6000	RG1	DN_64
SB_65	13.70	602.50	24.10	0.8000	RG1	DN_65
SB_66	5.70	310.60	29.80	1.5000	RG1	DN_66
SB_67	8.80	492.50	23.90	1.8000	RG1	DN_67
SB_68	7.30	354.70	31.50	1.2000	RG1	DN_68
SB_69	6.20	335.00	35.50	1.5000	RG1	DN_69
SB_7	11.90	528.30	18.50	3.2000	RG1	DN_7
SB_70	14.80	378.00	35.10	1.3000	RG1	DN_70
SB_71	15.50	388.40	32.90	1.2000	RG1	DN_71
SB_72	3.20	202.50	0.00	2.4000	RG1	DN_72
SB_73	10.10	508.90	20.80	4.5000	RG1	DN_73
SB_74	7.90	387.10	21.50	0.6000	RG1	DN_74
SB_75	8.00	369.10	20.00	0.7000	RG1	DN_75
SB_76	13.20	410.40	28.00	1.9000	RG1	DN_76
SB_77	7.40	307.30	27.00	0.9000	RG1	DN_77
SB_78	11.70	450.40	21.40	0.7000	RG1	DN_78
SB_79	10.20	326.10	38.20	1.3000	RG1	DN_79
SB_8	19.40	609.60	2.10	2.7000	RG1	BOWLINGDN_8
SB_80	105.10	2346.00	3.50	1.9000	RG1	DN_80
SB_81	9.00	448.70	21.10	6.9000	RG1	DN_81
SB_82	12.30	537.60	20.30	3.5000	RG1	DN_82
SB_83	9.00	414.10	25.60	1.8000	RG1	DN_83
SB_84	8.40	374.90	31.00	1.5000	RG1	DN_84
SB_85	9.00	318.80	44.40	1.4000	RG1	DN_85
SB_86	13.90	555.80	47.50	1.9000	RG1	JN_818
SB_87	7.80	363.50	37.20	0.6000	RG1	DN_87
SB_88	8.70	405.90	26.40	0.7000	RG1	DN_88
SB_89	15.50	628.20	20.00	0.6000	RG1	DN_89
SB_9	143.10	800.10	2.40	2.4000	RG1	DN_9
SB_90	13.30	492.40	15.80	0.8000	RG1	DN_90
SB_91	2.20	190.90	13.60	1.2000	RG1	DN_91
SB_92	5.73	290.30	19.60	0.7000	RG1	DN_92
SB_93	20.20	625.00	5.90	0.6000	RG1	DN_93
SB_94	5.20	165.30	26.90	0.7000	RG1	DN_94
SB_95	9.30	323.00	37.60	0.7000	RG1	DN_95
SB_96	4.21	146.40	40.00	0.6000	RG1	JN_462
SB_97	3.10	273.10	35.50	1.4000	RG1	DN_97
SB_98	3.30	275.90	30.30	1.5000	RG1	DN_98
SB_99	3.40	274.10	29.40	1.5000	RG1	DN_99

Table III.B.4

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Subcatchment Runoff Summary

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Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Imperv Runoff in	Perv Runoff in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
SB_44	2.10	0.00	0.00	1.27	0.00	0.45	0.45	0.54	6.65	0.217
SB_51	2.10	0.00	0.00	0.94	0.44	0.57	1.01	0.10	4.78	0.480
SB_45	2.10	0.00	0.00	0.70	0.63	0.65	1.28	0.07	3.69	0.608
SB_41	2.10	0.00	0.00	0.27	1.46	0.31	1.77	0.24	17.46	0.842
SB_42	2.10	0.00	0.00	1.36	0.07	0.29	0.35	1.27	24.80	0.169
SB_54	2.10	0.00	0.00	0.93	0.42	0.58	1.00	0.11	4.56	0.477
SB_46	2.10	0.00	0.00	0.85	0.43	0.60	1.03	0.34	13.26	0.491
SB_47	2.10	0.00	0.00	0.82	0.53	0.54	1.06	0.37	15.90	0.506
SB_56	2.10	0.00	0.00	0.85	0.45	0.59	1.03	0.17	6.82	0.491
SB_111	2.10	0.00	0.00	0.77	0.63	0.52	1.14	0.31	14.80	0.543
SB_112	2.10	0.00	0.00	0.81	0.21	0.84	1.04	0.29	6.14	0.496
SB_113	2.10	0.00	0.00	0.85	0.16	0.81	0.98	0.28	5.06	0.465
SB_114	2.10	0.00	0.00	0.90	0.20	0.74	0.94	0.27	5.97	0.449
SB_115	2.10	0.00	0.00	0.94	0.18	0.71	0.90	0.26	5.46	0.426
SB_116	2.10	0.00	0.00	0.88	0.20	0.76	0.97	0.27	6.05	0.460
SB_123	2.10	0.00	0.00	0.97	0.13	0.81	0.94	0.12	3.69	0.448
SB_160	2.10	0.00	0.00	1.15	0.09	0.48	0.58	1.52	26.29	0.274
SB_161	2.10	0.00	0.00	0.98	0.33	0.64	0.97	0.07	2.61	0.463
SB_197	2.10	0.00	0.00	0.96	0.28	0.66	0.93	0.54	16.69	0.444
SB_162	2.10	0.00	0.00	0.75	0.55	0.63	1.18	0.39	17.36	0.560
SB_189	2.10	0.00	0.00	0.81	0.51	0.61	1.12	0.36	15.98	0.535
SB_163	2.10	0.00	0.00	0.87	0.33	0.72	1.05	0.48	16.18	0.501
SB_164	2.10	0.00	0.00	0.74	0.53	0.68	1.21	0.26	11.86	0.577
SB_118	2.10	0.00	0.00	0.93	0.17	0.80	0.97	0.35	9.52	0.463
SB_119	2.10	0.00	0.00	1.00	0.11	0.75	0.86	0.31	6.13	0.410
SB_120	2.10	0.00	0.00	1.16	0.13	0.64	0.78	0.29	8.27	0.369
SB_138	2.10	0.00	0.00	0.76	0.67	0.47	1.14	0.33	15.69	0.543
SB_139	2.10	0.00	0.00	0.62	0.65	0.64	1.28	0.37	16.39	0.612
SB_140	2.10	0.00	0.00	0.57	0.59	0.74	1.33	0.38	16.12	0.634
SB_141	2.10	0.00	0.00	0.82	0.18	0.84	1.02	0.29	5.74	0.485
SB_145	2.10	0.00	0.00	0.44	1.04	0.53	1.57	0.56	36.71	0.746
SB_147	2.10	0.00	0.00	0.95	0.16	0.77	0.93	0.34	7.33	0.443
SB_143	2.10	0.00	0.00	0.90	0.16	0.78	0.94	0.27	5.04	0.448
SB_148	2.10	0.00	0.00	0.94	0.16	0.78	0.94	0.34	7.27	0.445
SB_144	2.10	0.00	0.00	0.44	0.99	0.56	1.54	0.51	30.86	0.735
SB_146	2.10	0.00	0.00	0.96	0.13	0.78	0.91	0.32	6.90	0.435
SB_181	2.10	0.00	0.00	0.88	0.35	0.69	1.04	0.33	11.45	0.494
SB_198	2.10	0.00	0.00	1.16	0.26	0.51	0.77	0.40	15.65	0.366
SB_182	2.10	0.00	0.00	1.01	0.42	0.52	0.93	0.41	19.33	0.445
SB_35	2.10	0.00	0.00	0.75	0.62	0.57	1.19	0.36	17.46	0.565
SB_28	2.10	0.00	0.00	0.89	0.50	0.51	1.01	0.38	16.89	0.482
SB_14	2.10	0.00	0.00	1.16	0.15	0.56	0.71	0.27	6.61	0.338
SB_65	2.10	0.00	0.00	0.93	0.50	0.48	0.99	0.37	17.16	0.470
SB_66	2.10	0.00	0.00	0.75	0.63	0.58	1.20	0.19	9.26	0.572
SB_74	2.10	0.00	0.00	0.81	0.45	0.63	1.09	0.23	9.13	0.517
SB_75	2.10	0.00	0.00	0.88	0.42	0.60	1.01	0.22	8.58	0.483
SB_77	2.10	0.00	0.00	0.78	0.56	0.57	1.14	0.23	10.42	0.542
SB_78	2.10	0.00	0.00	0.83	0.45	0.60	1.05	0.33	13.13	0.500
SB_104	2.10	0.00	0.00	0.86	0.56	0.51	1.07	0.17	8.42	0.509
SB_90	2.10	0.00	0.00	0.96	0.33	0.58	0.91	0.33	11.28	0.432
SB_105	2.10	0.00	0.00	0.94	0.35	0.58	0.93	0.35	12.34	0.444
SB_135	2.10	0.00	0.00	0.72	0.78	0.43	1.21	0.41	20.69	0.574
SB_136	2.10	0.00	0.00	0.70	0.80	0.43	1.23	0.37	18.80	0.585
SB_137	2.10	0.00	0.00	0.94	0.47	0.47	0.94	0.32	13.95	0.447
SB_109	2.10	0.00	0.00	0.73	0.83	0.41	1.24	0.23	13.51	0.589
SB_69	2.10	0.00	0.00	0.76	0.74	0.47	1.21	0.20	11.64	0.577

SB_70	2.10	0.00	0.00	0.76	0.73	0.44	1.17	0.47	23.83	0.556
SB_87	2.10	0.00	0.00	0.66	0.77	0.51	1.28	0.27	14.01	0.611
SB_67	2.10	0.00	0.00	0.79	0.50	0.65	1.15	0.28	12.08	0.548
SB_108	2.10	0.00	0.00	0.69	0.81	0.46	1.27	0.24	13.55	0.603
SB_106	2.10	0.00	0.00	1.29	0.17	0.28	0.45	1.13	38.54	0.215
SB_122	2.10	0.00	0.00	1.21	0.30	0.32	0.62	0.38	16.49	0.297
SB_131	2.10	0.00	0.00	1.14	0.41	0.32	0.72	0.61	29.64	0.345
SB_159	2.10	0.00	0.00	1.18	0.10	0.30	0.40	1.48	32.98	0.191
SB_158	2.10	0.00	0.00	0.90	0.67	0.40	1.07	0.25	14.00	0.508
SB_235	2.10	0.00	0.00	1.33	0.05	0.27	0.32	0.37	6.50	0.154
SB_231	2.10	0.00	0.00	1.31	0.15	0.39	0.54	0.20	6.06	0.258
SB_230	2.10	0.00	0.00	1.27	0.23	0.40	0.63	0.20	7.81	0.299
SB_232	2.10	0.00	0.00	1.36	0.19	0.38	0.57	0.17	6.43	0.271
SB_233	2.10	0.00	0.00	1.27	0.15	0.47	0.61	0.14	3.88	0.293
SB_228	2.10	0.00	0.00	1.41	0.22	0.28	0.50	0.31	14.10	0.238
SB_176	2.10	0.00	0.00	0.70	1.00	0.32	1.32	0.16	11.50	0.628
SB_173	2.10	0.00	0.00	1.28	0.23	0.40	0.63	1.03	39.77	0.300
SB_201	2.10	0.00	0.00	1.18	0.24	0.53	0.77	0.38	13.83	0.368
SB_212	2.10	0.00	0.00	1.47	0.00	0.17	0.17	1.72	15.82	0.079
SB_205	2.10	0.00	0.00	0.65	1.01	0.36	1.37	0.22	15.25	0.651
SB_206	2.10	0.00	0.00	0.82	0.94	0.27	1.21	0.13	9.65	0.578
SB_207	2.10	0.00	0.00	0.82	0.95	0.24	1.19	0.39	27.76	0.567
SB_199	2.10	0.00	0.00	1.00	0.53	0.41	0.94	0.47	24.53	0.448
SB_142	2.10	0.00	0.00	0.88	0.20	0.77	0.97	0.28	6.13	0.462
SB_79	2.10	0.00	0.00	0.78	0.79	0.38	1.17	0.33	18.45	0.559
SB_57	2.10	0.00	0.00	1.32	0.09	0.44	0.53	0.66	12.89	0.250
SB_107	2.10	0.00	0.00	0.87	0.54	0.50	1.04	0.54	25.40	0.495
SB_88	2.10	0.00	0.00	0.77	0.55	0.59	1.14	0.27	12.02	0.542
SB_89	2.10	0.00	0.00	0.86	0.42	0.59	1.01	0.42	16.30	0.480
SB_25	2.10	0.00	0.00	0.83	0.62	0.48	1.10	0.47	24.23	0.526
SB_26	2.10	0.00	0.00	0.72	0.79	0.44	1.23	0.41	22.80	0.588
SB_27	2.10	0.00	0.00	1.09	0.27	0.52	0.79	1.02	35.04	0.377
SB_18	2.10	0.00	0.00	1.15	0.13	0.50	0.63	0.54	11.42	0.302
SB_12	2.10	0.00	0.00	1.22	0.06	0.51	0.57	1.00	13.52	0.273
SB_55	2.10	0.00	0.00	0.88	0.42	0.43	0.85	0.41	14.68	0.404
SB_58	2.10	0.00	0.00	0.83	0.47	0.61	1.07	0.22	9.08	0.512
SB_62	2.10	0.00	0.00	0.94	0.37	0.53	0.90	0.31	11.41	0.429
SB_63	2.10	0.00	0.00	0.88	0.39	0.58	0.97	0.34	12.49	0.464
SB_64	2.10	0.00	0.00	0.92	0.30	0.60	0.90	0.16	4.98	0.431
SB_95	2.10	0.00	0.00	1.01	0.78	0.18	0.96	0.24	15.51	0.458
SB_92	2.10	0.00	0.00	1.10	0.41	0.41	0.82	0.13	5.89	0.390
SB_30	2.10	0.00	0.00	1.36	0.08	0.23	0.31	0.50	12.08	0.148
SB_61	2.10	0.00	0.00	1.31	0.13	0.39	0.52	0.36	9.66	0.247
SB_19	2.10	0.00	0.00	1.22	0.21	0.42	0.63	0.98	31.86	0.298
SB_124	2.10	0.00	0.00	1.18	0.24	0.52	0.76	0.73	26.61	0.361
SB_121	2.10	0.00	0.00	0.88	0.45	0.63	1.08	0.30	13.84	0.512
SB_103	2.10	0.00	0.00	1.05	0.41	0.50	0.91	0.55	27.14	0.433
SB_81	2.10	0.00	0.00	0.98	0.44	0.55	0.99	0.24	12.17	0.471
SB_73	2.10	0.00	0.00	1.01	0.44	0.52	0.95	0.26	13.20	0.454
SB_60	2.10	0.00	0.00	1.06	0.49	0.38	0.87	0.40	20.68	0.413
SB_83	2.10	0.00	0.00	0.98	0.54	0.44	0.98	0.24	12.25	0.464
SB_82	2.10	0.00	0.00	0.86	0.43	0.65	1.08	0.36	15.13	0.513
SB_84	2.10	0.00	0.00	0.86	0.65	0.45	1.10	0.25	13.62	0.525
SB_102	2.10	0.00	0.00	0.71	0.79	0.48	1.28	0.16	9.19	0.608
SB_101	2.10	0.00	0.00	0.76	0.75	0.47	1.22	0.15	8.60	0.582
SB_100	2.10	0.00	0.00	0.80	0.58	0.59	1.16	0.13	6.33	0.555
SB_99	2.10	0.00	0.00	0.74	0.62	0.61	1.23	0.11	5.83	0.584
SB_98	2.10	0.00	0.00	0.77	0.64	0.57	1.20	0.11	5.84	0.574
SB_97	2.10	0.00	0.00	0.70	0.75	0.54	1.29	0.11	6.21	0.613
SB_172	2.10	0.00	0.00	0.79	0.65	0.55	1.20	0.14	8.11	0.570
SB_167	2.10	0.00	0.00	1.21	0.26	0.45	0.72	0.39	15.86	0.343
SB_185	2.10	0.00	0.00	0.83	0.68	0.47	1.15	0.20	12.40	0.549
SB_184	2.10	0.00	0.00	0.62	0.83	0.55	1.38	0.16	9.77	0.656
SB_188	2.10	0.00	0.00	0.75	0.86	0.42	1.27	0.08	5.77	0.607
SB_187	2.10	0.00	0.00	0.71	1.05	0.28	1.33	0.06	5.04	0.634
SB_183	2.10	0.00	0.00	0.81	0.67	0.48	1.15	0.36	19.49	0.549

SB_166	2.10	0.00	0.00	0.82	0.39	0.71	1.10	0.52	18.69	0.521
SB_165	2.10	0.00	0.00	0.89	0.16	0.86	1.02	0.22	6.81	0.486
SB_170	2.10	0.00	0.00	0.65	0.65	0.67	1.32	0.15	7.96	0.630
SB_171	2.10	0.00	0.00	0.65	0.73	0.60	1.33	0.17	9.47	0.634
SB_191	2.10	0.00	0.00	0.78	0.71	0.49	1.21	0.26	14.85	0.574
SB_194	2.10	0.00	0.00	0.75	0.80	0.44	1.24	0.20	12.26	0.590
SB_193	2.10	0.00	0.00	0.85	0.73	0.41	1.13	0.25	14.79	0.540
SB_192	2.10	0.00	0.00	0.77	0.82	0.40	1.22	0.27	16.84	0.580
SB_186	2.10	0.00	0.00	0.72	0.68	0.59	1.27	0.18	10.39	0.603
SB_190	2.10	0.00	0.00	1.06	0.32	0.56	0.88	0.37	14.54	0.419
SB_85	2.10	0.00	0.00	0.70	0.92	0.35	1.27	0.31	18.87	0.607
SB_40	2.10	0.00	0.00	0.54	0.74	0.69	1.43	0.19	10.05	0.683
SB_39	2.10	0.00	0.00	0.59	0.70	0.70	1.39	0.07	4.21	0.663
SB_38	2.10	0.00	0.00	1.04	0.23	0.60	0.83	0.29	8.40	0.394
SB_1	2.10	0.00	0.00	1.19	0.09	0.45	0.54	0.53	9.75	0.259
SB_15	2.10	0.00	0.00	0.70	0.88	0.40	1.28	0.13	8.17	0.610
SB_17	2.10	0.00	0.00	0.80	0.54	0.50	1.04	0.48	19.82	0.494
SB_16	2.10	0.00	0.00	1.57	0.12	0.18	0.29	0.20	8.30	0.140
SB_32	2.10	0.00	0.00	0.96	0.62	0.35	0.97	0.14	7.90	0.463
SB_20	2.10	0.00	0.00	1.18	0.08	0.52	0.60	0.90	14.12	0.287
SB_177	2.10	0.00	0.00	0.47	1.12	0.41	1.53	0.39	24.47	0.728
SB_149	2.10	0.00	0.00	0.95	0.15	0.77	0.93	0.35	7.48	0.441
SB_168	2.10	0.00	0.00	1.22	0.25	0.41	0.65	0.58	21.20	0.311
SB_130	2.10	0.00	0.00	0.77	0.64	0.47	1.11	0.35	15.91	0.527
SB_94	2.10	0.00	0.00	1.11	0.56	0.25	0.81	0.11	6.62	0.387
SB_96	2.10	0.00	0.00	0.97	0.83	0.17	1.00	0.11	7.14	0.476
SB_129	2.10	0.00	0.00	0.87	0.71	0.36	1.07	0.22	12.48	0.510
SB_128	2.10	0.00	0.00	0.93	0.76	0.28	1.04	0.21	13.16	0.495
SB_127	2.10	0.00	0.00	1.03	0.62	0.27	0.89	0.28	15.68	0.426
SB_134	2.10	0.00	0.00	0.53	1.31	0.20	1.52	0.32	24.76	0.723
SB_155	2.10	0.00	0.00	0.90	0.65	0.43	1.08	0.22	12.42	0.512
SB_157	2.10	0.00	0.00	1.25	0.26	0.24	0.50	0.74	30.78	0.238
SB_221	2.10	0.00	0.00	1.34	0.03	0.31	0.33	1.27	12.75	0.159
SB_234	2.10	0.00	0.00	1.27	0.00	0.59	0.59	0.17	3.19	0.281
SB_240	2.10	0.00	0.00	1.35	0.02	0.27	0.29	0.35	3.26	0.140
SB_241	2.10	0.00	0.00	1.32	0.03	0.27	0.30	0.44	4.51	0.141
SB_209	2.10	0.00	0.00	1.30	0.08	0.43	0.51	0.90	16.56	0.245
SB_208	2.10	0.00	0.00	1.12	0.03	0.61	0.64	0.95	13.34	0.303
SB_214	2.10	0.00	0.00	1.44	0.01	0.26	0.27	1.66	16.79	0.129
SB_37	2.10	0.00	0.00	1.53	0.00	0.33	0.33	0.33	4.95	0.156
SB_53	2.10	0.00	0.00	1.28	0.01	0.51	0.52	0.46	6.58	0.247
SB_52	2.10	0.00	0.00	1.23	0.41	0.25	0.66	0.74	39.24	0.313
SB_204	2.10	0.00	0.00	1.33	0.23	0.34	0.57	0.72	29.50	0.270
SB_91	2.10	0.00	0.00	1.14	0.28	0.52	0.81	0.05	1.93	0.385
SB_203	2.10	0.00	0.00	1.03	0.52	0.42	0.94	0.35	20.02	0.448
SB_22	2.10	0.00	0.00	1.37	0.03	0.44	0.47	0.73	11.03	0.224
SB_36	2.10	0.00	0.00	1.28	0.44	0.24	0.68	0.08	4.69	0.322
SB_21	2.10	0.00	0.00	1.35	0.03	0.29	0.32	1.39	13.55	0.153
SB_9	2.10	0.00	0.00	1.38	0.05	0.23	0.28	1.10	20.37	0.135
SB_10	2.10	0.00	0.00	1.21	0.16	0.48	0.64	0.62	16.39	0.305
SB_24	2.10	0.00	0.00	1.18	0.09	0.56	0.65	0.50	7.89	0.312
SB_23	2.10	0.00	0.00	1.30	0.05	0.24	0.30	0.47	8.24	0.141
SB_7	2.10	0.00	0.00	1.32	0.39	0.27	0.66	0.21	13.49	0.315
SB_8	2.10	0.00	0.00	1.67	0.04	0.22	0.27	0.14	2.70	0.127
SB_11	2.10	0.00	0.00	1.02	0.31	0.59	0.90	0.17	6.18	0.430
SB_3	2.10	0.00	0.00	0.45	1.30	0.26	1.56	1.60	97.38	0.742
SB_13	2.10	0.00	0.00	1.30	0.00	0.49	0.49	0.75	10.63	0.235
SB_2	2.10	0.00	0.00	1.26	0.00	0.54	0.54	0.80	11.75	0.256
SB_29	2.10	0.00	0.00	0.97	0.30	0.41	0.71	0.43	14.08	0.340
SB_31	2.10	0.00	0.00	1.28	0.11	0.27	0.39	0.48	12.84	0.183
SB_48	2.10	0.00	0.00	0.69	0.75	0.53	1.28	0.15	8.00	0.608
SB_34	2.10	0.00	0.00	0.66	0.74	0.54	1.28	0.21	10.63	0.611
SB_49	2.10	0.00	0.00	0.87	0.70	0.40	1.10	0.09	5.15	0.523
SB_50	2.10	0.00	0.00	0.82	0.62	0.54	1.16	0.09	5.01	0.554
SB_80	2.10	0.00	0.00	1.60	0.07	0.22	0.29	0.83	24.07	0.138
SB_6	2.10	0.00	0.00	1.24	0.32	0.09	0.41	0.83	30.29	0.194

SB_200	2.10	0.00	0.00	1.25	0.27	0.32	0.59	0.82	33.89	0.283
SB_211	2.10	0.00	0.00	1.33	0.10	0.54	0.64	0.49	17.03	0.305
SB_210	2.10	0.00	0.00	1.30	0.22	0.40	0.62	0.46	17.72	0.295
SB_219	2.10	0.00	0.00	1.39	0.00	0.44	0.44	0.94	14.33	0.210
SB_218	2.10	0.00	0.00	1.28	0.04	0.64	0.67	0.20	7.78	0.321
SB_93	2.10	0.00	0.00	1.42	0.12	0.30	0.42	0.23	7.23	0.200
SB_126	2.10	0.00	0.00	1.16	0.21	0.49	0.71	0.25	7.74	0.338
SB_132	2.10	0.00	0.00	1.03	0.32	0.54	0.86	0.14	4.91	0.408
SB_156	2.10	0.00	0.00	1.25	0.40	0.27	0.67	0.21	11.35	0.320
SB_217	2.10	0.00	0.00	1.28	0.05	0.62	0.67	0.34	11.36	0.319
SB_216	2.10	0.00	0.00	1.34	0.00	0.63	0.63	0.10	4.28	0.298
SB_220	2.10	0.00	0.00	1.32	0.00	0.65	0.65	0.14	6.33	0.307
SB_242	2.10	0.00	0.00	1.27	0.04	0.39	0.43	0.73	7.86	0.204
SB_150	2.10	0.00	0.00	1.40	0.01	0.15	0.16	1.04	10.70	0.076
SB_239	2.10	0.00	0.00	1.45	0.00	0.27	0.27	0.31	3.24	0.129
SB_174	2.10	0.00	0.00	1.14	0.27	0.38	0.66	0.35	13.12	0.313
SB_222	2.10	0.00	0.00	1.25	0.06	0.34	0.40	0.63	9.64	0.190
SB_152	2.10	0.00	0.00	1.28	0.08	0.33	0.40	0.90	17.05	0.193
SB_238	2.10	0.00	0.00	1.75	0.00	0.08	0.08	0.10	1.15	0.040
SB_225	2.10	0.00	0.00	1.67	0.00	0.11	0.11	0.27	2.80	0.050
SB_223	2.10	0.00	0.00	1.49	0.03	0.17	0.19	0.27	3.92	0.092
SB_224	2.10	0.00	0.00	1.48	0.00	0.18	0.18	0.12	1.08	0.087
SB_226	2.10	0.00	0.00	1.77	0.00	0.06	0.06	0.13	1.52	0.026
SB_237	2.10	0.00	0.00	1.40	0.00	0.21	0.21	0.16	1.47	0.100
SB_151	2.10	0.00	0.00	1.22	0.07	0.43	0.50	0.59	8.65	0.238
SB_236	2.10	0.00	0.00	1.38	0.04	0.26	0.30	0.46	6.82	0.141
SB_243	2.10	0.00	0.00	1.41	0.04	0.20	0.24	0.77	13.52	0.114
SB_244	2.10	0.00	0.00	1.81	0.00	0.03	0.03	0.12	1.29	0.015
SB_227	2.10	0.00	0.00	1.18	0.06	0.55	0.61	0.34	4.68	0.291
SB_133	2.10	0.00	0.00	0.97	0.40	0.53	0.93	0.20	7.99	0.443
SB_125	2.10	0.00	0.00	1.77	0.01	0.16	0.17	0.30	4.69	0.081
SB_68	2.10	0.00	0.00	0.78	0.66	0.51	1.17	0.23	12.11	0.559
SB_5	2.10	0.00	0.00	1.08	0.33	0.58	0.92	0.14	7.44	0.436
SB_215	2.10	0.00	0.00	1.59	0.00	0.38	0.38	0.51	13.23	0.181
SB_33	2.10	0.00	0.00	0.85	0.47	0.49	0.96	0.38	14.92	0.458
SB_180	2.10	0.00	0.00	1.19	0.10	0.43	0.53	1.08	20.41	0.252
SB_71	2.10	0.00	0.00	0.82	0.68	0.41	1.09	0.46	23.34	0.520
SB_86	2.10	0.00	0.00	0.66	0.99	0.35	1.34	0.51	32.62	0.638
SB_76	2.10	0.00	0.00	0.91	0.59	0.44	1.03	0.37	19.02	0.491
SB_72	2.10	0.00	0.00	1.42	0.00	0.51	0.51	0.04	1.09	0.242
SB_154	2.10	0.00	0.00	0.99	0.68	0.28	0.96	0.16	9.55	0.458
SB_229	2.10	0.00	0.00	0.98	0.67	0.37	1.04	0.06	4.55	0.495
SB_169	2.10	0.00	0.00	0.47	1.16	0.38	1.54	0.40	26.13	0.732
SB_179	2.10	0.00	0.00	0.62	0.88	0.48	1.36	0.24	14.03	0.648
SB_195	2.10	0.00	0.00	0.72	0.77	0.48	1.24	0.20	11.23	0.592
SB_110	2.10	0.00	0.00	0.74	0.69	0.49	1.18	0.33	16.37	0.562
SB_117	2.10	0.00	0.00	0.98	0.17	0.75	0.92	0.18	4.48	0.438
SB_202	2.10	0.00	0.00	0.80	0.80	0.41	1.21	0.16	11.70	0.575
SB_175	2.10	0.00	0.00	1.36	0.17	0.28	0.45	0.40	14.04	0.215
SB_153	2.10	0.00	0.00	1.17	0.46	0.21	0.66	0.31	15.13	0.316
SB_59	2.10	0.00	0.00	1.31	0.23	0.36	0.59	0.17	6.99	0.279
SB_178	2.10	0.00	0.00	0.64	1.01	0.36	1.37	0.10	6.73	0.651
SB_196	2.10	0.00	0.00	0.88	0.58	0.50	1.07	0.18	9.09	0.512
SB_213	2.10	0.00	0.00	1.34	0.03	0.39	0.42	0.44	5.21	0.202
1	2.10	0.00	0.00	1.17	0.09	0.45	0.54	1.18	21.18	0.258
2	2.10	0.00	0.00	1.18	0.08	0.40	0.48	0.21	3.43	0.227
3	2.10	0.00	0.00	1.15	0.13	0.46	0.59	0.71	15.23	0.282
4	2.10	0.00	0.00	1.21	0.03	0.55	0.58	1.14	16.27	0.276
5	2.10	0.00	0.00	1.22	0.00	0.62	0.62	0.54	9.66	0.295
80	2.10	0.00	0.00	1.99	0.07	0.00	0.07	0.11	12.45	0.031
81	2.10	0.00	0.00	1.42	0.65	0.00	0.65	0.13	11.68	0.311

Table III.B.5

[INFILTRATION]

;;Subcatchment	Curve Number	Param2	Param3	Param4	Param5
1	80	0.15	7	7	0
2	80	0.15	7	7	0
3	80	0.15	7	7	0
4	80	0.15	7	7	0
5	80	0.15	7	7	0
80	3.0	0.5	4	7	0
81	3.0	0.5	4	7	0
SB_1	79.40	0.15	7	7	0
SB_10	77.80	0.15	7	7	0
SB_100	83.20	0.15	7	7	0
SB_101	81.20	0.15	7	7	0
SB_102	82.10	0.15	7	7	0
SB_103	77.80	0.15	7	7	0
SB_104	81.20	0.15	7	7	0
SB_105	82.50	0.15	7	7	0
SB_106	74.70	0.15	7	7	0
SB_107	81.30	0.15	7	7	0
SB_108	82.40	0.15	7	7	0
SB_109	80.20	0.15	7	7	0
SB_11	80.80	0.15	7	7	0
SB_110	82.80	0.15	7	7	0
SB_111	83.10	0.15	7	7	0
SB_112	87.50	0.15	7	7	0
SB_113	87.00	0.15	7	7	0
SB_114	85.60	0.15	7	7	0
SB_115	84.90	0.15	7	7	0
SB_116	86.00	0.15	7	7	0
SB_117	84.00	0.15	7	7	0
SB_118	85.00	0.15	7	7	0
SB_119	84.20	0.15	7	7	0
SB_12	79.30	0.15	7	7	0
SB_120	79.70	0.15	7	7	0
SB_121	82.80	0.15	7	7	0
SB_122	74.30	0.15	7	7	0
SB_123	84.60	0.15	7	7	0
SB_124	77.00	0.15	7	7	0
SB_125	59.40	0.15	7	7	0
SB_126	78.10	0.15	7	7	0
SB_127	72.50	0.15	7	7	0
SB_128	72.50	0.15	7	7	0
SB_129	77.10	0.15	7	7	0
SB_13	78.00	0.15	7	7	0
SB_130	82.70	0.15	7	7	0
SB_131	74.10	0.15	7	7	0
SB_132	80.20	0.15	7	7	0
SB_133	80.80	0.15	7	7	0
SB_134	74.30	0.15	7	7	0
SB_135	81.90	0.15	7	7	0
SB_136	82.40	0.15	7	7	0
SB_137	80.40	0.15	7	7	0
SB_138	82.40	0.15	7	7	0
SB_139	87.50	0.15	7	7	0
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SB_141	87.40	0.15	7	7	0
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SB_143	85.90	0.15	7	7	0
SB_144	88.60	0.15	7	7	0
SB_145	88.00	0.15	7	7	0
SB_146	85.00	0.15	7	7	0
SB_147	84.90	0.15	7	7	0

SB_148	85.10	0.15	7	7	0
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SB_153	71.20	0.15	7	7	0
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SB_156	69.50	0.15	7	7	0
SB_157	74.00	0.15	7	7	0
SB_158	77.50	0.15	7	7	0
SB_159	79.70	0.15	7	7	0
SB_16	64.70	0.15	7	7	0
SB_160	80.50	0.15	7	7	0
SB_161	81.60	0.15	7	7	0
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SB_163	84.80	0.15	7	7	0
SB_164	85.70	0.15	7	7	0
SB_165	86.10	0.15	7	7	0
SB_166	85.30	0.15	7	7	0
SB_167	75.20	0.15	7	7	0
SB_168	75.30	0.15	7	7	0
SB_169	84.30	0.15	7	7	0
SB_17	83.50	0.15	7	7	0
SB_170	86.60	0.15	7	7	0
SB_171	85.40	0.15	7	7	0
SB_172	82.10	0.15	7	7	0
SB_173	73.80	0.15	7	7	0
SB_174	77.60	0.15	7	7	0
SB_175	72.00	0.15	7	7	0
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SB_177	85.30	0.15	7	7	0
SB_178	79.80	0.15	7	7	0
SB_179	83.80	0.15	7	7	0
SB_18	80.00	0.15	7	7	0
SB_180	79.40	0.15	7	7	0
SB_181	84.30	0.15	7	7	0
SB_182	78.90	0.15	7	7	0
SB_183	81.10	0.15	7	7	0
SB_184	85.00	0.15	7	7	0
SB_185	79.80	0.15	7	7	0
SB_186	84.20	0.15	7	7	0
SB_187	73.90	0.15	7	7	0
SB_188	79.00	0.15	7	7	0
SB_189	83.70	0.15	7	7	0
SB_19	76.20	0.15	7	7	0
SB_190	79.50	0.15	7	7	0
SB_191	81.40	0.15	7	7	0
SB_192	78.80	0.15	7	7	0
SB_193	78.00	0.15	7	7	0
SB_194	80.20	0.15	7	7	0
SB_195	82.40	0.15	7	7	0
SB_196	80.40	0.15	7	7	0
SB_197	83.10	0.15	7	7	0
SB_198	77.30	0.15	7	7	0
SB_199	76.60	0.15	7	7	0
SB_2	79.20	0.15	7	7	0
SB_20	79.90	0.15	7	7	0
SB_200	73.60	0.15	7	7	0
SB_201	76.90	0.15	7	7	0
SB_202	78.00	0.15	7	7	0
SB_203	75.70	0.15	7	7	0
SB_204	71.80	0.15	7	7	0
SB_205	79.30	0.15	7	7	0
SB_206	72.00	0.15	7	7	0

SB_207	71.00	0.15	7	7	0
SB_208	82.20	0.15	7	7	0
SB_209	76.30	0.15	7	7	0
SB_21	75.80	0.15	7	7	0
SB_210	73.10	0.15	7	7	0
SB_211	74.80	0.15	7	7	0
SB_212	72.50	0.15	7	7	0
SB_213	76.10	0.15	7	7	0
SB_214	73.40	0.15	7	7	0
SB_215	68.00	0.15	7	7	0
SB_216	76.80	0.15	7	7	0
SB_217	77.70	0.15	7	7	0
SB_218	77.70	0.15	7	7	0
SB_219	75.10	0.15	7	7	0
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SB_235	76.10	0.15	7	7	0
SB_236	74.70	0.15	7	7	0
SB_237	75.00	0.15	7	7	0
SB_238	60.70	0.15	7	7	0
SB_239	73.20	0.15	7	7	0
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SB_28	81.50	0.15	7	7	0
SB_29	82.40	0.15	7	7	0
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SB_30	74.40	0.15	7	7	0
SB_31	76.40	0.15	7	7	0
SB_32	75.80	0.15	7	7	0
SB_33	83.10	0.15	7	7	0
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SB_38	81.50	0.15	7	7	0
SB_39	87.60	0.15	7	7	0
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SB_41	87.70	0.15	7	7	0
SB_42	74.60	0.15	7	7	0
SB_44	78.80	0.15	7	7	0
SB_45	85.50	0.15	7	7	0
SB_46	83.90	0.15	7	7	0
SB_47	83.30	0.15	7	7	0
SB_48	83.80	0.15	7	7	0

SB_49	77.90	0.15	7	7	0
SB_5	78.40	0.15	7	7	0
SB_50	81.50	0.15	7	7	0
SB_51	81.00	0.15	7	7	0
SB_52	70.50	0.15	7	7	0
SB_53	78.30	0.15	7	7	0
SB_54	81.70	0.15	7	7	0
SB_55	83.00	0.15	7	7	0
SB_56	83.60	0.15	7	7	0
SB_57	75.60	0.15	7	7	0
SB_58	84.00	0.15	7	7	0
SB_59	72.50	0.15	7	7	0
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SB_61	75.00	0.15	7	7	0
SB_62	82.10	0.15	7	7	0
SB_63	83.60	0.15	7	7	0
SB_64	83.70	0.15	7	7	0
SB_65	80.00	0.15	7	7	0
SB_66	83.80	0.15	7	7	0
SB_67	84.50	0.15	7	7	0
SB_68	82.30	0.15	7	7	0
SB_69	81.20	0.15	7	7	0
SB_7	66.60	0.15	7	7	0
SB_70	81.60	0.15	7	7	0
SB_71	80.00	0.15	7	7	0
SB_72	74.20	0.15	7	7	0
SB_73	78.60	0.15	7	7	0
SB_74	84.80	0.15	7	7	0
SB_75	83.20	0.15	7	7	0
SB_76	79.10	0.15	7	7	0
SB_77	84.00	0.15	7	7	0
SB_78	84.20	0.15	7	7	0
SB_79	79.00	0.15	7	7	0
SB_8	62.80	0.15	7	7	0
SB_80	64.90	0.15	7	7	0
SB_81	79.60	0.15	7	7	0
SB_82	83.60	0.15	7	7	0
SB_83	77.40	0.15	7	7	0
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SB_87	84.40	0.15	7	7	0
SB_88	84.30	0.15	7	7	0
SB_89	83.60	0.15	7	7	0
SB_9	74.30	0.15	7	7	0
SB_90	82.20	0.15	7	7	0
SB_91	77.50	0.15	7	7	0
SB_92	75.80	0.15	7	7	0
SB_93	70.90	0.15	7	7	0
SB_94	70.70	0.15	7	7	0
SB_95	67.00	0.15	7	7	0
SB_96	66.90	0.15	7	7	0
SB_97	83.60	0.15	7	7	0
SB_98	83.10	0.15	7	7	0
SB_99	84.30	0.15	7	7	0

APPENDIX C : GROWTH AND BUILDOUT CALCULATIONS

Growth Rate	3.5%

Year	Est. Growth Rate	Estimated Population
2021		7,632
2022	3.5%	7,632
2023	3.5%	7,900
2024	3.5%	8,177
2025	3.5%	8,464
2026	3.5%	8,761
2027	3.5%	9,068
2028	3.5%	9,386
2029	3.5%	9,715
2030	3.5%	10,056
2031	3.5%	10,408
2032	3.5%	10,773
2033	3.5%	11,151
2034	3.5%	11,542
2035	3.5%	11,946
2036	3.5%	12,365
2037	3.5%	12,798
2038	3.5%	13,246
2039	3.5%	13,710
2040	3.5%	14,190
2041	3.5%	14,687
2042	3.5%	15,202
2043	3.5%	15,735

Year	Census Population	Growth Rate
1970	120	-
1980	678	18.91%
1990	1947	11.13%
2000	3467	5.94%
2010	5803	5.29%
2020	7374	2.42%
Past 20-Year Growth Rate		3.85%

Residential Connections (2023)

2549

Commercial/Other Connections (2023)

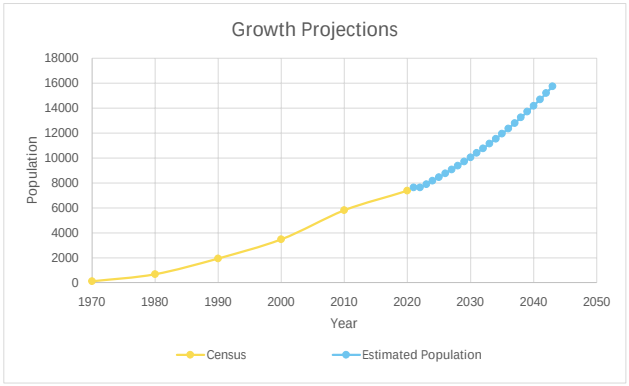
28 (not including 11 city owned)

1

$2 current user rate for residential, $4 commercial

Year	Est. Growth Rate	Estimated Commercial Connections	Estimated Residential Connections	Estimated Total Connections
2023	3.5%	28	2,549	2,577
2024	3.5%	29	2,638	2,667
2025	3.5%	30	2,730	2,760
2026	3.5%	31	2,826	2,857
2027	3.5%	32	2,925	2,957
2028	3.5%	33	3,027	3,060
2029	3.5%	34	3,133	3,167
2030	3.5%	35	3,243	3,278
2031	3.5%	36	3,357	3,393
2032	3.5%	37	3,474	3,511
2033	3.5%	38	3,596	3,634
2034	3.5%	39	3,722	3,761
2035	3.5%	40	3,852	3,892
2036	3.5%	41	3,987	4,028
2037	3.5%	42	4,127	4,169
2038	3.5%	43	4,271	4,314
2039	3.5%	45	4,420	4,465
2040	3.5%	47	4,575	4,622
2041	3.5%	49	4,735	4,784
2042	3.5%	51	4,901	4,952
2043	3.5%	53	5,073	5,126

Year	Est. Growth Rate	Estimated Population
2024	3.5%	8,177
2033	3.5%	11,151
2043	3.5%	15,735



Zoning Description	Zone Total Acres	Zone Developed Acres	Zone Undeveloped Acres	Existing Connections	Future Connections	Total Possible Connections
Mobile Home Park (MHP)	9	9	0	41	0	41
Mixed Residential (MXR_18)	46	40.5	5.5	45	6	51
Rural Residential 5 (R-R-5)	190	92	98	11	27	38
Professional Office (P-O)	4	4	0	4	0	4
Research Industrial Park (R/I-P)	505	373	132	60	22	82
Multiple Residential (M-R-2)	77	24	53	31	69	100
Community Commercial (C-C)	440	113	327	195	565	760
Neighborhood Commercial (N-C	8	4	4	2	2	4
Regional Commercial (R-C)	4	4	0	1	0	1
RV Park (RVP)	5	3.5	1.5	1	1	2
Residential 18 (R-1-18)	2670	1893	777	2326	955	3281
Residential 11 (R-1-11)	678	114	564	262	1296	1558
Rural Residential 1 (R-R-1)	490	170	320	71	134	205
Total All Zones	5126	2844	2282	3050	3077	6127
		0.554818572	0.445181428			

Zoning Description	Runoff Coefficient	Equivalent Residential Acreage
Mobile Home Park (MHP)	0.65	1.63
Mixed Residential (MXR_18)	0.5	1.25
Rural Residential 5 (R-R-5)	0.3	0.75
Professional Office (P-O)	0.7	1.75
Research Industrial Park (R/I-P)	0.8	2
Multiple Residential (M-R-2)	0.65	1.63
Community Commercial (C-C)	0.8	2
Neighborhood Commercial (N-C	0.6	1.5
Regional Commercial (R-C)	0.9	2.25
RV Park (RVP)	0.65	1.63
Residential 18 (R-1-18)	0.35	0.88
Residential 11 (R-1-11)	0.4	1
Rural Residential 1 (R-R-1)	0.3	0.75

Zoning Description	Zone Undeveloped Acres	Future Connections	Lot Size Avg (acres)	Weighted Average Lot Size * Developable
Mobile Home Park (MHP)	0	0		0
Mixed Residential (MXR_18)	5.5	6	0.92	5.06
Rural Residential 5 (R-R-5)	98	27	3.63	355.74
Professional Office (P-O)	0	0		0
Research Industrial Park (R/I-P)	132	22	6	792
Multiple Residential (M-R-2)	53	69	0.77	40.81
Community Commercial (C-C)	327	565	0.58	189.66
Neighborhood Commercial (N-C	4	2	2	8
Regional Commercial (R-C)	0	0		0
RV Park (RVP)	1.5	1	1.5	2.25
Residential 18 (R-1-18)	777	955	0.81	629.37
Residential 11 (R-1-11)	564	1296	0.44	248.16
Rural Residential 1 (R-R-1)	320	134	2.39	764.8
Total All Zones	2282	3077	0.74	1688.68
		Weighted average Residential	1.07	
		Weighted average Commercial	0.6	

APPENDIX D : RECOMMENED IMPROVEMENTS COSTS

SUNRISE ENGINEERING

11 North 300 West, Washington Utah 84780
Tel 435.652.8450 | **FAX** 435.652.8416

Engineer's Opinion of Probable Cost

Enoch Stormwater Master Plan and Impact Fees Facilities Plan 10-Jul-24
Enoch City BMD/BL

NO.	DESCRIPTION	AMOUNT
Drainage Channel and Crossing Projects		
1	Ravine Channel	$ 297,000.00
2	Jones Rd Ditch Upsizing	$ 89,000.00
3	Hatch Property Ditch	$ 83,000.00
4	Cottonwood Heights Ditch	$ 58,000.00
5	West Enoch Ditch	$ 920,000.00
	SUBTOTAL	**$ 1,447,000.00**
Detention Facilities Projects		
1	Detention Basin 1	$ 458,000.00
2	Detention Basin 2	$ 779,000.00
3	Detention Basin 3	$ 2,859,000.00
4	Detention Basin 4	$ 1,637,000.00
5	Detention Basin 5	$ 850,000.00
6	Detention Basin 6	$ 1,348,000.00
	SUBTOTAL	**$ 7,931,000.00**
Storm Drain Pipe System Projects		
1	Westward Dr to 3380 N	$ 610,000.00
2	3600 N through Bulldog Rd	$ 3,803,000.00
3	Driftwood Ln to Midvalley Rd	$ 5,582,000.00
4	Palomino Dr to Midvalley Rd	$ 2,831,000.00
5	Sarah Ave to West Enoch Ditch	$ 981,000.00
6	Minersville Hwy – 3000 N to 5600 N	$ 13,022,000.00
7	Grimshaw Ln – Churchfield Rd to 6400N	$ 7,997,000.00
8	Garden Park	$ 1,952,000.00
9	Midvalley Rd – Minersville Hwy to Horseshoe Trail	$ 6,780,000.00
10	Half Mile Rd	$ 5,148,000.00
11	4200 N	$ 934,000.00
12	Rose Ln – Maple Ln to Half Mile Rd	$ 2,585,000.00
13	Hideaway Rd	$ 487,000.00
14	Homestead Blvd & Sunshine Ln	$ 1,156,000.00
15	Stagecoach Ln – Upsize Existing	$ 1,664,000.00
16	Southern Homestead Blvd – Connect to Existing	$ 441,000.00
17	Rachel Ln/Sunset Rd/Tomahawk Dr	$ 3,222,000.00
18	Enoch Rd – Heritage Dr to Jones Rd	$ 177,000.00
19	Mountain View Loop to Ravine Dr	$ 456,000.00
20	North Enoch Rd	$ 649,000.00
21	Enoch Rd – Culvert	$ 30,000.00
	SUBTOTAL	**$ 60,507,000.00**
Roadway Conveyance Projects		
1	Proposed Cross Gutters	$ 40,000.00
2	Rehab Existing Cross Gutters	$ 309,000.00
3	3600 N	$ 1,077,000.00
4	Bulldog Rd	$ 589,000.00
5	Cotton Wood Heights Subdivision	$ 1,184,000.00
6	Driftwood Ln	$ 672,000.00
7	Palomino Dr	$ 525,000.00
8	Minersville Hwy	$ 3,604,000.00
9	4200 N	$ 1,078,000.00
10	Garden Park Subdivision	$ 1,887,000.00
11	Corner of California and Homestead Blvd	$ 111,000.00
12	Maple Ln	$ 1,162,000.00
13	Stagecoach Ln	$ 625,000.00
14	Quick Draw Ln	$ 120,000.00
15	Homestead Blvd	$ 447,000.00
16	Wagon Wheel to 1365E - Southern Homestead Blvd	$ 166,000.00
17	Southern Homestead Blvd	$ 360,000.00
18	Half Mile Rd East	$ 256,000.00
19	Half Mile Rd West	$ 143,000.00
20	Old Scout Trl	$ 264,000.00
21	Mule Train Dr	$ 272,000.00
22	Pioneer Dr	$ 266,000.00
23	Grimshaw Ln (600E)	$ 200,000.00
24	Midvalley Rd	$ 5,943,000.00
25	5600 N	$ 477,000.00
26	Sunset Rd	$ 292,000.00
27	Ravine Road (Pomeroy Green Rd)	$ 153,000.00
28	Village Green Rd	$ 478,000.00
29	Veterans Memorial Dr	$ 176,000.00
30	Jones Rd (5250N)	$ 316,000.00
31	Tomahawk Dr	$ 210,000.00
32	Horseshoe Dr	$ 67,000.00
	SUBTOTAL	**$ 23,469,000.00**
NRCS Projects		
1	Midvalley Rd to 5200 N Ditch Upsizing	$ 504,000.00
2	East Bench EA Projects - 25% Cost Share	$ 6,571,000.00
	SUBTOTAL	**$ 7,075,000.00**
		$ 100,429,000.00

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

Project	Cost Estimate (Today's $)	Est. Year of Installation	Estimated Costs with Inflation
0 To 10 Year Improvements			
Drainage Channel and Crossing Projects			
Ravine Channel	$ 297,000.00	2026	$ 316,000.00
Detention Facilities Projects			
Detention Basin 4	$ 1,637,000.00	2025	$ 1,687,000.00
Storm Drain Pipe System Projects			
Enoch Rd – Culvert	$ 30,000.00	2025	$ 31,000.00
Half Mile Rd	$ 5,148,000.00	2026	$ 5,462,000.00
North Enoch Rd	$ 649,000.00	2027	$ 710,000.00
Homestead Blvd & Sunshine Ln	$ 1,156,000.00	2028	$ 1,302,000.00
Roadway Conveyance Projects			
Half Mile Rd West	$ 143,000.00	2025	$ 148,000.00
Ravine Road (Pomeroy Green Rd)	$ 153,000.00	2026	$ 163,000.00
Village Green Rd	$ 478,000.00	2026	$ 508,000.00
Half Mile Rd East	$ 256,000.00	2027	$ 280,000.00
4200 N	$ 1,078,000.00	2027	$ 1,178,000.00
Corner of California and Homestead Blvd	$ 111,000.00	2028	$ 125,000.00
Homestead Blvd	$ 447,000.00	2028	$ 504,000.00
Grimshaw Ln (600E)	$ 200,000.00	2029	$ 232,000.00
Wagon Wheel to 1365E - Southern Homestead Blvd	$ 166,000.00	2031	$ 205,000.00
Jones Rd (5250N)	$ 316,000.00	2032	$ 401,000.00
Veterans Memorial Dr	$ 176,000.00	2033	$ 230,000.00
NRCS Projects - 25% Cost Share			
Midvalley Rd to 5200 N Ditch Upsizing	$ 504,000.00	2025	$ 520,000.00
East Bench EA Projects - 25% Cost Share	$ 6,571,000.00	2030	$ 7,847,000.00
Total Costs for 0 to 10 Year Improvements	**$ 19,516,000.00**		**$ 21,849,000.00**
10 To 20 Year Improvements			
Drainage Channel and Crossing Projects			
West Enoch Ditch	$ 920,000.00	2040	$ 1,477,000.00
Hatch Property Ditch	$ 83,000.00	2041	$ 138,000.00
Cottonwood Heights Ditch	$ 58,000.00	2042	$ 99,000.00
Jones Rd Ditch Upsizing	$ 89,000.00	2043	$ 157,000.00
Detention Facilities Projects			
Detention Basin 5	$ 850,000.00	2035	$ 1,177,000.00
Detention Basin 2	$ 779,000.00	2036	$ 1,111,000.00
Detention Basin 1	$ 458,000.00	2041	$ 758,000.00
Detention Basin 6	$ 1,348,000.00	2042	$ 2,295,000.00
Detention Basin 3	$ 2,859,000.00	2044	$ 5,164,000.00
Storm Drain Pipe System Projects			
Midvalley Rd – Minersville Hwy to Horseshoe Trail	$ 6,780,000.00	2034	$ 9,112,000.00
Rose Ln – Maple Ln to Half Mile Rd	$ 2,585,000.00	2036	$ 3,686,000.00
Garden Park	$ 1,952,000.00	2036	$ 2,784,000.00
Grimshaw Ln – Churchfield Rd to 6400N	$ 7,997,000.00	2036	$ 11,402,000.00
Stagecoach Ln – Upsize Existing	$ 1,664,000.00	2036	$ 2,373,000.00
Southern Homestead Blvd – Connect to Existing	$ 441,000.00	2037	$ 648,000.00
4200 N	$ 934,000.00	2037	$ 1,372,000.00
Mountain View Loop to Ravine Dr	$ 456,000.00	2037	$ 670,000.00
Minersville Hwy – 3000 N to 5600 N	$ 13,022,000.00	2038	$ 19,697,000.00
3600 N through Bulldog Rd	$ 3,803,000.00	2039	$ 5,925,000.00
Palomino Dr to Midvalley Rd	$ 2,831,000.00	2040	$ 4,543,000.00
Driftwood Ln to Midvalley Rd	$ 5,582,000.00	2040	$ 8,958,000.00
Sarah Ave to West Enoch Ditch	$ 981,000.00	2041	$ 1,622,000.00
Westward Dr to 3380 N	$ 610,000.00	2041	$ 1,009,000.00
Rachel Ln/Sunset Rd/Tomahawk Dr	$ 3,222,000.00	2042	$ 5,486,000.00
Enoch Rd – Heritage Dr to Jones Rd	$ 177,000.00	2043	$ 311,000.00
Hideaway Rd	$ 487,000.00	2044	$ 880,000.00
Roadway Conveyance Projects			
Midvalley Rd	$ 5,943,000.00	2034	$ 7,987,000.00
Old Scout Trl	$ 264,000.00	2035	$ 366,000.00
Mule Train Dr	$ 272,000.00	2035	$ 377,000.00
Pioneer Dr	$ 266,000.00	2035	$ 369,000.00
Maple Ln	$ 1,162,000.00	2036	$ 1,657,000.00
Garden Park Subdivision	$ 1,887,000.00	2036	$ 2,691,000.00
Stagecoach Ln	$ 625,000.00	2036	$ 892,000.00
Quick Draw Ln	$ 120,000.00	2036	$ 172,000.00
5600 N	$ 477,000.00	2036	$ 681,000.00
Southern Homestead Blvd	$ 360,000.00	2037	$ 529,000.00
Minersville Hwy	$ 3,604,000.00	2038	$ 5,452,000.00
3600 N	$ 1,077,000.00	2039	$ 1,678,000.00
Bulldog Rd	$ 589,000.00	2039	$ 918,000.00
Cotton Wood Heights Subdivision	$ 1,184,000.00	2040	$ 1,900,000.00
Driftwood Ln	$ 672,000.00	2040	$ 1,079,000.00
Palomino Dr	$ 525,000.00	2040	$ 843,000.00
Sunset Rd	$ 292,000.00	2041	$ 483,000.00
Tomahawk Dr	$ 210,000.00	2041	$ 348,000.00
Horseshoe Dr	$ 67,000.00	2041	$ 111,000.00
Proposed Cross Gutters	$ 40,000.00	2042	$ 69,000.00
Rehab Existing Cross Gutters	$ 309,000.00	2043	$ 542,000.00
Total Costs for 10 to 20 Year Improvements	**$ 80,913,000.00**		**$ 121,998,000.00**
Total Costs for All Improvements	**$ 100,429,000.00**		**$ 143,847,000.00**

DITCHES AND BASINS

Midvalley Rd to 5200 N Ditch Upsizing

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	Upsize from 8' bottom width to 30'	8112	CY	$ 5.00	$ 40,560.00
2	Upsized from 25' bottom width to 40'	3380	CY	$ 5.00	$ 16,900.00
3	6' x 4' Box Culvert from 48" Pipe	510	LF	$ 710.00	$ 362,100.00
	Contingency			20%	$ 83,912.00
				Rounded Total	$ 504,000.00

Jones Rd Ditch Upsizing

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	8%	LS	$ 3,920.00	$ 3,920.00
2	Dust Control & Watering	1	LS	$ 5,000.00	$ 5,000.00
3	Excavation	1375	CY	$ 5.00	$ 6,875.00
4	Reseeding	18562.5	SF	$ 2.00	$ 37,125.00
5	Engineering	13.46%	LS	$ 7,126.00	$ 7,126.00
6	Funding	5.62%	HR	$ 5,000.00	$ 5,000.00
7	Bidding and Negotiating	10.11%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 14,810.00
				Rounded Total	$ 89,000.00

Ravine Channel

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	8%	LS	$ 15,111.00	$ 15,111.00
2	Dust Control & Watering	1	LS	$ 3,000.00	$ 3,000.00
3	Excavation	8082	CY	$ 5.00	$ 40,410.00
4	Reseeding	72738	SF	$ 2.00	$ 145,476.00
5	Engineering	14.30%	LS	$ 29,172.00	$ 29,172.00
6	Funding	1.68%	HR	$ 5,000.00	$ 5,000.00
7	Bidding and Negotiating	3.03%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 49,434.00
				Rounded Total	$ 297,000.00

Hatch Property Ditch

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	8%	LS	$ 3,588.00	$ 3,588.00
2	Dust Control & Watering	1	LS	$ 5,000.00	$ 5,000.00
3	Excavation	1245	CY	$ 5.00	$ 6,225.00
4	Reseeding	16808	SF	$ 2.00	$ 33,616.00
5	Engineering	13.83%	LS	$ 6,697.00	$ 6,697.00
6	Funding	6.02%	HR	$ 5,000.00	$ 5,000.00
7	Bidding and Negotiating	10.84%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 13,826.00
				Rounded Total	$ 83,000.00

Cottonwood Heights Ditch

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	8%	LS	$ 2,199.00	$ 2,199.00
2	Dust Control & Watering	1	LS	$ 3,000.00	$ 3,000.00
3	Excavation	415	CY	$ 5.00	$ 2,075.00
4	Reseeding	11205	SF	$ 2.00	$ 22,410.00
5	Engineering	14.25%	LS	$ 4,231.00	$ 4,231.00
6	Funding	8.62%	HR	$ 5,000.00	$ 5,000.00
7	Bidding and Negotiating	15.52%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 9,583.00
				Rounded Total	$ 58,000.00

West Enoch Ditch

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	8%	LS	$ 51,632.00	$ 51,632.00
2	Dust Control & Watering	1	LS	$ 5,000.00	$ 5,000.00
3	Excavation	24075	CY	$ 5.00	$ 120,375.00
4	Reseeding	260010	SF	$ 2.00	$ 520,020.00
5	Engineering	7.95%	LS	$ 55,415.00	$ 55,415.00
6	Funding	0.54%	HR	$ 5,000.00	$ 5,000.00
7	Bidding and Negotiating	0.98%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 153,289.00
				Rounded Total	$ 920,000.00

Detention Basin 1

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	1	LS	$ 26,594.00	$ 26,594.00
2	CLEARING AND GRUBBING	1	LS	$ 10,000.00	$ 10,000.00
3	RIP RAP MATERIAL (INLET/OUTLET)	100	SF	$ 4.00	$ 400.00
4	Reseeding	14954	SF	$ 2.00	$ 29,908.00
5	EXCAVATION	3323	CY	$ 5.00	$ 16,615.00
6	Outlet pipe (12")	1450	LF	$ 190.00	$ 275,500.00
7	Outlet Ditch	0	CY	$ 5.00	$ -
8	Engineering	14.28%	LS	$ 8,126.00	$ 8,126.00
9	Funding	1.09%	HR	$ 5,000.00	$ 5,000.00
10	Bidding and Negotiating	1.97%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 76,229.00
				Rounded Total	$ 458,000.00

Detention Basin 2

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	1	LS	$ 44,065.00	$ 44,065.00
2	CLEARING AND GRUBBING	1	LS	$ 50,000.00	$ 50,000.00
3	RIP RAP MATERIAL (INLET/OUTLET)	100	SF	$ 4.00	$ 400.00
4	Reseeding	141426	SF	$ 2.00	$ 282,852.00
5	EXCAVATION	31428	CY	$ 5.00	$ 157,140.00
6	Outlet pipe (18")	310	LF	$ 190.00	$ 58,900.00
7	Outlet Ditch	304	CY	$ 5.00	$ 1,520.00
8	Engineering	8.20%	LS	$ 40,196.00	$ 40,196.00
9	Funding	0.64%	HR	$ 5,000.00	$ 5,000.00
10	Bidding and Negotiating	1.16%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 129,815.00
				Rounded Total	$ 779,000.00

Detention Basin 3

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	1	LS	$ 165,359.00	$ 165,359.00
2	CLEARING AND GRUBBING	1	LS	$ 100,000.00	$ 100,000.00
3	RIP RAP MATERIAL (INLET/OUTLET)	100	SF	$ 4.00	$ 400.00
4	Reseeding	608112	SF	$ 2.00	$ 1,216,224.00
5	EXCAVATION	135136	CY	$ 5.00	$ 675,680.00
6	Outlet pipe (24")	370	LF	$ 190.00	$ 70,300.00
7	Outlet Ditch	876	CY	$ 5.00	$ 4,380.00
8	Engineering	6.80%	LS	$ 135,530.00	$ 135,530.00
9	Funding	0.17%	HR	$ 5,000.00	$ 5,000.00
10	Bidding and Negotiating	0.31%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 476,375.00
				Rounded Total	$ 2,859,000.00

Detention Basin 4

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	1	LS	$ 93,738.00	$ 93,738.00
2	CLEARING AND GRUBBING	1	LS	$ 100,000.00	$ 100,000.00
3	RIP RAP MATERIAL (INLET/OUTLET)	100	SF	$ 4.00	$ 400.00
4	Reseeding	339467	SF	$ 2.00	$ 678,934.00
5	EXCAVATION	75437	CY	$ 5.00	$ 377,185.00
6	Outlet pipe (24")	80	LF	$ 190.00	$ 15,200.00
7	Outlet Ditch	0	CY	$ 5.00	$ -
8	Engineering	6.76%	LS	$ 84,559.00	$ 84,559.00
9	Funding	0.31%	HR	$ 5,000.00	$ 5,000.00
10	Bidding and Negotiating	0.55%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 272,804.00
				Rounded Total	$ 1,637,000.00

Detention Basin 5

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	1	LS	$ 48,361.00	$ 48,361.00
2	CLEARING AND GRUBBING	1	LS	$ 30,000.00	$ 30,000.00
3	RIP RAP MATERIAL (INLET/OUTLET)	100	SF	$ 4.00	$ 400.00
4	Reseeding	160529	SF	$ 2.00	$ 321,058.00
5	EXCAVATION	35673	CY	$ 5.00	$ 178,365.00
6	Outlet pipe (24")	370	LF	$ 190.00	$ 70,300.00
7	Outlet Ditch	876	CY	$ 5.00	$ 4,380.00
8	Engineering	7.80%	LS	$ 41,331.00	$ 41,331.00
9	Funding	0.59%	HR	$ 5,000.00	$ 5,000.00
10	Bidding and Negotiating	1.06%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 141,639.00
				Rounded Total	$ 850,000.00

Detention Basin 6

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	MOBILIZATION	1	LS	$ 72,776.00	$ 72,776.00
2	CLEARING AND GRUBBING	1	LS	$ 50,000.00	$ 50,000.00
3	RIP RAP MATERIAL (INLET/OUTLET)	100	SF	$ 4.00	$ 400.00
4	Reseeding	276201	SF	$ 2.00	$ 552,402.00
5	EXCAVATION	61378	CY	$ 5.00	$ 306,890.00
6	Outlet pipe (18")	310	LF	$ 190.00	$ 58,900.00
7	Outlet Ditch	0	CY	$ 5.00	$ -
8	Engineering	7.47%	LS	$ 67,935.00	$ 67,935.00
9	Funding	0.37%	HR	$ 5,000.00	$ 5,000.00
10	Bidding and Negotiating	0.67%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 224,661.00
				Rounded Total	$ 1,348,000.00

PIPES

Westward Dr to 3380 N

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 60,380.00	$ 60,380.00
2	24" HDPE	339	LF	$ 190.00	$ 64,410.00
3	30" HDPE	532	LF	$ 210.00	$ 111,720.00
4	42" HDPE	174	LF	$ 275.00	$ 47,850.00
5	48" HDPE	70	LF	$ 290.00	$ 20,300.00
6	24" BOX	2	EA	$13,000.00	$ 26,000.00
7	30" BOX	2	EA	$13,500.00	$ 27,000.00
8	42" BOX	1	EA	$20,000.00	$ 20,000.00
9	48" BOX	1	EA	$29,500.00	$ 29,500.00
10	ASPHALT W BASE	11150	SF	$5.00	$ 55,750.00
	Engineering	8.66%	LS	$ 40,100.00	$ 40,100.00
	Funding	0.82%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	1.48%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 92,582.00
				Rounded Total	$ 610,000.00

Palomino Dr to Midvalley Rd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 289,828.00	$ 289,828.00
2	24" HDPE	352	LF	$ 190.00	$ 66,880.00
3	30" HDPE	714	LF	$ 210.00	$ 149,940.00
4	36" HDPE	2303	LF	$ 260.00	$ 598,780.00
5	42" HDPE	2221	LF	$ 275.00	$ 610,775.00
6	24" BOX	1	EA	$13,000.00	$ 13,000.00
7	30" BOX	1	EA	$13,500.00	$ 13,500.00
8	36" BOX	5	EA	$13,750.00	$ 68,750.00
9	42" BOX	7	EA	$20,000.00	$ 140,000.00
10	ASPHALT W BASE	55900	SF	$4.84	$ 270,556.00
	Contingency			20%	$ 444,402.00
	Engineering	6.76%	LS	$ 150,173.00	$ 150,173.00
	Funding	0.18%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.32%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 2,831,000.00

3600 N through Bulldog Rd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 390,257.00	$ 390,257.00
2	24" HDPE	1244	LF	$ 190.00	$ 236,360.00
3	30" HDPE	754	LF	$ 210.00	$ 158,340.00
4	36" HDPE	2804	LF	$ 260.00	$ 729,040.00
5	42" HDPE	2672	LF	$ 275.00	$ 734,800.00
6	48" HDPE	43	LF	$ 290.00	$ 12,470.00
7	60" HDPE	30	LF	$ 320.00	$ 9,600.00
8	24" BOX	3	EA	$13,000.00	$ 39,000.00
9	30" BOX	2	EA	$13,500.00	$ 27,000.00
10	36" BOX	7	EA	$13,750.00	$ 96,250.00
11	42" BOX	6	EA	$20,000.00	$ 120,000.00
12	48" BOX	1	EA	$29,500.00	$ 29,500.00
13	60" BOX	1	EA	$32,000.00	$ 32,000.00
14	ASPHALT W BASE	75470	SF	$5.00	$ 377,350.00
	Engineering	6.61%	LS	$ 197,700.00	$ 197,700.00
	Funding	0.13%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.24%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 598,394.00
				Rounded Total	$ 3,803,000.00

Sarah Ave to West Enoch Ditch

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 98,544.00	$ 98,544.00
2	30" HDPE	2358	LF	$ 210.00	$ 495,180.00
3	30" BOX	5	EA	$13,500.00	$ 67,500.00
4	DITCH INLET	1	EA	$11,750.00	$ 11,750.00
5	ASPHALT W BASE	16506	SF	$5.00	$ 82,530.00
	Contingency			20%	$ 151,101.00
	Engineering	7.89%	LS	$ 59,604.00	$ 59,604.00
	Funding	0.51%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.92%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 981,000.00

Driftwood Ln to Midvalley Rd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 6,955.00	$ 6,955.00
2	24" HDPE	480	LF	$ 190.00	$ 91,200.00
3	36" HDPE	13136	LF	$ 260.00	$ 3,415,360.00
4	24" BOX	1	EA	$13,000.00	$ 13,000.00
5	36" BOX	1	EA	$13,750.00	$ 13,750.00
6	DUAL 36" BOX	13	EA	$19,160.00	$ 249,080.00
7	ASPHALT W BASE	122544	SF	$5.00	$ 612,720.00
	Engineering	6.47%	LS	$ 284,982.00	$ 284,982.00
	Funding	0.09%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.16%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 880,413.00
				Rounded Total	$ 5,582,000.00

Minersville Hwy – 3000 N to 5600 N

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 1,346,506.00	$ 1,346,506.00
1	18" HDPE	220	LF	$ 165.00	$ 36,300.00
2	24" HDPE	2950	LF	$ 190.00	$ 560,500.00
3	30" HDPE	1590	LF	$ 210.00	$ 333,900.00
4	36" HDPE	1060	LF	$ 260.00	$ 275,600.00
5	48" HDPE	15712	LF	$ 290.00	$ 4,556,480.00
6	60" HDPE	3534	LF	$ 320.00	$ 1,130,880.00
7	18" BOX	3	EA	$ 15,165.00	$ 45,495.00
8	24" BOX	6	EA	$ 13,000.00	$ 78,000.00
9	30" BOX	3	EA	$ 13,000.00	$ 39,000.00
10	36" BOX	3	EA	$ 13,750.00	$ 41,250.00
11	48" BOX	12	EA	$ 13,750.00	$ 165,000.00
12	DUAL 48" BOX	11	EA	$ 29,000.00	$ 319,000.00
13	DITCH INLET	1	EA	$ 11,750.00	$ 11,750.00
14	ASPHALT W BASE	276710	SF	$ 5.00	$ 1,383,550.00
	Contingency			20%	$ 2,064,643.00
	Engineering	6.00%	LS	$ 619,393.00	$ 619,393.00
	Funding	0.04%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.07%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 13,022,000.00

Grimshaw Ln – Churchfield Rd to 6400N

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 824,291.00	$ 824,291.00
2	30" HDPE	602	LF	$ 210.00	$ 126,420.00
3	36" HDPE	9936	LF	$ 260.00	$ 2,583,360.00
4	48" HDPE	5703	LF	$ 290.00	$ 1,653,870.00
5	30" BOX	2	EA	$13,500.00	$ 27,000.00
6	DUAL 36" BOX	10	EA	$19,160.00	$ 191,600.00
7	48" BOX	12	EA	$29,500.00	$ 354,000.00
8	ASPHALT W BASE	109454	SF	$5.00	$ 547,270.00
9	DITCH INLET	1	EA	$11,750.00	$ 11,750.00
	Contingency			20%	$ 1,263,913.00
	Engineering	6.32%	LS	$ 399,212.00	$ 399,212.00
	Funding	0.06%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.11%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 7,997,000.00

Half Mile Rd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 528,503.00	$ 528,503.00
2	60" HDPE	6705	LF	$ 320.00	$ 2,145,600.00
3	DITCH INLET	1	EA	$11,750.00	$ 11,750.00
4	60" BOX	14	EA	$32,000.00	$ 829,598.00
5	ASPHALT W BASE	107280	SF	$5.00	$ 536,400.00
	Contingency			20%	$ 810,371.00
	Engineering	6.69%	LS	$ 270,979.00	$ 270,979.00
	Funding	0.10%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.17%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 5,148,000.00

Garden Park

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 207,594.00	$ 207,594.00
1	18" HDPE	1049	LF	$ 165.00	$ 173,085.00
2	24" HDPE	1069	LF	$ 190.00	$ 203,110.00
3	36" HDPE	350	LF	$ 260.00	$ 91,000.00
4	48" HDPE	1808	LF	$ 290.00	$ 524,320.00
5	18" BOX	4	EA	$ 15,165.00	$ 60,660.00
6	24" BOX	3	EA	$13,000.00	$ 39,000.00
7	36" BOX	2	EA	$13,750.00	$ 27,500.00
8	48" BOX	3	EA	$29,500.00	$ 88,500.00
9	ASPHALT W BASE	35356	SF	$5.00	$ 176,780.00
10	Engineering	7.10%	LS	$ 27,857.00	$ 27,857.00
11	Funding	0.26%	HR	$ 5,000.00	$ 5,000.00
12	Bidding and Negotiating	0.46%	HR	$ 9,000.00	$ 9,000.00
	Contingency			20%	$ 318,310.00
				Rounded Total	$ 1,952,000.00

4200 N

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 94,451.00	$ 94,451.00
2	36" HDPE	952	LF	$ 260.00	$ 247,520.00
3	42" HDPE	843	LF	$ 275.00	$ 231,825.00
4	36" BOX	2	EA	$13,750.00	$ 27,500.00
5	42" BOX	3	EA	$20,000.00	$ 60,000.00
6	ASPHALT W BASE	12565	SF	$5.00	$ 62,825.00
	Contingency			20%	$ 144,825.00
	Engineering	7.95%	LS	$ 50,070.00	$ 50,070.00
	Funding	0.54%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.96%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 934,000.00

Midvalley Rd – Minersville Hwy to Horseshoe Trail

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 729,152.00	$ 729,152.00
1	24" HDPE	5088	LF	$ 190.00	$ 966,720.00
2	30" HDPE	2668	LF	$ 210.00	$ 560,280.00
3	36" HDPE	1446	LF	$ 260.00	$ 375,960.00
4	48" HDPE	6556	LF	$ 290.00	$ 1,901,240.00
5	24" BOX	7	EA	$ 13,000.00	$ 91,000.00
6	DUAL 24" BOX	4	EA	$ 15,165.00	$ 60,660.00
7	30" BOX	1	EA	$ 13,051.00	$ 13,051.00
8	DUAL 30" BOX	3	EA	$ 17,500.00	$ 52,500.00
9	DUAL 36" BOX	2	EA	$ 19,160.00	$ 38,320.00
10	48" BOX	5	EA	$ 13,750.00	$ 68,750.00
11	DUAL 48" BOX	8	EA	$ 28,460.00	$ 227,680.00
12	ASPHALT W BASE	100970	SF	$ 5.00	$ 504,850.00
	Contingency			20%	$ 1,118,033.00
	Engineering	6.37%	LS	$ 56,863.00	$ 56,863.00
	Funding	0.07%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.13%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 6,780,000.00

Rose Ln – Maple Ln to Half Mile Rd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TRAFFIC CONTROL, ETC)	15%	LS	$ 264,480.00	$ 264,480.00
2	60" HDPE	3260	LF	$ 320.00	$ 1,043,200.00
3	DUAL 60" BOX	6	EA	$ 60,000.00	$ 360,000.00
4	ASPHALT W BASE	14670	SF	$ 5.00	$ 360,000.00
	Contingency			20%	$ 405,536.00
	Engineering	6.79%	LS	$ 137,770.00	$ 137,770.00
	Funding	0.19%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.35%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 2,585,000.00

PIPES

Hideaway Rd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TR	15%	LS	$ 49,401.00	$ 49,401.00
2	24" HDPE	661	LF	$ 190.00	$ 125,590.00
3	36" HDPE	347	LF	$ 260.00	$ 90,220.00
4	24" BOX	3	EA	$ 13,000.00	$ 39,000.00
5	36" BOX	2	EA	$ 13,750.00	$ 27,500.00
6	DITCH INLET	1	EA	$ 11,750.00	$ 11,750.00
7	ASPHALT W BASE	7056	SF	$ 5.00	$ 35,280.00
	Contingency			20%	$ 75,749.00
	Engineering	9.03%	LS	$ 18,394.00	$ 18,394.00
	Funding	1.03%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	1.85%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 487,000.00

Southern Homestead Blvd – Connect to Existing

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TR	15%	LS	$ 42,987.00	$ 42,987.00
2	30" HDPE	965	LF	$ 210.00	$ 202,650.00
3	30" BOX	3	EA	$13,500.00	$ 40,500.00
4	ASPHALT W BASE	8685	SF	$5.00	$ 43,425.00
	Contingency			20%	$ 65,913.00
	Engineering	9.33%	LS	$ 30,756.00	$ 30,756.00
	Funding	1.13%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	2.04%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 441,000.00

Mountain View Loop to Ravine Dr

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TR	15%	LS	$ 44,955.00	$ 44,955.00
2	24" HDPE	466	LF	$ 190.00	$ 88,540.00
3	36" HDPE	358	LF	$ 260.00	$ 93,080.00
4	24" BOX	2	EA	$ 13,000.00	$ 26,000.00
5	36" BOX	4	EA	$ 13,750.00	$ 55,000.00
6	ASPHALT W BASE	7416	SF	$5.00	$ 37,080.00
	Contingency			20%	$ 68,931.00
	Engineering	9.23%	LS	$ 27,669.00	$ 27,669.00
	Funding	1.10%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	1.97%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 456,000.00

Mountain View Loop to Ravine Dr - Upsize NRCS

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	24" Pipe Upsize to 36"	800	LF	$ 20.00	$ 16,000.00
	Contingency			20%	$ 3,200.00
				Rounded Total	$ 20,000.00

Homestead Blvd & Sunshine Ln

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, T	15%	LS	$ 122,829.00	$ 122,829.00
2	24" HDPE	642	LF	$ 190.00	$ 121,980.00
3	36" HDPE	371	LF	$ 260.00	$ 96,460.00
4	60" HDPE	1341	LF	$ 320.00	$ 429,120.00
5	24" BOX	2	EA	$ 13,000.00	$ 26,000.00
6	36" BOX	1	EA	$13,750.00	$ 13,750.00
7	CONNECT TO 60" BOX	2	EA	$12,000.00	$ 24,000.00
8	DITCH INLET	1	EA	$ 11,750.00	$ 11,750.00
9	ASPHALT W BASE	19160	SF	$ 5.00	$ 95,800.00
	Contingency			20%	$ 188,338.00
	Engineering	6.75%	LS	$ 11,568.00	$ 11,568.00
	Funding	0.43%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.78%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 1,156,000.00

Rachel Ln/Sunset Rd/Tomahawk Dr

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, T	15%	LS	$ 345,350.00	$ 345,350.00
2	18" HDPE	2965	LF	$ 165.00	$ 489,225.00
3	24" HDPE	245	LF	$ 190.00	$ 46,550.00
4	30" HDPE	1591	LF	$ 210.00	$ 334,110.00
5	36" HDPE	1318	LF	$ 260.00	$ 342,680.00
6	48" HDPE	1721	LF	$ 290.00	$ 499,090.00
7	18" BOX	8	EA	$ 15,165.00	$ 121,320.00
8	24" BOX	1	EA	$ 13,000.00	$ 13,000.00
9	30" BOX	5	EA	$ 13,500.00	$ 67,500.00
10	36" BOX	3	EA	$ 13,750.00	$ 41,250.00
11	48" BOX	6	EA	$ 13,750.00	$ 82,500.00
12	DITCH INLET	1	EA	$ 11,750.00	$ 11,750.00
13	ASPHALT W BASE	50671	SF	$ 5.00	$ 253,355.00
	Contingency			20%	$ 529,536.00
	Engineering	6.67%	LS	$ 30,432.00	$ 30,432.00
	Funding	0.16%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.28%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 3,222,000.00

North Enoch Rd - Upsize NRCS

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	30" Pipe Upsize to 42"	1295	LF	$ 65.00	$ 84,175.00
	Contingency			20%	$ 16,835.00
				Rounded Total	$ 101,000.00

Stagecoach Ln – Upsize Existing

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TR	15%	LS	$ 169,755.00	$ 169,755.00
2	60" HDPE	2370	LF	$ 320.00	$ 758,400.00
3	60" BOX	5	EA	$32,000.00	$ 160,000.00
4	REMOVE EXISTING 36" PIPE	2370	LF	$50.00	$ 118,500.00
5	ASPHALT W BASE	18960	SF	$ 5.00	$ 94,800.00
	Contingency			20%	$ 260,291.00
	Engineering	7.31%	LS	$ 88,206.00	$ 88,206.00
	Funding	0.30%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	0.54%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 1,664,000.00

Enoch Rd – Heritage Dr to Jones Rd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TR	15%	LS	$ 16,320.00	$ 16,320.00
2	24" HDPE	360	LF	$ 190.00	$ 68,400.00
3	24" BOX	2	EA	$ 13,000.00	$ 26,000.00
4	ASPHALT W BASE	2880	SF	$ 5.00	$ 14,400.00
	Contingency			20%	$ 25,024.00
	Engineering	11.28%	LS	$ 12,493.00	$ 12,493.00
	Funding	2.82%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	5.08%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 177,000.00

North Enoch Rd

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TR	15%	LS	$ 64,481.00	$ 64,481.00
2	42" HDPE	1141	LF	$ 280.00	$ 319,480.00
3	42" BOX	3	EA	$ 13,750.00	$ 41,250.00
4	DITCH INLET	2	EA	$ 11,750.00	$ 23,500.00
5	ASPHALT W BASE	9128	SF	$ 5.00	$ 45,640.00
	Contingency			20%	$ 98,871.00
	Engineering	8.27%	LS	$ 40,875.00	$ 40,875.00
	Funding	0.77%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	1.39%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 649,000.00

Enoch Rd – Culvert

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
1	GENERAL CONSTRUCTION (MOBILIZATION, TR	15%	LS	$ 1,500.00	$ 1,500.00
2	18" HDPE	50	LF	$ 165.00	$ 8,250.00
3	ASPHALT W BASE	350	SF	$ 5.00	$ 1,750.00
	Contingency			20%	$ 2,300.00
	Engineering	14.30%	LS	$ 1,395.00	$ 1,395.00
	Funding	16.67%	HR	$ 5,000.00	$ 5,000.00
	Bidding and Negotiating	30.00%	HR	$ 9,000.00	$ 9,000.00
				Rounded Total	$ 30,000.00

ROADWAY CONVEYANCE

Cross gutters

NO.	DESCRIPTION	EST. QTY	UNIT PRICE		SUBTOTAL CONSTRUCTION AMOUNT	GENERAL CONSTRUCTION (15%)	Contingency (20%)	Engineering (FMHARAT %)	Funding	Bidding & Negotiating	Rounded TOTAL
1	Proposed Cross Gutters	762	$ 20.00		$ 15,240.00	$ 2,286.00	$ 5,334.00	$ 2,507.00	$ 5,000.00	$ 9,000.00	$ 40,000.00
2	Rehab Existing Cross Gutters	9120	$ 20.00		$ 182,400.00	$ 27,360.00	$ 63,840.00	$ 21,354.00	$ 5,000.00	$ 9,000.00	$ 309,000.00
										Total	$ 349,000.00

Curb and gutter

NO.	DESCRIPTION	Concrete Qty (LF)	Concrete Unit Price	Asphalt Section Qty (SF)	Asphalt Unit Price	SUBTOTAL CONSTRUCTION AMOUNT	GENERAL CONSTRUCTION (15%)	Contingency (20%)	Engineering (FMHARAT %)	Funding	Bidding & Negotiating	Rounded TOTAL
1	3600 N	4673	$ 30.00	102806	$ 5.00	$ 654,220.00	$ 98,133.00	$ 228,977.00	$ 81,179.00	$ 5,000.00	$ 9,000.00	$ 1,077,000.00
2	Bulldog Rd	2505	$ 30.00	55110	$ 5.00	$ 350,700.00	$ 52,605.00	$ 122,745.00	$ 48,397.00	$ 5,000.00	$ 9,000.00	$ 589,000.00
3	Cotton Wood Heights Subdivision	5151	$ 30.00	113322	$ 5.00	$ 721,140.00	$ 108,171.00	$ 252,399.00	$ 87,576.00	$ 5,000.00	$ 9,000.00	$ 1,184,000.00
4	Driftwood Ln	2874	$ 30.00	63228	$ 5.00	$ 402,360.00	$ 60,354.00	$ 140,826.00	$ 53,907.00	$ 5,000.00	$ 9,000.00	$ 672,000.00
5	Palomino Dr	2220	$ 30.00	48840	$ 5.00	$ 310,800.00	$ 46,620.00	$ 108,780.00	$ 43,856.00	$ 5,000.00	$ 9,000.00	$ 525,000.00
6	Minersville Hwy	16062	$ 30.00	353364	$ 5.00	$ 2,248,680.00	$ 337,302.00	$ 787,038.00	$ 216,447.00	$ 5,000.00	$ 9,000.00	$ 3,604,000.00
7	4200 N	4679	$ 30.00	102938	$ 5.00	$ 655,060.00	$ 98,259.00	$ 229,271.00	$ 81,208.00	$ 5,000.00	$ 9,000.00	$ 1,078,000.00
8	Garden Park Subdivision	8305	$ 30.00	182710	$ 5.00	$ 1,162,700.00	$ 174,405.00	$ 406,945.00	$ 128,363.00	$ 5,000.00	$ 9,000.00	$ 1,887,000.00
9	Corner of California and Homestead Blvd	443	$ 30.00	9303	$ 5.00	$ 59,805.00	$ 8,971.00	$ 20,932.00	$ 6,603.00	$ 5,000.00	$ 9,000.00	$ 111,000.00
10	Maple Ln	5057	$ 30.00	111254	$ 5.00	$ 707,980.00	$ 106,197.00	$ 247,793.00	$ 85,326.00	$ 5,000.00	$ 9,000.00	$ 1,162,000.00
11	Stagecoach Ln	2678	$ 30.00	58916	$ 5.00	$ 374,920.00	$ 56,238.00	$ 131,222.00	$ 48,161.00	$ 5,000.00	$ 9,000.00	$ 625,000.00
12	Quick Draw Ln	455	$ 30.00	10010	$ 5.00	$ 63,700.00	$ 9,555.00	$ 22,295.00	$ 10,154.00	$ 5,000.00	$ 9,000.00	$ 120,000.00
13	Homestead Blvd	1878	$ 30.00	41316	$ 5.00	$ 262,920.00	$ 39,438.00	$ 92,022.00	$ 38,067.00	$ 5,000.00	$ 9,000.00	$ 447,000.00
14	Wagon Wheel to 1365E - Southern Homestead Blvd	658	$ 30.00	14476	$ 5.00	$ 92,120.00	$ 13,818.00	$ 32,242.00	$ 13,338.00	$ 5,000.00	$ 9,000.00	$ 166,000.00
15	Southern Homestead Blvd	1502	$ 30.00	33044	$ 5.00	$ 210,280.00	$ 31,542.00	$ 73,598.00	$ 29,817.00	$ 5,000.00	$ 9,000.00	$ 360,000.00
16	Half Mile Rd East	2700	$ 30.00	13500	$ 5.00	$ 148,500.00	$ 22,275.00	$ 51,975.00	$ 19,076.00	$ 5,000.00	$ 9,000.00	$ 256,000.00
17	Half Mile Rd West	1430	$ 30.00	7150	$ 5.00	$ 78,650.00	$ 11,797.50	$ 27,527.50	$ 10,103.00	$ 5,000.00	$ 9,000.00	$ 143,000.00
18	Old Scout Trl	1070	$ 30.00	23540	$ 5.00	$ 149,800.00	$ 22,470.00	$ 52,430.00	$ 24,635.00	$ 5,000.00	$ 9,000.00	$ 264,000.00
19	Mule Train Dr	1110	$ 30.00	24420	$ 5.00	$ 155,400.00	$ 23,310.00	$ 54,390.00	$ 24,412.00	$ 5,000.00	$ 9,000.00	$ 272,000.00
20	Pioneer Dr	1083	$ 30.00	23826	$ 5.00	$ 151,620.00	$ 22,743.00	$ 53,067.00	$ 23,731.00	$ 5,000.00	$ 9,000.00	$ 266,000.00
21	Grimshaw Ln (600E)	800	$ 30.00	17600	$ 5.00	$ 112,000.00	$ 16,800.00	$ 39,200.00	$ 17,530.00	$ 5,000.00	$ 9,000.00	$ 200,000.00
22	Midvalley Rd	18600	$ 30.00	632400	$ 5.00	$ 3,720,000.00	$ 558,000.00	$ 1,302,000.00	$ 348,657.00	$ 5,000.00	$ 9,000.00	$ 5,943,000.00
23	5600 N	2012	$ 30.00	44264	$ 5.00	$ 281,680.00	$ 42,252.00	$ 98,588.00	$ 40,395.00	$ 5,000.00	$ 9,000.00	$ 477,000.00
24	Sunset Rd	1200	$ 30.00	26400	$ 5.00	$ 168,000.00	$ 25,200.00	$ 58,800.00	$ 25,986.00	$ 5,000.00	$ 9,000.00	$ 292,000.00
25	Ravine Road (Pomeroy Green Rd)	600	$ 30.00	13200	$ 5.00	$ 84,000.00	$ 12,600.00	$ 29,400.00	$ 12,993.00	$ 5,000.00	$ 9,000.00	$ 153,000.00
26	Village Green Rd	2000	$ 30.00	44000	$ 5.00	$ 280,000.00	$ 42,000.00	$ 98,000.00	$ 43,309.00	$ 5,000.00	$ 9,000.00	$ 478,000.00
27	Veterans Memorial Dr	1782	$ 30.00	8910	$ 5.00	$ 98,010.00	$ 14,701.50	$ 34,303.50	$ 14,304.00	$ 5,000.00	$ 9,000.00	$ 176,000.00
28	Jones Rd (5250N)	1300	$ 31.00	28600	$ 5.00	$ 183,300.00	$ 27,495.00	$ 64,155.00	$ 26,750.00	$ 5,000.00	$ 9,000.00	$ 316,000.00
29	Tomahawk Dr	841	$ 30.00	18502	$ 5.00	$ 117,740.00	$ 17,661.00	$ 41,209.00	$ 18,523.00	$ 5,000.00	$ 9,000.00	$ 210,000.00
30	Horseshoe Dr	226	$ 30.00	4972	$ 5.00	$ 31,640.00	$ 4,746.00	$ 11,074.00	$ 5,204.00	$ 5,000.00	$ 9,000.00	$ 67,000.00
											Total	$ 23,120,000.00

Major Rds, 70' wide, local 50'
SF for asphalt, base, and subbase for 27.5" section

$	3.21
$	1.54
$	1.19
$	5.94

Assume a smaller section for $5/SF
Major Rds, 70' wide, local 50'

Local Rds ($/LF)
250
Major ($/LF)
350

APPENDIX E : CASH FLOW ANALYSIS

ENOCH CITY

FY 2026 USER RATE ANALYSIS

EXPENSES: (First Year)	
Salaries & Wages	$13,219
Employee Benefits	$752
Supplies and Materials	$10,300
Professional Services	$448,050
Collection Fees	$0
Depreciation	$29,870
Capital Outlay	$109,651
Increase to Fund Balance	$143,914
Other Expenses	$0
Projects Expenses Fund	
Subtotal Expenses:	**$755,756**
EXISTING DEBT SERVICE	
Subtotal Existing Annual Debt Service:	**$0**
NEW DEBT SERVICE	
2026 Loan	$1,084,729
Loan Reserve (Payment/10)	$108,473
Subtotal New Annual Debt Service:	**$1,193,202**
Renewal and Replacement Fund (5% of Annual Expenses)	$37,788
GRAND TOTAL EXPENSES:	**$1,986,745**
ANNUAL INCOME	
Projected Yearly Impact Fees Received	$1,287,932
Total Number Of Connections	2,760
Average Monthly Storm Sewer User Rate/ERU	**$21.10**
TOTAL ANNUAL INCOME:	**$1,986,745**

ENOCH CITY

FY 2026 FINANCING PLAN

TOTAL PROJECTS COST			**$**	**21,965,000**
FY 2026 EXPENSES				
Proposed Funding:	**Rate**	**Term in Yrs.**		**Principal**
Self Participation				$0
2026 Loan	2.75%	30	$	21,965,000
TOTAL PROJECT FUNDING:			**$**	**21,965,000**

Cash Flow - 20 Year Planning Horizon

Fiscal Year Beginning July 1	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Ending June 30	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Monthly Rate Residential					$2.00	$20.87	$21.29	$21.72	$22.15	$22.59	$23.04	$23.51	$23.98	$24.46
Monthly Rate Commercial					$4.00	$41.75	$42.58	$43.43	$44.30	$45.19	$46.09	$47.01	$47.95	$48.91
Impact Fee/ Acre - Average Residential					$1,593.14	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00
Impact Fee/ Acre - Average Commercial						$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68
System Users:														
Residential Connections				2,549	2,638	2,730	2,826	2,925	3,027	3,133	3,243	3,357	3,474	3,596
Commerical Connections				28	29	30	31	32	33	34	35	36	37	38
New Residential Connections						92	96	99	102	106	110	114	117	122
New Commercial Connections:						1	1	1	1	1	1	1	1	1
REVENUES:														
Stormwater Service Sales	47,283	49,293	51,470	48,043	53,000	$698,813.31	$737,826.63	$778,902.73	$822,124.14	$867,847.32	$916,176.74	$967,220.47	$1,020,802.63	$1,077,608.51
Impact Fee Revenue	164,478	176,311	91,488	143,539	127,452	$1,287,932.13	$1,339,020.93	$1,377,337.53	$1,415,654.12	$1,466,742.92	$1,517,831.72	$1,568,920.52	$1,607,237.11	$1,671,098.11
Federal Grant			296,474	275,438	435,000									
TOTAL REVENUE:	**$211,761**	**$225,604**	**$439,432**	**$467,020**	**$615,452**	**$1,986,745**	**$2,076,848**	**$2,156,240**	**$2,237,778**	**$2,334,590**	**$2,434,008**	**$2,536,141**	**$2,628,040**	**$2,748,707**
EXPENSES:	**= Annual Inflation Rate+1/2 Annual Growth Rate**													
Salaries & Wages	25,365	49,488	49,840	12,834	1,000	13,219	13,616	14,024	14,445	14,878	15,324	15,784	16,258	16,745
Employee Benefits		1,044	1,135	355	730	752	774	798	822	846	872	898	925	952
Supplies and Materials	11,035	43,651	10,128	10,772	10,000	10,300	10,609	10,927	11,255	11,593	11,941	12,299	12,668	13,048
Professional Services		5,655	9,715	234,604	435,000	448,050	461,492	475,336	489,596	504,284	519,413	534,995	551,045	567,576
Collection Fees						0	0	0	0	0	0	0	0	0
Depreciation	28,841	32,523	41,128		29,000	29,870	30,766	31,689	32,640	33,619	34,628	35,666	36,736	37,838
Capital Outlay		36,517	4,920	277,936		109,651	112,941	116,329	119,819	123,414	127,116	130,930	134,857	138,903
Increase to Fund Balance					139,722	143,914	148,231	152,678	157,258	161,976	166,835	171,840	176,996	182,306
Other Expenses						0	0	0	0	0	0	0	0	0
Projects Expenses Fund						0	0	0	0	0	0	0	0	0
Total Expenses	**$65,241**	**$168,878**	**$116,866**	**$536,501**	**$615,452**	**$755,756**	**$778,429**	**$801,782**	**$825,835**	**$850,610**	**$876,128**	**$902,412**	**$929,485**	**$957,369**
EXISTING DEBT SERVICE														
Sub-Total Existing Debt Service	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
NEW DEBT SERVICE														
2026 Loan						1,084,729	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729
Loan Reserve (Payment/10)						108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473
Sub-Total New Debt Service		**$0**	**$0**	**$0**	**$0**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**
Total Debt Service		**$0**	**$0**	**$0**	**$0**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**
Renewal and Replacement Fund						37,788	38,921	40,089	41,292	42,531	43,806	45,121	46,474	47,868
TOTAL EXPENSES:		**$168,878**	**$116,866**	**$536,501**	**$615,452**	**$1,986,745**	**$2,010,552**	**$2,035,072**	**$2,060,328**	**$2,086,342**	**$2,113,136**	**$2,140,734**	**$2,169,160**	**$2,198,439**
Net Cashflow		**$56,726**	**$322,566**	**($69,481)**	**$0**	**$0**	**$66,296**	**$121,168**	**$177,450**	**$248,248**	**$320,872**	**$395,407**	**$458,879**	**$550,267**
CASH ON HAND														
Fund Balance					0	0	66,296	187,464	364,914	613,162	934,034	1,329,440	1,788,320	2,338,587
Renewal and Replacement Account Balance:					0	37,788	76,709	116,798	158,090	200,621	244,427	289,548	336,022	383,890
New Bond Reserves						108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473
Total					**$0**	**$146,261**	**$251,478**	**$412,735**	**$631,477**	**$922,255**	**$1,286,934**	**$1,727,461**	**$2,232,814**	**$2,830,950**

Cash Flow - 20 Year Planning Horizon

Fiscal Year Beginning July 1	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
Ending June 30	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
Monthly Rate Residential	$24.94	$25.44	$25.95	$26.47	$27.00	$27.54	$28.09	$28.65	$29.23	$29.81
Monthly Rate Commercial	$49.89	$50.89	$51.90	$52.94	$54.00	$55.08	$56.18	$57.31	$58.45	$59.62
Impact Fee/ Acre - Average Residential	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00	$24,070.00
Impact Fee/ Acre - Average Commercial	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68	$46,648.68
System Users:										
Residential Connections	3,722	3,852	3,987	4,127	4,271	4,420	4,575	4,735	4,901	5,073
Commerical Connections	39	40	41	42	43	45	47	49	51	53
New Residential Connections	126	130	135	140	144	149	155	160	166	172
New Commercial Connections:	1	1	1	1	1	2	2	2	2	2
REVENUES:										
Stormwater Service Sales	$1,137,475.65	$1,200,527.72	$1,267,204.03	$1,337,655.46	$1,411,714.12	$1,490,513.49	$1,573,922.76	$1,661,791.40	$1,754,649.54	$1,852,703.70
Impact Fee Revenue	$1,722,186.91	$1,773,275.70	$1,837,136.70	$1,900,997.70	$1,952,086.49	$2,128,837.29	$2,205,470.49	$2,269,331.48	$2,345,964.68	$2,422,597.87
Federal Grant										
TOTAL REVENUE:	**$2,859,663**	**$2,973,803**	**$3,104,341**	**$3,238,653**	**$3,363,801**	**$3,619,351**	**$3,779,393**	**$3,931,123**	**$4,100,614**	**$4,275,302**
EXPENSES:										
Salaries & Wages	17,248	17,765	18,298	18,847	19,413	19,995	20,595	21,213	21,849	22,504
Employee Benefits	981	1,010	1,041	1,072	1,104	1,137	1,171	1,207	1,243	1,280
Supplies and Materials	13,439	13,842	14,258	14,685	15,126	15,580	16,047	16,528	17,024	17,535
Professional Services	584,604	602,142	620,206	638,812	657,977	677,716	698,047	718,989	740,558	762,775
Collection Fees	0	0	0	0	0	0	0	0	0	0
Depreciation	38,974	40,143	41,347	42,587	43,865	45,181	46,536	47,933	49,371	50,852
Capital Outlay	143,070	147,362	151,783	156,337	161,027	165,858	170,833	175,958	181,237	186,674
Increase to Fund Balance	187,775	193,408	199,210	205,186	211,342	217,682	224,213	230,939	237,867	245,003
Other Expenses	0	0	0	0	0	0	0	0	0	0
Projects Expenses Fund	0	0	0	0	0	0	0	0	0	0
Total Expenses	**$986,090**	**$1,015,673**	**$1,046,143**	**$1,077,527**	**$1,109,853**	**$1,143,149**	**$1,177,443**	**$1,212,766**	**$1,249,149**	**$1,286,624**
EXISTING DEBT SERVICE										
Sub-Total Existing Debt Service	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
NEW DEBT SERVICE										
2026 Loan	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729	1,084,729
Loan Reserve (Payment/10)	108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473
Sub-Total New Debt Service	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**
Total Debt Service	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**	**$1,193,202**
Renewal and Replacement Fund	49,305	50,784	52,307	53,876	55,493	57,157	58,872	60,638	62,457	64,331
TOTAL EXPENSES:	**$2,228,596**	**$2,259,658**	**$2,291,652**	**$2,324,605**	**$2,358,547**	**$2,393,508**	**$2,429,517**	**$2,466,606**	**$2,504,809**	**$2,544,157**
Net Cashflow	**$631,066**	**$714,145**	**$812,689**	**$914,048**	**$1,005,253**	**$1,225,843**	**$1,349,876**	**$1,464,516**	**$1,595,806**	**$1,731,145**
CASH ON HAND										
Fund Balance	2,969,653	3,683,799	4,496,488	5,410,535	6,415,789	7,641,632	8,991,508	10,456,024	12,051,830	13,782,975
Renewal and Replacement Account Balance:	433,195	483,978	536,286	590,162	645,655	702,812	761,684	822,322	884,780	949,111
New Bond Reserves	108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473	108,473
Total	**$3,511,321**	**$4,276,250**	**$5,141,246**	**$6,109,170**	**$7,169,916**	**$8,452,916**	**$9,861,665**	**$11,386,820**	**$13,045,083**	**$14,840,559**

APPENDIX F : IMPACT FEE ANALYSIS

Impact Fee Projects & Impact Fee Eligibility

Drainage Channel and Crossing Projects	Current Costs	Year	Costs w/ Inflation*	% IF El.	IF El. Cost
Ravine Channel	$ 297,000.00	2026	$ 316,000.00	82.0%	$ 259,200.00
		Sub total	$ 316,000.00		
Detention Facilities Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Detention Basin 4	$ 1,637,000.00	2025	$ 1,687,000.00	67.7%	$ 1,141,300.00
		Sub total	$ 1,687,000.00		
Storm Drain Pipe System Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Enoch Rd – Culvert	$ 30,000.00	2025	$ 31,000.00	82.0%	$ 25,500.00
Half Mile Rd	$ 5,148,000.00	2026	$ 5,462,000.00	67.7%	$ 3,695,200.00
North Enoch Rd	$ 649,000.00	2027	$ 710,000.00	82.0%	$ 582,200.00
Homestead Blvd & Sunshine Ln	$ 1,156,000.00	2028	$ 1,302,000.00	63.4%	$ 825,500.00
		Sub total	$ 7,505,000.00		
Roadway Conveyance Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Half Mile Rd West	$ 143,000.00	2025	$ 148,000.00	63.4%	$ 93,900.00
Ravine Road (Pomeroy Green Rd)	$ 153,000.00	2026	$ 163,000.00	88.9%	$ 145,000.00
Village Green Rd	$ 478,000.00	2026	$ 508,000.00	88.9%	$ 451,700.00
Half Mile Rd East	$ 256,000.00	2027	$ 280,000.00	63.4%	$ 177,600.00
4200 N	$ 1,078,000.00	2027	$ 1,178,000.00	63.4%	$ 746,900.00
Corner of California and Homestead Blvd	$ 111,000.00	2028	$ 125,000.00	63.4%	$ 79,300.00
Homestead Blvd	$ 447,000.00	2028	$ 504,000.00	63.4%	$ 319,600.00
Grimshaw Ln (600E)	$ 200,000.00	2029	$ 232,000.00	63.2%	$ 146,700.00
Wagon Wheel to 1365E - Southern Homestead Blvd	$ 166,000.00	2031	$ 205,000.00	63.4%	$ 130,000.00
Jones Rd (5250N)	$ 316,000.00	2032	$ 401,000.00	17.1%	$ 68,600.00
Veterans Memorial Dr	$ 176,000.00	2033	$ 230,000.00	17.1%	$ 39,400.00
		Sub total	$ 3,974,000		
NRCS Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Midvalley Rd to 5200 N Ditch Upsizing	$ 504,000.00	2025	$ 520,000.00	70.8%	$ 368,100.00
East Bench EA Projects - 25% Cost Share	$ 6,571,000.00	2030	$ 7,847,000.00	70.8%	$ 5,553,400.00
		Sub total	$ 8,367,000.00		
Future Planning Projects	**Current Costs**	**Year**	**Costs w/ Inflation**		
Stormwater IFFP & IFA Update	$ 100,000	2029	$ 116,000.00	100.0%	$ 116,000.00
		Sub total	$ 116,000.00	**Impact Fee**	
Total			**$ 21,965,000.00**	**Amount**	**$ 14,965,100.00**

* Inflation is assumed at 3%

Impact Fee Eligiblity %

Basin Name	Developed Acres	Total Acres	Developable
Basin 1	165.6	1487.5	88.9%
Basin 2	204.2	543.2	62.4%
Basin 3	226.3	1035	78.1%
Basin 4	282.5	1567.6	82.0%
Basin 5	243.4	293.6	17.1%
Basin 6	932	2543.7	63.4%
Basin 7	384.5	872.1	55.9%
Total	2438.5	8342.7	70.8%

Impact Fee By Zone $ 13,482,000.00 **Developed 10yr Acres In Zoned Boundary** **613**

Base Impact Fee/ 0.25 Acre (R-1-11) $ 6,020.00 Average Impact Fee/Acre $ 24,430.00

Base Runoff Coefficient 0.40 $14,965,818.00

Zoning Description	Runoff Coefficient	Runoff Coefficient Ratio	Developable Acres	Buildout Connections	Lot Size Avg (acres)	10 Year Projected Connections (2033)	Developed Acres Anticipated in 10 Years Based on Average Lot Size	Equivalent Residential Acres	Impact Fee/Acre	Impact Fee/ 0.25 Acre
Mobile Home Park (MHP)	0.65	1.63	0	0		0	0	0	$ 39,240.00	$ 9,810.00
Mixed Residential (MXR_18)	0.5	1.25	5.5	6	0.92	1	0.9	1.2	$ 30,090.00	$ 7,530.00
Rural Residential 5 (R-R-5)	0.3	0.75	98	27	3.63	10	36.3	27.3	$ 18,060.00	$ 4,520.00
Professional Office (P-O)	0.7	1.75	0	0		0	0	0	$ 42,130.00	$ 10,540.00
Research Industrial Park (R/I-P)	0.8	2	132	22	6	1	6	12	$ 48,140.00	$ 12,040.00
Multiple Residential (M-R-2)	0.65	1.63	53	69	0.77	20	15.4	25.2	$ 39,240.00	$ 9,810.00
Community Commercial (C-C)	0.8	2	327	565	0.58	8	4.6	9.2	$ 48,140.00	$ 12,040.00
Neighborhood Commercial (N-C)	0.6	1.5	4	2	2	1	2	3	$ 36,110.00	$ 9,030.00
Regional Commercial (R-C)	0.9	2.25	0	0		0	0	0	$ 54,160.00	$ 13,540.00
RV Park (RVP)	0.65	1.63	1.5	1	1.5	0	0	0	$ 39,240.00	$ 9,810.00
Residential 18 (R-1-18)	0.35	0.88	777	955	0.81	161	130.41	114.8	$ 21,190.00	$ 5,300.00
Residential 11 (R-1-11)	0.4	1	564	1296	0.44	872	384	384	$ 24,070.00	$ 6,020.00
Rural Residential 1 (R-R-1)	0.3	0.75	320	134	2.39	20	47.8	35.9	$ 18,060.00	$ 4,520.00
Total All Zones			2282	3077	0.74	1094	627.41	612.6		

new commercial conections projected in 10yrs 10

new residential connections in 10 yr **1084** $ 24,438.03

CERTIFICATION OF IMPACT FEE ANALYSIS BY CONSULTANT

In accordance with Utah Code Annotated § 11-36a-306, Brittany Darnell, P.E., on behalf of Sunrise Engineering, LLC, make the following certification:

I certify that the attached Impact Fee Facilities Plan and Impact Fee Analysis:

1. Includes only the costs of public facilities that are:
    a. Allowed under the Impact Fees Act; and
    b. Actually incurred; or
    c. Projected to be incurred or encumbered within six years after the day on which each impact fee is paid;

2. Does not include:
    a. costs of operation and maintenance of public facilities;
    b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents; or
    c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and that methodological standards set forth by the Federal Office of Management and Budget for federal grant reimbursement;

3. Offsets costs with grants or other alternate sources of payment; and

4. Complies in each and every relevant respect with the Impact Fees Act.

Brittany Darnell, P.E., makes this certification with the following qualifications:

1. All of the recommendations for implementation of the Impact Fee Facilities Plan ("IFFP") made in the IFFP documents or in the Impact Fee Analysis documents are followed in their entirety by the Enoch City, Utah, staff, and elected officials.

2. If all or a portion of the IFFP or Impact Fee Analyses are modified or amended, this certification is no longer valid.

3. All information provided to Sunrise Engineering, Inc., its contractors or suppliers, is assumed to be correct, complete and accurate. This includes information provided by Enoch City, Utah, and outside sources.

4. The undersigned is trained and licensed as a professional engineer and has not been trained or licensed as a lawyer. Nothing in the foregoing certification shall be deemed an opinion of law or an opinion of compliance with law which under applicable professional licensing laws or regulations or other laws or regulations must be rendered by a lawyer licensed in the State of Utah.

5. The foregoing Certification is an expression of professional opinion based on the undersigned's best knowledge, information and belief and shall not be construed as a warranty or guaranty of any fact or circumstance.

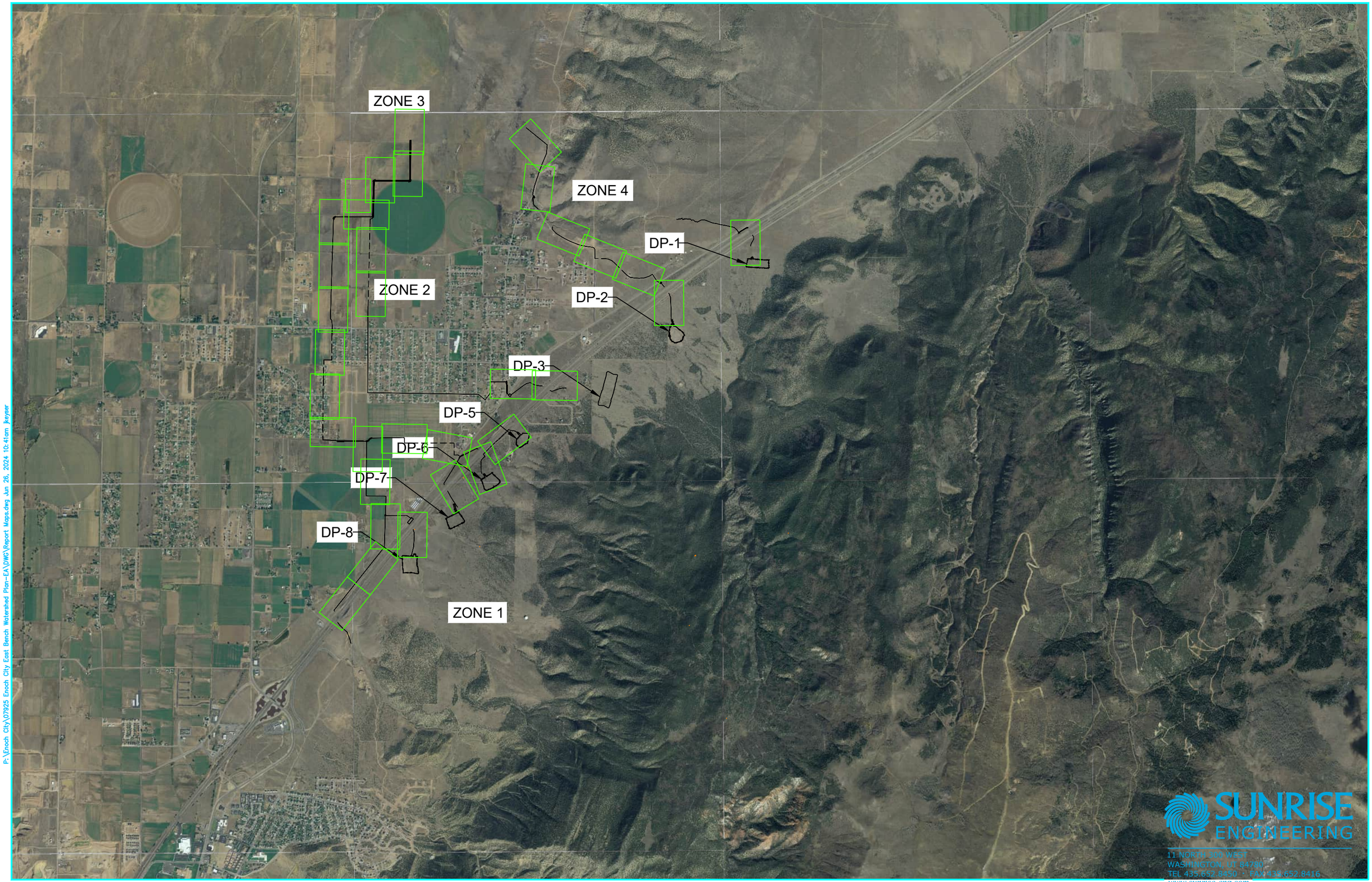
6. The foregoing certification is made only to Enoch City, Utah, and may not be used or relied upon by any other person or entity without the expressed written authorization of the undersigned.

Sunrise Engineering, LLC.

By: _____

Dated: _____

APPENDIX G : NRCS EAST BENCH EA TABLES AND FIGURES



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11 NORTH 300 WEST
WASHINGTON, UT 84780
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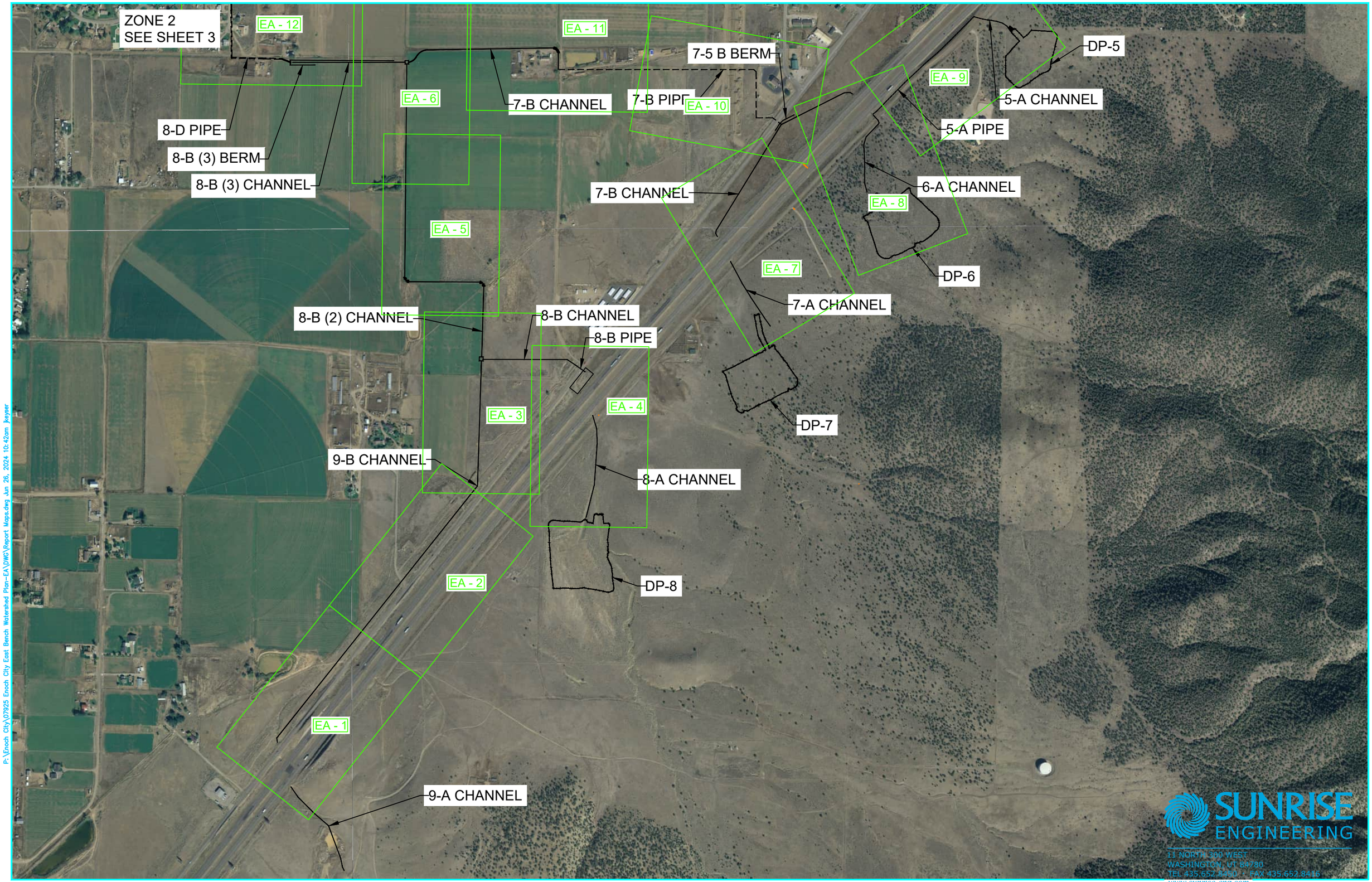

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EA - 17
EA - 18
ZONE 3
SEE SHEET 4
EA - 29
8-D (1) CULVERT
4-C PIPE
ZONE 4
SEE SHEET 5
EA - 20
EA - 16
4-C PIPE CONNECT
TO EXISTING
8-D (1) CHANNEL
EA - 19
EA - 15
EA - 14
4-B CHANNEL
EA - 25
EX PIPE
4-A CHANNEL
EA - 24
DP-3
8-D DUAL PIPE
4-B BERM
EA - 13
EX CHANNEL
ZONE 1
SEE SHEET 2

P:\Enoch City\07925 Enoch City East Bench Watershed Plan-EA\DWG\Report Maps.dwg Jun 26, 2024 10:42am Keyser

SUNRISE ENGINEERING
1 NORTH 500 WEST
WASHINGTON, UT 84780
PH 435.652.8440 FAX 435.652.8610
www.sunrise-eng.com

EA - 23

8-D LEFT BERM 1

8-D RIGHT BERM

EA - 22

EA - 21

8-D (2) CULVERT

8-D (3) CHANNEL

8-D (2) CHANNEL

EA - 17

EA - 18

4-C PIPE

EA - 31

ZONE 4
SEE SHEET 5

EA - 30

SUNRISE ENGINEERING
11 NORTH 300 WEST
WASHINGTON, UT 84780
TEL 435.652.8450 FAX 435.652.8410
www.sunrise-eng.com

EA - 31
2-D CHANNEL
2-D PIPE
2-C CHANNEL
EA - 30
2-C BERM
EA - 29
2-C PIPE
EA - 28
EA - 27
2-B CHANNEL
2-B BERM
2-A CHANNEL
EA - 26
DP-2
EX CHANNEL
1-B- BERM
1-B- CHANNEL
1-A CHANNEL
EA - 32
DP-1

SUNRISE ENGINEERING
11 NORTH 300 WEST
WASHINGTON, UT 84780
PH: 435-652-8550 | FAX: 435-652-8556
www.sunrise-eng.com

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
0:00	0	0	0	0.2	0	0.2	0	0
0:05	0	0	0	0.2	0	0.2	0	0
0:10	0	0	0	0.2	0	0.2	0	0
0:15	0	0	0	0.1	0	0.2	0	0
0:20	0	0	0	0.1	0	0.2	0	0
0:25	0	0	0	0.1	0	0.2	0	0
0:30	0	0	0	0.1	0	0.2	0	0
0:35	0	0	0	0.1	0	0.2	0	0
0:40	0	0	0	0.1	0	0.2	0	0
0:45	0	0	0	0.1	0	0.2	0	0
0:50	0	0	0	0.1	0	0.2	0	0
0:55	0	0	0	0.2	0	0.2	0	0
1:00	0	0	0	0.2	0	0.2	0	0
1:05	0	0	0	0.2	0	0.2	0	0
1:10	0.1	0	0	0.3	0	0.3	0	0
1:15	0.1	0	0	0.4	0	0.4	0	0
1:20	0.3	0	0	0.5	0.1	0.6	0	0
1:25	0.6	0	0	0.8	0.1	0.9	0	0
1:30	1.1	0	0.1	1.2	0.2	1.3	0.1	0
1:35	1.9	0	0.1	1.9	0.4	1.8	0.1	0
1:40	3.1	0	0.2	2.8	0.7	2.6	0.2	0
1:45	4.8	0	0.3	4.1	1	3.7	0.4	0
1:50	6.9	0	0.5	5.7	1.6	4.9	0.7	0
1:55	9.4	0	0.7	7.7	2.3	6.5	1.1	0
2:00	12.4	0	1	10	3.1	8.2	1.7	0
2:05	15.5	0.1	1.3	12.6	4.1	10.2	2.4	0
2:10	18.6	0.1	1.6	15.3	5.2	12.3	3.4	0
2:15	20.9	0.1	1.9	18	6.5	14.4	4.6	0
2:20	22.8	0.2	2.2	20.2	7.8	16.4	6.1	0
2:25	24.6	0.3	2.7	21.8	9.2	18.4	7.7	0
2:30	26.2	0.4	3.5	23.3	10.7	19.9	9.5	0
2:35	27.6	0.6	5.4	24.7	12.1	21.1	11.5	0
2:40	28.9	0.8	8.7	26	13.4	22.1	13.6	0
2:45	30.1	1	12.9	27.1	14.7	23	15.7	0
2:50	31.2	1.3	17.7	28.1	15.8	23.9	17.8	0

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
2:55	32.2	1.5	22.6	29	17	24.6	19.5	0
3:00	33.1	1.7	27.5	29.8	18	25.3	20.8	0
3:05	33.9	1.9	32.1	30.5	18.9	25.9	22	0
3:10	34.7	2.2	35.5	31.2	19.7	26.5	23.1	0.6
3:15	35.3	2.4	38.1	31.8	20.2	27	24.2	2.1
3:20	36	2.7	40.3	32.3	20.7	27.4	25.1	4.6
3:25	36.5	3	42.4	32.8	21.1	27.9	26	8
3:30	37.1	3.3	44.2	33.2	21.5	28.2	26.8	12.2
3:35	37.6	3.7	45.8	33.6	21.8	28.6	27.6	17.1
3:40	38	4	47.3	34	22.2	28.9	28.3	22.4
3:45	38.4	4.3	48.7	34.3	22.5	29.2	28.9	28
3:50	38.8	4.7	49.9	34.4	22.7	29.5	29.6	33.8
3:55	39.1	5	51	34.5	23	29.7	30.1	39.5
4:00	39.4	5.3	52	34.5	23.2	30	30.7	44.8
4:05	39.7	5.7	53	34.5	23.4	30.2	31.2	49.9
4:10	40	6	53.9	34.5	23.6	30.3	31.6	54.6
4:15	40.2	6.3	54.7	34.4	23.7	30.5	32.1	58.9
4:20	40.5	6.6	55.5	34.4	23.9	30.7	32.5	62.6
4:25	40.7	6.9	56.2	34.4	24	30.8	32.9	65.9
4:30	40.9	7.2	56.8	34.4	24.1	31	33.3	68.6
4:35	41.1	7.5	57.4	34.4	24.3	31.1	33.6	70.9
4:40	41.3	7.8	58	34.4	24.4	31.2	34	72.7
4:45	41.5	8	58.5	34.3	24.5	31.3	34.3	74.1
4:50	41.6	8.2	59	34.3	24.6	31.5	34.6	75.2
4:55	41.8	8.4	59.5	34.3	24.7	31.6	34.9	76
5:00	41.9	8.6	60	34.3	24.8	31.7	35.2	76.5
5:05	42.1	8.8	60.4	34.3	24.9	31.8	35.4	76.8
5:10	42.3	9	60.8	34.3	25	31.9	35.7	76.9
5:15	42.4	9.2	61.2	34.3	25	32	35.9	76.9
5:20	42.6	9.4	61.5	34.3	25.1	32.1	36.2	76.7
5:25	42.7	9.5	61.9	34.3	25.2	32.2	36.4	76.4
5:30	42.8	9.7	62.2	34.3	25.3	32.3	36.7	76
5:35	43	9.9	62.5	34.3	25.4	32.4	36.9	75.6
5:40	43.1	10	62.8	34.3	25.4	32.5	37.1	75.1
5:45	43.2	10.2	63.1	34.2	25.5	32.5	37.3	74.5
5:50	43.3	10.3	63.4	34.2	25.5	32.6	37.5	73.9
5:55	43.4	10.5	63.7	34.2	25.5	32.6	37.7	73.2
6:00	43.4	10.6	63.9	34.1	25.5	32.6	37.9	72.5
6:05	43.5	10.7	64.2	34.1	25.5	32.6	38	71.7

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
6:10	43.5	10.8	64.4	34	25.5	32.6	38.2	70.8
6:15	43.5	10.9	64.7	33.9	25.5	32.6	38.3	69.8
6:20	43.5	11	64.9	33.7	25.4	32.5	38.4	68.8
6:25	43.5	11.1	65.1	33.6	25.3	32.5	38.5	67.7
6:30	43.4	11.2	65.3	33.4	25.2	32.4	38.6	66.5
6:35	43.4	11.2	65.4	33.2	25.1	32.3	38.7	65.2
6:40	43.3	11.3	65.6	33	25	32.2	38.8	63.9
6:45	43.3	11.3	65.7	32.7	24.9	32.1	38.8	62.5
6:50	43.2	11.3	65.9	32.5	24.8	32	38.9	61
6:55	43.1	11.4	66	32.2	24.7	31.9	38.9	59.5
7:00	43	11.4	66.1	32	24.5	31.8	38.9	57.9
7:05	42.9	11.3	66.1	31.7	24.4	31.6	38.9	56.2
7:10	42.8	11.3	66.2	31.4	24.3	31.5	38.9	54.6
7:15	42.7	11.3	66.2	31.1	24.1	31.4	38.9	52.9
7:20	42.5	11.2	66.3	30.8	24	31.2	38.9	51.2
7:25	42.4	11.2	66.3	30.5	23.8	31.1	38.8	49.5
7:30	42.3	11.1	66.3	30.2	23.6	31	38.8	47.8
7:35	42.2	11.1	66.2	29.8	23.5	30.8	38.7	46.1
7:40	42	11	66.2	29.5	23.3	30.7	38.7	44.4
7:45	41.9	10.9	66.2	29.1	23.2	30.5	38.6	42.7
7:50	41.7	10.8	66.1	28.8	23	30.4	38.6	41.1
7:55	41.6	10.8	66	28.4	22.8	30.2	38.5	39.5
8:00	41.5	10.7	66	28.1	22.7	30.1	38.5	37.9
8:05	41.3	10.6	65.9	27.7	22.5	29.9	38.4	36.3
8:10	41.2	10.5	65.8	27.4	22.3	29.7	38.3	34.7
8:15	41	10.4	65.7	27	22.1	29.6	38.3	33.2
8:20	40.9	10.3	65.6	26.6	22	29.4	38.2	31.8
8:25	40.7	10.2	65.5	26.3	21.8	29.3	38.1	30.4
8:30	40.6	10.1	65.4	25.9	21.6	29.1	38	29.1
8:35	40.4	10	65.3	25.5	21.4	28.9	37.9	27.9
8:40	40.3	9.9	65.1	25.1	21.3	28.8	37.9	26.6
8:45	40.1	9.8	65	24.8	21.1	28.6	37.8	25.5
8:50	40	9.7	64.9	24.4	20.9	28.5	37.7	24.4
8:55	39.8	9.6	64.7	24	20.7	28.3	37.6	23.3
9:00	39.7	9.5	64.6	23.6	20.6	28.1	37.5	22.3
9:05	39.5	9.4	64.4	23.2	20.4	28	37.4	21.4
9:10	39.3	9.3	64.3	22.8	20.2	27.8	37.3	20.5
9:15	39.2	9.2	64.1	22.4	20	27.6	37.2	19.6
9:20	39	9.1	64	22	19.8	27.5	37.1	18.8

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
9:25	38.9	9	63.8	21.6	19.6	27.3	37	18
9:30	38.7	8.9	63.7	21.2	19.4	27.1	36.9	17.3
9:35	38.5	8.8	63.5	20.8	19.2	27	36.8	16.6
9:40	38.4	8.7	63.3	20.4	18.9	26.8	36.7	15.9
9:45	38.2	8.6	63.1	20	18.6	26.7	36.6	15.2
9:50	38.1	8.5	63	19.6	18.4	26.5	36.5	14.6
9:55	37.9	8.4	62.8	19.2	18.1	26.3	36.4	14
10:00	37.8	8.3	62.6	18.6	17.9	26.2	36.3	13.5
10:05	37.6	8.2	62.4	18	17.6	26	36.2	12.9
10:10	37.4	8.1	62.3	17.4	17.4	25.8	36.1	12.4
10:15	37.3	8	62.1	16.9	17.1	25.7	36	11.9
10:20	37.1	7.8	61.9	16.3	16.9	25.5	35.9	11.5
10:25	36.9	7.7	61.7	15.8	16.6	25.3	35.8	11
10:30	36.8	7.6	61.5	15.3	16.4	25.2	35.7	10.6
10:35	36.6	7.5	61.3	14.8	16.2	25	35.6	10.2
10:40	36.4	7.4	61.2	14.3	15.9	24.8	35.5	9.8
10:45	36.3	7.3	61	13.9	15.7	24.6	35.4	9.5
10:50	36.1	7.1	60.8	13.4	15.5	24.5	35.3	9.1
10:55	35.9	7	60.6	13	15.3	24.3	35.2	8.8
11:00	35.8	6.9	60.4	12.6	15	24.1	35.1	8.5
11:05	35.6	6.8	60.2	12.2	14.8	24	35	8.2
11:10	35.4	6.7	60	11.8	14.6	23.8	34.9	7.9
11:15	35.3	6.6	59.8	11.4	14.4	23.6	34.8	7.6
11:20	35.1	6.5	59.6	11	14.2	23.5	34.7	7.3
11:25	34.9	6.4	59.4	10.7	14	23.3	34.6	7.1
11:30	34.8	6.3	59.2	10.3	13.8	23.1	34.5	6.8
11:35	34.6	6.2	59	10	13.6	22.9	34.4	6.6
11:40	34.4	6.1	58.8	9.7	13.4	22.8	34.3	6.3
11:45	34.3	6.1	58.6	9.4	13.2	22.6	34.2	6.1
11:50	34.1	6	58.4	9.1	13	22.4	34.1	5.9
11:55	33.9	5.9	58.2	8.8	12.8	22.3	34	5.7
12:00	33.7	5.8	58	8.5	12.6	22.1	33.9	5.5
12:05	33.6	5.7	57.8	8.2	12.5	21.9	33.8	5.3
12:10	33.4	5.6	57.6	8	12.3	21.7	33.7	5.2
12:15	33.2	5.5	57.4	7.8	12.1	21.6	33.6	5
12:20	33	5.5	57.2	7.5	11.9	21.4	33.5	4.8
12:25	32.9	5.4	57	7.3	11.8	21.2	33.3	4.7
12:30	32.7	5.3	56.8	7.1	11.6	21.1	33.2	4.5
12:35	32.5	5.2	56.6	6.9	11.4	20.9	33.1	4.4

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
12:40	32.4	5.2	56.4	6.7	11.3	20.7	33	4.3
12:45	32.2	5.1	56.2	6.5	11.1	20.6	32.9	4.1
12:50	32	5	55.9	6.3	10.9	20.4	32.8	4
12:55	31.8	4.9	55.7	6.1	10.8	20.2	32.7	3.9
13:00	31.7	4.9	55.5	6	10.6	20	32.6	3.8
13:05	31.5	4.8	55.3	5.8	10.5	19.9	32.5	3.7
13:10	31.3	4.7	55.1	5.6	10.3	19.7	32.4	3.6
13:15	31.1	4.7	54.9	5.5	10.2	19.5	32.3	3.5
13:20	31	4.6	54.7	5.3	10	19.3	32.2	3.4
13:25	30.8	4.6	54.5	5.2	9.9	19.2	32.1	3.3
13:30	30.6	4.5	54.3	5.1	9.7	19	32	3.2
13:35	30.4	4.4	54	4.9	9.6	18.7	31.9	3.1
13:40	30.3	4.4	53.8	4.8	9.5	18.5	31.7	3
13:45	30.1	4.3	53.6	4.7	9.3	18.3	31.6	2.9
13:50	29.9	4.3	53.4	4.6	9.2	18	31.5	2.8
13:55	29.7	4.2	53.2	4.4	9.1	17.8	31.4	2.8
14:00	29.5	4.2	52.9	4.3	8.9	17.5	31.3	2.7
14:05	29.4	4.1	52.7	4.2	8.8	17.3	31.2	2.6
14:10	29.2	4	52.5	4.1	8.7	17.1	31.1	2.6
14:15	29	4	52.3	4	8.6	16.8	31	2.5
14:20	28.8	3.9	52.1	3.9	8.5	16.6	30.9	2.4
14:25	28.6	3.9	51.9	3.8	8.4	16.4	30.8	2.4
14:30	28.5	3.8	51.6	3.7	8.2	16.2	30.7	2.3
14:35	28.3	3.8	51.4	3.7	8.1	16	30.6	2.2
14:40	28.1	3.7	51.2	3.6	8	15.7	30.5	2.2
14:45	27.9	3.7	51	3.5	7.9	15.5	30.4	2.1
14:50	27.7	3.7	50.8	3.4	7.8	15.3	30.3	2.1
14:55	27.6	3.6	50.5	3.3	7.7	15.1	30.1	2
15:00	27.4	3.6	50.3	3.2	7.6	14.9	30	2
15:05	27.2	3.5	50.1	3.2	7.5	14.7	29.9	1.9
15:10	27	3.5	49.9	3.1	7.4	14.5	29.8	1.9
15:15	26.8	3.4	49.6	3	7.3	14.3	29.7	1.9
15:20	26.6	3.4	49.4	3	7.2	14.1	29.6	1.8
15:25	26.5	3.4	49.2	2.9	7.1	13.9	29.5	1.8
15:30	26.3	3.3	49	2.8	7	13.7	29.4	1.7
15:35	26.1	3.3	48.8	2.8	6.9	13.5	29.3	1.7
15:40	25.9	3.2	48.5	2.7	6.8	13.4	29.2	1.7
15:45	25.7	3.2	48.3	2.6	6.8	13.2	29	1.6
15:50	25.6	3.2	48.1	2.6	6.7	13	28.9	1.6

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
15:55	25.4	3.1	47.9	2.5	6.6	12.8	28.8	1.6
16:00	25.2	3.1	47.6	2.5	6.5	12.7	28.7	1.5
16:05	25	3.1	47.4	2.4	6.4	12.5	28.6	1.5
16:10	24.8	3	47.2	2.4	6.3	12.3	28.5	1.5
16:15	24.6	3	46.9	2.3	6.3	12.1	28.4	1.4
16:20	24.4	3	46.7	2.3	6.2	12	28.3	1.4
16:25	24.2	2.9	46.5	2.2	6.1	11.8	28.2	1.4
16:30	24	2.9	46.2	2.2	6	11.7	28.1	1.3
16:35	23.9	2.9	46	2.1	6	11.5	27.9	1.3
16:40	23.7	2.8	45.8	2.1	5.9	11.4	27.8	1.3
16:45	23.5	2.8	45.6	2.1	5.8	11.2	27.7	1.3
16:50	23.3	2.8	45.3	2	5.7	11	27.6	1.2
16:55	23.1	2.7	45.1	2	5.7	10.9	27.5	1.2
17:00	22.9	2.7	44.9	1.9	5.6	10.7	27.4	1.2
17:05	22.7	2.7	44.6	1.9	5.5	10.6	27.3	1.2
17:10	22.5	2.6	44.4	1.9	5.5	10.5	27.2	1.2
17:15	22.3	2.6	44.2	1.8	5.4	10.3	27.1	1.1
17:20	22.1	2.6	43.9	1.8	5.3	10.2	27	1.1
17:25	22	2.6	43.7	1.8	5.3	10	26.8	1.1
17:30	21.8	2.5	43.5	1.7	5.2	9.9	26.7	1.1
17:35	21.6	2.5	43.3	1.7	5.2	9.8	26.6	1.1
17:40	21.4	2.5	43	1.7	5.1	9.6	26.5	1
17:45	21.2	2.5	42.8	1.6	5	9.5	26.4	1
17:50	21	2.4	42.6	1.6	5	9.4	26.3	1
17:55	20.8	2.4	42.3	1.6	4.9	9.3	26.2	1
18:00	20.6	2.4	42.1	1.6	4.9	9.1	26.1	1
18:05	20.4	2.4	41.9	1.5	4.8	9	26	1
18:10	20.2	2.3	41.6	1.5	4.8	8.9	25.9	0.9
18:15	20.1	2.3	41.4	1.5	4.7	8.8	25.7	0.9
18:20	19.9	2.3	41.2	1.4	4.6	8.7	25.6	0.9
18:25	19.7	2.3	40.9	1.4	4.6	8.6	25.5	0.9
18:30	19.5	2.2	40.7	1.4	4.5	8.5	25.4	0.9
18:35	19.3	2.2	40.4	1.4	4.5	8.3	25.3	0.9
18:40	19	2.2	40.2	1.4	4.4	8.2	25.2	0.9
18:45	18.8	2.2	40	1.3	4.4	8.1	25.1	0.8
18:50	18.5	2.2	39.7	1.3	4.3	8	25	0.8
18:55	18.2	2.1	39.5	1.3	4.3	7.9	24.8	0.8
19:00	17.9	2.1	39.2	1.3	4.3	7.8	24.7	0.8
19:05	17.7	2.1	39	1.2	4.2	7.7	24.6	0.8

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
19:10	17.4	2.1	38.8	1.2	4.2	7.6	24.5	0.8
19:15	17.2	2	38.5	1.2	4.1	7.5	24.4	0.8
19:20	16.9	2	38.3	1.2	4.1	7.4	24.3	0.8
19:25	16.6	2	38	1.2	4	7.4	24.2	0.7
19:30	16.4	2	37.8	1.2	4	7.3	24.1	0.7
19:35	16.1	2	37.6	1.1	3.9	7.2	23.9	0.7
19:40	15.9	2	37.3	1.1	3.9	7.1	23.8	0.7
19:45	15.7	1.9	37.1	1.1	3.9	7	23.7	0.7
19:50	15.4	1.9	36.9	1.1	3.8	6.9	23.6	0.7
19:55	15.2	1.9	36.6	1.1	3.8	6.8	23.5	0.7
20:00	15	1.9	36.4	1.1	3.7	6.8	23.4	0.7
20:05	14.7	1.9	36.1	1	3.7	6.7	23.3	0.7
20:10	14.5	1.8	35.9	1	3.7	6.6	23.2	0.7
20:15	14.3	1.8	35.7	1	3.6	6.5	23	0.6
20:20	14.1	1.8	35.4	1	3.6	6.4	22.9	0.6
20:25	13.9	1.8	35.2	1	3.6	6.4	22.8	0.6
20:30	13.6	1.8	34.9	1	3.5	6.3	22.7	0.6
20:35	13.4	1.8	34.7	1	3.5	6.2	22.6	0.6
20:40	13.2	1.7	34.5	0.9	3.5	6.1	22.5	0.6
20:45	13	1.7	34.2	0.9	3.4	6.1	22.4	0.6
20:50	12.8	1.7	34	0.9	3.4	6	22.2	0.6
20:55	12.6	1.7	33.7	0.9	3.4	5.9	22.1	0.6
21:00	12.4	1.7	33.4	0.9	3.3	5.9	22	0.6
21:05	12.3	1.7	33.1	0.9	3.3	5.8	21.9	0.6
21:10	12.1	1.7	32.7	0.9	3.2	5.7	21.8	0.6
21:15	11.9	1.6	32.4	0.9	3.2	5.7	21.7	0.6
21:20	11.7	1.6	32	0.8	3.2	5.6	21.6	0.5
21:25	11.5	1.6	31.7	0.8	3.2	5.5	21.5	0.5
21:30	11.4	1.6	31.3	0.8	3.1	5.5	21.3	0.5
21:35	11.2	1.6	31	0.8	3.1	5.4	21.2	0.5
21:40	11	1.6	30.7	0.8	3.1	5.4	21.1	0.5
21:45	10.8	1.6	30.3	0.8	3	5.3	21	0.5
21:50	10.7	1.5	30	0.8	3	5.2	20.9	0.5
21:55	10.5	1.5	29.7	0.8	3	5.2	20.8	0.5
22:00	10.4	1.5	29.4	0.8	2.9	5.1	20.7	0.5
22:05	10.2	1.5	29	0.8	2.9	5.1	20.6	0.5
22:10	10	1.5	28.7	0.7	2.9	5	20.4	0.5
22:15	9.9	1.5	28.4	0.7	2.9	5	20.3	0.5
22:20	9.7	1.5	28.1	0.7	2.8	4.9	20.2	0.5

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
22:25	9.6	1.5	27.8	0.7	2.8	4.9	20.1	0.5
22:30	9.4	1.4	27.5	0.7	2.8	4.8	20	0.5
22:35	9.3	1.4	27.2	0.7	2.8	4.7	19.9	0.5
22:40	9.2	1.4	26.9	0.7	2.7	4.7	19.7	0.5
22:45	9	1.4	26.6	0.7	2.7	4.6	19.6	0.4
22:50	8.9	1.4	26.3	0.7	2.7	4.6	19.5	0.4
22:55	8.8	1.4	26	0.7	2.7	4.6	19.4	0.4
23:00	8.6	1.4	25.7	0.7	2.6	4.5	19.3	0.4
23:05	8.5	1.4	25.4	0.6	2.6	4.5	19.2	0.4
23:10	8.4	1.4	25.2	0.6	2.6	4.4	19.1	0.4
23:15	8.3	1.3	24.9	0.6	2.6	4.4	18.9	0.4
23:20	8.1	1.3	24.6	0.6	2.5	4.3	18.8	0.4
23:25	8	1.3	24.3	0.6	2.5	4.3	18.6	0.4
23:30	7.9	1.3	24.1	0.6	2.5	4.2	18.5	0.4
23:35	7.8	1.3	23.8	0.6	2.5	4.2	18.3	0.4
23:40	7.7	1.3	23.6	0.6	2.4	4.1	18.1	0.4
23:45	7.6	1.3	23.3	0.6	2.4	4.1	18	0.4
23:50	7.5	1.2	23	0.6	2.4	4.1	17.8	0.4
23:55	7.4	1.2	22.8	0.6	2.4	4	17.7	0.4
0:00	7.3	1.2	22.5	0.6	2.4	4	17.5	0.4
0:05	7.2	1.2	22.3	0.6	2.3	3.9	17.4	0.4
0:10	7.1	1.2	22.1	0.6	2.3	3.9	17.2	0.4
0:15	7	1.2	21.8	0.6	2.3	3.9	17	0.4
0:20	6.9	1.2	21.6	0.5	2.3	3.8	16.9	0.4
0:25	6.8	1.1	21.3	0.5	2.3	3.8	16.7	0.4
0:30	6.7	1.1	21.1	0.5	2.2	3.8	16.6	0.4
0:35	6.6	1.1	20.9	0.5	2.2	3.7	16.4	0.4
0:40	6.5	1.1	20.7	0.5	2.2	3.7	16.3	0.3
0:45	6.4	1.1	20.4	0.5	2.2	3.7	16.2	0.3
0:50	6.3	1.1	20.2	0.5	2.2	3.6	16	0.3
0:55	6.3	1.1	20	0.5	2.1	3.6	15.9	0.3
1:00	6.2	1.1	19.8	0.5	2.1	3.5	15.7	0.3
1:05	6.1	1	19.5	0.5	2.1	3.5	15.6	0.3
1:10	6	1	19.3	0.5	2.1	3.5	15.4	0.3
1:15	5.9	1	19.1	0.5	2.1	3.4	15.3	0.3
1:20	5.9	1	18.9	0.5	2.1	3.4	15.2	0.3
1:25	5.8	1	18.7	0.5	2	3.4	15	0.3
1:30	5.7	1	18.5	0.5	2	3.4	14.9	0.3
1:35	5.6	1	18.3	0.5	2	3.3	14.8	0.3

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
1:40	5.6	1	18.1	0.5	2	3.3	14.6	0.3
1:45	5.5	0.9	17.9	0.5	2	3.3	14.5	0.3
1:50	5.4	0.9	17.7	0.5	2	3.2	14.4	0.3
1:55	5.4	0.9	17.5	0.5	1.9	3.2	14.2	0.3
2:00	5.3	0.9	17.3	0.4	1.9	3.2	14.1	0.3
2:05	5.2	0.9	17.1	0.4	1.9	3.1	14	0.3
2:10	5.2	0.9	16.9	0.4	1.9	3.1	13.9	0.3
2:15	5.1	0.9	16.8	0.4	1.9	3.1	13.7	0.3
2:20	5	0.9	16.6	0.4	1.9	3	13.6	0.3
2:25	5	0.9	16.4	0.4	1.9	3	13.5	0.3
2:30	4.9	0.9	16.2	0.4	1.8	3	13.4	0.3
2:35	4.8	0.9	16.1	0.4	1.8	3	13.3	0.3
2:40	4.8	0.8	15.9	0.4	1.8	2.9	13.1	0.3
2:45	4.7	0.8	15.7	0.4	1.8	2.9	13	0.3
2:50	4.7	0.8	15.6	0.4	1.8	2.9	12.9	0.3
2:55	4.6	0.8	15.4	0.4	1.8	2.9	12.8	0.3
3:00	4.6	0.8	15.2	0.4	1.8	2.8	12.7	0.3
3:05	4.5	0.8	15.1	0.4	1.7	2.8	12.6	0.3
3:10	4.5	0.8	14.9	0.4	1.7	2.8	12.5	0.3
3:15	4.4	0.8	14.8	0.4	1.7	2.8	12.3	0.3
3:20	4.4	0.8	14.6	0.4	1.7	2.7	12.2	0.3
3:25	4.3	0.8	14.5	0.4	1.7	2.7	12.1	0.3
3:30	4.3	0.8	14.3	0.4	1.7	2.7	12	0.3
3:35	4.2	0.8	14.2	0.4	1.7	2.7	11.9	0.3
3:40	4.2	0.7	14	0.4	1.6	2.6	11.8	0.3
3:45	4.1	0.7	13.9	0.4	1.6	2.6	11.7	0.2
3:50	4.1	0.7	13.7	0.4	1.6	2.6	11.6	0.2
3:55	4	0.7	13.6	0.4	1.6	2.6	11.5	0.2
4:00	4	0.7	13.5	0.4	1.6	2.6	11.4	0.2
4:05	3.9	0.7	13.3	0.4	1.6	2.5	11.3	0.2
4:10	3.9	0.7	13.2	0.4	1.6	2.5	11.2	0.2
4:15	3.8	0.7	13.1	0.3	1.6	2.5	11.1	0.2
4:20	3.8	0.7	12.9	0.3	1.6	2.5	11	0.2
4:25	3.8	0.7	12.8	0.3	1.5	2.4	10.9	0.2
4:30	3.7	0.7	12.7	0.3	1.5	2.4	10.8	0.2
4:35	3.7	0.7	12.5	0.3	1.5	2.4	10.7	0.2
4:40	3.6	0.7	12.4	0.3	1.5	2.4	10.6	0.2
4:45	3.6	0.7	12.3	0.3	1.5	2.4	10.5	0.2
4:50	3.6	0.6	12.2	0.3	1.5	2.4	10.4	0.2

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
4:55	3.5	0.6	12.1	0.3	1.5	2.3	10.3	0.2
5:00	3.5	0.6	11.9	0.3	1.5	2.3	10.2	0.2
5:05	3.4	0.6	11.8	0.3	1.5	2.3	10.1	0.2
5:10	3.4	0.6	11.7	0.3	1.4	2.3	10	0.2
5:15	3.4	0.6	11.6	0.3	1.4	2.3	10	0.2
5:20	3.3	0.6	11.5	0.3	1.4	2.2	9.9	0.2
5:25	3.3	0.6	11.4	0.3	1.4	2.2	9.8	0.2
5:30	3.3	0.6	11.3	0.3	1.4	2.2	9.7	0.2
5:35	3.2	0.6	11.2	0.3	1.4	2.2	9.6	0.2
5:40	3.2	0.6	11.1	0.3	1.4	2.2	9.5	0.2
5:45	3.2	0.6	10.9	0.3	1.4	2.2	9.4	0.2
5:50	3.1	0.6	10.8	0.3	1.4	2.1	9.4	0.2
5:55	3.1	0.6	10.7	0.3	1.4	2.1	9.3	0.2
6:00	3.1	0.6	10.6	0.3	1.3	2.1	9.2	0.2
6:05	3	0.6	10.5	0.3	1.3	2.1	9.1	0.2
6:10	3	0.6	10.4	0.3	1.3	2.1	9	0.2
6:15	3	0.6	10.3	0.3	1.3	2	9	0.2
6:20	2.9	0.6	10.2	0.3	1.3	2	8.9	0.2
6:25	2.9	0.5	10.2	0.3	1.3	2	8.8	0.2
6:30	2.9	0.5	10.1	0.3	1.3	2	8.7	0.2
6:35	2.8	0.5	10	0.3	1.3	2	8.7	0.2
6:40	2.8	0.5	9.9	0.3	1.3	2	8.6	0.2
6:45	2.8	0.5	9.8	0.3	1.3	2	8.5	0.2
6:50	2.8	0.5	9.7	0.3	1.3	1.9	8.4	0.2
6:55	2.7	0.5	9.6	0.3	1.3	1.9	8.4	0.2
7:00	2.7	0.5	9.5	0.3	1.2	1.9	8.3	0.2
7:05	2.7	0.5	9.4	0.3	1.2	1.9	8.2	0.2
7:10	2.6	0.5	9.4	0.3	1.2	1.9	8.2	0.2
7:15	2.6	0.5	9.3	0.3	1.2	1.9	8.1	0.2
7:20	2.6	0.5	9.2	0.3	1.2	1.9	8	0.2
7:25	2.6	0.5	9.1	0.3	1.2	1.8	8	0.2
7:30	2.5	0.5	9	0.3	1.2	1.8	7.9	0.2
7:35	2.5	0.5	8.9	0.3	1.2	1.8	7.8	0.2
7:40	2.5	0.5	8.9	0.3	1.2	1.8	7.8	0.2
7:45	2.5	0.5	8.8	0.2	1.2	1.8	7.7	0.2
7:50	2.4	0.5	8.7	0.2	1.2	1.8	7.6	0.2
7:55	2.4	0.5	8.6	0.2	1.2	1.8	7.6	0.2
8:00	2.4	0.5	8.6	0.2	1.1	1.8	7.5	0.2
8:05	2.4	0.5	8.5	0.2	1.1	1.7	7.5	0.2

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
8:10	2.4	0.5	8.4	0.2	1.1	1.7	7.4	0.2
8:15	2.3	0.5	8.3	0.2	1.1	1.7	7.3	0.2
8:20	2.3	0.5	8.3	0.2	1.1	1.7	7.3	0.2
8:25	2.3	0.4	8.2	0.2	1.1	1.7	7.2	0.2
8:30	2.3	0.4	8.1	0.2	1.1	1.7	7.2	0.2
8:35	2.2	0.4	8	0.2	1.1	1.7	7.1	0.2
8:40	2.2	0.4	8	0.2	1.1	1.7	7	0.2
8:45	2.2	0.4	7.9	0.2	1.1	1.6	7	0.2
8:50	2.2	0.4	7.8	0.2	1.1	1.6	6.9	0.2
8:55	2.2	0.4	7.8	0.2	1.1	1.6	6.9	0.2
9:00	2.2	0.4	7.7	0.2	1.1	1.6	6.8	0.2
9:05	2.1	0.4	7.6	0.2	1.1	1.6	6.8	0.2
9:10	2.1	0.4	7.6	0.2	1.1	1.6	6.7	0.2
9:15	2.1	0.4	7.5	0.2	1	1.6	6.7	0.2
9:20	2.1	0.4	7.4	0.2	1	1.6	6.6	0.2
9:25	2.1	0.4	7.4	0.2	1	1.6	6.6	0.1
9:30	2	0.4	7.3	0.2	1	1.5	6.5	0.1
9:35	2	0.4	7.3	0.2	1	1.5	6.5	0.1
9:40	2	0.4	7.2	0.2	1	1.5	6.4	0.1
9:45	2	0.4	7.1	0.2	1	1.5	6.4	0.1
9:50	2	0.4	7.1	0.2	1	1.5	6.3	0.1
9:55	1.9	0.4	7	0.2	1	1.5	6.3	0.1
10:00	1.9	0.4	7	0.2	1	1.5	6.2	0.1
10:05	1.9	0.4	6.9	0.2	1	1.5	6.2	0.1
10:10	1.9	0.4	6.8	0.2	1	1.5	6.1	0.1
10:15	1.9	0.4	6.8	0.2	1	1.5	6.1	0.1
10:20	1.9	0.4	6.7	0.2	1	1.4	6	0.1
10:25	1.8	0.4	6.7	0.2	1	1.4	6	0.1
10:30	1.8	0.4	6.6	0.2	1	1.4	5.9	0.1
10:35	1.8	0.4	6.6	0.2	1	1.4	5.9	0.1
10:40	1.8	0.4	6.5	0.2	0.9	1.4	5.8	0.1
10:45	1.8	0.4	6.5	0.2	0.9	1.4	5.8	0.1
10:50	1.8	0.4	6.4	0.2	0.9	1.4	5.8	0.1
10:55	1.8	0.4	6.4	0.2	0.9	1.4	5.7	0.1
11:00	1.7	0.4	6.3	0.2	0.9	1.4	5.7	0.1
11:05	1.7	0.4	6.3	0.2	0.9	1.4	5.6	0.1
11:10	1.7	0.4	6.2	0.2	0.9	1.3	5.6	0.1
11:15	1.7	0.3	6.2	0.2	0.9	1.3	5.5	0.1
11:20	1.7	0.3	6.1	0.2	0.9	1.3	5.5	0.1

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
11:25	1.7	0.3	6.1	0.2	0.9	1.3	5.5	0.1
11:30	1.7	0.3	6	0.2	0.9	1.3	5.4	0.1
11:35	1.6	0.3	6	0.2	0.9	1.3	5.4	0.1
11:40	1.6	0.3	5.9	0.2	0.9	1.3	5.3	0.1
11:45	1.6	0.3	5.9	0.2	0.9	1.3	5.3	0.1
11:50	1.6	0.3	5.8	0.2	0.9	1.3	5.3	0.1
11:55	1.6	0.3	5.8	0.2	0.9	1.3	5.2	0.1
12:00	1.6	0.3	5.7	0.2	0.9	1.3	5.2	0.1
12:05	1.6	0.3	5.7	0.2	0.9	1.3	5.2	0.1
12:10	1.6	0.3	5.7	0.2	0.9	1.3	5.1	0.1
12:15	1.5	0.3	5.6	0.2	0.8	1.2	5.1	0.1
12:20	1.5	0.3	5.6	0.2	0.8	1.2	5	0.1
12:25	1.5	0.3	5.5	0.2	0.8	1.2	5	0.1
12:30	1.5	0.3	5.5	0.2	0.8	1.2	5	0.1
12:35	1.5	0.3	5.4	0.2	0.8	1.2	4.9	0.1
12:40	1.5	0.3	5.4	0.2	0.8	1.2	4.9	0.1
12:45	1.5	0.3	5.4	0.2	0.8	1.2	4.9	0.1
12:50	1.5	0.3	5.3	0.2	0.8	1.2	4.8	0.1
12:55	1.5	0.3	5.3	0.2	0.8	1.2	4.8	0.1
13:00	1.4	0.3	5.2	0.2	0.8	1.2	4.8	0.1
13:05	1.4	0.3	5.2	0.2	0.8	1.2	4.7	0.1
13:10	1.4	0.3	5.2	0.2	0.8	1.2	4.7	0.1
13:15	1.4	0.3	5.1	0.2	0.8	1.2	4.7	0.1
13:20	1.4	0.3	5.1	0.2	0.8	1.1	4.6	0.1
13:25	1.4	0.3	5.1	0.2	0.8	1.1	4.6	0.1
13:30	1.4	0.3	5	0.2	0.8	1.1	4.6	0.1
13:35	1.4	0.3	5	0.2	0.8	1.1	4.5	0.1
13:40	1.4	0.3	4.9	0.2	0.8	1.1	4.5	0.1
13:45	1.3	0.3	4.9	0.2	0.8	1.1	4.5	0.1
13:50	1.3	0.3	4.9	0.2	0.8	1.1	4.5	0.1
13:55	1.3	0.3	4.8	0.2	0.8	1.1	4.4	0.1
14:00	1.3	0.3	4.8	0.2	0.8	1.1	4.4	0.1
14:05	1.3	0.3	4.8	0.2	0.8	1.1	4.4	0.1
14:10	1.3	0.3	4.7	0.2	0.7	1.1	4.3	0.1
14:15	1.3	0.3	4.7	0.1	0.7	1.1	4.3	0.1
14:20	1.3	0.3	4.7	0.1	0.7	1.1	4.3	0.1
14:25	1.3	0.3	4.6	0.1	0.7	1.1	4.2	0.1
14:30	1.3	0.3	4.6	0.1	0.7	1.1	4.2	0.1
14:35	1.3	0.3	4.6	0.1	0.7	1.1	4.2	0.1

	Basin Outflows (cfs)							
Time (H:M)	DP-1	DP-2	DP-3	DP-5	DP-6	DP-7	DP-8	DP-9
14:40	1.2	0.3	4.5	0.1	0.7	1	4.2	0.1
14:45	1.2	0.3	4.5	0.1		1	4.1	0.1
14:50	1.2	0.3	4.5	0.1		1	4.1	0.1
14:55	1.2		4.4	0.1		1	4.1	0.1
15:00	1.2		4.4	0.1		1	4.1	
15:05	1.2		4.4	0.1		1	4	
15:10	1.2		4.4	0.1		1	4	
15:15	1.2		4.3	0.1		1	4	
15:20	1.2		4.3	0.1		1		
15:25	1.2		4.3			1		
15:30	1.2		4.2			1		
15:35	1.2		4.2			1		
15:40	1.1		4.2			1		
15:45	1.1		4.2			1		
15:50	1.1		4.1			1		
15:55	1.1		4.1			1		
16:00	1.1		4.1					

SUNRISE ENGINEERING, INC.

1180 N Mountain Springs Parkway, Springville, Utah 84663

Tel: (801) 704-5220

Engineer's Opinion of Probable Cost

Enoch Watershed Plan-EA 1-Jun-24

Enoch City

NO.	DESCRIPTION	EST. QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL CONSTRUCTION					
	Mobilization	1	LS	$ 1,000,000.00	$ 1,000,000.00
	Quality Control & Testing	1	LS	$ 250,000.00	$ 250,000.00
	Traffic Control	1	LS	$ 250,000.00	$ 250,000.00
	Piping				
	60" ADS Pipe	13,620	LF	$ 300.00	$ 4,086,000.00
	54" ADS Pipe	1,310	LF	$ 250.00	$ 327,500.00
	48" ADS Pipe	2,400	LF	$ 225.00	$ 540,000.00
	42" ADS Pipe	1,295	LF	$ 215.00	$ 278,425.00
	24" ADS Pipe	4,300	LF	$ 170.00	$ 731,000.00
	84" Manhole	35	EA	$ 19,000.00	$ 665,000.00
	72" Manhole	10	EA	$ 14,500.00	$ 145,000.00
	60" Manhole	4	EA	$ 8,000.00	$ 32,000.00
	48" Manhole	18	EA	$ 6,250.00	$ 112,500.00
	Native Backfill	22,925	LF	$ 15.00	$ 343,875.00
	Import Pipe Bedding	22,925	LF	$ 30.00	$ 687,750.00
	Import Structural Backfill	13,620	LF	$ 50.00	$ 681,000.00
	Untreated Base Course	3,000	CY	$ 50.00	$ 150,000.00
	Bituminous Surfacing (4" depth)	12,000	SY	$ 80.00	$ 960,000.00
	Detention Basins				
	DP-1				
	Cut	137,900	CY	$ 5.00	$ 689,500.00
	Fill	330	CY	$ 12.00	$ 3,960.00
	Low-Level Outlet	1	LS	$ 75,000.00	$ 75,000.00
	Riprap	200	CY	$ 50.00	$ 10,000.00
	DP-2				
	Cut	105,100	CY	$ 5.00	$ 525,500.00
	Fill	1,130	CY	$ 12.00	$ 13,560.00
	Low-Level Outlet	1	LS	$ 100,000.00	$ 100,000.00
	Riprap	385	CY	$ 50.00	$ 19,250.00
	DP-3				
	Cut	223,465	CY	$ 5.00	$ 1,117,325.00
	Fill	49,430	CY	$ 12.00	$ 593,160.00
	Low-Level Outlet	1	LS	$ 100,000.00	$ 100,000.00
	Riprap	12,270	CY	$ 50.00	$ 613,500.00
	DP-5				
	Cut	78,450	CY	$ 5.00	$ 392,250.00
	Fill	650	CY	$ 12.00	$ 7,800.00
	Low-Level Outlet	1	LS	$ 100,000.00	$ 100,000.00
	Riprap	325	CY	$ 50.00	$ 16,250.00
	DP-6				
	Cut	172,375	CY	$ 5.00	$ 861,875.00
	Fill	155	CY	$ 12.00	$ 1,860.00
	Low-Level Outlet	1	LS	$ 100,000.00	$ 100,000.00
	Riprap	310	CY	$ 50.00	$ 15,500.00
	DP-7				
	Cut	133,060	CY	$ 5.00	$ 665,300.00
	Fill	580	CY	$ 12.00	$ 6,960.00
	Low-Level Outlet	1	LS	$ 100,000.00	$ 100,000.00
	Riprap	800	CY	$ 50.00	$ 40,000.00
	DP-8				
	Cut	96,175	CY	$ 5.00	$ 480,875.00
	Fill	20,670	CY	$ 12.00	$ 248,040.00
	Low-Level Outlet	1	LS	$ 100,000.00	$ 100,000.00
	Riprap	675	CY	$ 50.00	$ 33,750.00
	Ditches & Berm				
	Excavation	95,000	CY	$ 5.00	$ 475,000.00
	Riprap	41,405	CY	$ 50.00	$ 2,070,250.00
	Fill	4,885	CY	$ 12.00	$ 58,620.00
	Existing Channel				
	Channel Improvements	1	LS	$ 150,000.00	$ 150,000.00
			SUBTOTAL		**$ 21,025,135.00**
			CONTINGENCY	25%	**$ 5,256,283.75**
			CONSTRUCTION TOTAL		**$ 26,281,418.75**

In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and