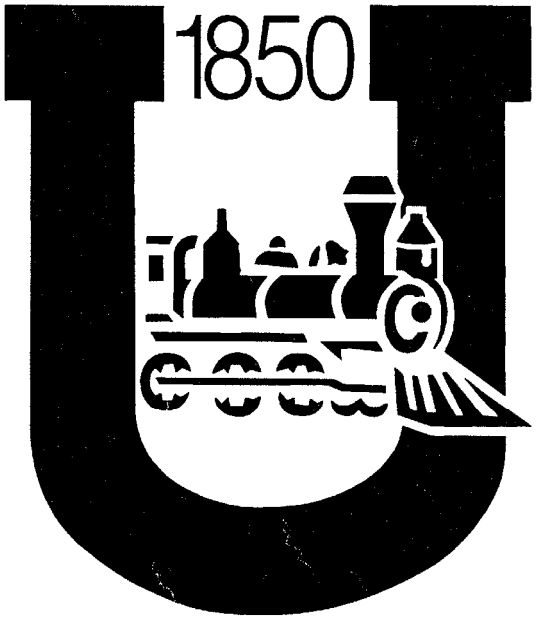
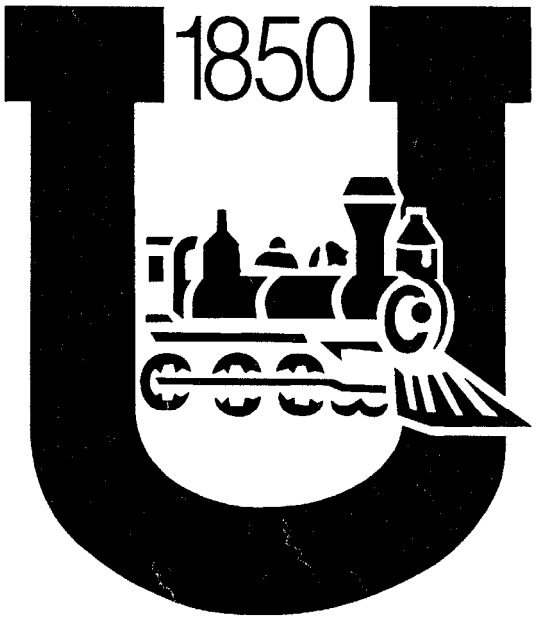
UINTAH CITY
GENERAL PLAN



March 2017

UINTAH CITY
GENERAL PLAN



The General Plan was approved by the City Council
March 7, 2017

Introduction

Background and Objective

The General Plan is an official document developed for the purpose of guiding the growth and development of the City, primarily in regard to land use. The plan is developed by the Planning Commission with input from the public, and adopted by the City Council.

The following are objectives which were sought in the development of this document:

- Convey the intents and desires of the current residents of the City.
- Respect landowner rights, including development rights.
- Plan for a future that will preserve the character of the City while recognizing the need to accommodate growth and change.

The public's input was gathered in a number of ways, including a survey conducted by students at the University of Utah, formation of a citizen committee, and lastly conducting a public hearing.

Organization

The document is organized with the intention of producing an easily readable and readily modified "living document." To accomplish this the plan consists of a concise overview for each key topic. Each overview includes the following:

- Background and Narrative
- Objective
- Recommendations and Conclusions

Additional background information is provided in the commentary and appendices.

The following key topics are addressed in this plan:

1. Growth & Zoning
2. Transportation
3. Sanitary Waste Disposal
4. Culinary Water
5. Secondary Water
6. Stormwater
7. Pathways
8. Parks
9. Moderate Income Housing
10. Emergency Services Plan

Additional topics which should be considered in future plans include the following:

- Safety
- Historic Preservation
- Nuisance Enforcement
- Communications
- Environmental Protection
- Railroad Relations

Section 1 – Growth and Zoning

Background and Narrative

Uintah residents have consistently and collectively expressed a desire to preserve a rural atmosphere. However, residents' definition of a rural atmosphere varies. To some a rural atmosphere means large residential lots and drainage swells in lieu of curb and sidewalks. To others it would be better achieved through smaller lots in exchange for preserving more open space.

Uintah's location, character, and beauty make it extremely desirable for residential development. Growth has historically been restrained by the requirement to maintain large residential lots; a requirement which has traditionally been thought to be directly connected to the need for septic systems. This perception, in connection with a desire to maintain a rural atmosphere, creates pressure to resist the development of a sewer system. However, there are other reasons for limiting the overall buildout density of the city. Primary among these are limitations on the transportation infrastructure and compatibility with existing development.

Transportation is discussed in greater detail in its own section. In regard to growth, the critical conclusion is that the capacity of 6600 South is extremely limited. As the only corridor into and through the city, the demand on this corridor must be limited in order to preserve safety.

Recommended land use is shown in the attached land use map.

Objective

Maintain rural atmosphere and character of Uintah while accommodating growth and personal property rights for development.

Recommendations and Conclusions

- Target maximum buildout density based on half acre minimum lot size. This density will approximately double the current population of the City.
- Maximum density should be based on factors other than septic systems versus sewer. These factors include transportation limitations and preservation of the town's character and atmosphere.
- Consider options such as a development right exchange if a sewer system is developed in the future. This approach could be used to maintain a maximum target population density while allowing for more diverse growth and preserving open space.

Attachments

- Land use map
- U.S. Census data (summary)

Section 2 - Transportation

Background and Narrative

This section is written specifically in regard to vehicular traffic. Pedestrian and bicycle traffic is addressed in the section titled Pathways.

The development of Uintah, particularly in regard to transportation, is extremely restricted due to geography. Uintah is bordered by unbuildable slopes to the north, the Weber River on the south, and divided by east to west by 6600 South and two railroads. This results in 6600 South being the only east to west corridor through the city, with essentially no potential for development of additional entrances. Additionally, much of 6600 South is owned by Union Pacific Railroad (UPR) and therefore options for improvements are limited.

According to discussions with local Utah Department of Transportation (UDOT) representatives, there are currently no plans for modifications to US. Hwy 89 north of Interstate 84 in UDOT's immediate or future plans.

A traffic study is needed to determine the existing demand and capacity of 6600 South. This study will provide information essential for planning future road improvements as well as setting a threshold for maximum traffic as a basis for target buildout density.

Objective

Plan for future transportation demands at target buildout density. Provide safe travel into, out of, and within Uintah now and in the future.

Recommendations and Conclusions

- Require east to west interconnection of new residential developments in order to reduce the demand on 6600 South for travel within the city.
- Paint shoulder lines on 6600 South to establish lane widths. This visual constraint is intended to slow traffic as well as define shoulders for pedestrian and bicycle traffic. The width and location of the striping should be determined by the City Engineer. Road widening will likely be required in order to incorporate pedestrian and bicycle lanes.
- Conduct traffic study of 6600 South. Alternatively, this information may be obtained as part of a site plan review process for a commercial development.
- Work with UPR to develop cross sections agreeable to UPR in regard to pavement width and offset requirements between 6600 South and the railway. This may provide options for minor relocations or widening of the road to better accommodate pedestrian and bicycle traffic.

Attachments

- Transportation Map

Section 3 - Sanitary Waste Disposal

Background and Narrative

With the exception of the Cottonwood Estates Mobile Home Park, Uintah residents and commercial buildings utilize septic systems for disposal of sanitary waste. This section considers the need for development of a sewer system to accommodate future growth of the city.

Septic systems in the city are subject to approval by the Weber County Health Department. A representative of the department was contacted for consultation on the subject in order to learn what if any restrictions the health department could place on the city if sewer is not developed. In other areas of the county the department has conducted testing to determine maximum permissible densities which are allowed where septic systems are utilized. Uintah has not been included in these studies to date and due to the small size of the city it is not anticipated that a study will be conducted in the near future. In the absence of a site specific study, the health department is obligated to approve septic systems within the city, provided that local ordinances and requirements are met. However, the department may significantly restrict the size of the homes for which the system is approved.

The development of a sewer system in Uintah has traditionally been resisted due to the perceived cost and in a desire to slow growth of the city. As discussed in the section titled Growth, there are other factors which will limit the future maximum density of the city. A sewer system does not necessarily need to be considered an invitation for a population boom. An updated study is needed to determine alternatives and associated costs for development of a sewer system.

Objective

Plan for sanitary waste disposal which is environmentally responsible and which will not unnecessarily restrict the future growth of the city.

Recommendations and Conclusions

- Update study and preliminary design for sewer system. This will provide anticipated cost as well as provide needed information for developers to install “dry sewers” in anticipation for a future system.

Attachments

- Sanitary Sewer Feasibility Study by Jones & Associates, dated July 1999.

Section 4 – Culinary Water

Background and Narrative

The Uintah City culinary water system is divided into three pressure zones. The system was upgraded in 2005 to accommodate anticipated future growth within the city consisting of up to 813 total connections. This represents an approximate increase of 100% in relation to existing connections.

Uintah city culinary water is provided by contract from Weber Basin Water Conservancy District. The contract is setup as a stepped system where Uintah commits to purchase a set amount of water. When the city exceeds this amount they are bumped into the next step.

The limitations of the existing secondary water system (primarily resulting from ditches which were not extended to residential lots at the time of development) necessitates that many of the residential lots in the city rely on culinary water for irrigation of landscaping and gardening. This places a burden on the culinary water system which would be relieved by a pressurized secondary system.

Objective

Provide safe, clean, and reliable water infrastructure.

Recommendations and Conclusions

- Maintain water system to minimize repairs which could otherwise be avoided.
- Promote water conservation by maintaining a water rate structure which accurately corresponds to actual usage.

Attachments

- None

Section 5 – Secondary Water

Background and Narrative

Uintah City is not a provider of secondary water. The existing secondary irrigation system in the city primarily consists of three canal companies which provide water diverted from the Weber River or collected from springs and delivered by gravity through open ditches and limited piping. The system was developed specifically for agricultural irrigation.

As the agricultural lands of Uintah have been developed for residential use, the secondary system has not kept up. Many of neighborhoods have limited and sometime no access to the ditches. The end result is that many if not most residences in the city rely on culinary water as the primary source of irrigation for landscaping and gardening.

While some may argue that it is not the city's responsibility to provide secondary water, the truth is that the inadequacies of the existing system place a burden on the culinary water system for which the city is responsible. For this reason it is important for the city to understand and plan for the impact that the lack of a pressurized secondary water system places on the culinary system, whether or not the city chooses to become a provider of secondary water.

In 2010, a feasibility study for the development of a pressurized irrigation water system was completed by Franson Civil Engineers. This study was conducted following the findings of the survey referenced by the 2006 general plan update which indicated that a large percentage (75 percent) of residents considered pressurized secondary water as an important asset to the community.

Objective

Accommodate access to economic source of secondary water for all residences.

Recommendations and Conclusions

- The city's involvement in the provision of secondary water is directly related to the impact that the lack of a secondary system has on the culinary system.
- Maintain water fee structure which accurately reflects actual water usage by individual residents
- The city should continue to evaluate the need for pressurized secondary water as a means for offsetting the demands on the culinary water system.

Attachments

- None

Section 6 - Stormwater

Background and Narrative

The existing stormwater system in Uintah consists primarily of drainage swales along residential streets. These swales are intended as continuous retention ponds as opposed to a conveyance system. The system works well when the drainage swales are maintained. However, many residents fill the swales in with impermeable topping which forces stormwater to adjacent residents.

With the exception of areas where the swales are not maintained, the existing system has functioned adequately and fits with the character of the city desired by residents.

In addition to drainage swales, there is a limited amount of stormwater piping in the city.

Objective

Provide for safe conveyance of stormwater which meets state and federal regulatory requirements.

Recommendations and Conclusions

- No changes are recommended in regard to stormwater for residential developments.
- The city engineer should continue to verify that future developments (residential and commercial) are in compliance with state and federal regulations.

Attachments

- None

Section 7 - Pathways

Background and Narrative

The existing development of Uintah has resulted in a number of neighborhood pockets with access only to 6600 South. This results in a heavy burden being placed on 6600 South as the primary corridor through the city, and discourages bicycle and pedestrian travel due to safety concerns. The development of pathways will improve safety for the pedestrian, bicycle, and vehicular traffic in addition to promoting healthy lifestyles.

While residents seem to generally support the concept of developing pathways, a number of concerns have been expressed. These include the potential for criminal activity and invasion of privacy, particularly where pathways and trailheads are located adjacent to residential neighborhoods. These concerns should be addressed and mitigated wherever a pathway is considered for development.

Weber Pathways (a private nonprofit organization) owns several parcels of land within the city and has worked with the City Council in the past to promote the development of pathways. In March of 2015 the City Council passed a resolution (15-0303) in support of these efforts, which included a draft pathway map. The map included in this plan is similar to the draft map included in the resolution with the exceptions of eliminating east to west trails on the north and south side of Weber River as well as a future bridge on property currently owned by the Utah State Road Commission. The trail on the south side of the river was eliminated as part of this plan because it is outside of the city limits. The path on the north was eliminated because it primarily consists of existing roads and provides little value as a pathway.

Objective

Promote residential pedestrian and bicycle transportation through the city as a means for improving safety as well as a promotion of healthy lifestyles.

Recommendations and Conclusions

- Support and promote development of pathways for pedestrian and bicycles travelling within Uintah to use as an alternate to 6600 South.
- The city could consider providing encouragement to developers for providing pathway access by allowing an increase in allowable housing density.
- Support the development by Weber Pathways of a trail on the south side of the Weber River. Connections to this trail and development of other trails within the city should consider impacts to residential neighborhoods and should be designed in a way that best protects personal privacy while still being assessable.

Attachments

- Transportation Map

Section 8 - Parks

Background and Narrative

Uintah City currently has two parks. These are the Uintah City Park at 2105 East 6550 South, and the Memorial Park located south of the City Hall.

The Uintah City Park is the home of U-days and provides recreational opportunities such as tennis, softball, little league baseball, and a playground. The park is also the location of the Scout House and a covered bowery, which provide additional opportunities for community and family gatherings.

The Memorial Park is a small grassy area south of the City Hall. This park includes a small pavilion and is intended for more casual use and smaller gatherings.

There are several parcels of land within the City which are well suited for use as a public park. However, there is little to no support within the city for the development of another traditional park. Resident concerns include increased traffic in existing neighborhoods, the cost of development, and the potential for increased criminal activity if the parks are connected with pathways outside of the City.

While there is concern over development of a traditional park, there is a strong desire by residents to preserve open space. Providing improved access to the Weber River is also a feature that would benefit many of the residents of the City, but must be weighed against the property rights of residents currently living adjacent to the river.

Objective

Provide recreational opportunities which accommodate as many interests as possible and to promote healthy lifestyles, while protecting private property rights and the character of existing residential neighborhoods.

Recommendations and Conclusions

- The City should acquire the property illustrated in Attachment 1 (currently owned by the Utah State Road Commission). This property should be acquired with the intention of maintaining it as open space. This property currently includes an easement owned by the Division of Wildlife Resources, which provides them the right to develop parking and angler access. The City should work with DWR to minimize the impact of this easement on the adjacent residents. The DWR could apply this right at any time, no matter who owns the property. Acquiring the property will ensure that the City is in the strongest position possible to guide the use of the land.

- The attached park map identifies additional parcels which the City should acquire if given the opportunity. These properties should be used for access to the river as opposed to development as traditional parks.

Attachments

- Land Use Map

Section 9 – Moderate Income Housing

Background and Narrative

Utah Code requires that the general plan for cities address moderate income housing (MIH), including an estimate of the need for the development of additional MIH. Consideration should be given to the State Legislature's determination that cities should facilitate a reasonable opportunity for a variety of housing, including MHI.

Moderate income housing is defined by the Utah Code as housing occupied or reserved by households with a gross household income equal to or less than 80 percent of the median gross income for households of the same size in the county. The latest US census data (2010) indicates that the current median household income in Weber County is $56,216. The most recent state certified survey of Uintah was conducted in 2016 and found that 63.3% of Uintah residents fall within the criteria for low to moderate income.

The existing residences in Uintah are diverse and offer a full range of housing options for households of varying incomes. This diversity is an asset to the character of the community. However, the majority of the current MIH is comprised of the Cottonwood Estates Mobile Home Park and older subdivisions. Housing in new developments does not accommodate MIH. As the city continues to grow, options which would promote a continuation of the diverse character of the city should be considered. This may include the development right exchange described in the Growth & Zoning section of this plan.

Objective

Facilitate a reasonable opportunity for residents of varying incomes to obtain housing in Uintah City.

Recommendations and Conclusions

- No changes to the existing ordinances are recommended at this time.

Attachments

- State certified income survey, dated 2016

Section 10 – Emergency Services Plan

Background and Narrative

As with most communities, there are a number of potential natural disasters to which Uintah City may subjected and for which we should be prepared. These include earthquakes, flooding, fires, and significant wind events.

A detailed emergency services plan is needed in order for the City to adequately respond in the case of emergency. The Fire Department is traditionally looked to for support in this area; however, additional measures can and should be taken in order improve preparedness and readiness.

Objective

Maintain a state of readiness by the City and residents to respond to emergency events.

Recommendations and Conclusions

- The City should maintain an updated and detailed Emergency Services Plan (ESP), which is coordinated with Weber County and adjacent municipalities. This plan should address as a minimum communications, shelter, distribution, rally points, and transportation.
- Communication – The ESP should assume no availability of cell communication in the event of a natural disaster. The communication component of the plan should also address the need for a notification system (such as would be required in the event of a dam breach on the Weber River). Continued support of local HAM radio operators through exercises such as “The Great Shakeout” is an important step.
- Shelter – Identify a location (such as the LDS Church and/or Crossroads Church) for survivors to gather. Confirm this location with the Red Cross. Shelter management personnel should be trained (some exist).
- Rally Points – Identify alternative rally points in addition to the primary shelter location. The Crossroads Church could be used for residents on the east side of Hwy 89 or in the event that flooding requires a rally point at higher ground.
- Transportation – The existing roads should be reviewed to ensure emergency services can respond to disasters throughout the City. Areas where deficiencies are identified should be addressed.

Attachments

- None

Commentary

Section 1 Commentary – Growth and Zoning

Estimate of buildout density

The future buildout household density using half acre average lot sizes was estimated by assuming an average of 1.8 lots per acre in order to account for roads (which equates to an effective usage rate of 90%). This approximation was based on an informal review of the existing developments in Uintah which vary between 1.5 lots per acre to 1.85 lots per acre.

The current number of households in Uintah is approximately 420. The total acreage of buildable land within Uintah City limits and which may reasonably be expected to be annexed in the future for residential development is approximately 240 acres. At 1.8 lots per acre the expected growth is 432 new residential lots. This represents a 103 percent increase relative to existing, which is the basis for the statement in the plan that this would approximately double the density of Uintah.

For comparison, the buildout density for Uintah was also estimated using an average of quarter acre lots. A lower effective usage rates of 80 percent was used to account for a greater amount of land that would be taken up by roads if smaller lots were developed. At this effective usage rate the expected growth would be 768 new residential lots. This represents an increase relative to the existing density of 183 percent (effectively tripling the current density).

Example of development right exchange

The following examples illustrate how a development right exchange could be used to maintain the target buildout density, while allowing for flexibility in subdivision development and preservation of open space. This approach could only be implemented after the development of a sewer system. It is important to note that implementation of this or a similar concept should be used with the objective of preserving open space and rural atmosphere. Modifications to the city ordinances which would accommodate this type of development should be tailored to accomplish this objective.

The following examples are for two 10 acre parcels (A and B) which both contain 10 acres of buildable land. Based on an average of 1.8 lots per acre, each of these properties include the development rights for 18 lots.

Example 1

- The owner of Property B purchases the rights to 9 residential lots from the owner of Property A.
- Property B may be developed with up to 27 lots, but must still satisfy all other development requirements, including frontage, etc..
- Property A may be developed with a maximum of 9 lots.

Example 2

- The owner of Property B purchases the development rights for all 18 permitted lots from Property A.

- Property B may be developed with up to 36 lots, but must still satisfy all other development requirements, including frontage, etc..
- Property A may not be developed. A permanent easement will be recorded to preserve Property A as open space.

Section 2 Commentary - Transportation

Transportation in Uintah, particularly in regard to the limitations and safety concerns on 6600 South, is a critical issue in the eyes of the majority of the city's residents. The city's options are limited due to land ownership restraints. The city should continue to work with Union Pacific Railroad (UPR) in an effort to improve the safety for vehicular and pedestrian traffic.

The existing paved width of 6600 South is approximately 26 feet. The American Association of State Highway and Transportation Officials (AASHTO) recommends a vehicular lane width of 12 feet for roads with a design speed limit of 40 mph. A reduced lane width of 11 feet could be used but may need to be accompanied by a reduction of the speed limit to 35 mph. The City Engineer should make this determination based on the results of a traffic study.

The recommended minimum bicycle lane width for roads without a curb and where parking is prohibited is 4 feet. Additional shoulder width clear of vertical obstructions is required beyond the bicycle lane but does not need to be paved. A minimum paved width of 30 feet is needed in order to provide two 11 foot vehicular lanes and two 4 foot bicycle lanes. An additional 2 feet of paved width is required to accommodate 12 foot vehicular lanes.

Section 3 Commentary - Sanitary Waste Disposal

General

Consideration by the city regarding development of a sewer system in Uintah would surely create significant discussion among the residents, much of which may be contentious. However, this potential should not inhibit the city's efforts to obtain updated information in pursuit of making informed decisions.

Potential Health Department Restrictions

As discussed in the plan, the Weber County Health Department is the approving authority for septic systems in Uintah. While the department is currently obligated to approve septic systems for residential lots in Uintah provided that they satisfy local ordinances, the department does have the ability to significantly restrict the maximum number of bedrooms permitted in new homes. This limitation has the potential for negatively impact the property value of buildable land in Uintah.

The Health Department currently does not have the authority to dictate the minimum lot sizes for which septic systems are approved within Uintah. However, if the city were ever to be included in a site specific study, the department would then have the ability to dictate minimum lot size (or maximum density) for future development in the city. The proximity of Uintah to the Weber River, as well as the presence of predominantly free draining soils in the city, make it very likely that these restrictions would be severe.

Environmental Impact

Studies have not been conducted to determine the impact of the existing septic systems in Uintah, or the potential impact of new systems.

Updated Study

A feasibility study for the construction of a sewer system in Uintah was completed by Jones & Associates in 1999. The plan recommends that this study should be updated in order to better inform the city leaders and residence of the financial impact that installing a sewer system would have.

Potential sources for funding assistance have changed since the completion of the 1999 study, and continue to change. Updating the study will put the city in a better position to act quickly when funding is available and if the city determines that a sewer system should be constructed.

Section 4 Commentary – Culinary Water

No comments.

Section 5 Commentary – Secondary Water

It is difficult to determine if there is a consensus among city residents concerning the development of a pressurized secondary water system. The survey referenced by the 2006 general plan update indicated that 75 percent of residents considered pressurized secondary as an important asset to the community. Similarly, the limited survey which was conducted by University of Utah students in preparation for this update also indicated that pressurized secondary was viewed as a positive development, and likely inevitable in the coming 20 years.

These survey findings appear to stand in contrast to resident reaction to a 2010 feasibility study performed by Franson Civil Engineers, which considered multiple options for converting the existing gravity fed system to a pressurized system. The study was met with considerable resistance by what may have been a minority but very vocal contingent of residents. Resistance centered on the potential cost as well as what some considered the fundamental question of whether secondary water should fall within the responsibility of the city.

The city's culinary water system is directly impacted by the lack of a pressurized secondary water system. For this reason the city's actions in regard to the secondary water system should be tied directly to the impact to the culinary system.

Section 6 Commentary – Stormwater

No comments.

Section 7 Commentary - Pathways

Opinions regarding pathways in Uintah are divided by resident location, particularly in regard to a pathway along the Weber River. Residents adjacent to the river are generally opposed to any kind of path, even a path on the south side of the river. The city does not have a significant

amount of control over a pathway on the south side of the river and most residents seem to recognize that it is likely that a path will someday be located there.

Some residents have indicated that they do not want a connection across the river to a future pathway on the south of the trail to be located near their homes. These residents indicated that they would prefer to access a river pathway at the east or west end of the city rather than at a river crossing within the city. Concerns include transient activity, vandalism, and other criminal activity. The legitimacy of these concerns is not evaluated in this document, but have been addressed by including the recommendation that the concerns should be mitigated in the development and location of pathways and trailheads.

There appears to be general support for pathways but only where the concerns indicated above can be mitigated. Locating trailheads and river crossings as part of future developments as opposed to existing neighborhoods may be one way to alleviate concerns since the new facility would not be seen as being forced onto existing residents. Educational efforts may also be helpful.

Section 8 Commentary - Parks

As indicated in the plan, there appears to be very little support from residents for the development of an additional traditional park. Future park plans should accommodate other activities such as river access and other outdoor activities. Preserving open space with low maintenance should be objectives in the development of such a park.

The plan indicates that the city should acquire the 8.8 acre parcel of land currently owned by the Utah State Road Commission and located at the west end of 6850 South. This property possesses the characteristics needed for the non-traditional park described above. However, there are resident concerns which would need to be addressed. The Utah Division of Natural Resources (DNR) currently owns an easement on the property, which gives them the right to provide fisherman access through the property. The nearby residents have expressed concern that this type of access would lead to a significant increase in traffic and potentially other problems. However, the road which accesses the property (6850 South) has been master planned to continue through this property and eventually reconnect back to 6600 South. This is reflected in this general plan as well as the previous general plan. The additional traffic that would be created by a fisherman access would not exceed what would be associated with the continuation of the road and accompanying residential developments. For this reason the concern of additional traffic should not be considered an obstruction to acquiring the property and allowing the establishment of a fisherman access.

To date the DNR has expressed a strong desire to work with the city in the development of their easement. This would likely remain the case whether the city owns the property or not, but city ownership would provide the city the best opportunity to dictate the use of the land.

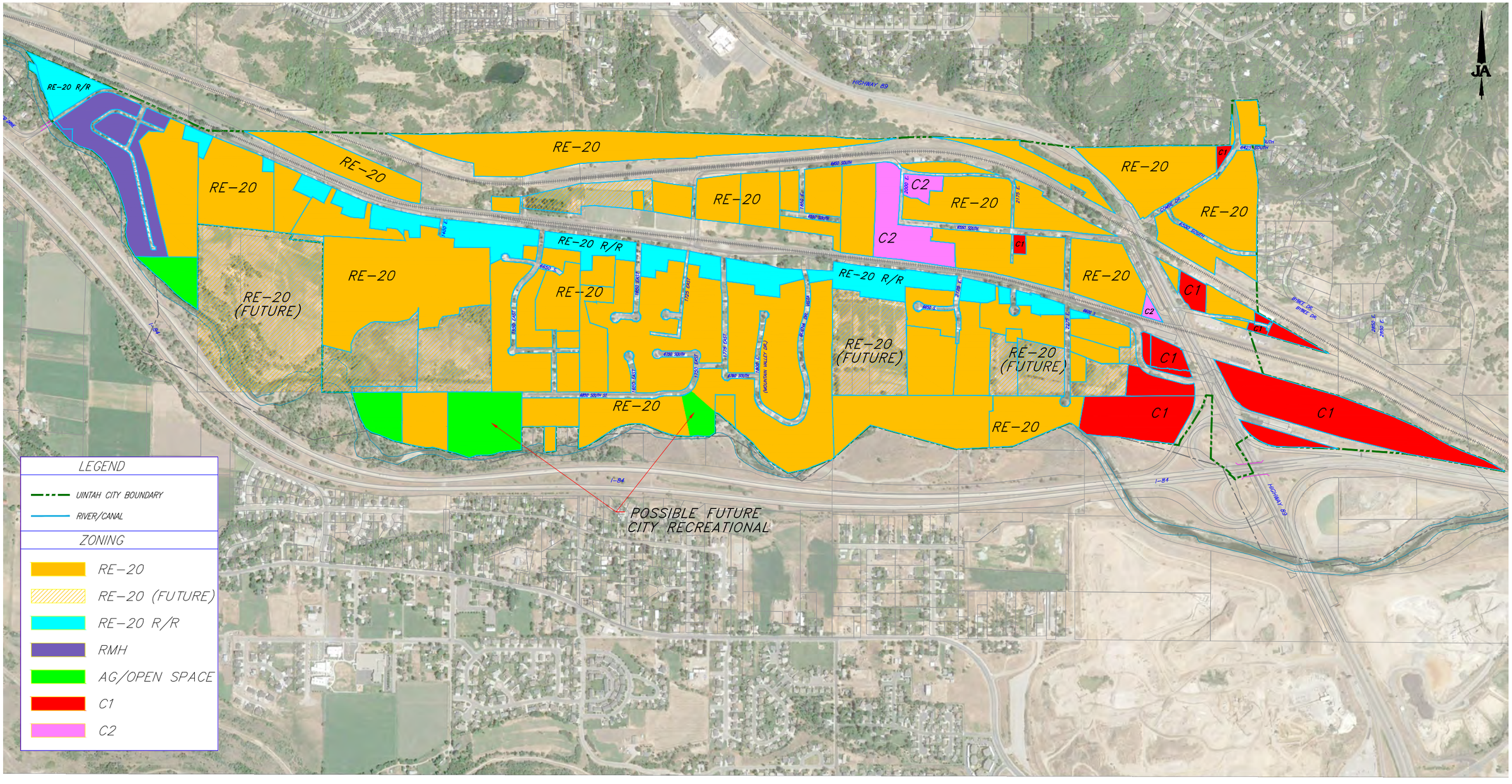
Section 9 Commentary – Moderate Income Housing

No Comments.

Section 10 Commentary – Emergency Services Plan

No Comments.

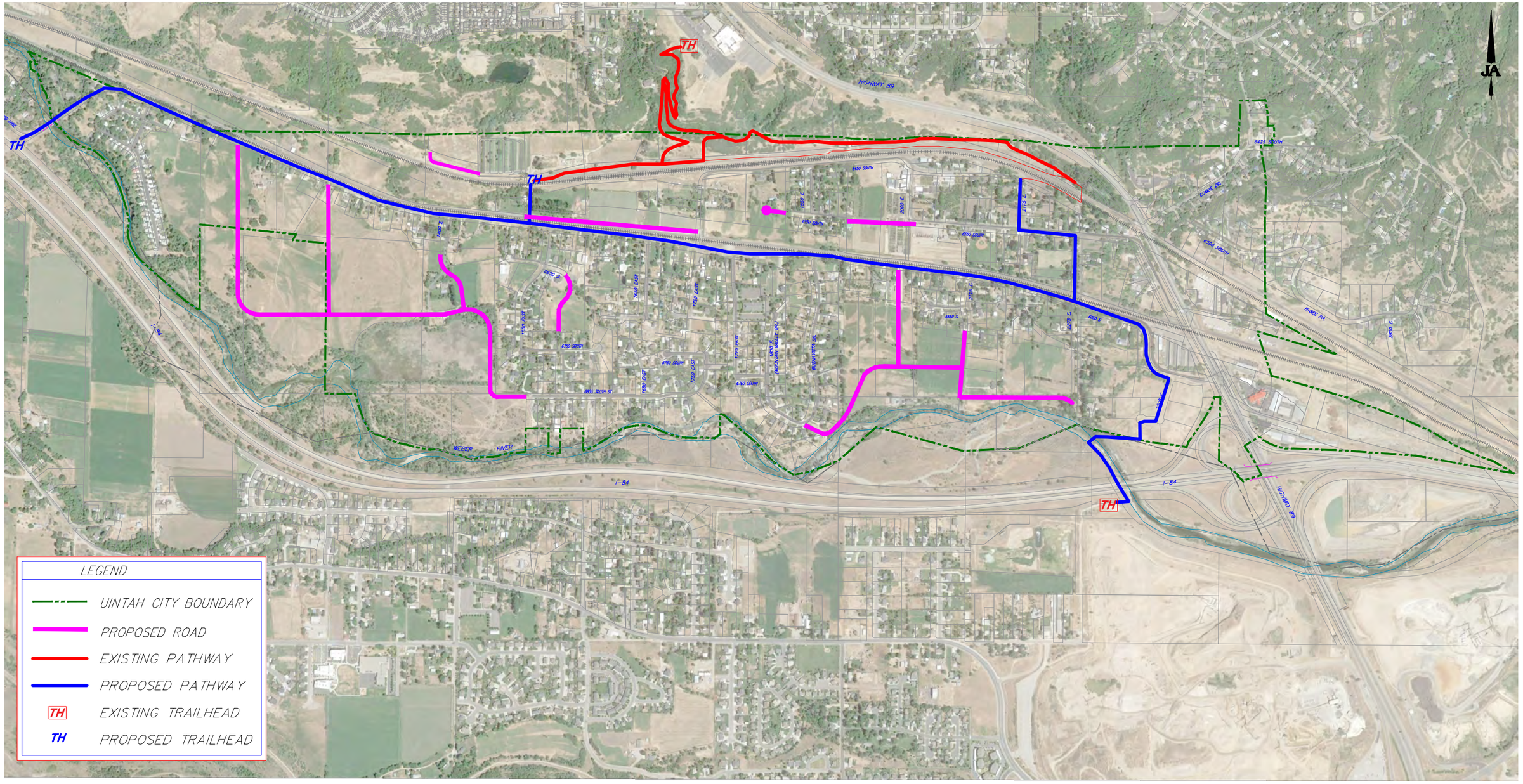
Official Maps



NOTE

MAP IS A DEPICTION OF PLANNED FUTURE LAND USE.
THE CURRENT ZONING MAP MAY BE OBTAINED FROM THE
CITY RECORDER IN ACCORDANCE WITH CITY ORDINANCES.

UINTAH CITY - LAND USE MAP (2017)



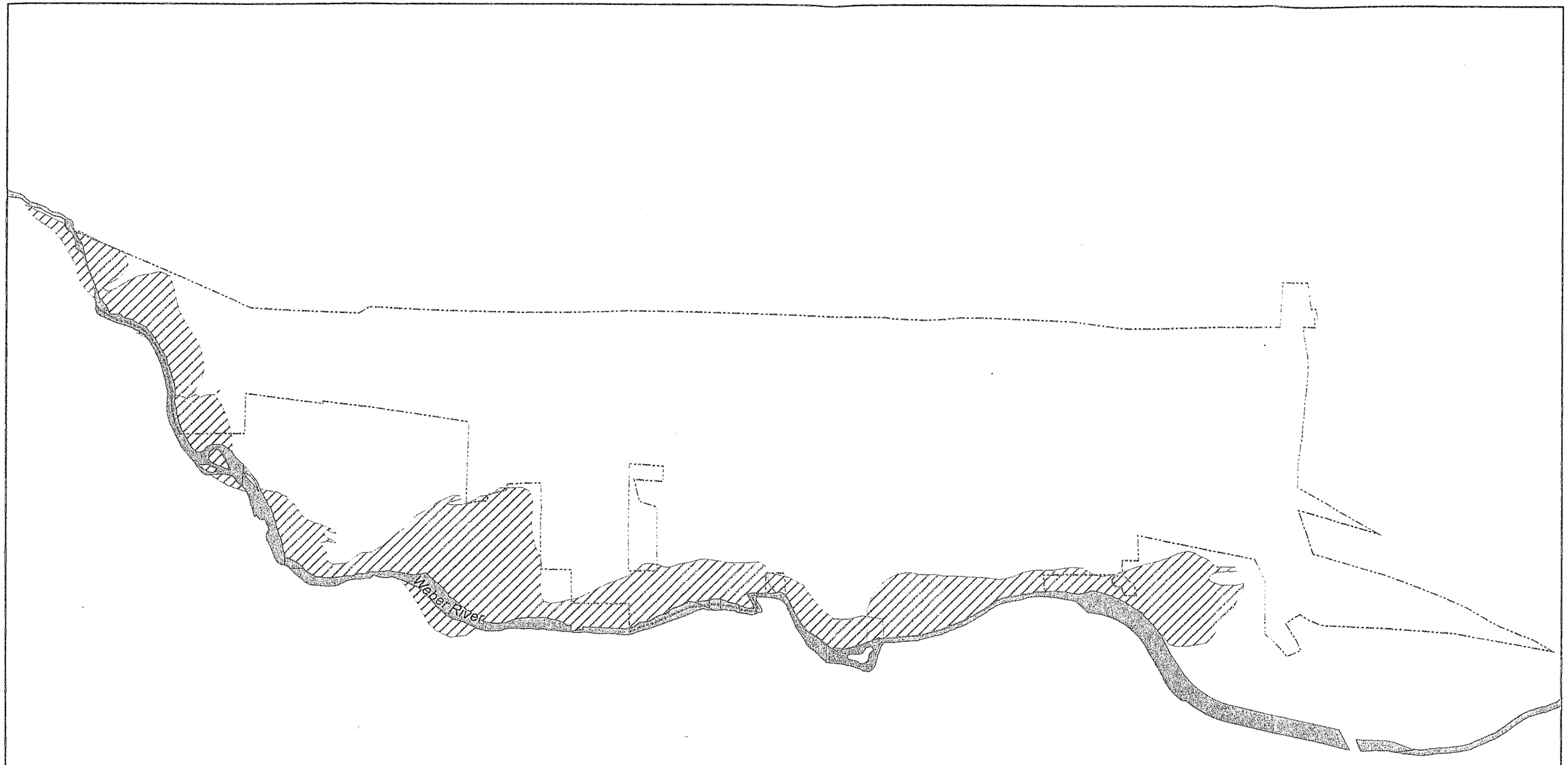
NOTES

1. FOR ADDITIONAL PATHWAYS AND TRAILHEADS BEYOND THE CITY BOUNDARIES SEE MAPPING BY WEBER PATHWAYS.

2. ALIGNMENT OF PROPOSED ROADS AND PATHWAYS IS CONCEPTUAL ONLY.

UINTAH CITY - TRANSPORTATION MAP (2017)

Map 6. Uintah City Floodplain Map



Uintah City Floodplain

1:13000

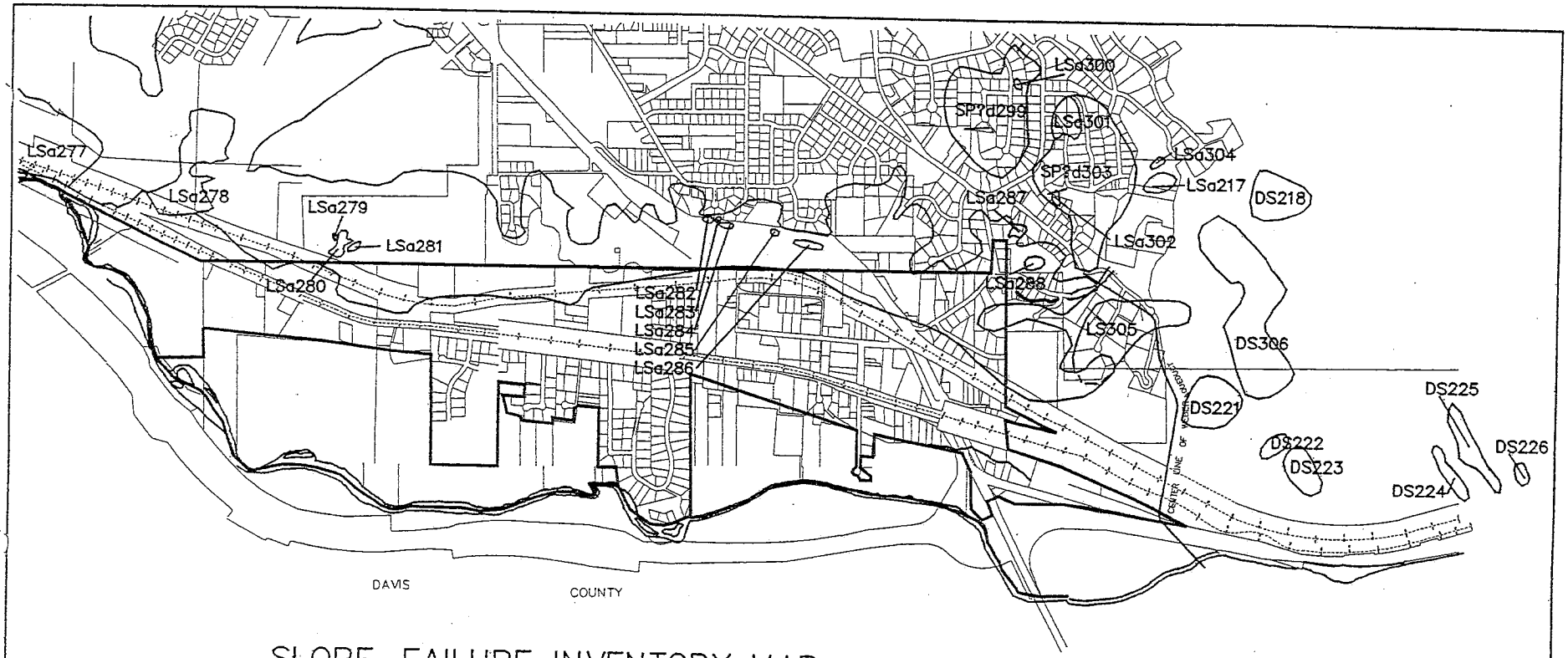
0 0.25 0.5 1 Mile

WSU 4/2005
AD

Legend

- Uintah City Limit
- Parcels
- Weber River
- Floodplain
- 100 Year
- 500 Year

Source: FEMA 1982 & Weber County GIS



SLOPE–FAILURE INVENTORY MAP

SLOPE FAILURES COMPILED FROM ORIGINAL MAPPING BY BRYANT, 1984, CHRISTENSON, 1985, CRITTENDEN AND SORENSEN, 1985, DAMES AND MOORE, 1980, 1984, 1985, GILL, 1981, 1982, KALISER, 1969, 1973, 1976, 1984, KAPPESSER, UNPUBLISHED, LOWE, UNPUBLISHED, LUND, 1980, MILLER, 1980, NELSON AND PERSONIUS, IN PREPARATION, OGDEN CITY AND WEBER COUNTY, 1985 OLSON, 1976, 1981, PASHLEY AND WIGGINS, 1972, SHRODER, 1971, UTAH DEPARTMENT OF TRANSPORTATION, 1972, AND WEBER COUNTY, 1981, BY MIKE LOWE, WEBER/DAVIS COUNTIES GEOLOGIST, 1988.

EXPLANATION:

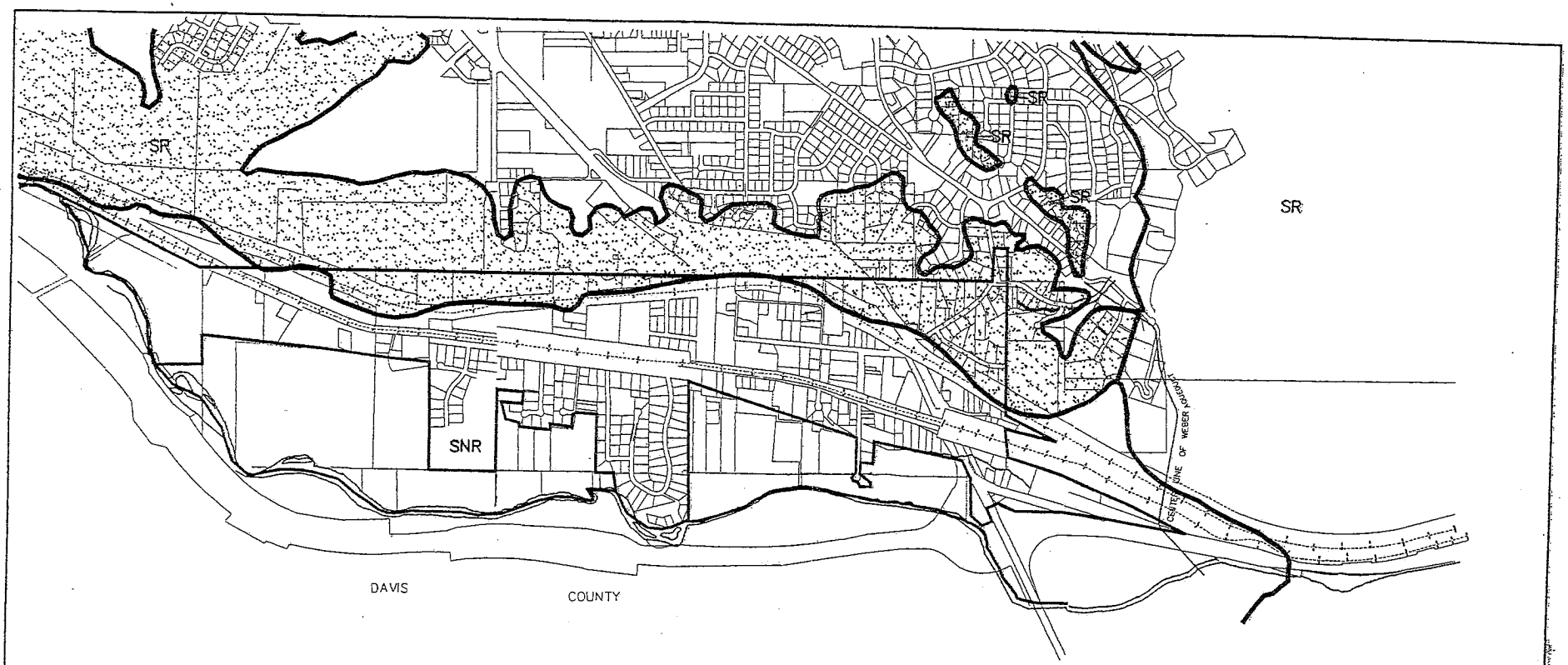
——— LANDSLIDE BOUNDARY
RS = ROCK SLIDE ROCKFALL AREA
DS = SHALLOW FAILURE, CHIEFLY DEBRIS SLIDES GRADING TO DEBRIS FLOW
DF = DEBRIS FLOW, GRADATIONAL WITH DEBRIS SLIDES
LS = DEEP FAILURE, CHIEFLY SLUMPS AND
CX = COMPLEX AREA OF MORE THAN ONE FAILURE
SP = LATERAL SPREAD
? = FAILURE MODE UNCERTAIN
a = ACTIVE (HISTORIC)
b = INACTIVE, YOUNG
c = INACTIVE, MATURE
d = INACTIVE, OLD
123 = INVENTORY NUMBER FOR SLOPE FAILURE

NORTH

GRAPHIC SCALE
850 0 425 850 1700
(IN FEET)
1 inch = 850 ft.

TOW... UINTAH 1995 (COURTESY OF WEBER COUNTY)

Image 1



LANDSLIDE HAZARD MAP

LANDSLIDE- HAZARD BOUNDARY COMPILED FROM SLOPE AND EXISTING LANDSLIDES BY MIKE LOWE, WEBER/DAVIS COUNTIES GEOLOGIST, 1988. FOR LOCATIONS OF HISTORIC AND PREHISTORIC LANDSLIDES SEE SLOPE-FAILURE INVENTORY MAPS.

EXPLANATION:

LANDSLIDE HAZARD BOUNDARY

SNR=AREA WHERE LANDSLIDE HAZARD SPECIAL STUDIES ARE NOT REQUIRED.

SR=AREA WHERE LANDSLIDE-HAZARD SPECIAL STUDIES ARE RECOMMENDED.

MOUNTAIN AREAS=SR

NORTH

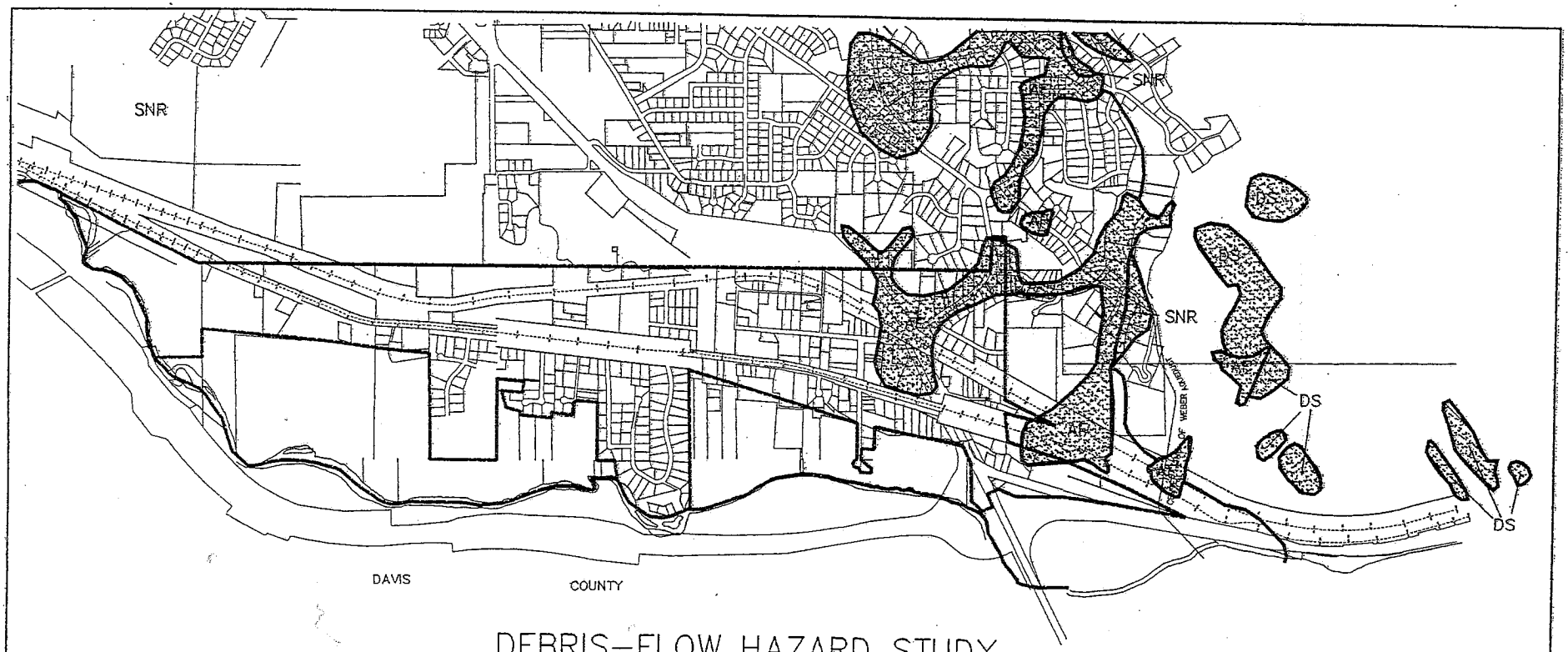
GRAPHIC SCALE

850 0 425 850 1700

(IN FEET)

1 inch = 850 ft.

Image 2



DEBRIS–FLOW HAZARD STUDY

ALLUVIAL FAN BOUNDARIES COMPILED FROM PRELIMINARY DRAFTS OF GEOLOGIC MAPPING BY A.R. NELSON AND S.F. PERSONIUS U.S. GEOLOGICAL SURVEY, BY MIKE LOWE, WEBER/DAVIS COUNTIES GEOLOGIST, 1988. SOURCE OF SLOPE–FAILURE MAPPING ARE IDENTIFIED ON SLOPE–FAILURE INVENTORY MAP EXPLANATION:

DEBRIS–FLOW HAZARD SPECIAL STUDY ZONE BOUNDARY.

BOUNDARY OF DEBRIS SLIDES, DEBRIS FLOW, AND YOUNG HOLOCENE (ACTIVE) ALLUVIAL FANS

SNR = AREA WHERE DEBRIS–FLOW SPECIAL STUDIES ARE NOT REQUIRED.

AF = YOUNGER HOLOCENE (ACTIVE) ALLUVIAL FANS

DF = DEBRIS FLOW

DS = BEBRIS SLIDE

A = ACTIVE (HISTORIC) SLOPE FAILURE

NORTH

GRAPHIC SCALE

850 0 425 850 1700

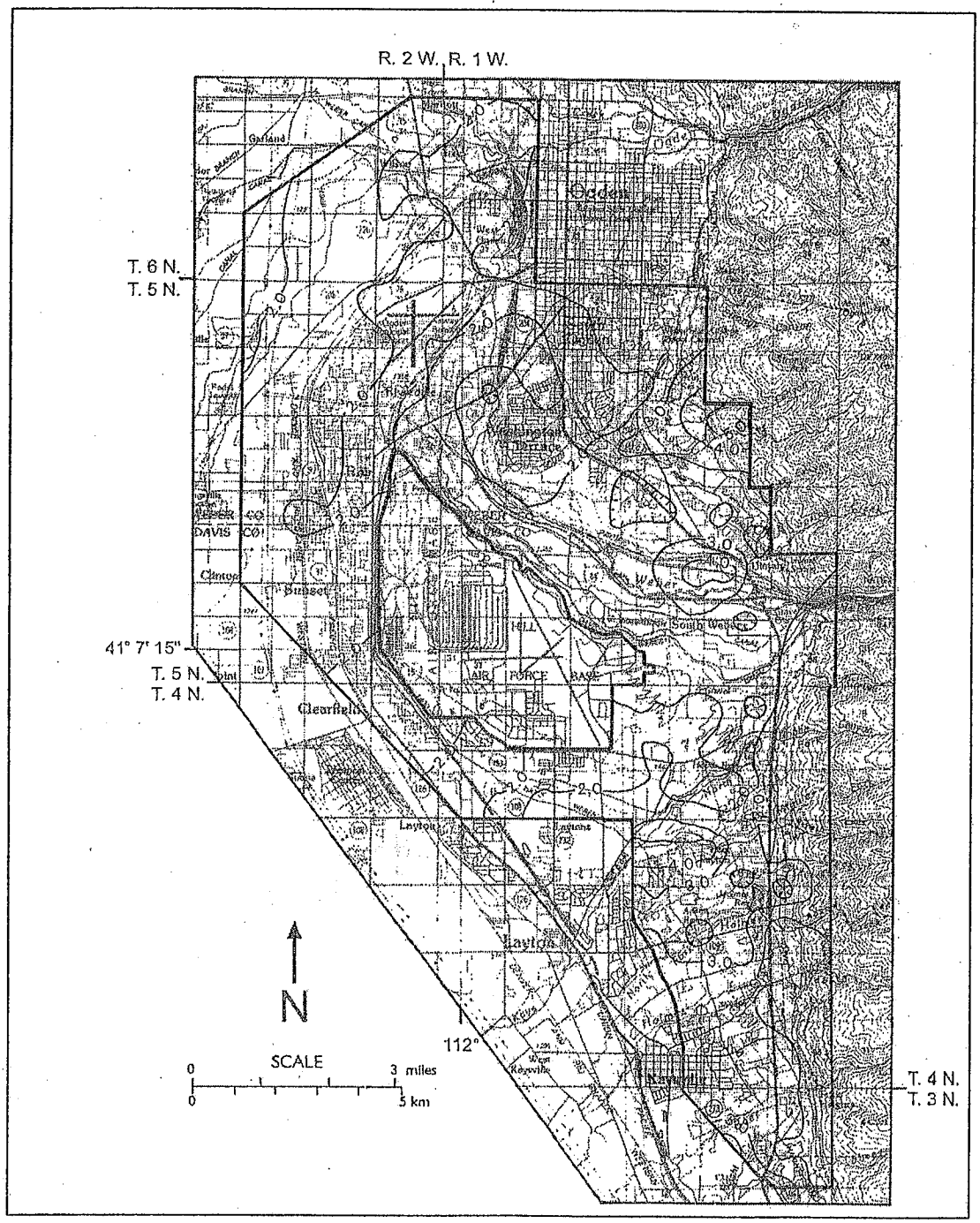
(IN FEET)

1 inch = 850 ft.

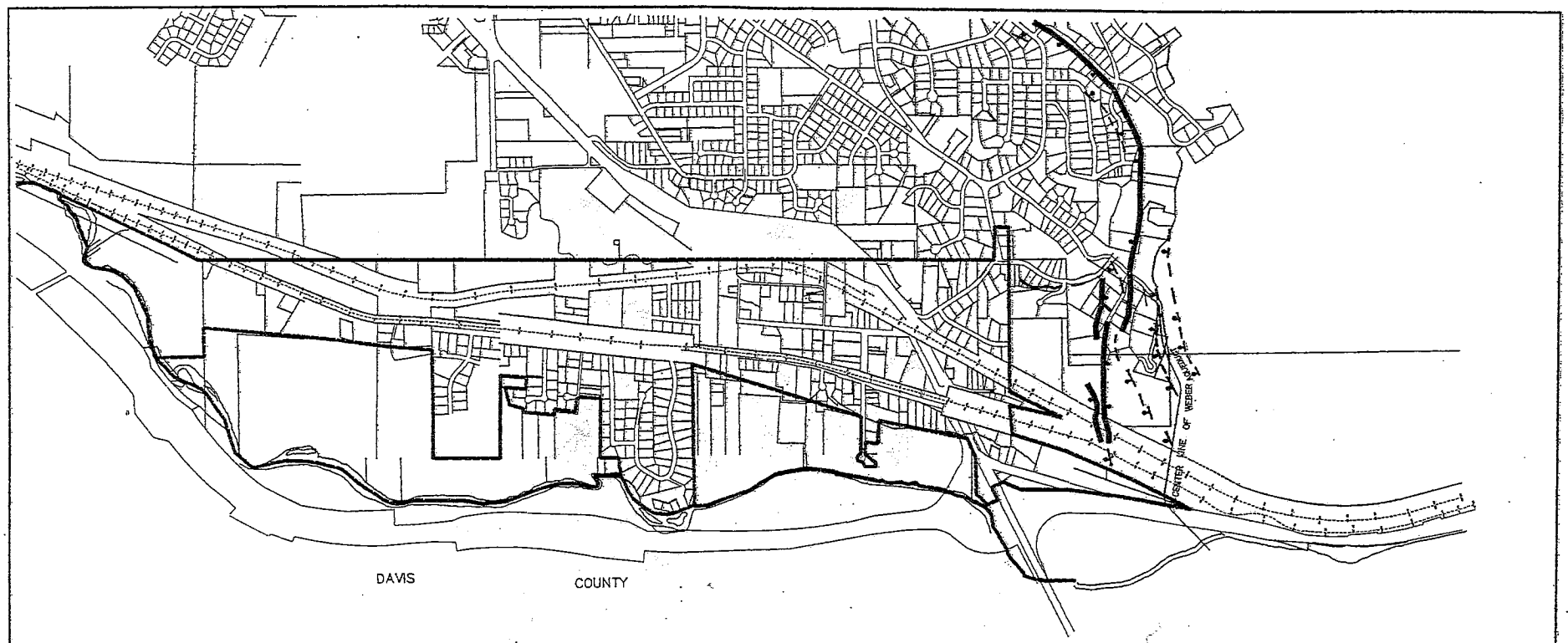
TOWN of UINTAH 1995 (COURTESY OF WEBER COUNTY)

Image 3

Image 6: **Radon Levels (shown in ppm)**



Black, B.D. and Solomon, B.J. 1996



FAULTS

POTENTIAL SURFACE– FAULT RUPTURE SENSITIVE AREA
LOCATION OF FAULTS COMPILED FROM PRELIMINARY DRAFTS OF SURFICAL GEOLOGIC MAPPING BY A.R. NELSON AND S.F. PERSONIUS, U.S. GEOLOGICAL SURVEY, BY MIKE LOWE WEBER/DAVIS COUNTIES GEOLOGIST, 1988.

EXPLANTION:

FAULT = BALL ON DOWNDROPPED SIDE

GRAPHIC SCALE

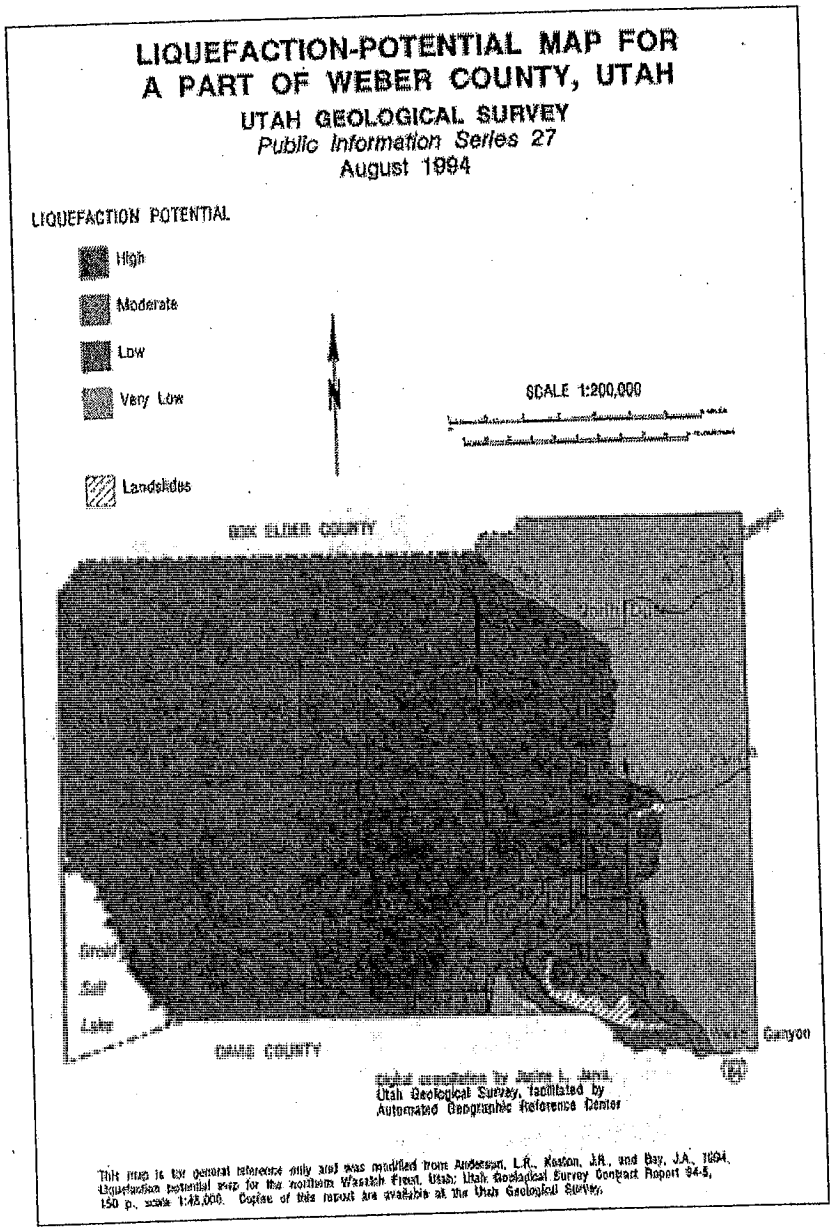
850 0 425 850 1700

(IN FEET)

1 inch = 850 ft.

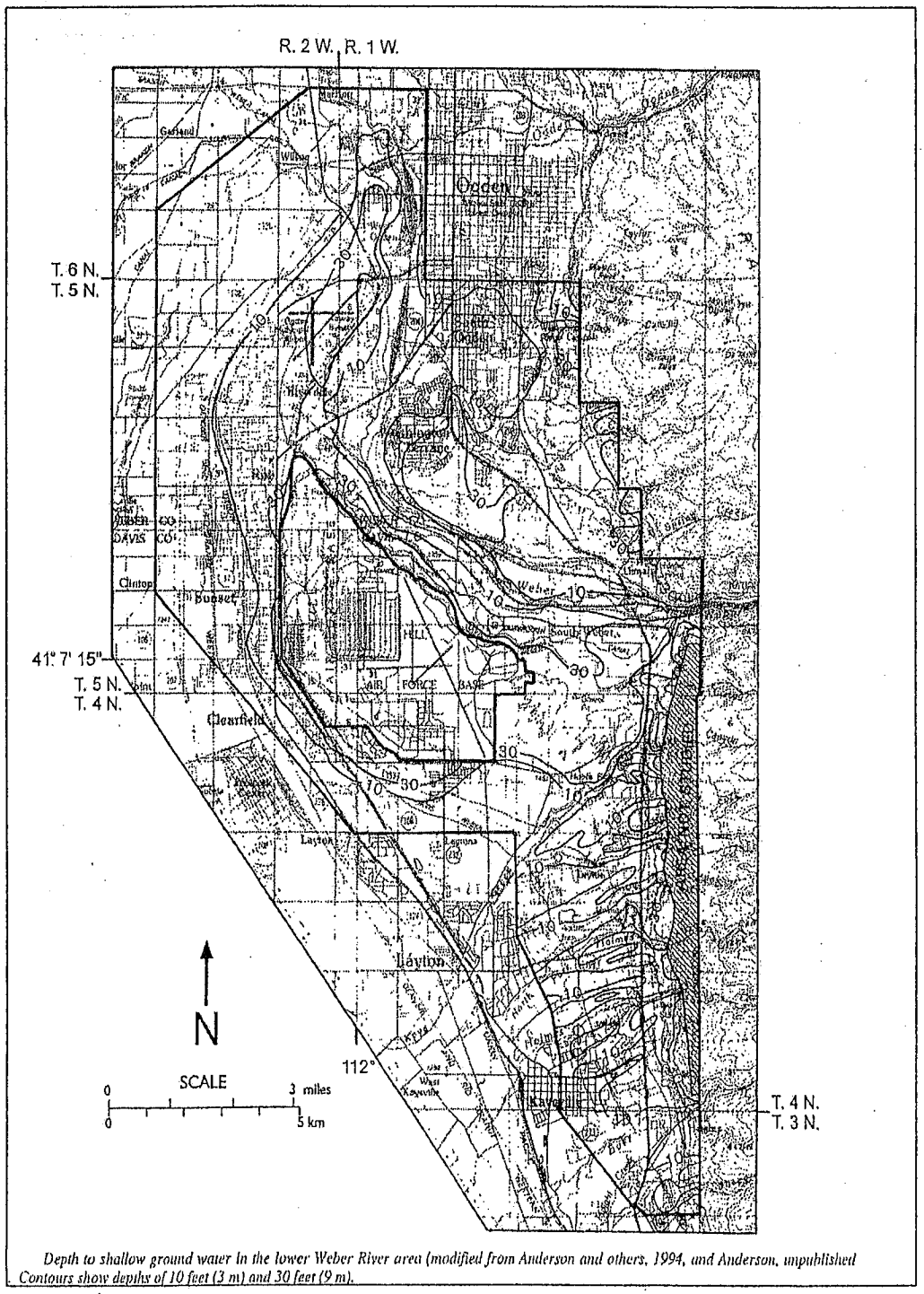
Image 7

Liquefaction Map



Anderson, L. R. and Keaton, J.R. 2004

Groundwater Level Map



Depth to shallow ground water in the lower Weber River area (modified from Anderson and others, 1994, and Anderson, unpublished Contours show depths of 10 feet (3 m) and 30 feet (9 m).

Black, B.D. and Solomon, B.J. 1996

State Certified Tally for Moderate Income

Tooele	Uintah City - City Wide Survey		% LMI	63.3%	Morgan
	Total	602		381	
	Household	Persons	Income	Category	LMI Persons
	1	1	100000	Non LMI	0
	2	1	33100	<80%	1
	3	1	41200	<80%	1
	4	1	15450	<30%	1
	5	1	15450	<30%	1
	6	1	15450	<30%	1
	7	1	15450	<30%	1
	8	1	15450	<30%	1
	9	1	15450	<30%	1
	10	1	15450	<30%	1
	11	1	15450	<30%	1
	12	1	5000	<30%	1
	13	1	17650	<50%	1
	14	1	17650	<50%	1
	15	1	24250	<50%	1
	16	1	20090	<50%	1
	17	1	25750	<50%	1
	18	1	20090	<50%	1
	19	1	20090	<50%	1
	20	1	25750	<50%	1
	21	1	20090	<50%	1
	22	1	17650	<50%	1
	23	1	20090	<50%	1
	24	1	40890	<80%	1
	25	1	29400	<80%	1
	26	1	40890	<80%	1
	27	1	32570	<80%	1
	28	1	36750	<80%	1
	29	1	32570	<80%	1
	30	1	98000	Non LMI	0
	31	1	68250	Non LMI	0
	32	1	72950	Non LMI	0
	33	1	82350	Non LMI	0
	34	1	51500	Non LMI	0
	35	2	15450	<30%	2
	36	2	140000	Non LMI	0
	37	2	25750	<50%	2
	38	2	39700	<80%	2
	39	2	54450	Non LMI	0
	40	2	54800	Non LMI	0
	41	2	63550	Non LMI	0
	42	2	51500	Non LMI	0
	43	2	51500	Non LMI	0
	44	2	48550	Non LMI	0
	45	2	17650	<30%	2
	46	2	17650	<30%	2
	47	2	15450	<30%	2
	48	2	24250	<50%	2
	49	2	20090	<50%	2

Certified Tally 63.3%
01/26/2016
Valid for 2016-2020 application cycles

50	2	25750	<50%	2
51	2	20090	<50%	2
52	2	25750	<50%	2
53	2	24250	<50%	2
54	2	28410	<50%	2
55	2	28410	<50%	2
56	2	29400	<50%	2
57	2	28410	<50%	2
58	2	29400	<50%	2
59	2	20090	<50%	2
60	2	24250	<50%	2
61	2	29400	<50%	2
62	2	29400	<50%	2
63	2	36730	<80%	2
64	2	32570	<80%	2
65	2	32570	<80%	2
66	2	40890	<80%	2
67	2	33100	<80%	2
68	2	32570	<80%	2
69	2	45600	<80%	2
70	2	36750	<80%	2
71	2	47050	<80%	2
72	2	36730	<80%	2
73	2	36750	<80%	2
74	2	40890	<80%	2
75	2	39700	<80%	2
76	2	40890	<80%	2
77	2	77650	Non LMI	0
78	2	130000	Non LMI	0
79	2	87050	Non LMI	0
80	2	68250	Non LMI	0
81	2	63550	Non LMI	0
82	2	63550	Non LMI	0
83	2	77650	Non LMI	0
84	2	68250	Non LMI	0
85	2	87050	Non LMI	0
86	2	54450	Non LMI	0
87	2	51500	Non LMI	0
88	2	48550	Non LMI	0
89	2	54800	Non LMI	0
90	2	48550	Non LMI	0
91	2	48550	Non LMI	0
92	2	82350	Non LMI	0
93	2	90000	Non LMI	0
94	2	51500	Non LMI	0
95	2	51500	Non LMI	0
96	2	150000	Non LMI	0
97	2	100000	Non LMI	0
98	2	54800	Non LMI	0
99	2	51500	Non LMI	0
100	2	175000	Non LMI	0
101	2	125000	Non LMI	0

102	2	63550	Non LMI	0
103	2	51500	Non LMI	0
104	2	87050	Non LMI	0
105	2	54800	Non LMI	0
106	2	87050	Non LMI	0
107	2	125000	Non LMI	0
108	2	82350	Non LMI	0
109	2	63550	Non LMI	0
110	3	20090	<30%	3
111	3	28410	<50%	3
112	3	24250	<50%	3
113	3	25750	<50%	3
114	3	32570	<50%	3
115	3	15450	<30%	3
116	3	87050	Non LMI	0
117	3	28410	<50%	3
118	3	28410	<50%	3
119	3	33100	<50%	3
120	3	32570	<50%	3
121	3	24250	<50%	3
122	3	25750	<50%	3
123	3	24250	<50%	3
124	3	42650	<80%	3
125	3	36750	<80%	3
126	3	36730	<80%	3
127	3	36730	<80%	3
128	3	41200	<80%	3
129	3	45300	<80%	3
130	3	51500	<80%	3
131	3	51500	<80%	3
132	3	42650	<80%	3
133	3	42650	<80%	3
134	3	52950	<80%	3
135	3	45600	<80%	3
136	3	87050	Non LMI	0
137	3	120000	Non LMI	0
138	3	100000	Non LMI	0
139	3	63550	Non LMI	0
140	3	68250	Non LMI	0
141	3	72950	Non LMI	0
142	3	77650	Non LMI	0
143	3	63550	Non LMI	0
144	4	15450	<30%	4
145	4	54800	<80%	4
146	4	54450	<80%	4
147	4	91000	Non LMI	0
148	4	88000	Non LMI	0
149	4	15450	<30%	4
150	4	29400	<50%	4
151	4	36750	<50%	4
152	4	33100	<50%	4
153	4	28410	<50%	4

154	4	54800	<80%	4
155	4	45300	<80%	4
156	4	54450	<80%	4
157	4	51500	<80%	4
158	4	42850	<80%	4
159	4	87050	Non LMI	0
160	4	87050	Non LMI	0
161	4	63550	Non LMI	0
162	4	72950	Non LMI	0
163	4	185000	Non LMI	0
164	5	20090	<30%	5
165	5	250000	Non LMI	0
166	5	40890	<80%	5
167	5	25750	<30%	5
168	5	24250	<30%	5
169	5	32570	<50%	5
170	5	48550	<80%	5
171	5	51500	<80%	5
172	5	63550	<80%	5
173	5	47050	<80%	5
174	5	87050	Non LMI	0
175	5	77650	Non LMI	0
176	5	102000	Non LMI	0
177	5	82350	Non LMI	0
178	5	87050	Non LMI	0
179	5	87050	Non LMI	0
180	5	89000	Non LMI	0
181	6	32570	<30%	6
182	6	68250	<80%	6
183	6	63550	<80%	6
184	6	120000	Non LMI	0
185	6	25750	<30%	6
186	6	36750	<50%	6
187	6	39700	<50%	6
188	6	47050	<80%	6
189	6	63550	<80%	6
190	6	63550	<80%	6
191	6	116000	Non LMI	0
192	6	105000	Non LMI	0
193	6	72950	Non LMI	0
194	7	63550	<80%	7
195	7	54450	<80%	7
196	7	72950	<80%	7
197	3	36750	<80%	3
198	3	42650	<80%	3
199	3	32570	<50%	3
200	3	48550	<80%	3
201	2	45600	<80%	2
202	2	42650	<80%	2
203	4	63550	Non LMI	0
204	4	87050	Non LMI	0
205	4	63550	Non LMI	0

206	4	52950	<80%	4
207	4	33100	<50%	4
208	4	51500	<80%	4
209	4	51500	<80%	4
210	4	36750	<50%	4
211	4	87050	Non LMI	0
212			<30%	0
213			<30%	0
214			<30%	0
215			<30%	0
216			<30%	0
217			<30%	0
218			<30%	0
219			<30%	0
220			<30%	0
221			<30%	0
222			<30%	0
223			<30%	0
224			<30%	0
225			<30%	0
226			<30%	0
227			<30%	0
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229			<30%	0
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231			<30%	0
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236			<30%	0
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238			<30%	0
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242			<30%	0
243			<30%	0
244			<30%	0
245			<30%	0
246			<30%	0
247			<30%	0
248			<30%	0
249			<30%	0
250			<30%	0
251			<30%	0
252			<30%	0
253			<30%	0
254			<30%	0
255			<30%	0
256			<30%	0
257			<30%	0

US Census Data

2010 US Census Data Summary

Subject	Number	Percent
SEX AND AGE		
Total population	1,322	100
Under 5 years	92	7
5 to 9 years	130	9.8
10 to 14 years	117	8.9
15 to 19 years	104	7.9
20 to 24 years	80	6.1
25 to 29 years	59	4.5
30 to 34 years	88	6.7
35 to 39 years	70	5.3
40 to 44 years	98	7.4
45 to 49 years	100	7.6
50 to 54 years	93	7
55 to 59 years	67	5.1
60 to 64 years	75	5.7
65 to 69 years	40	3
70 to 74 years	44	3.3
75 to 79 years	17	1.3
80 to 84 years	26	2
85 years and over	22	1.7
Median age (years)	34.3	(X)
16 years and over	953	72.1
18 years and over	907	68.6
21 years and over	858	64.9
62 years and over	194	14.7
65 years and over	149	11.3

2010 US Census Data Summary

Subject	Number	Percent
Male population	**658**	**49.8**
Under 5 years	46	3.5
5 to 9 years	65	4.9
10 to 14 years	59	4.5
15 to 19 years	47	3.6
20 to 24 years	44	3.3
25 to 29 years	30	2.3
30 to 34 years	46	3.5
35 to 39 years	35	2.6
40 to 44 years	42	3.2
45 to 49 years	58	4.4
50 to 54 years	47	3.6
55 to 59 years	33	2.5
60 to 64 years	32	2.4
65 to 69 years	22	1.7
70 to 74 years	24	1.8
75 to 79 years	4	0.3
80 to 84 years	12	0.9
85 years and over	12	0.9
Median age (years)	33.8	(X)
16 years and over	477	36.1
18 years and over	453	34.3
21 years and over	431	32.6
62 years and over	94	7.1
65 years and over	74	5.6

2010 US Census Data Summary

Subject	Number	Percent
Female population	**664**	**50.2**
Under 5 years	46	3.5
5 to 9 years	65	4.9
10 to 14 years	58	4.4
15 to 19 years	57	4.3
20 to 24 years	36	2.7
25 to 29 years	29	2.2
30 to 34 years	42	3.2
35 to 39 years	35	2.6
40 to 44 years	56	4.2
45 to 49 years	42	3.2
50 to 54 years	46	3.5
55 to 59 years	34	2.6
60 to 64 years	43	3.3
65 to 69 years	18	1.4
70 to 74 years	20	1.5
75 to 79 years	13	1
80 to 84 years	14	1.1
85 years and over	10	0.8
Median age (years)	34.8	(X)
16 years and over	476	36
18 years and over	454	34.3
21 years and over	427	32.3
62 years and over	100	7.6
65 years and over	75	5.7

2010 US Census Data Summary

Subject	Number	Percent
RACE		
Total population	1,322	100
One Race	1,311	99.2
White	1,289	97.5
Black or African American	3	0.2
American Indian and Alaska Native	4	0.3
Asian	10	0.8
Asian Indian	3	0.2
Chinese	0	0
Filipino	0	0
Japanese	6	0.5
Korean	0	0
Vietnamese	0	0
Other Asian [1]	1	0.1
Native Hawaiian and Other Pacific Islander	1	0.1
Native Hawaiian	1	0.1
Guamanian or Chamorro	0	0
Samoan	0	0
Other Pacific Islander [2]	0	0
Some Other Race	4	0.3
Two or More Races	11	0.8
White; American Indian and Alaska Native [3]	3	0.2
White; Asian [3]	6	0.5
White; Black or African American [3]	2	0.2
White; Some Other Race [3]	0	0
Race alone or in combination with one or more other races: [4]		
White	1,300	98.3
Black or African American	5	0.4
American Indian and Alaska Native	7	0.5
Asian	16	1.2
Native Hawaiian and Other Pacific Islander	1	0.1
Some Other Race	4	0.3
HISPANIC OR LATINO		
Total population	1,322	100
Hispanic or Latino (of any race)	40	3
Mexican	24	1.8
Puerto Rican	1	0.1
Cuban	6	0.5
Other Hispanic or Latino [5]	9	0.7
Not Hispanic or Latino	1,282	97

2010 US Census Data Summary

Subject	Number	Percent
HISPANIC OR LATINO AND RACE		
Total population	1,322	100
Hispanic or Latino	40	3
White alone	34	2.6
Black or African American alone	1	0.1
American Indian and Alaska Native alone	1	0.1
Asian alone	0	0
Native Hawaiian and Other Pacific Islander alone	0	0
Some Other Race alone	4	0.3
Two or More Races	0	0
Not Hispanic or Latino	1,282	97
White alone	1,255	94.9
Black or African American alone	2	0.2
American Indian and Alaska Native alone	3	0.2
Asian alone	10	0.8
Native Hawaiian and Other Pacific Islander alone	1	0.1
Some Other Race alone	0	0
Two or More Races	11	0.8

2010 US Census Data Summary

Subject	Number	Percent
RELATIONSHIP		
Total population	1,322	100
In households	1,322	100
Householder	417	31.5
Spouse [6]	300	22.7
Child	493	37.3
Own child under 18 years	368	27.8
Other relatives	80	6.1
Under 18 years	43	3.3
65 years and over	9	0.7
Nonrelatives	32	2.4
Under 18 years	4	0.3
65 years and over	3	0.2
Unmarried partner	17	1.3
In group quarters	0	0
Institutionalized population	0	0
Male	0	0
Female	0	0
Noninstitutionalized population	0	0
Male	0	0
Female	0	0
HOUSEHOLDS BY TYPE		
Total households	417	100
Family households (families) [7]	346	83
With own children under 18 years	155	37.2
Husband-wife family	300	71.9
With own children under 18 years	134	32.1
Male householder, no wife present	18	4.3
With own children under 18 years	7	1.7
Female householder, no husband present	28	6.7
With own children under 18 years	14	3.4
Nonfamily households [7]	71	17
Householder living alone	58	13.9
Male	27	6.5
65 years and over	7	1.7
Female	31	7.4
65 years and over	20	4.8
Households with individuals under 18 years	178	42.7
Households with individuals 65 years and over	104	24.9

2010 US Census Data Summary

Subject	Number	Percent
Average household size	3.17	(X)
Average family size [7]	3.52	(X)
HOUSING OCCUPANCY		
Total housing units	432	100
Occupied housing units	417	96.5
Vacant housing units	15	3.5
For rent	2	0.5
Rented, not occupied	0	0
For sale only	6	1.4
Sold, not occupied	1	0.2
For seasonal, recreational, or occasional use	2	0.5
All other vacants	4	0.9
Homeowner vacancy rate (percent) [8]	1.6	(X)
Rental vacancy rate (percent) [9]	4	(X)
HOUSING TENURE		
Occupied housing units	417	100
Owner-occupied housing units	369	88.5
Population in owner-occupied housing units	1,154	(X)
Average household size of owner-occupied units	3.13	(X)
Renter-occupied housing units	48	11.5
Population in renter-occupied housing units	168	(X)
Average household size of renter-occupied units	3.5	(X)
Subject	Number	Percent

Sanitary Sewer Feasibility Study

Sewer

TOWN OF UINTAH CORPORATION

SANITARY SEWER FEASIBILITY STUDY

CONTRACT DOCUMENTS,
SPECIFICATIONS, AND DRAWINGS

July 1999

JA JONES & ASSOCIATES
CONSULTING ENGINEERS
4768 South Harrison Boulevard
Ogden, Utah 84403
Phone (801) 476-9767
Fax (801) 476-9768

SANITARY SEWER FEASIBILITY STUDY

for

TOWN OF UINTAH CORPORATION

July 1999

prepared by

JONES AND ASSOCIATES
Consulting Engineers

4768 South Harrison Boulevard
Ogden, Utah 84403

476-9767

TABLE OF CONTENTS

SANITARY SEWER FEASIBILITY STUDY

for

TOWN OF UINTAH CORPORATION

SECTION 1

BACKGROUND

Introduction

With the exception of the trailer park on the west side of town residents within the Town of Uintah currently maintain septic tanks to meet their sewage needs. The Town wishes to incorporate a sanitary sewer system in its general plan. This sewer system would be more convenient for residents to maintain than individual septic tanks. This report will provide background information, cover relevant state design requirements, detail a proposed sewer system, estimate the cost to construct it, list financing options, and then conclude with recommendations.

Purpose of the Report

There are several purposes for this report. A pre-determined elevation for all sewer mains is needed as development progresses so that pipes will properly connect as constructed. Currently the Town requires new development to provide a dry sewer line in addition to a septic tank system. This dry sewer line would then be connected at the time that the Town incorporated a sewer service system for all of its residents. It is critical that every dry sewer line be set at the proper elevation determined by the Town's master sewer plan. This information would be needed before any new construction commenced on new homes and Town roads.

Another purpose of this report is to help determine an alignment for the sewer mains. All public utilities such as a sewer system should be located within the public right-of-way. Town standards show the location for sewer lines to be ten feet off of the center line of public roads. It would be most convenient and economical to locate a major portion of the outfall line in areas of new construction. It is also convenient and cost effective to locate the outfall sewer line along a low elevation that runs the length of town. This is helpful because all sub-main lines that contribute to the outfall line will need to drain to it. This will minimize the depth of excavation for sub-mains which helps reduce the cost of construction.

Also, there is a need to evaluate the cost and financial options available to construct such a project. These cost estimates and financial options are discussed in Section 4 and Section 5 of

this report.

Railroad Right of Way

Because the railroad owns major sections of property through the center of town many public roads are on or cross railroad right-of-way. It would be very difficult to serve the homes within the Town that are along these roads without encroaching on railroad right-of-way. In order to provide service for the entire town it will be necessary to cross under the railroad tracks in a number of places.

The cost of using the railroad right of way for utilities is also a concern. It may prove economically infeasible to provide a sewer main in the street of many homes that front railroad property. This issue will need further investigation as construction becomes eminent.

Participation From Central Weber Sewer Improvement District (CWSID)

Central Weber Sewer Improvement District has expressed interest in providing treatment services for the Town of Uintah. The District currently services the trailer park on the west end of town. The service line in this area is sized and located at an elevation sufficient to service the entire Town of Uintah. The facilities at the CWSID plant are also adequate to process or treat the sewage that will be produced by the Town. However, monthly treatment costs and annexation issues will need to be resolved by the Town as well as annual taxes and one-time impact fees.

Additionally, the District (CWSID) currently is considering requests from other communities, such as Uintah Highlands Improvement District and Mountain Green, that have expressed interest in their services. For this reason, it would be beneficial to coordinate construction with the District so as to provide a link from these communities to the Central Weber Sewer System through the Town of Uintah. The Town would then have the option of turning over the maintenance or upkeep of their outfall line to the Central Weber Improvement District which could provide a long term savings in maintenance. A condition of this ownership transferal is the up-size of the trunk line to 12" in diameter to service the future upstream communities. The increase in pipe size would be paid for by the District but coordinated by the Town during construction.

SECTION 2

DESIGN PARAMETERS

Population

There are approximately 365 homes and businesses within the corporate limits of the Town of Uintah with a population of 948 as of 1997. This gives a population density of 2.6 persons per residence. It is anticipated that the Town will grow out to a maximum of 800 homes and businesses. Assuming a maximum density of 3.5 persons per residence the future population would be 2,800 at "build-out". The ultimate tributary population (2,800) is the population considered in the design of a sewer system. This future population will determine the size of sewer collector lines within the system.

Central Weber Sewer Improvement District Facilities

Central Weber Sewer Improvement District (CWSID) currently serves surrounding areas as well as the northwest corner of the Town of Uintah. The District has in place a 21" sewer main at this location. The depth and size of this sewer main is sufficient to service the entire Town of Uintah. Additionally, Central Weber Sewer Improvement District has facilities adequate to support the Towns sewage needs. These favorable conditions put the Town in a position to join the District. What is needed, then, is the infrastructure within the Town to transmit sewage to the District's sewer main. The budgetary cost of such an outfall project is discussed in Section 4 of this report.

State Design Requirements

Before any new sewer project can be constructed an applicant must submit an engineering report that details the design and construction of the system to the Executive Secretary. When approved, a construction permit is issued. This report is not intended to fulfill that purpose. However, this report will provide the Town with information needed to make educated decisions as to the economic feasibility of providing such a system and the impact of constructing it.

Sewer design can be separated into two parts -- collection and treatment. Because Central Weber Sewer Improvement District will process or treat the sewage from the Town of Uintah, only the collection requirements (pipe sizing and location) are considered as part of this report.

The sizing of pipe required by the state is determined by the ultimate tributary population (population at "build-out"). The State also requires that the size of any sewer collector or outfall be 8" in diameter or greater for a gravity system. Collector sewer lines are designed to carry 400 gallons per capita per day, while outfall sewer lines are designed to carry 250 gallons per capita per day. All pipes are sloped so as to maintain a velocity of 2 feet per second when flowing full based on Manning's formula and using a roughness coefficient (n) of 0.013.

Manholes are also an important part of the sewer system. The distance between manholes cannot exceed 400 feet for sewer lines 15" and smaller. Additionally a manhole is required at all intersections and every change in grade, alignment, and pipe size. Two sizes are typically used for manholes. Four-foot diameter manholes are standard for most applications. Wherever three or more sewer lines come together a five-foot manhole is required.

SECTION 3

PROPOSED SYSTEM

Sanitary Sewer Outfall Location

The best location of the outfall line is determined by the topography of the Town. With steeper grades to the north and the Weber River to the south the favorable location would be just above the limits of the flood plain of the Weber River on the south. This location also works well with future road planning and development. Locating the outfall line to the south would be the most economical because it would not require excessive excavation depths to maintain the flow line of the gravity outfall line. A preliminary alignment of the proposed sanitary sewer system is shown graphically on Figure 3-A.

The geography of the Town and the location of the railroad tracks create isolated pockets of homes that will need to be serviced. To service these homes the sewer lines will need to cross the railroad tracks in at least six places. Also, because the corporate limits of the Town extend beyond Highway 89 the sewer will need to cross the highway in order to service the homes on the east side. One highway crossing is planned.

Pipe Sizes

To meet design requirements within the State of Utah an outfall sewer line must carry 250 gallons per capita per day. With a future population estimation of 2,800 people and assuming a slope of 0.4% the outfall line would need to be 10" in diameter at the CWSID connection. This pipe diameter would continue east until a point at approximately 1500 East. The remaining outfall line as well as all sub-mains that contribute to the outfall line would need to be the State minimum pipe size of 8" in diameter. Each sub-main that contributes to the outfall line must be sized to carry 400 gallons per capita per day. The design flow rates are shown for all major pipes in million gallons per day (MGD) on Figure 3-B.

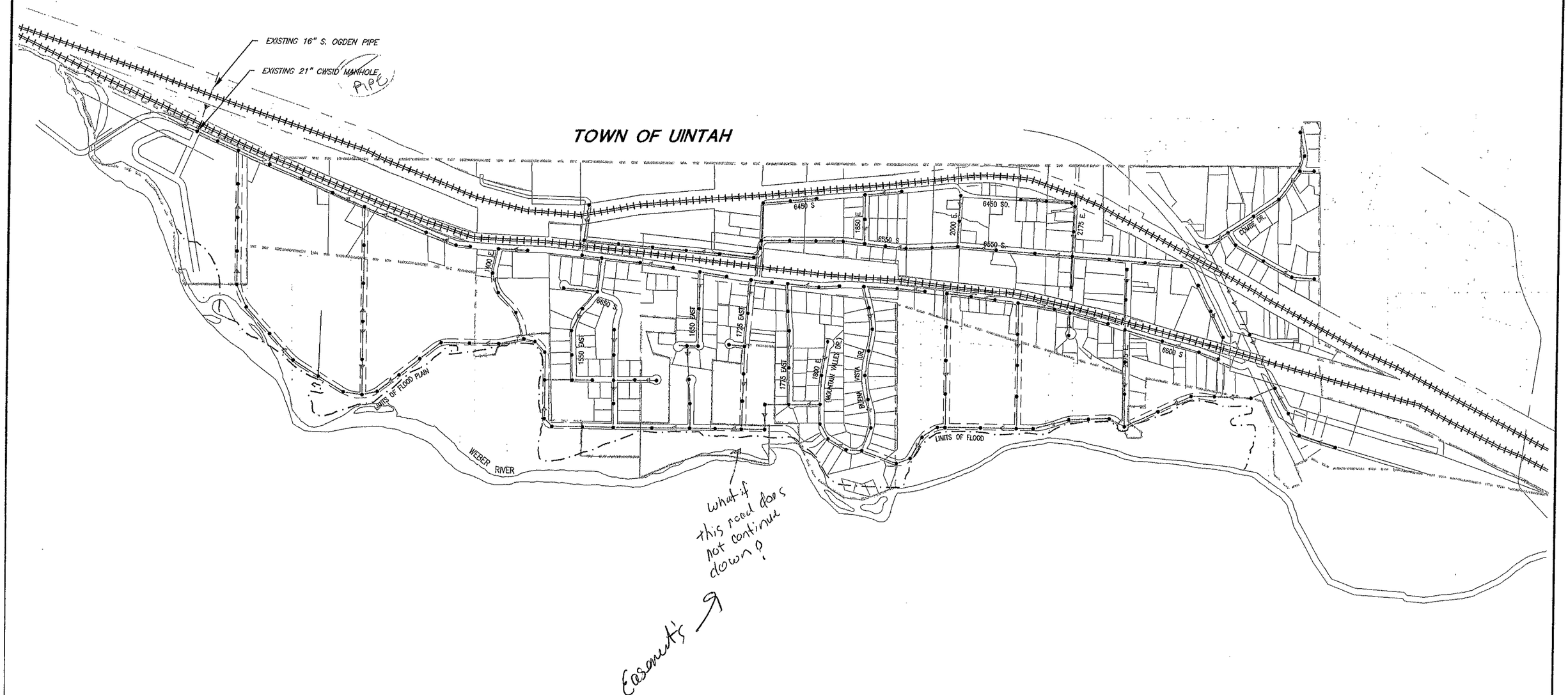
Quantities

The following table summarizes the quantities associated with the construction of the proposed sanitary sewer system as required by the Town of Uintah.

TABLE 3-A: *SANITARY SEWER QUANTITIES*			
Item	**Description**	**Quantity**	**Unit**
1	10" PVC SDR-35 sewer pipe	6,022	lf.
2	8" PVC SDR-35 sewer pipe	52,083	lf.
3	4" lateral to homes (120' per home, 365 homes)	43,800	lf.
4	5-foot manhole	29	ea.
5	4-foot manhole	199	ea.

LEGEND

CITY LIMITS
RAILROAD RIGHT OF WAY
SEWER LINE
LIMITS OF FLOOD PLAIN
MANHOLE



PROJECT ENGINEER	REV.	DATE	APPR.	SCALE: 1"=1000'	DESIGNED	JA JONES & ASSOCIATES CONSULTING ENGINEERS 4768 South Harrison Boulevard Ogden, Utah 84403 (801) 476-9767	TOWN OF UINTAH
DATE					DRAWN		SANITARY SEWER FEASIBILITY STUDY
					CHECKED		PROPOSED SANITARY SEWER SYSTEM

SHEET: FIG. 3-A OF 1 SHEETS
D

LEGEND

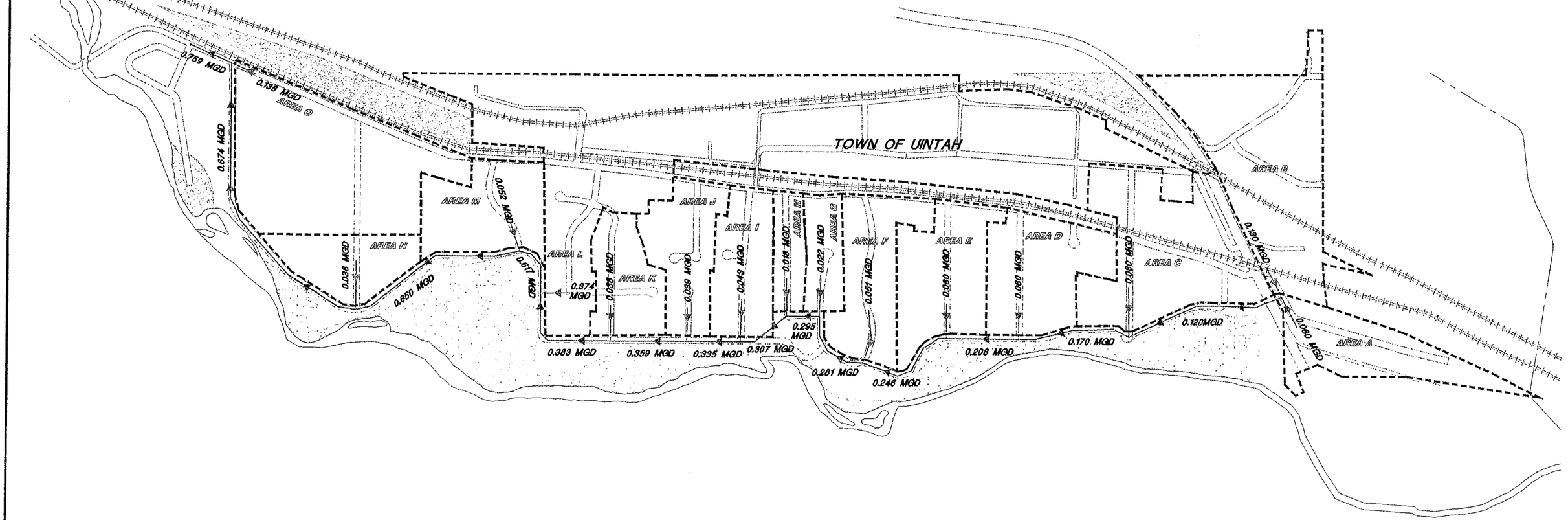
- SERVICE AREA BOUNDARY LINE
- SEWER OUTFALL LINE
- SEWER SUB-MAIN
- UNBUILDABLE
- FLOOD ZONE/PARK

SUB-MAIN FLOW SUMMARY TABLE (400 GPD PER CAPITA)

AREA	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
EX. ERU'S	22	93	36	9	3	34	15	13	13	18	3	100	3	0	12
EX. FLOW (MGD)	0.030	0.130	0.050	0.012	0.004	0.048	.022	0.018	0.018	0.025	0.004	0.140	0.004	0.000	0.017
FUT. ERU'S	21	0	21	34	40	2	0	0	18	10	24	167	34	27	85
FUT. FLOW (MGD)	0.030	0	0.030	0.048	0.056	0.003	0	0	0.025	0.014	0.034	0.234	0.048	0.038	0.119
TOTAL FLOW (MGD)	0.060	0.130	0.080	0.060	0.060	0.051	0.022	0.018	0.043	0.039	0.038	0.374	0.052	0.038	0.136

SEWER OUTFALL FLOW SUMMARY TABLE (250 GPD PER CAPITA)

FLOW (MGD)	0.038	0.082	0.050	0.038	0.038	0.035	0.014	0.012	0.027	0.025	0.024	0.234	0.033	0.024	0.085
CUM. FLOW (MGD)	0.038	0.120	0.170	0.208	0.246	0.281	0.295	0.307	0.335	0.359	0.383	0.617	0.650	0.674	0.759



PROJECT ENGINEER

DATE

REV.	DATE	APPR.	

SCALE: 1"=1000'

DESIGNED

DRAWN

CHECKED

JA JONES & ASSOCIATES

CONSULTING ENGINEERS

4768 South Harrison Boulevard
Ogden, Utah 84403 (801) 476-9767

TOWN OF UINTAH

SANITARY SEWER FEASIBILITY STUDY

ESTIMATED SANITARY SEWER FLOW RATES

SHEET: FIG. 3-B OF 1 SHEETS

0

LEGEND

CITY LIMITS

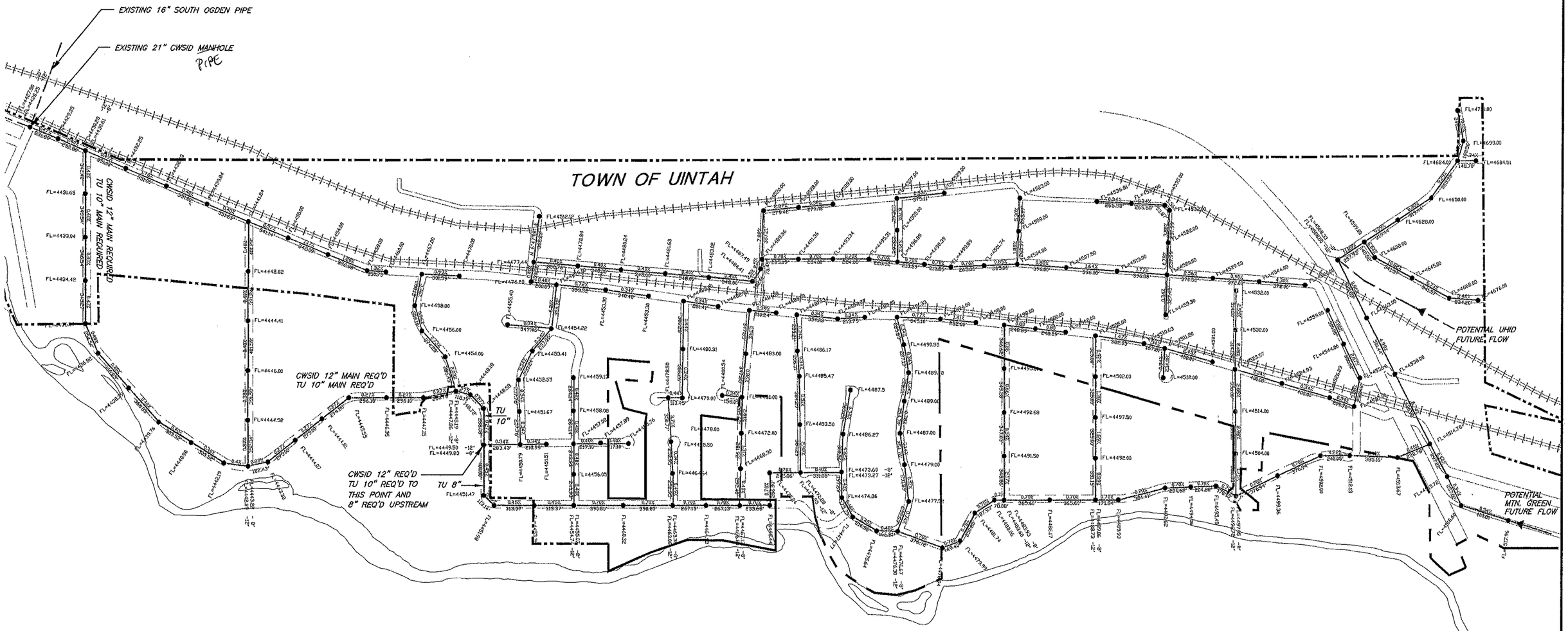
8" SEWER LINE

12" SEWER LINE

MANHOLE

NOTES:

1. ELEVATIONS SHOWN ARE FOR FLOW LINE OF MANHOLES.
2. NO DROP ACROSS MANHOLES HAS BEEN CALCULATED



PROJECT ENGINEER

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REV.	DATE	APPR.

SCALE: NTS

DESIGNED

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CHECKED

JA JONES & ASSOCIATES

CONSULTING ENGINEERS

4768 South Harrison Boulevard
Ogden, Utah 84403 (801) 476-9767

TOWN OF UINTAH

SANITARY SEWER FEASIBILITY STUDY

SEWER ELEVATIONS

SHEET: FIG. 3-C OF 1 SHEETS

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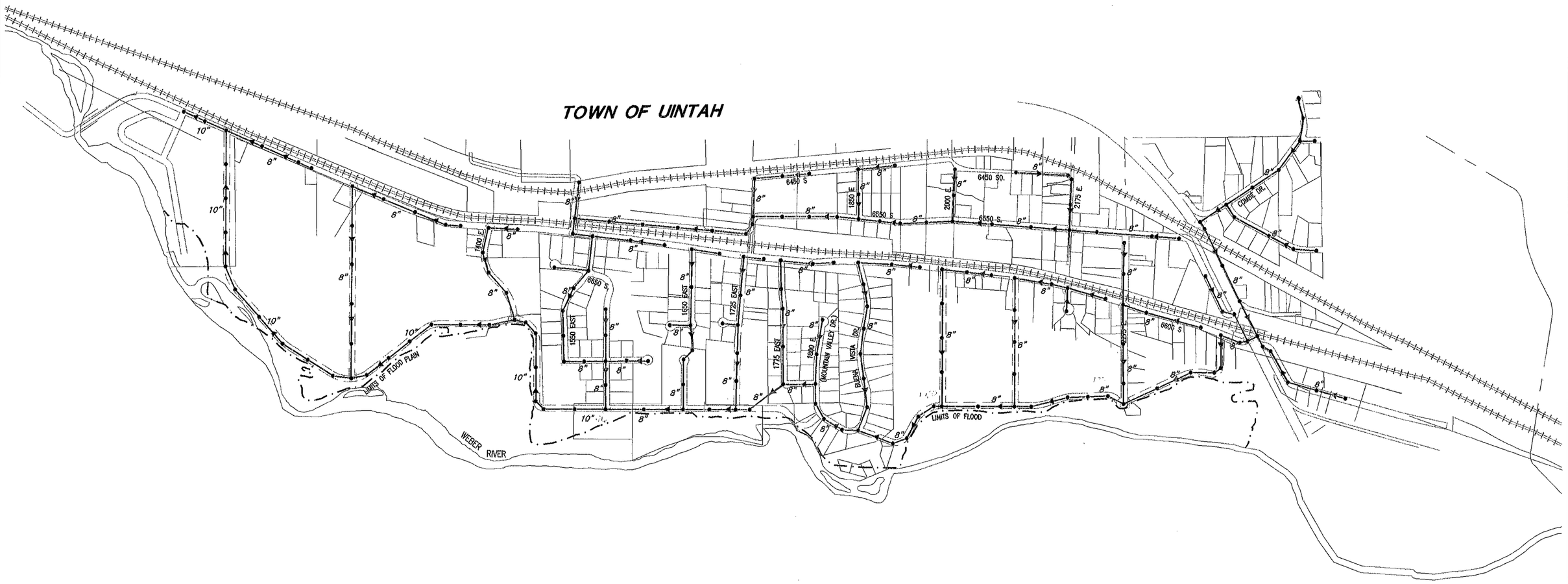
SEWER LINE
SEWER SUB-MAIN
LIMITS OF FLOOD PLAIN
MANHOLE



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DATE

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SCALE: 1" = 500'

DESIGNED
DRAWN
CHECKED

JA JONES & ASSOCIATES

CONSULTING ENGINEERS
4768 South Harrison Boulevard
Ogden, Utah 84403 (801) 476-9767

TOWN OF UINTAH
SANITARY SEWER FEASIBILITY STUDY

PROPOSED SANITARY SEWER SYSTEM

SHEET: 1 OF 1 SHEETS
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SECTION 4

COST ESTIMATES

Costs Associated with the Proposed Sewer System

The cost of constructing the sewer system is summarized in Table 4-A.

TABLE 4-A: ***BUDGETARY COST ESTIMATE (CWSID INCLUDED)***

Item	Description	Quantity	Unit	Unit Price	Amount
1	Saw cut 3" thick asphalt	36,690	l.f.	$1.00	$36,690.00
2	Remove and dispose of asphalt road section.	20,400	s.y.	$3.50	$71,400.00
3	Core hole in existing Central Weber sewer manhole, furnish and install watertight pipe fitting and connect pipe to existing manhole.	1	ea.	$3,000.00	$3,000.00
4	Furnish and install 12" PVC SDR-35 sewer pipe.	17,475	l.f.	$34.00	$594,150.00
5	Furnish and install 8" PVC SDR-35 sewer pipe.	40,630	l.f.	$21.00	$853,230.00
6	Furnish and install 4" lateral connections to new sanitary sewer main, includes connection, tee, and all necessary appurtenances.	365	ea.	$250.00	$91,250.00
7	Furnish and install 4" lateral to homes (120' per home, 365 homes)	43,800	l.f.	$17.50	$766,500.00
8	Furnish and install 5-foot manhole.	29	ea.	$2,400.00	$69,600.00
9	Furnish and install 4-foot manhole.	199	ea.	$2,000.00	$398,000.00
10	Sewer line trench patching (3" A.C., 8" untreated base course).	36,690	l.f.	$22.50	$825,525.00
11	Landscape restoration (100' x 10' per home)	365,000	s.f.	$1.75	$638,750.00
12	Bore under railroad tracks and U.S. 89	1,400	l.f.	$200.00	$280,000.00
13	Easement Acquisition	32	acres	$60,000.00	$1,920,000.00
14	Railroad crossing fee	6	ea.	$1,500.00	$9,000.00
15	Railroad encroachment fee (per year)	2.16	mi.	$1,000.00	$2,160.00
16	One time railroad fees (admin fee)	1	ea.	$2,055.00	$2,055.00
			Subtotal		$6,561,310.00
			10% Engineering & Inspections		$656,131.00
			5% Administration		$328,065.50
			Total		**$7,545,506.50**

Table 4-A includes the 12" diameter main required by CWSID even though the Town will be reimbursed for the cost of increasing the size.

Table 4-B is a summary of the system as needed by the Town of Uintah.

TABLE 4-B: ***BUDGETARY COST ESTIMATE (TOWN OF UINTAH ONLY)***

Item	Description	Quantity	Unit	Unit Price	Amount
1	Saw cut 3" thick asphalt	36,690	l.f.	$1.00	$36,690.00
2	Remove and dispose of asphalt road section.	20,400	s.y.	$3.50	$71,400.00
3	Core hole in existing Central Weber sewer manhole, furnish and install watertight pipe fitting and connect pipe to existing manhole.	1	ea.	$3,000.00	$3,000.00
4	Furnish and install 10" PVC SDR-35 sewer pipe.	6,022	l.f.	$28.00	$168,616.00
5	Furnish and install 8" PVC SDR-35 sewer pipe.	52,083	l.f.	$21.00	$1,093,743.00
6	Furnish and install 4" lateral connections to new sanitary sewer main, includes connection, tee, and all necessary appurtenances.	365	ea.	$250.00	$91,250.00
7	Furnish and install 4" lateral to homes (120' per home, 365 homes)	43,800	l.f.	$17.50	$766,500.00
8	Furnish and install 5-foot manhole.	29	ea.	$2,400.00	$69,600.00
9	Furnish and install 4-foot manhole.	199	ea.	$2,000.00	$398,000.00
10	Sewer line trench patching (3" A.C., 8" untreated base course).	36,690	l.f.	$22.50	$825,525.00
11	Landscape restoration (100' x 10' per home)	365,000	s.f.	$1.75	$638,750.00
12	Bore under railroad tracks and U.S. 89	1,400	l.f.	$200.00	$280,000.00
13	Easement Acquisition	32	acres	$60,000.00	$1,920,000.00
14	Railroad crossing fee	6	ea.	$1,500.00	$9,000.00
15	Railroad encroachment fee (per year)	2.16	mi.	$1,000.00	$2,160.00
16	One time railroad fees (admin fee)	1	ea.	$2,055.00	$2,055.00
			Subtotal		$6,376,289.00
			10% Engineering & Inspections		$637,628.90
			5% Administration		$318,814.45
			Total		**$7,332,732.35**

There is only a small portion of 10" diameter pipe that is needed to meet the Towns needs. The

total length of pipe is still the same but the diameters have been reduced. See Figure 3-C for the location and size of pipes required by CWSID and also the Town of Uintah (TU).

The contribution from CWSID to build the system as they would require can be obtained by comparing the difference in the subtotals from Table 4-A and Table 4-B. Table 4-C shows this cost difference. This is the cost needed to up-size the sewer pipe to meet Central Weber's needs. The Central Weber Sewer Improvement District would need to supply the funds indicated for the improvements they require.

TABLE 4-C:	***COST SUMMARY***
Subtotal From Table 4-A	$6,561,310.00
Subtotal From Table 4-B	$6,376,289.00
Difference (CWSID Contribution)	**$185,021.00**

Central Weber Sewer Improvement District Fees and Rates

Part of the overall cost of the project is for the operation and maintenance of the processing facilities provided by Central Weber. Central Weber Sewer Improvement District will begin collecting money from the Town of Uintah to pay for these costs once the Town is annexed into the district and connected to the system. This is done in three ways.

First, the District assesses a *one time* Impact Fee to individual residents as they connect rather than to the community as a whole. Central Weber will require each home owner to pay an impact fee (currently $300) when they become a part of the sewer district.

Secondly, Central Weber will also receive revenue *annually* from property taxes paid by individual home owners. The tax rate used to pay this Mill Levy is currently 0.000636. In other words the yearly taxes on a property with a value of $100,000 would increase by $63.60 (100,000 x 0.000636 = $63.60).

Thirdly, the District also receives money from the communities they service by assessing a *quarterly* fee based on population and assessed valuations. This will be paid directly by the Town and not individual residents. It is estimated that the Town of Uintah would pay approximately $3,700 each quarter to Central Weber.

Operation and Maintenance Costs for the Town of Uintah

In addition to helping pay for the cost for Central Weber to operate and maintain their treatment facilities, the Town of Uintah will also incur costs to operate and maintain their collection system. Most communities budget a predetermined amount of money for this purpose. For a system as small as the one proposed in this report an annual operation and maintenance cost of $8,000 should be sufficient.

The Town would most likely pass operation and maintenance costs as well as fees from CWSID to its residents through monthly billing by way of a user charge fee. The following Table summarizes these costs.

Costs & Fees	Amount	Billing Period	Annual Cost to TU
Impact Fee	$300 per connection	One Time	N/A
Property Taxes	0.000636 x Assessed Property Value	Yearly	N/A
CWSID O&M	$3,700.00	Quarterly	$14,800.00
TU O&M	$8,000.00	Yearly	$8,000.00
Total			$22,800.00

Given that there are 365 connections the yearly contribution per connection would be:

$22,800.00 / 365 = $62.47 per year or **$5.21 per month. (User Charge Fee)**

The average homeowner (0.67 acre lot with a property value of $100,000) would then pay approximately $126.07 each year ($63.60 *property taxes* + $62.47 *costs & fees* = $126.07) to cover these costs. This is in addition to any cost incurred by actually constructing the system as summarized in Table 4-A or Table 4-B.

SECTION 5

FINANCING OPTIONS

Sources of Funding

Because of the high cost of constructing a sanitary sewer system it will be necessary for the Town of Uintah to secure a substantial amount of money. This money can come from various sources such as bonds, loans or grants.

Bonds

General Obligation Bonds:

General Obligation Bonds would be available to fund the project but must be approved by a bond election. The debt incurred by General Obligation Bonds cannot exceed certain limits set by the Constitution of Utah and Enabling Statute.

Revenue Bonds:

Revenue Bonds area also an option. These bonds are secured solely by pledge of revenues from the sewer system. No bond election is required (unless required by the lending agency) but it must be shown that revenues are sufficient to make all payments on the bond.

Special Assessment Bonds:

Before Special Assessment Bonds can be issued a district must be established to regulate the implementation of the facility (sewer system). This district is created by "Negative Election" and no separate election is required to issue bonds. Special Assessment Bonds are secured solely by special assessments on property located within district boundaries. The assessment is determined by allocating total project costs to all parcels within the district based upon frontage or square footage. The assessment then acts as a lien on the property — if property owner fails to pay, lien can be foreclosed.

Loans and Grants

Financial assistance is available from governmental organizations that protect the water quality within the state. The Division of Water Quality provides money (both state and federal) in the form of loans and grants to cities, towns and special improvement districts for this kind of

wastewater project. To determine what types of funding would be available the Town would need to attend a Pre-Application meeting with the DWQ. Grant money could pay for all costs in excess of 1.4% of the median users annual household income if sufficient grant money was available and the Town of Uintah met the requirements. Loans are also available at interest rates no higher than 4% and as low as 0%. Financial assistance may also be provided throughout the planning and construction phases of the project before revenues are generated.

Rural development (Old Farmers Home Administration)

Community Impact Fund Board

Money available from the Community Impact Fund Board is generally for mineral lease areas.

Community Development Block Grants (CDBG)

CDBG money is typically for smaller amounts. This is due to the competition for this money from other communities. CDBG money may be available for small sections of town but is also contingent upon the benefit for low to moderate income citizens.

SID

Combination of loans.

Repayment / Assessment

SECTION 6

CONCLUSIONS & RECOMMENDATIONS

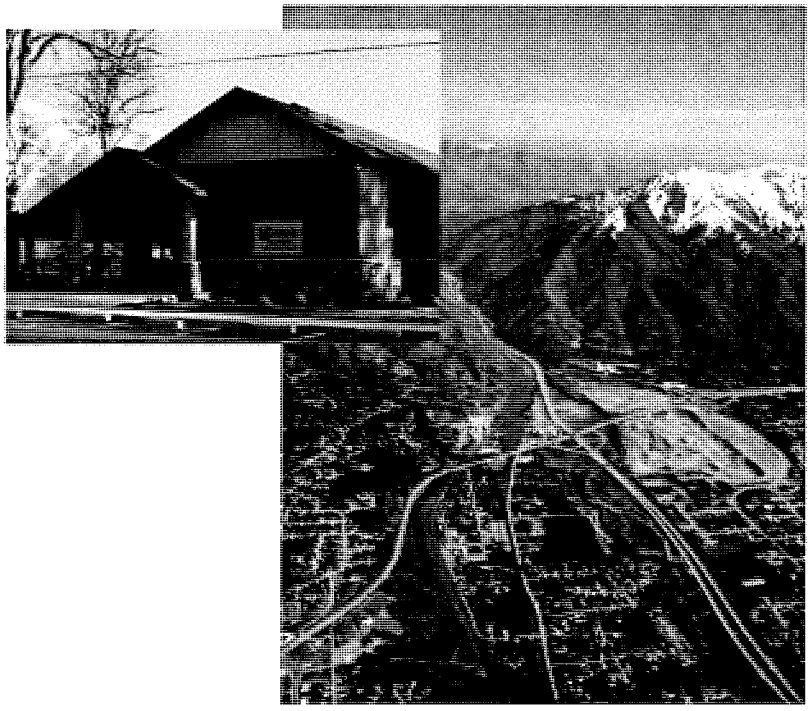
Pressurized Irrigation Feasibility Study

City of Uintah
Pressurized Irrigation Water System
Feasibility Study

January 2010

Prepared For:

Uintah City, Utah



Prepared By:

FRANSON
CIVIL ENGINEERS

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EXECUTIVE SUMMARY

Introduction

Irrigation water in Uintah City (City) has been provided by three canal companies and some private irrigation systems in the past. The three main canal companies providing water are:

- Uintah Central Canal Company (UCCC)
- Pioneer Irrigation Canal Company (PICC)
- Uintah Mountain Streams Irrigation Company (UMSIC)

As the city continues to grow, the culinary system is becoming less adequate to serve the increasing residential population. Uintah City has recently appropriated moneys to perform a feasibility study on the possibility of constructing a Pressurized Irrigation System. This study will assess the feasibility of building a pressured irrigation system for the City, with participation from the canal companies. This will allow the City and irrigation companies to make an informed decision on the most beneficial course of action.

Existing Secondary Water System

Currently, the secondary irrigation being utilized in Uintah City is gravity-fed from canals. The majority of the residential outdoor watering is done from the pressurized culinary water system. The gravity-fed water is diverted from the Weber River, taken from various springs, or is diverted from Spring Creek into the UMSIC irrigation canal.

The UMSIC also buys water from Weber Basin Water Conservancy District (WBWCD) in late summer as the Spring Creek flows diminish. The UMSIC also serves the one existing piped irrigation system. The system is on 6425 South and is not within the city limits. The developer of the Shadow Oaks subdivision installed the system and the quality and construction method of the system is unknown. The original plans for the subdivisions were created in October of 1978.

It is anticipated that all the residents in the city will need a new connection to the proposed Pressurized Irrigation System.

Water Quality

The water coming from Spring Creek, the springs, and the Weber River have historically had no significant pollutants or high concentrations of naturally occurring elements that are harmful to irrigated plants. The open channel ditches do have large amounts of moss that occur and break loose. However, this is not predicted to be a problem as there will be no open channel conveyance after the pressurized system is installed.

Fish in the water could have a significant impact on the system; however, there is a design underway to provide the main UCCC diversion with fish screens. The South Weber Irrigation Company utilizes the same river diversion and has reported issues with fish in their pressurized irrigation pipes.

Future Irrigation Water Demands

Estimates of the current and future water demands have been prepared to size the system. These demands are based on state requirements. The following are demand results:

- There are currently 636 acres within the city limit. It is anticipated that as many as 171 acres may be annexed into the city, resulting in 807 total acres of residential land that has the potential to be serviced with the system.
- It is assumed that at full build out, a conservative 40% of the total acreage is un-irrigable, leaving approximately 484 acres to irrigate.
- A 4 acre-feet per acre application rate was applied to the irrigable lands; this duty is given by the State of Utah for this particular region of the state.
- The resulting future annual water demand as dictated by a 4 acre-feet/acre duty was calculated as 1,993.7 acre-feet per year.
- For the purposes of this study, the Utah State Division of Drinking Water peak demand Requirements of 7.92 gallons per minute, per irrigable acre, has been increased by 1.5 times to 11.88 gallons per minute, to reflect the standard sprinkling practice that recommends outdoor watering be avoided during the daytime.

Water Rights

Uintah City will utilize the three canal company water right sources for the secondary water system. The City owns a small amount of water in conjunction with the UMSIC. The three companies have a sufficient amount of water to serve the community.

Water users that currently hold water shares in a company have the choice to turn the water into the city or keep their water shares; however, all water shares that are kept must be contracted to the system.

Uintah City should also enact an ordinance that requires developers to convey water shares associated with the land to the City before approval of subdivisions is granted.

Table ES-1 summarizes the existing minimum water rights and respective shares within the three canal companies and the maximum yearly water volume that would be available from each canal according to the duty in the region. These are the low-flow values and assume no flood or high flows during the year. The maximum amount of water that can be utilized is controlled in this case by the duty on the land. The 4 acre-ft per acre, plus the stock water and domestic water, give us a total of 1,993.7 acre-feet as the maximum amount of water available for use.

To be able to divert the water all from the same point of diversion, change applications would have to be filed on a number of the water rights.

Table ES-1: Existing Water Rights

Canal Company	No. of Shares	Irrigated Acres	Total Water Right (cfs)	Duty (4 acft/ac)
Pioneer Irrigation Canal Company	100	100	1.33	400
Uintah Central Canal Company	234.4	266	3.28	984
Uintah Mountain Streams Irrigation Company	184	52.5	.66	210
Uintah City Water Rights	-	60.5	1.04	242
TOTAL:	**518.4**	**479**	**6.31**	**1993.72***

*Stock Water and Domestic water rights have been included, see section 3.1.2 for details

Pressurized Irrigation System Design and Operating Criteria

The following system design and operational criteria were utilized in formulating the plan for the secondary water system.

1. *Water Demand Requirements* – The State of Utah requires that no more than 4 acre-feet per acre be applied in this region of the state. This, added to domestic and stock water units, controls the amount of total water that can be diverted from the river on an annual bases. An annual requirement of 48 inches of water per irrigated acre was utilized in determining source and storage demands. A peak instantaneous demand of 11.88 gpm per acre was required.

2. *Pressure Pipe Network* - Determination of water line diameters was based on the following criteria:
   - 30 to 80 psi pressure range to ensure sufficient pressure for sprinkler operation, but also prevent line damage with excessive pressures.
   - A maximum velocity of 5 feet per second in all distribution lines to ensure minimal friction losses and prevent line damage. With consideration of velocities up to 7 feet per second in transmission lines.
   - A minimum pipe size of 4 inches.
   - HDPE, PIP pipe and C-900 PVC are pipe options to be used with an accompanying Hazen Williams friction loss coefficient of 130 to 140, depending on pipe size.
   - Pipe to have a minimum cover of 2 feet.

3. *Pump Stations* - Pumping rates from the canals were assumed to be steady. Estimations on the pump and motor efficiency were made depending on the pump type; these were utilized to determine horsepower and power requirements. It was assumed that power for the pumps could be purchased at $0.055 per KW-hour.

4. *Water Quality Requirements* - As a minimum it is suggested that every home install an individual filter to their system. A larger, system-wide filter could be integrated into the system; however, it is not currently part of the cost estimate, and not a recommendation of the engineer. Additionally to increase the water quality in specific areas, periodic flushing within "dead-end lines" may be necessary.

Pressurized Irrigation System Alternatives

Four Pressurized Irrigation System alternatives had a preliminary evaluation performed with the help of a hydraulic computer model. A Fifth alternative was found to be unfeasible and was not evaluated. A Sixth alternative was included to discuss the City's option of not continuing with a citywide Pressurized Irrigation System. There are also two sub alternatives that account for the possibility of wind-powered pumping and the placement of a reservoir in each alternative. The following describes in more detail the alternatives:

Alternative A – The water demands are entirely provided by the three irrigation company water rights. No water will be purchased from WBWCD. A tank will be built on the bench near the other City water tanks. This tank would be above all the houses in the city and would require a pressure reducing valve. Water will be boosted to fill the peaking tank.

Alternative B – The water demands are entirely provided by the three irrigation company water rights. No water will be purchased from WBWCD. A tank will be placed at a specific elevation to serve the lower part of the system with adequate pressure. The tank's elevation will not allow all homes on the bench to be served from the tank. The Mountain Streams water could be use for a portion of the season to serve houses above the tank; however, the stream does not always run for the entire summer. As a sub alternative to this alternative, a small amount of water could be purchased from WBWCD to supplement service to the houses above the tank in the late summer if Spring Creek is dry.

Alternative C - This alternative evaluated a dual system, with lower and upper divisions. The lower section would be boosted and the upper section would rely on Mountain Streams water and a small tank. In the late fall a portion of the water would have to be purchased from WBWCD to serve the residence up on the bench.

Alternative D – This Alternative would exclude the houses on the bench from service in the current phase of construction. The water would be boosted to the rest of the city.

Alternative E - All of the necessary water would be purchased in the WBWCD Aqueduct. The water would come from the 48-inch pipe. A peaking tank will be constructed just below the aqueduct. No boosting would be necessary. Water rights would be sold or transferred to help cover the costs of buying the needed water from current water users in the aqueduct.

No Pressurized Irrigation System Alternative - An additional alternative that the City could pursue, is a no-action alternative in regards to a city-wide Pressurized Irrigation System. The City would continue to operate its existing culinary water for outdoor use. There would have to be eventual expansions in the culinary systems. A detailed evaluation of this alternative was not

in the scope of this study. However, it is presumable that the culinary system would require additional storage, supply, and increased pipe sizes to account for the increased demands of outdoor watering. The expenses for these improvements may be very costly.

Sub Alternative 1- The use of wind mills to provide supplemental power to pump water to a peaking tank will be considered for all alternatives with a tank.

Sub Alternative 2- Reservoir storage for peaking will be evaluated for the alternatives. It is anticipated that with scheduled flood turns and nighttime sprinkling, a water storage tank on the hill will be sufficient; however, a reservoir could provide added storage and stability to the water source if the town so desired.

Cost Estimate Summary

An important aspect of a feasibility study is the cost estimate of constructing the proposed facilities. Final costs incurred by the City will depend on actual labor and material costs, market conditions, site conditions, scope of work, and other fluctuating factors.

Table ES-2 summarizes the City's estimated costs of the five alternatives. Costs were developed using information from the City, local material suppliers, and similar project costs along the Wasatch Front. The total construction cost includes estimates of Capital Improvements, Contingency, Land Acquisition, Design, and Construction Engineering.

Table ES-2: Alternative Estimated Total Cost Summary

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Construction Cost	$2,185,766	$1,973,877	$1,738,514	$1,584,310	$ 1,500,000
Design, Land & Admin Cost	$468,513	$439,619	$316,615	$272,860	$ 250,000
Total Project Cost	$2,654,279	$2,413,496	$2,055,129	$1,857,170	$ 12,500,000*

*Alternative E requires purchasing all required water from existing water users on the WBWCD aqueduct. This number could be reduced by the sale or exchange of current water rights held by the three irrigation companies in Uintah. See section 3.1.3

Two Additional sub alternative costs can be applied to any alternative. And the cost estimates are shown below in table ES-3

Table ES-3: Sub Alternatives Estimated Total Cost Summary

	Wind Power	Reservoir
Construction Cost	$200,000	$300,000
Design, Land & Admin Cost	$100,000	$175,000
Total Alternative costs	**$300,000**	**$475,000**

Economical Analysis Summary

Another important aspect of a feasibility study is the Economic Analysis or how the City will pay for the construction and annual O&M of a secondary water system. The financing of the system may come by way of connection fees, impact fees, and user rates.

Cash Flow Summary

In order to compare the sample rates and fees necessary to fund each Pressurized Irrigation System alternative, a simple cash flow analysis was performed. For the analysis, a 2.6 percent interest rate and a 30-year repayment period were used. It was assumed that share holders will pay $30 per share; the balance of the yearly payment would be assumed by residents of the city. Connection fees also may be applied to the system. These will fill the revolving operation and maintenance account.

The analysis assumed the following:

- New combined secondary rates and culinary rates would be reasonably close to the existing average culinary water rates
- The existing Pressurized Irrigation System user's connection fee would be a maximum of $1,000

Rates and Fee Summary

The system could be metered or user rates could be defined by lot size. Section 5.5.2 discusses sample rates and fees for each alternative using an average cost for the residential connection fees and rates. Once the City makes a decision regarding the implementation of the Pressurized Irrigation System, a detailed rate study must be initiated to determine actual fees and rates for each lot or connection size, and each land use type.

In order to objectively analyze the feasibility and added costs of a Pressurized Irrigation System, to individual property owners, an analysis of current outdoor watering costs for residents is important. The City supplied a sample of residential water usages for Uintah City residents from 2008. From the sample, the average culinary water cost per year for each connection is $40.44. If alternative B is selected, the combined monthly fees for a culinary system and pressurized system are projected to increase to $52.44.

Conclusions

The implementation of a Pressurized Irrigation System for Uintah City is **feasible**. The cost to the individual water user is less than what is characteristic across the State. With the future increase of rates for treated culinary water, it appears that the Citizens of Uintah City would save significant amounts of money overtime by constructing a Pressurized Irrigation System. As well as gain the benefits of pressurized irrigation.

Table ES-4 is organized to summarize the pros and cons of each alternative in regards to a number of issues. It appears from the data that a pressurized secondary water system is economically and environmentally viable for Uintah City.

Table ES-4 Summary of pros and Cons

Alternative	Pros	Cons
Alternative A	• Services all homes in the city with full pressure • Lower maintenance pumps can be used • Includes Peaking tank	• High Cost • Wasted Energy • High Tank Elevation • Excessive Pressures
Alternative B	• Includes peaking tank • Less expensive • Services most homes with full pressure • No wasted energy or pressures	• Will not service homes above the tank in late summer without water from Weber Basin, or additional pumping.
Alternative C	• Services most homes with full pressure • Smaller tank is less expensive	• Utilizes variable speed pumps which are more expensive • No peaking tank for the lower system • WBWCD lease is ending and renewal is in question
Alternative D	• Least expensive option	• Houses on the bench are not serviced • Variable speed pumps are expensive to buy and maintain
Alternative E	N/A	Unfeasible

Recommendations

The following summarizes the recommendations made by Franson Civil Engineers (FCE):

1. FCE recommends Alternative B as the most beneficial alternative.
2. A detailed rate study with a specific alternative should be performed, with city input; including desired connection fees and impact fees for development.

3. Should the City choose to build the Pressurized Irrigation System, it is recommended that a program to educate the public in regards to water conservation and watering times be instituted.
4. To protect the culinary water system from contamination, it is recommended that the City implement a stringent cross-connection policy.
5. If the City implements a city-wide Pressurized Irrigation System, it is recommended that new developments should be required to do the following:
    - Pay an impact fee.
    - Submit engineer's design calculations demonstrating that the development's secondary water system meets design criteria.
    - Install a secondary water system with C-900 pipe and adequate secondary water system valves.
    - Obtain and provide to the City sufficient water rights for the development's irrigation needs.

CHAPTER 1 - INTRODUCTION

1.1 Background

The following report documents the findings of a feasibility study to construct a Pressurized Irrigation System for Uintah City (City). The report was assembled by Franson Civil Engineers in coordination with City staff and Irrigation Company personnel.

The City's single source of culinary water is purchased from Weber Basin Water Conservancy District (WBWCD). The price of culinary water is expected to increase significantly in the future. The City is also concerned with the water available for growth in the city. The development of an alternative outdoor watering source would decrease their reliance on WBWCD water, and preserve drinking water supplies by utilizing alternative water sources for outdoor irrigating.

The City and the Irrigation Companies have come together to assess the feasibility of using the various Canal Company water shares for a Pressurized Irrigation System, and therefore provide the citizens with a long term economical solution to their outdoor watering needs.

1.2 Purpose of Study

The purpose of this study is to assess the feasibility of constructing a city-wide Pressurized Irrigation System, to serve secondary water needs. Other purposes accomplished include:

- Quantifying the amount of required secondary water
- Identifying sources of water
- Assessing the feasibility of various pressurized system alternatives
- Exploring costs, financing, and repayment options
- Examining ways to accommodate the irrigation company shareholder and the city's need
- Determining the potential effects on the culinary system and environment

CHAPTER 2 - PROBLEMS & NEEDS

The following chapter describes the problems and needs associated with the existing secondary water systems, and also the problems and needs involved in implementing a city-wide Pressurized Irrigation System. Additionally, this chapter describes the approach used to quantify demands and thus determine the water needs of the proposed system.

2.1 Existing Canal System

Currently, there are approximately 518.4 shares distributed among the three irrigation companies serving the city. There are about 364 residential homes, the majority of which are not using canal company water. There is one piped irrigation system in the area; however, it is not in the city. It is in unincorporated Weber County. The existing canal systems are functional; however, the systems have the potential to serve the entire city with secondary water and reduce the culinary water demand for the city, as well as save money for the residents. These systems and their alignments are shown in Figure 2-1.

2.1.2 Distribution Systems

In the late 1800's the farmers began to develop gravity-fed secondary water systems to provide water to their lands. In the Uintah City area there are three such canal systems that are not interconnected. The UCCC and PICC take water directly out of the Weber River, while the UMSIC receives its water from Spring Creek. Most of the current irrigators flood-irrigate their land. However there are a select few that have started sprinkling in recent years. The water in the three canal systems flows mainly in open channels. There are a number of areas where the canals have been piped; however, they are still gravity fed and do not generate pressure.

Uintah City is proposing to make a transition from these several independent gravity fed systems to a city-wide Pressurized Irrigation System.

2.1.3 Operation & Maintenance

The City currently has no control over the irrigation companies. They do however make recommendations to those who are sprinkle irrigating with culinary water, to water at night. Each individual canal company has historically had a ditch rider and/or a water master who takes care of the system operation and most maintenance issues. The new system will have an Operation and Maintenance plan as well as an Emergency Action Plan in the case of a pipe failure. It is recommended that the city also implement a watering schedule for the city's residents.

There may be a number of irrigators who do not wish to make the switch from flood irrigation to sprinklers. These water users could be accommodated with an option to flood irrigate; however, there will need to be a turn schedule for the flood irrigators. It is anticipated that a flood turn schedule would have the flood irrigators irrigating from 10 AM until 6 PM, while the rest of the sprinkle irrigators will sprinkle from 10 PM until 6 AM. The flood irrigation option will not be available to residential irrigators.

2.1.4 Storage

There is a current storage right held by the UMSIC. The storage right has a non-use filed on it and will need to be proved by 2012. With daytime watering restrictions, there will need to be sufficient storage to handle the nighttime peaking demands as well as the daytime flood irrigators. Currently there are four sites that have been identified as potential reservoir or storage tank locations. These locations are discussed in section 4.1.2. A storage tank is sufficient to run the system. A larger reservoir would add more flexibility to the system in terms of meeting peak demands and issues with river flows.

2.1.5 Water Quality

There have been no significant water quality issues reported in the Uintah City or by any canal company members. There will be a fish screen on the system intake which will protect the system from fish and major floating debris. There will be a relatively low percentage of Total Suspended Solids (TSS), like seeds and other small debris, that will have the potential of clogging sprinklers. It is recommended that each individual user install and maintain a filter on their systems. The system can be filtered with large system filters; however, economically it is not as viable an option to have one large filtration system.

2.2 Build Out Projections and Future Growth Areas

A key factor in the design of a city-wide system will be the consideration of future growth. As Uintah City continues to grow, both in terms of population and in the amount of developed area, the delivery of irrigation water at an acceptable quantity and pressure will be of paramount importance. The following section discusses population projections and future growth areas as they affect the proposed Uintah City Pressurized Irrigation System.

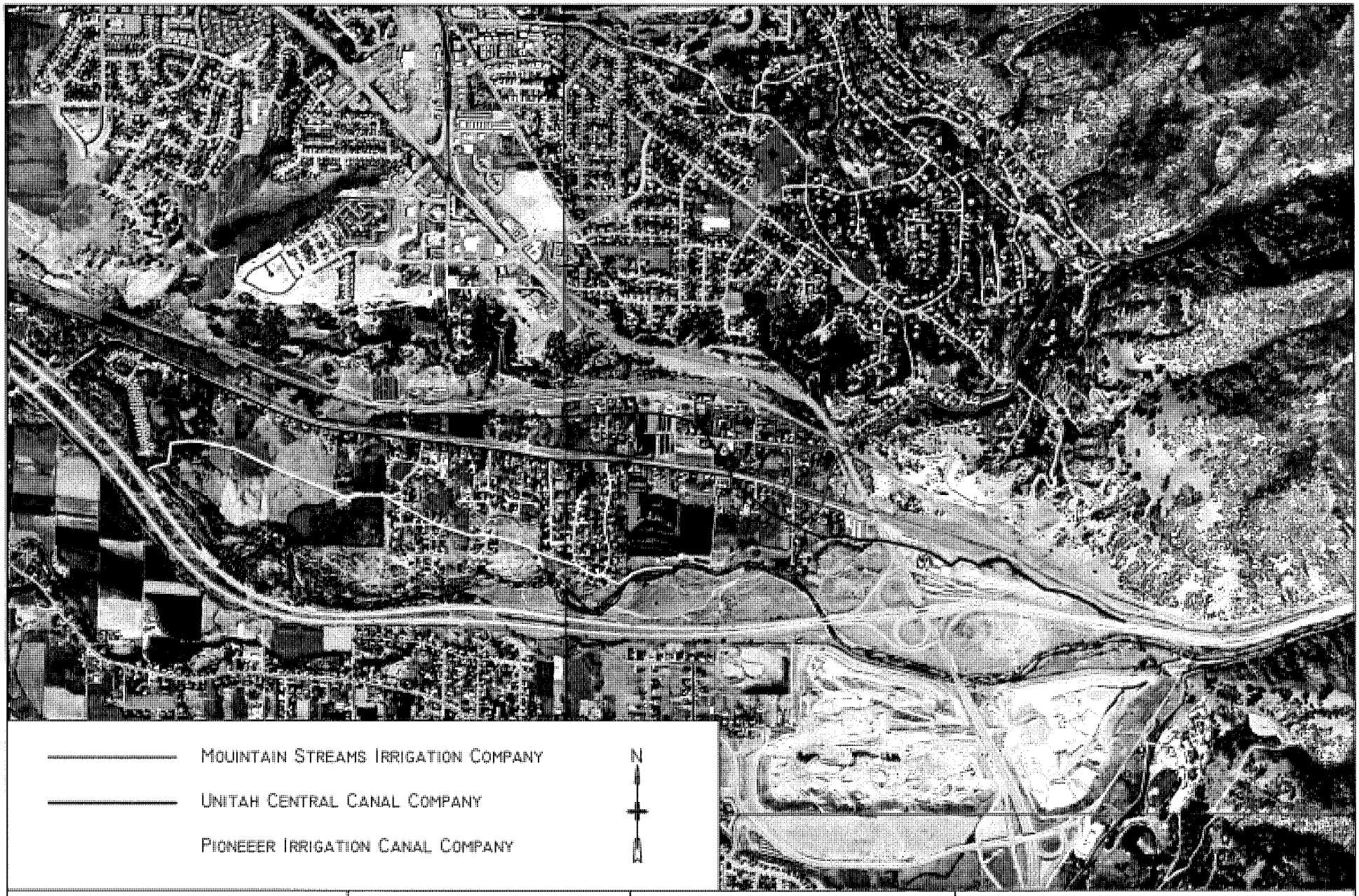

FIGURE 2-1

CURRENT CANAL COMPANY ALIGNMENTS

DATE:	JANUARY 25, 2010
SCALE:	1" = 2000'
Canals.dwg	
H:\CLIENT\8-Wasatch-Weber Area\Uintah Pressurized Irrigation System\Drawings	
LAYOUT: Layout1	

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2.2.1 *Build Out Projections*

The City provided current build out numbers for the feasibility study. Currently, with the minimum lot size at .459 acres, there is the potential for approximately 372 additional lots. There are approximately 364 residential homes in Uintah City at present, including each mobile home on the west side of the city. If the city were to change the minimum lot size, there is potential for significantly more homes. This would increase the culinary demand and decrease the irrigation demand. The City, in their projections, estimated that the potential minimum lot size could be 1/8 acre plots, which would provide 1,490 lots at build out.

The City has indicated that it may possibly annex as much as 171 acres into the city. At a residential density of .459, the new city land creates an additional 372 lots at build out. These expansions were taken into consideration during the preliminary sizing of the pipe.

2.2.2 *Historical Water Use*

Historically water use drastically increases during the warmer summer months and then decreases with the cooler winter months. Indoor water use can be assumed to remain nearly constant year round, while outdoor water use begins in March, peaks in July, and ends in October. The total indoor and outdoor water use can be quantified by determining a hypothetical line of segregation, which defines the two separate uses. Total culinary indoor use being the area below the line of segregation, this total indoor culinary water usage was quantified in dollars per user as $24, the total average water bill being $40.44 per user. Even though a portion of the Uintah residents use canal company water for irrigation, 41% of the culinary water in Uintah is used for irrigation purposes.

2.2.3 *Irrigated Area for Each Land-use zone*

Each parcel of land within Uintah City has been zoned for a specific use. General categories of these uses include: residential, commercial, and agricultural. Residential zoning has been broken into two subset densities: low density residential and high density residential. The percent of ground irrigated was estimated with each land use zone. The official future land use map prepared by the City defines these land use categories and their subsets. Table 2-1 shows the land use and its accompanying total irrigated acreage.

Table 2-1: Land Use Percent Irrigated

Land Use	Total Acres	Percent of Land Irrigated	Irrigated Acres
High Density Residential	12.2	50.0%	6.1
Low Density Residential	245.4	65.0%	159.5
Commercial	20.0	30.0%	6.0
Agricultural	149.3	100.0%	149.3
Unirrigated Lands	226.1	0.0%	0.0
TOTAL:	**653**		**320.9**

An average irrigated density for each land use zone was determined by comparing the averages of irrigated land vs. unirrigated land within one use type. A sample from each land use type was evaluated in this manner to generate the percent irrigated land per land use type. The density zones and their percent irrigated areas are shown in Figure 2-2. The Total future acreage with potential annexations is 807 acres, it is conservatively estimated that 60% of the area will still be irrigated under these conditions with yields of 484 irrigated acres.

2.2.4 Irrigation Requirements

Irrigation requirements are based on the State of Utah Drinking Water Division (R-309-510 sections 7 to 9). The Peak Daily Flow is taken from table 510-3 and was found to be 3.96 cfs. However, this value was corrected for the actual time spent watering, which will be from 6 PM to 10 AM. This is essentially a 16 hour water day, or two thirds of the original water day; however, the same amount of water is expected to be used. Therefore the 3.96 cfs was increased by 3/2 or 1.5, resulting in a peak daily demand of 5.94 cfs.

The total annual water demand for Uintah City at build out was obtained by using the state guide line of 1.87 acre-feet per acre for map zone 4. The total build out acreage is estimated to be 807 acres. This resulted in a future yearly demand of 1,509 acre-feet; the current build out requires 1,221.1 acre-feet per year. The amount of water available on any given year is controlled by the water right duty, which for region 4, is 4 acre-feet per acre. This 4 acre-feet applied the total irrigated land as dictated by the water right, and the total water available as 1,993.7 acre feet. The duty is sufficient to supply the water needed currently and at build out for basic irrigation needs.

Peak instantaneous demand values are based upon Utah Division of Drinking Water Requirements, Table 510-7. This value is 7.92 gallons per minute per irrigable acre for map zone 4. The peak instantaneous demand has been increased by 1.5 times again to 11.88 gallons per minute to reflect the daytime watering restrictions within the City. Because the peak instantaneous demand values reflect the largest volume of water that will need to be delivered at any one time, they will be used to size the proposed system pipelines.

Flood irrigation will be during the hours of 10 AM to 6 PM. The flood irrigation will have to be analyzed as the number of flood irrigators and quantity of water needed is assessed. Because the water is pressurized the amount of water the individual user will get must be calculated during design and an orifice plate added the individual's turnout. The time it will take to get their allotted water will be relatively short due to the pressure in the pipeline. It is anticipated that only a select few will continue to flood irrigate.

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LEGEND

- CITY LIMITS
- AGRICULTURAL LAND - 100% IRRIGATED
- HIGH DENSITY RESIDENTIAL LAND - 50% IRRIGATED
- LOW DENSITY RESIDENTIAL LAND - 65% IRRIGATED
- COMMERCIAL LAND - 30% IRRIGATED
- IRRIGATED LAND OUT OF CITY BOUNDARY

N

DATE: JANUARY 25, 2010
SCALE:
Canals.dwg
H:\CLIENTS\Wasatch-Weber Area\Uintah Pressurized Irrigation System\Drawings
LAYOUT: Area

FIGURE 2-2
CURRENTLY IRRIGATED AREAS

2.3 Future Culinary Water System Needs

As was discussed in the previous chapter, one of the major motives behind the implementation of a Pressurized Irrigation System is the cost savings incurred from not having to use expensive treated culinary water for irrigation purposes. These cost savings are magnified as the City grows and continually adds new culinary water connections.

An additional problem attributed to the growing population is the declining amount of culinary water for future growth and the needed culinary distribution and storage improvements associated with a growing City. Not having to use the high quality culinary water for irrigation purposes will free up culinary water and reduce the required improvements to the culinary system.

2.4 Elevation of the Homes on the Bench

There are approximately 29 homes that would be serviced east of Highway 89. These homes pose a significant challenge to the overall cost of the system. There are homes over 200 feet above the ground just west of the highway. This heavily affects pumping costs. It also affects the pressure class of pipe required to build the system, as well as the need for pressure reducing valves.

CHAPTER 3 - RESOURCES AVAILABLE TO MEET NEEDS

Several existing resources are available to meet the needs of Uintah City's proposed Pressurized Irrigation System. Primary among these resources is an adequate and reliable water supply for the system.

3.1 Water Sources

3.1.1 Irrigation Company Shares

There are three irrigation companies that currently serve the Uintah City area with irrigation water: The Uintah Central Canal Company (UCCC), the Pioneer Irrigation Canal Company (PICC), and the Uintah Mountain Streams Irrigation Company (UMSIC).

Uintah City owns a small amount of shares in the PICC and the UMSIC; however, they are not a controlling amount of shares. They also own a water right in conjunction with UMSIC. The water right source is a spring and will need to have a water right change in order to use the water for the irrigation system. The canal companies and the city have agreed to look at the feasibility of combining their resources to create a Pressurized Irrigation System for the city. Table 3-1 summarizes the water rights available to be used for the pressurized irrigation company.

The UCCC has a water right (a4131) that is in question. The study has been performed with the addition of this small water right. It appears that UCCC has been paying the assessment on the right over the years; however, the original right is in the name of South Weber Irrigation Company. This right will need to be investigated during design. Original water rights information can be found in Appendix B.

Table 3-1: Existing Water Right for use in the Pressurized Irrigation System.

Canal Company	Water Right No.	Irrigated acres	No. of Shares	Water Right (cfs)		
				Flood	High	Low
Pioneer Irrigation Canal Company	35-8011	100	100	2.86	2.22	1.33
Uintah Central Canal Company	35-8017	246	234.4	7.03	5.47	3.28
Uintah Central Canal Company	A4131	20	-	.57	.44	.278
Uintah Mountain Streams Irrigation Company	35-8022	52.5	184	2.1	2.1	.66
Shared UMSID and Uintah City Water Rights*	35-1874	60.5	N/A	1.04	1.04	1.04
TOTAL:	-	**479**	**518.4**	**13.6**	**11.27**	**6.58**

* Squirrel Hole and Cold Water springs. The water rights show that .2 cfs of this is owned by Uintah City, the remainder is owned by UMSIC.

Of concern when utilizing the canal water as a source for the secondary irrigation system is the reliability of the water supply. The springs and rivers have the potential to run dry, or not yield

the water right allotted by the state. These factors have not been incorporated into this study. It is assumed that the low flow water right, as well as the annual duty, will be available for use in the system.

3.1.2 Water Right Duty

The State of Utah assigns a water right duty to all regions of the state. The duty is the maximum amount of water that can be used on a particular acre of land in one water year. For the Uintah City region the duty is 4 acre-feet of water per irrigated acre. So essentially each acre of land specified in the water right can have 48 inches of water applied to it in one irrigation season. In addition to the land duty there can be domestic water units and stock water units. Table 3-2 shows the total duty available with the current water right to be 1,993.7 acre-feet, including the stock water and domestic water units. 1,993.7 acre-feet is the maximum amount of water that can be diverted with the currently held water rights.

Table 3-2: Water Right Duty

Canal Company	Water Right No.	Allowable Duty 4 ac-ft/ac	Domestic .45 ac-ft / unit	Stock Water .028 ac-ft / unit
Pioneer Irrigation Canal Company	35-8011	400	100	1.4
Uintah Central Canal Company	35-8017	984	13.5	5.6
Uintah Central Canal Company	A4131	80	-	1.4
Uintah Mountain Streams Irrigation Company	35-8022	210	-	3.08
Shared UMSID and Uintah City Water Rights*	35-1874	242	45.9	1.04
SUB TOTAL:	-	**1916**	**66.6**	**11.1**
		TOTAL	**1,993.7**	**ac-ft**

3.1.3 Weber Basin Water Conservancy District Water

Weber Basin Water Conservancy District (WBWCD) as a wholesale water supplier could assist with providing water to the City. Currently the UMSID leases water late in the season for $3 per acre-foot. These leases are due to expire shortly and WBWCD has not indicated what they are going to do in terms of renewal.

The Weber Basin aqueduct is a 48-inch round concrete pipeline which supplies South Ogden and various surrounding areas with secondary water, and supplies raw water to a nearby water treatment plant. The aqueduct runs south to north on the east side of Uintah City and is located up on the side of the mountain. Supplying the entire Uintah Pressurized Irrigation System from the aqueduct would result in reduction of capital cost due to the elimination of pumping.

Franson Civil Engineers met with WBWCD and found that they have recently performed a system study of the aqueduct and found that it is undersized for its current service area, and that they are trying to reduce the demand on the pipeline. In meeting with WBWCD, Franson Civil

Engineers found that there was very little possibility of using the aqueduct as the primary water source for the water system. The current lease with UMSID may, however, be a viable source of a portion of water to serve the houses on the bench.

The water that is currently being delivered in the Aqueduct is essentially not for sale as it would leave portions of its current paying customers without water. The alternative would be to pay or cost share with WBWCD to build a new parallel pipeline following the same alignment as the old. This, however, is not currently a part of WBWCD's future plans and would be significantly more expensive than just building the system in the Uintah City area.

As an example of the costs of using the aqueduct, if Uintah City was to find 1,993 acre feet for sale downstream of them in the aqueduct, the going rate for highly demanded water is about $6,000 per acre foot. This would result in $11.9 million needed to replace the existing amount of water shared by the irrigation companies. In addition, the system would still need to be built, adding about $1.5 million to the cost estimate. The existing water right in Uintah could be exchanged or sold to help fund this. If the city would like to pursue this option more fully, a detailed study could be performed including searching for people on the Weber Basin aqueduct that would be willing to sell their water and go without secondary water, as well as looking for downstream buyers on the Weber River for the Irrigation companies existing rights.

3.2 Existing Pressurized Irrigation System Infrastructure

There is currently one piped irrigation system in the proposed service areas of Uintah City. The pipeline is not within the city limits; it is in unincorporated Weber County. UMSID provides water to the system. The system does not provide full pressure for the residents near the top of the hill; however, it does build pressure and reportedly services a portion of the lower houses with adequate pressure. The option to replace this section of pipe will need to be discussed between the city and UMSIC. The water users are share holders; however, they are not within the city limits. It could be designed such that these home owners could continue using their existing system. Details would be decided by the irrigation company and the City.

The condition of the system is unknown. It was designed in 1978 and installed in the year thereafter. Which means that if this existing system was to be integrated into the new system it could create significant maintenance costs or need to be replaced shortly. The current cost estimates for alternatives that will serve these homes have been calculated with the pipes and connections being replaced.

3.2.1 Existing Private Springs and Wells

There are a number of springs and wells within the city that provide water for a small number of houses. However, all homes that are connected to the culinary water system will also be connected to the proposed Pressurized Irrigation System.

Due to the small amount of reliable water from the springs, and the technicality of inserting the water into the pressurized pipeline, it is not recommended that these small water sources be incorporated into the City system.

3.2.2 Existing Diversion Dam

The existing Weber River Diversion is currently the point of diversion for the UCCC. It is anticipated that the diversion will be incorporated into the design of the system. The Weber River Diversion is currently undergoing a modernization that is being funded in part by the UCCC. The Diversion is being designed such that it will easily incorporate the proposed system.

3.2.3 Spring Creek

Spring Creek is the main source of water for the UMSIC. The creek is located such that it will be able to be utilized for the system without pumping. The water can be captured above the reservoir and easily stored for future use. Spring creek may also be utilized to serve houses on the bench, which would require higher head pumps than are necessary to boost pressure to the houses in the lower part of the city.

CHAPTER 4 - PROPOSED PRESSURIZED IRRIGATION SYSTEM ALTERNATIVES

Uintah City requested that a number of Pressurized Irrigation System Alternatives be analyzed. The following chapter describes the Hydraulic Model and System Operating Criteria utilized in developing and evaluating the alternatives. This chapter also describes in detail the five requested alternatives.

4.1 Hydraulic Model Development

As part of Uintah City's Pressurized Irrigation Feasibility Study, a computerized hydraulic model was developed to size and plan out the location of the proposed secondary infrastructure. Haestad Method's Water CAD V8i was chosen to model the system's hydraulics. The model evaluates pipes, pump stations, storage reservoirs, and water demands. A model was created to test the implications of each alternative, utilizing the design and operating criteria developed by Franson Civil Engineers. Specific output for the models may be found in Appendix A. The model is not a full design model for each alternative; such a model will be produced during the design of the system.

4.1.1 System Pressure

System Pressure is based upon the criterion that dynamic pressures fall within the range of 30 to 80 psi. Regulating this pressure will require Pressure Reducing Valves for some of the alternatives. The system piping was sized for future peak instantaneous demands at all connections with velocities less than 5 feet per second.

4.1.2 Water Storage Locations

Storage sites were chosen according to each alternative. There were a number of sites identified as possible water storage locations during a site visit to the City. Currently there are four sites that have been identified as potential reservoir or storage tank locations. Two of the sites are up on the bench above the city, near the locations of the current culinary water tanks that serve the city. If a site is chosen on the bench it will most likely need to be a tank, as they have a smaller foot print and are more easily constructed and maintained on the side of a hill. The other sites are down off the hill. One is on the north side of the city near Highway 89. This location, however, would require full time booster pumps. The other reservoir site would be near Highway 84, in line with the transmission pipe from the Weber River. The storage tanks on the hill would be supplied by the UMSIC canal which would be gravity fed. As additional waters are needed to fill the tank, water would have to be pumped up to the tank in order to accommodate the large peaks. Alternative B would require a tank location that has not yet been identified, due the specific elevation required to maximize the efficiency of the system for the alternative.

4.1.3 Pump Station Location

The pump station location was selected to minimize head loss due to friction. The pump station is intended to lift water to the reservoir above the system and the reservoir is intended to serve

the pipeline with pressure. The location of the pump station is however, variable and can be moved depending on the availability of space within the easement, or available land to purchase.

4.1.4 Filtration

It is recommended that the system users install a filter system to increase the life and maintenance on their sprinkler systems. The water quality on the Weber River is such that individual filtration at the head of each user's system is a more cost effective way to handle the oversized particles.

A large filter system can be added to the system if desired. This will increase the head required to supply the system with pressure due to the head loss across the large system filters. It will also increase the capital cost as well as the operation and maintenance costs; however, it will insure a less particle-rich water supply for irrigation.

4.2 System Design and Operating Criteria

The following system design and operational criteria were utilized in formulating the plan for each alternative.

4.2.1 Water Demand Requirements

As discussed earlier, the peak instantaneous demand is 11.88 gpm/acre and the peak daily demand is 5.94 gpm/irrigated acre. These two values applied to the acreage, yield 12.8 cfs and 6.4 cfs of source demand. The future daily source demand of 6.4 is less than the low flow water right of 6.58. The future peak daily source demand is estimated to be approximately 6.4 cfs, which is also less than the current low flow water right; however, situations may arise in which the river in late fall may not yield this full amount, and the duty allowed by the state is insufficient to provide for the full future usage under some scenarios of water usage. It is recommended that the city take steps to secure more water rights for the future peak daily source demand.

4.2.2 Pressure Pipe Network

The proper sizing of the distribution pipelines is essential to ensure efficient and cost-effective water delivery. Determination of water line diameters was based on the following criteria:

- 30 to 80 psi pressure range at each demand to ensure sufficient pressure for sprinkler operation, but also prevent line damage with excessive pressures.
- A maximum velocity of 5 feet per second in all distribution lines to ensure minimal friction losses and prevent line damage, with velocities up to 7 feet per second for transmission lines.
- A minimum pipe size of 4 inches.
- HDPE, C-900 PVC pipe, C-905 PVC pipe are the alternatives to be used with an accompanying Hazen Williams friction loss coefficient of 130 to140, depending on pipe size.
- Pipe to have a minimum cover of 2 feet.

4.2.3 Pump Stations

Pumping rates from the canals were assumed to be steady. Estimations on the pump and motor efficiency were made depending on the pump type; these were utilized to determine horsepower and power requirements. It was assumed that power for the pumps could be purchased at $0.055 per KW-hour. Alternatives C and D require variable speed pumps, while Alternatives A and B will utilize constant speed pumps.

Wind power has also been discussed as a potential source of pumping power. Weber Canyon is particularly consistent in its wind. A sub alternative which could be applied to all alternatives in the study is wind powered pump stations.

4.2.4 Connections and Meters

Individual connections to the system for homeowners will be 1-inch in diameter and dual connections will be 1.5 inches in diameter. Dual connections allow two adjoining lot owners to share one connection from the main pipe, which saves installation costs. Constructions of the residential connections were assumed to utilize directional drilling to offer minimal asphalt reconstruction. Commercial and agricultural connections will need to be sized sufficiently to convey peak water demands for the properties.

A meter could be placed on each service connection in addition to the filter. The meters are optional and should be considered carefully.

4.3 Water Sources

As mentioned in Chapter 3, a number of alternatives exist as water sources. This study is based upon the utilization of water from the Weber River Diversion Structure and/or the WBWCD aqueduct, as well as water from Spring Creek which would be captured above the reservoir and would not require pumping. These sources could be added to the system at a later date if the opportunity arises.

4.4 Storage

Water storage for the system will be achieved with a tank. A reservoir could also be added to the system. The reservoir would provide more stability during large flow changes in the river. The storage facility is imperative to ensure adequate water supply during peak days, pressure in the water lines, and to enable the canals to divert water through the entire day due to watering only taking place from 6 PM to 10 AM.

The tank will enable the large peaks in demand to be met. During times of lower demand the tank will fill.

4.5 Distribution System Alternatives

The City staff and Irrigation Companies directed Franson Civil Engineers to evaluate a minimum of three distribution alternatives. Two additional alternatives were added to the evaluation, and a

sixth alternative was included to discuss the City's option of not continuing with a City-wide Pressurized Irrigation System. This alternative may have an adverse effect on the existing culinary system. The following describes, in more detail, the alternatives.

Four Pressurized Irrigation System alternatives had a preliminary evaluation done with a hydraulic computer model; the fifth alternative was found unfeasible. A Sixth alternative was included to discuss the City's option of not continuing with a citywide Pressurized Irrigation System. There are also two sub alternatives that account for the possibility of wind powered pumping and the placement of a reservoir in each alternative. Figures 4-1 through 4-4 show the pipe alignments for each alternative. The following describes, in more detail, the alternatives:

Alternative A

The water demands are entirely provided by the three irrigation company water rights. No water will be purchased from Weber Basin Water Conservancy District. A tank will be built on the bench near the other City water tanks. This tank would be above all the houses in the city and would require a pressure-reducing valve. Water will be boosted to fill the peaking tank.

Alternative B

The water demands are entirely provided by the three irrigation company water rights. No water will be purchased from WBWCD. A tank will be placed at a specific elevation to serve the lower part of the system with adequate pressure. The tank's elevation will not allow all homes on the bench to be served from the tank. The Mountain Streams water could be use for a portion of the season to serve houses above the tank; however, the stream does not always run for the entire summer. As a sub alternative to this alternative a small amount of water could be purchased from WBWCD to supplement service to the houses above the tank in the late summer if Spring Creek is dry.

Alternative C

This alternative evaluated a dual system, with lower and upper divisions. The lower section would be boosted and the upper section would rely on Mountain Streams water and a small tank. In the late fall, a portion of the water would have to be purchased from WBWCD to serve the residences up on the bench.

Alternative D

This Alternative would exclude the houses on the bench from service in the current phase of construction. The water would be boosted to the rest of the city.

Alternative E

All of the necessary water would be purchased in the WBWCD Aqueduct. The water would come from the 48-inch pipe. A peaking tank will be constructed just below the aqueduct. No boosting would be necessary. Water rights would be sold or transferred to help cover the costs of buying the needed water from current water users in the aqueduct.

Sub Alternative 1

The use of wind mills to pump water to a peaking tank will be considered for all alternatives with a tank. The wind mills would provide supplemental power to the pumps and reduce pumping costs. A detailed evaluation of the wind power available is beyond the scope of this study; however, it should not be overlooked due to the prime wind locations available near the city.

Sub Alternative 2

Reservoir storage for peaking will be evaluated for the alternatives. It is anticipated that with scheduled flood turns and nighttime sprinkling, no reservoir is currently needed to serve the city; however, storage will be needed to meet demands in the future. This will be confirmed during the design of the system.

No Pressurized Irrigation System Alternative

An additional alternative that the City could pursue is a no-action alternative in regards to a citywide Pressurized Irrigation System. The City would continue to operate its existing culinary water for outdoor use. Eventually there would have to be expansions in the culinary systems. A detailed evaluation of this alternative was not in the scope of this study; however, it is presumable that the culinary system would require additional storage, supply, and increased pipe sizes to account for the increased demands of outdoor watering. The expenses for these improvements may be very costly.

TANK LOCATION

PUMP STATION 2

PUMP STATION 1

LEGEND

ALTERNATIVE A PIPELINE ALIGNMENT

0 300' 600' 900' 1200'

N

FRANSON
CIVIL ENGINEERS

DATE: JANUARY 25, 2010

SCALE:

Canals.dwg
H:\CLIENTS\Wasatch Weber Area\Uintah Pressurized Irrigation System\Drawings

FIGURE 4-1
ALTERNATIVE A
PIPELINE ALIGNMENT

SERIVCED BY MOUNTAIN STREAM WATER

UNIDENTIFIED TANK LOCATION AT APPROXIMATELY ELEVATION 4650

PUMP STATION

LEGEND

ALTERNATIVE B PIPELINE ALIGNMENT

N

0 300' 600' 900' 1200'

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LAYOUT: alt B

FIGURE 4-2
ALTERNATIVE B
PIPELINE ALIGNMENT

SMALL TANK UPPER AREA SERVICED BY MOUNTAIN STREAMS WATER

BOOSTER PUMP STATION

LEGEND

ALTERNATIVE C PIPELINE ALIGNMENT

0 300' 600' 900' 1200'

N

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LAYOUT: alt C

FIGURE 4-3
ALTERNATIVE C
PIPELINE ALIGNMENT

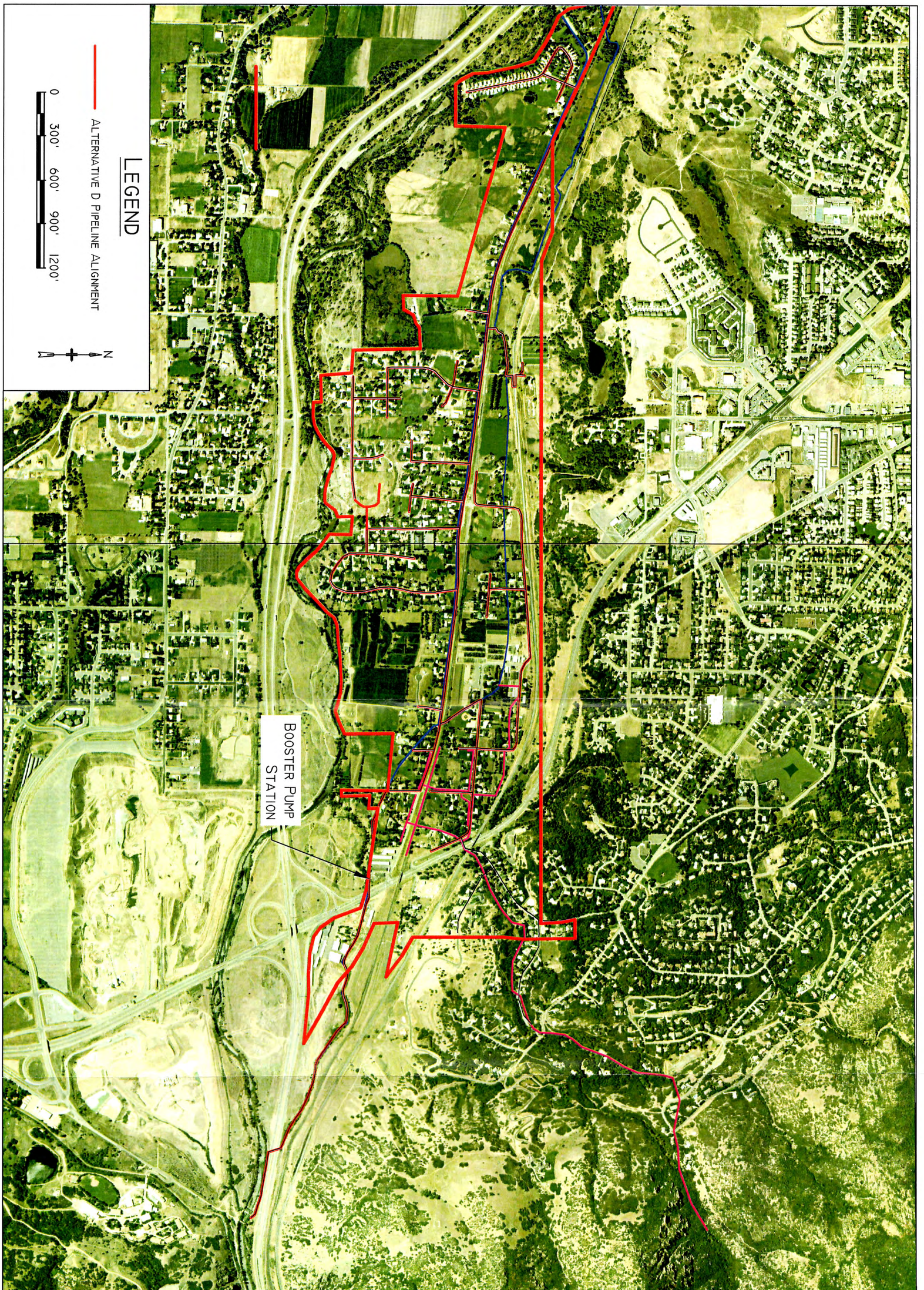

FIGURE 4-4

ALTERNATIVE D
PIPELINE ALIGNMENT

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LAYOUT: alt D

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CIVIL ENGINEERS

CHAPTER 5 - EVALUATION OF ALTERNATIVES

The cost to construct a Pressurized Irrigation System and the repayment rates and fees are very important to impacted citizens, and often determine the likelihood of a project. To assist with the decision making process, this chapter evaluates the five alternatives in regards to costs, repayment, environmental impacts and an institutional analysis.

5.1 Cost Estimates

An important aspect of a feasibility study is the cost of constructing the proposed facilities. The cost estimates summarized within the study were prepared as a support in the alternative evaluation. Costs were prepared from information available at the time of the estimate. Final costs incurred by the City will depend on actual labor and material costs, market conditions, site conditions, scope of work and other fluctuating factors. Due to these varying factors, it is recommended that specific project budgets be examined individually.

5.1.1 Construction Cost Estimates

Table 5-1 summarizes the total costs of the five alternatives, and Table 5-2 shows the estimated costs to include wind power or a reservoir. These sub-alternatives can be added to any alternative to aid with peaking demand and late summer water shortages, and increasing power costs. Tables 5-3 to 5-6 compare, in more detail, the cost estimate for each alternative. Costs were developed using information from the City, local material suppliers, and similar project costs along the Wasatch Front. The total construction cost includes estimates of Capital Improvements, Contingency, Land Acquisition, Design and Construction Engineering.

Table 5-1: Alternative Estimated Total Cost Summary

	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Construction Cost	$2,185,766	$1,973,877	$1,738,514	$1,584,310	$ 1,500,000
Design, Land & Admin Cost	$468,513	$439,619	$316,615	$272,860	$ 250,000
Total Project Cost	$2,654,279	$2,413,496	$2,055,129	$1,857,170	$ 12,500,000

Table 5-2: Sub Alternatives Estimated Total Cost Summary

	Wind Power	Reservoir
Construction Cost	$200,000	$300,000
Design, Land & Admin Cost	$100,000	$175,000
Total Project Cost	**$300,000**	**$475,000**

5.1.1.1 Cost Estimates Tables

Capital improvements are factored into the current cost estimate. A detailed Cost Estimate for each alternative is given in Tables 5-3 to 5-6. Anticipated capital improvements include: a pump station, tank or reservoir storage, and distribution facilities for the Pressurized Irrigation System. The diversion structure is currently undergoing an upgrade. The majority of the costs, approximately 75 to 80 percent, are incurred while constructing the distribution lines including the pipe, fittings, valves, asphalt replacement, and connections.

Table 5–3: Alternative A – Estimate of Pressurized Irrigation System Cost

Item	Item	Unit	Approx. Quantity	Unit Price	Total Price
Mobilization		LS	1	$10,000	$10,000
Construction Surveying		LS	1	$8,000	$8,000
Site Clearing		LS	1	$8,000	$8,000
Quality Control - Materials Testing		LS	1	$5,000	$5,000
Traffic Control		LS	1	$10,000	$10,000
Connect to existing Pipe at Diversion		LS	1	$3,000	$3,000
Install Pipe In Pavement					
	Furnish and Install 18" PVC 80 psi	LF	4210	$49	$206,272
	Furnish and Install 14" PVC 80 psi	LF	4162	$35	$145,676
	Furnish and Install 12" PVC 80 psi		745	$29	$21,597
	Furnish and Install 10" PVC 80 psi	LF	0.0	$25	$0
	Furnish and Install 8" PVC 80 psi	LF	2594	$20	$51,872
	Furnish and Install 6" PVC 80 psi	LF	3039	$16	$48,615
	Furnish and Install 4" PVC 80 psi	LF	7274	$14	$101,839
Install Pipe					
	Furnish and Install 18" PVC 80 psi	LF	6314	$24	$151,546
	Furnish and Install 14" PVC 80 psi	LF	6243	$19	$118,622
	Furnish and Install 12" PVC 80 psi	LF	1117	$17	$18,991
	Furnish and Install 10" PVC 80 psi	LF	0.0	$15	$0
	Furnish and Install 8" PVC 80 psi	LF	3890	$11	$42,794
	Furnish and Install 6" PVC 80 psi	LF	4557	$9	$41,019
	Furnish and Install 4" PVC 80 psi	LF	10911	$7	$76,379
Pump System					
	Pumps	EA	6.0	$25,000	$150,000
	Land acquisition for pump station	EA	1.0	$50,000	$50,000
Furnish and Install Valves					
	Butterfly valves	EA	4	$4,000	$16,000
	Check Valves	EA	2	$8,000	$16,000
	PRV	EA	1	$15,000	$15,000
Install Flood turnouts		EA	12	$4,000	$48,000
Install Turnout/Connections residential areas		EA	364	$800	$291,200
Install Drain to field		EA	2	$5,000	$10,000
Slip line across existing freeway conduit		LS	1	$8,000	$8,000
500,000 gallon tank		LS	1	$350,000	$350,000
	Land acquisition for Tank	LS	1	$100,000	$100,000
10,000 gallon tank		LS	na	na	na
				Sub Total=	$2,123,423
	10% contingency				$212,342
	Engineering fees 15%				$318,514
				TOTAL=	$2,654,279

Table 5–4 Alternative B – Estimate of Pressurized Irrigation System Cost

Item	Item	Unit	Approx. Quantity	Unit Price	Total Price
Mobilization		LS	1	$10,000	$10,000
Construction Surveying		LS	1	$8,000	$8,000
Site Clearing		LS	1	$8,000	$8,000
Quality Control - Materials Testing		LS	1	$5,000	$5,000
Traffic Control		LS	1	$10,000	$10,000
Connect to existing Pipe at Diversion		LS	1	$3,000	$3,000
Install Pipe In Pavement					
	Furnish and Install 18" PVC 80 psi	LF	4210	$49	$206,272
	Furnish and Install 14" PVC 80 psi	LF	3314	$35	$115,982
	Furnish and Install 12" PVC 80 psi		745	$29	$21,597
	Furnish and Install 10" PVC 80 psi	LF	0	$25	$0
	Furnish and Install 8" PVC 80 psi	LF	2594	$20	$51,872
	Furnish and Install 6" PVC 80 psi	LF	3038	$16	$48,615
	Furnish and Install 4" PVC 80 psi	LF	7088	$14	$99,238
Install Pipe					
	Furnish and Install 18" PVC 80 psi	LF	6314	$24	$151,546
	Furnish and Install 14" PVC 80 psi	LF	4971	$19	$94,442
	Furnish and Install 12" PVC 80 psi		1117	$17	$18,991
	Furnish and Install 10" PVC 80 psi	LF	0	$15	$0
	Furnish and Install 8" PVC 80 psi	LF	3890	$11	$42,794
	Furnish and Install 6" PVC 80 psi	LF	4558	$9	$41,019
	Furnish and Install 4" PVC 80 psi	LF	10633	$7	$74,429
Pump System					
	Pumps	EA	3	$22,000	$66,000
	Land acquisition for pump station	EA	1	$50,000	$50,000
Furnish and Install Valves					
	Butterfly valves	EA	4	$4,000	$16,000
	Check Valves	EA	na	na	na
	PRV	EA	na	na	na
Install Flood turnouts		EA	12	$4,000	$48,000
Install Turnout/Connections residential areas		EA	340	$800	$272,000
Install Drain to field		EA	2	$5,000	$10,000
Slip line across existing freeway conduit		LS	1	$8,000	$8,000
500000 gallon tank		LS	1	$350,000	$350,000
	Land acquisition for Tank	LS	1	$100,000	$100,000
10,000 gallon tank		LS	1	na	na
				Sub Total=	$1,930,797
	10% contingency				$193,080
	Engineering fees 15%				$289,620
				TOTAL=	$2,413,497

Table 5–5 Alternative C – Estimate of Pressurized Irrigation System Cost

Item	Item	Unit	Approx. Quantity	Unit Price	Total Price
Mobilization		LS	1	$10,000	$10,000
Construction Surveying		LS	1	$8,000	$8,000
Site Clearing		LS	1	$8,000	$8,000
Quality Control - Materials Testing		LS	1	$5,000	$5,000
Traffic Control		LS	1	$10,000	$10,000
Connect to existing Pipe at Diversion		LS	1	$3,000	$3,000
Install Pipe In Pavement					
	Furnish and Install 18" PVC 80 psi	LF	4210	$49	$206,272
	Furnish and Install 14" PVC 80 psi	LF	3196	$35	$111,877
	Furnish and Install 12" PVC 80 psi		695	$29	$20,151
	Furnish and Install 10" PVC 80 psi	LF	609	$25	$15,223
	Furnish and Install 8" PVC 80 psi	LF	2594	$20	$51,872
	Furnish and Install 6" PVC 80 psi	LF	3445	$16	$55,122
	Furnish and Install 4" PVC 80 psi	LF	7274	$14	$101,839
Install Pipe					
	Furnish and Install 18" PVC 80 psi	LF	6314	$24	$151,546
	Furnish and Install 14" PVC 80 psi	LF	4795	$19	$91,100
	Furnish and Install 12" PVC 80 psi		1042	$17	$17,719
	Furnish and Install 10" PVC 80 psi	LF	913	$15	$13,701
	Furnish and Install 8" PVC 80 psi	LF	3890	$11	$42,794
	Furnish and Install 6" PVC 80 psi	LF	5168	$9	$46,509
	Furnish and Install 4" PVC 80 psi	LF	10911	$7	$76,379
Pump System					
	Pumps	EA	4	$31,000	$124,000
	Land acquisition for pump station	EA	1	$50,000	$50,000
Furnish and Install Valves					
	Butterfly valves	EA	4	$4,000	$16,000
	Check Valves	EA	na	na	na
	PRV	EA	na	na	na
Install Flood turnouts		EA	12	$4,000	$48,000
Install Turnout/Connections residential areas		EA	340	$800	$272,000
Install Drain to field		EA	2	$5,000	$10,000
Slip line across existing freeway conduit		LS	1	$8,000	$8,000
500000 gallon tank		LS	na	na	na
	Land acquisition for Tank	LS	1	$20,000	$20,000
10,000 gallon tank		LS	1	$50,000	$50,000
				Sub Total=	$1,644,103
	10% contingency				$164,410
	Engineering fees 15%				$246,616
				TOTAL=	$2,055,129

Table 5–6 Alternative D – Estimate of Pressurized Irrigation System Cost

Item	Item	Unit	Approx. Quantity	Unit Price	Total Price
Mobilization		LS	1	$10,000	$10,000
Construction Surveying		LS	1	$8,000	$8,000
Site Clearing		LS	1	$8,000	$8,000
Quality Control - Materials Testing		LS	1	$5,000	$5,000
Traffic Control		LS	1	$10,000	$10,000
Connect to existing Pipe at Diversion		LS	1	$3,000	$3,000
Install Pipe In Pavement					
	Furnish and Install 18" PVC 80 psi	LF	4210	$49	$206,272
	Furnish and Install 14" PVC 80 psi	LF	2779	$35	$97,282
	Furnish and Install 12" PVC 80 psi		695	$29	$20,151
	Furnish and Install 10" PVC 80 psi	LF	609	$25	$15,223
	Furnish and Install 8" PVC 80 psi	LF	2594	$20	$51,872
	Furnish and Install 6" PVC 80 psi	LF	3038	$16	$48,615
	Furnish and Install 4" PVC 80 psi	LF	6666	$14	$93,329
Install Pipe					
	Furnish and Install 18" PVC 80 psi	LF	6314	$24	$151,546
	Furnish and Install 14" PVC 80 psi	LF	4169	$19	$79,216
	Furnish and Install 12" PVC 80 psi		1042	$17	$17,719
	Furnish and Install 10" PVC 80 psi	LF	913	$15	$13,701
	Furnish and Install 8" PVC 80 psi	LF	3890	$11	$42,794
	Furnish and Install 6" PVC 80 psi	LF	4558	$9	$41,019
	Furnish and Install 4" PVC 80 psi	LF	10000	$7	$69,997
Pump System					
	Pumps	EA	3	$31,000	$93,000
	Land acquisition for pump station	EA	1	$50,000	$50,000
Furnish and Install Valves					
	Butterfly valves	EA	4	$4,000	$16,000
	Check Valves	EA	na	na	na
	PRV	EA	na	na	na
Install Flood turnouts		EA	12	$4,000	$48,000
Install Turnout/Connections residential areas		EA	335	$800	$268,000
Install Drain to field		EA	2	$5,000	$10,000
Slip line across existing freeway conduit		LS	1	$8,000	$8,000
500000 gallon tank		LS	na	na	na
	Land acquisition for Tank	LS	na	na	na
10,000 gallon tank		LS	na	na	na
				Sub Total=	$1,485,737
	10% contingency				$148,574
	Engineering fees 10%				$222,860
				TOTAL=	$1,857,171

5.1.1.2 Contingency

It is common practice to apply a contingency factor in the feasibility level cost estimates to cover unforeseen expenses. The contingency for this study was approximated at 10 percent.

5.1.1.3 Land Acquisition

Land acquisition costs were estimated to include additional land required by the City to place pump stations and storage facilities. For estimation purposes it was assumed that an undeveloped acre in Uintah City would cost $100,000.

5.1.1.4 Design and Construction Engineering

Design engineering includes those costs associated with preparing design drawings, technical specifications, and contract documents. Construction Management includes the cost to ensure the system is built according to specifications and, if necessary, to make design changes during construction. These costs have been approximated to be 15 percent of the total construction costs.

5.1.2 Annual Operation and Maintenance Cost Estimates

Annual Operation and Maintenance (O&M) cost estimates are required for the economic and repayment analysis. The annual O&M costs for a secondary water system include operating the pump stations and water lines; and also the maintenance of the storage facilities, pump stations, and water lines. The costs include equipment, labor, materials, and power charges for pump operations. Administration fees are not included in the cost estimate and are assumed to be undertaken by Uintah City.

Table 5-7: Estimated Pressurized Irrigation System O&M Costs

Operation & Maintenance Item	Alternative A Estimated Secondary O&M Costs	Alternative B Estimated Secondary O&M Costs	Alternative C Estimated Secondary O&M Costs	Alternative D Estimated Secondary O&M Costs
Pumping Operation Costs	$40,470	$31,517	$38,892	$38,892
Pumping Maintenance	$20,000	$10,000	$18,600	$18,600
Total:	**$60,471**	**$41,517**	**$57,492**	**$57,492**

*This table does not consider individual, maintenance or labor costs to keep individual user filters in operation.

5.2 Economic Analysis

Another important aspect of a feasibility study is the Economic Analysis, or how the City will pay for the construction and annual O&M of a secondary water system. The financing of the system will come by way of connection fees, impact fees, and user rates. Connection fees are used to pay for facilities that benefit an existing property owner at the time of the connection. Impact fees are used to pay for the impacts that the new development incurs on an existing system. User rates are generally used to pay capital cost installments, debt service, annual O&M expenses, and future replacement costs.

5.2.1 *Cash Flow Summary*

In order to compare sample rates and fees necessary to fund each Pressurized Irrigation System alternative, generation of revenues and debt service payments are based on the number of existing connections. It was also assumed that connection to the new system would be mandatory.

The analysis assumed the following rates and fees: secondary rates would not be more than the average culinary water rates, the existing Pressurized Irrigation System user's connection fee would be a maximum of $1,000, and share holders will not pay more than $30 per share per year. If the connection fee is $1,000 and 364 people connect, this will generate $364,000 in revenue. This revenue was used in the analysis to pay down principal. The analysis is shown in Table 5-8. The costs have been shown on a per connection basis.

5.2.2 *Rates and Fee Summary*

It is anticipated that the City may want to alter the above mentioned finance fees and rates. Due to budgetary concerns, it is likely that the Pressurized Irrigation System will not be metered; therefore the user rates could be defined by lot size or be charged simply by connection (as shown in table 5-8). However, meters throughout the system are recommended. Table 5-8 summarizes a sample rate and fee comparison for each alternative. A connection based rate is shown for each alternative. Once the City makes a decision regarding the implementation of the Pressurized Irrigation System, a detailed rate study should be initiated to determine actual fees and rates for each lot or connection size, and each land use type.

Table 5-8: Proposed Pressurized Irrigation System Rate Structure

Item	Alt. A	Alt. B	Alt. C	Alt. D
Alternative Cost estimate	$2,654,279	$2,413,497	$2,055,129	$1,857,171
Connection fees ($1000)	$364,000	$364,000	$364,000	$335,000
Balance	$2,290,279	$2,049,497	$1,691,129	$1,522,171
Interest	2.60%	2.60%	2.60%	2.60%
Period	30	30	30	30
Payment on loan per year	$110,900	$99,200	$81,900	$73,700
Pumping Cost : .055 $/KW-hour	$40,471	$31,517	$38,892	$38,892
Pumping maintenance	$20,000	$10,000	$18,600	$18,600
Total Payment Per year	$171,371	$140,717	$139,392	$131,192
Balance after stockholder user deduction	$155,831	$125,177	$123,852	$115,652
Acres Serviced	321	321	321	306
Number of Connections	364	364	364	335
Payment per connection per year	$428	$344	$340	$345
Payment per month per connection	**$35.68**	**$28.66**	**$28.35**	**$28.77**

5.2.3 Existing Culinary Rates and Fees

The current monthly rates for culinary water for residents and businesses are $13 for the first 15,000 gallons, with an average of $1.62/1,000 gallons over four tiers. Current monthly agriculture rates are $24 for the first 15,000 gallons, with an average of $2.95/1,000 gallons over four tiers. The rates for water users outside the city limits are $36 for the first 15,000 gallons, with an average of $4.42/1,000 gallons over four tiers. The average water bill per household for culinary water is $40.44.

5.2.4 Culinary Outdoor Watering Cost Analysis

In order to objectively analyze the feasibility and added costs of a Pressurized Irrigation System to individual property owners, an analysis of current and future outdoor watering costs for residents can be beneficial. For a culinary water analysis, the City supplied the average cost of culinary water per household ($40.44). A constant indoor water usage can be assumed and therefore, by looking at a graph of water bills over a year, the indoor water use can be deduced. This value is approximately $24. If the Alternative B was implemented, the cost for outdoor water would be $28.66. Using this method, the average culinary bill would drop from $40.44 to around $24 dollars plus the new pressurized system costs of $28.66. This yields a total average monthly bill of $52.66. For a new Pressurized Irrigation System this cost increase is low. The major saving on the system would be realized as growth occurs and the City is forced to develop new water sources. Uintah city already pays overage charges to Weber Basin due to the culinary water usage.

5.3 Environmental Analysis

It is not likely that the proposed Pressurized Irrigation System will adversely affect the environment. The proposed system pipelines will be constructed within previously disturbed areas; preferably roadways, road shoulders, and existing ditch alignments. There may be some heavily water-dependant foliage along the existing canals that will not receive that water due to the pipe.

5.4 Institutional Analysis

There is currently enough water to meet existing demands. The City will want to establish a policy on collecting water rights from developers as developments are created .

CHAPTER 6 - CONCLUSIONS AND RECOMMENDATIONS

The purpose of this chapter is to establish conclusions and recommendations based upon this report's findings. The intent of the recommendations is to direct the City in its implementation of a citywide secondary water system.

6.1 Conclusions

Table 6-1 is organized to summarize the pros and cons of each alternative in regards to a number of issues. It appears from the data that a pressurized secondary water system is economically and environmentally viable for Uintah City. With the future increase of rates for treated culinary water, it appears that the citizens of Uintah City would save money by constructing a pressurized secondary water system. The following are conclusions described in the previous chapters:

1. Though groundwater, reuse water, and culinary water are possible water sources for outdoor irrigation, the existing canal water is the most economical water source at this time.
2. Alternative B is the most effective system option in regards to culinary water conservation, full city coverage, and cost. This alternative utilizes secondary water for all of the outdoor water users throughout the City and residential lots. It has a peaking tank, to handle larger demands and reduce pumping costs.
3. If the City decides not to utilize a citywide secondary water system, the culinary water system would need to be analyzed for the additional outdoor irrigation demands that the existing system requires. The potential expenses for these improvements may be very costly.
4. The cost estimates revealed that Alternative A involves the most expensive construction costs. The economical analysis revealed that Alternative C is the least expensive relative to average user rates. Alternative D requires the least amount of capital improvement costs.
5. The costs for implementation of the system would be a water bill increase of $10 to $15 a month. This is a low cost for implementation of a Pressurized Irrigation System.
6. The culinary rates are likely to increase if a citywide secondary water system is not constructed. Also, the WBWCD may have rate increases in the next few years. Beyond ten years, culinary rates are projected to increase dramatically as more expensive sources are developed.
7. The economic climate is such that building a Pressurized Irrigation System will most likely never be less expensive.

6.2 Recommendations

The following recommendations are based on past experience with Pressurized Irrigation System integration.

6.2.1 Decision Recommendations

Before a decision or vote is made regarding the Pressurized Irrigation System, it may be beneficial to receive more information, and also educate and inform the public. The following are recommendations of actions that could be taken:

1. **Culinary Water System Evaluation** – The City reports the current load on the culinary water system to be high. Placing future outdoor water demands on the culinary system would possible require some pipe sizing increases, as well as additional development of culinary water sources. The findings of this report are that the current indoor watering costs for Uintah City users is around $24 a month, while outdoor water costs around $17 a month. The cost per month to implement a new Pressurized Irrigation System will be from $28 to $35 per user, per month. This cost comparison does not account for the probable increase of water rates required to improve the culinary system and provide outdoor watering. Nor does it consider the projected increase in cost of water delivered by the WBWCD, as it brings more expensive sources of water on line in the future. Therefore, further evaluation of the culinary system could be beneficial to determine the cost of required improvements associated with outdoor watering, if a citywide secondary water system is not built.
2. **Pressurized Irrigation Water System Rate Study** – A rate study for the Pressurized Irrigation System could be conducted to determine how costs would be distributed to individual residents. The study would include an in-depth look at the complexities of combining the shareholders from the three canal companies. The rates provided in this report are average rates and are generalized. As a specific alternative is selected and the project progresses, the rates could be addressed more exactly. The rate study could determine user rates for different size lots, or actual usage if meters are installed, as well as residential versus institutional and commercial. Impact and connection fees would also be determined within the study.
3. **Culinary Water System Rate Study** – A rate study for the culinary water system could be conducted to determine probable rates if a Pressurized Irrigation System is not constructed. The rates would be based upon existing wholesale water costs, and costs associated with improving the culinary system to meet outdoor watering demands. The improvement costs would be supplied by the previously recommended culinary water system evaluation.
4. **Public Information Program** – Upon completion of the rate study and culinary water evaluation, a public information program could be instituted. This would clarify the information given to the city residents. Therefore, the program should specifically identify possible future rates for culinary and proposed citywide secondary water. The program will also assist in informing citizens of the advantages and disadvantages between utilizing a secondary or culinary system in outdoor irrigation, specifically water conservation.

6.2.2 Post Decision Recommendations

If the city decides to build a Pressurized Irrigation System, the following recommendations are made.

6.2.2.1 Public Education Program

It is recommended that a public education program be implemented. An understanding of how the system is to be used, watering times, plant selection, and water conservation techniques, should all be explained to the public. The program should provide information to both existing and new homeowners.

6.2.2.2 Cross Connection Policy

To protect the culinary water system from contamination, it is recommended that the City implement a stringent cross connection policy, if a citywide Pressurized Irrigation System is supported. The cross connection policy would apply to individual resident's connections, as well as contractors and developers who are constructing new distribution lines.

6.2.2.3 Secondary Design Criteria

If a citywide Pressurized Irrigation System is implemented, it is recommended that the City establish design criteria for secondary water systems that will be enforced by the city as new developments arise.

6.2.2.4 New Development Requirements

If the City implements a citywide secondary water system, the following should be required of new developments:

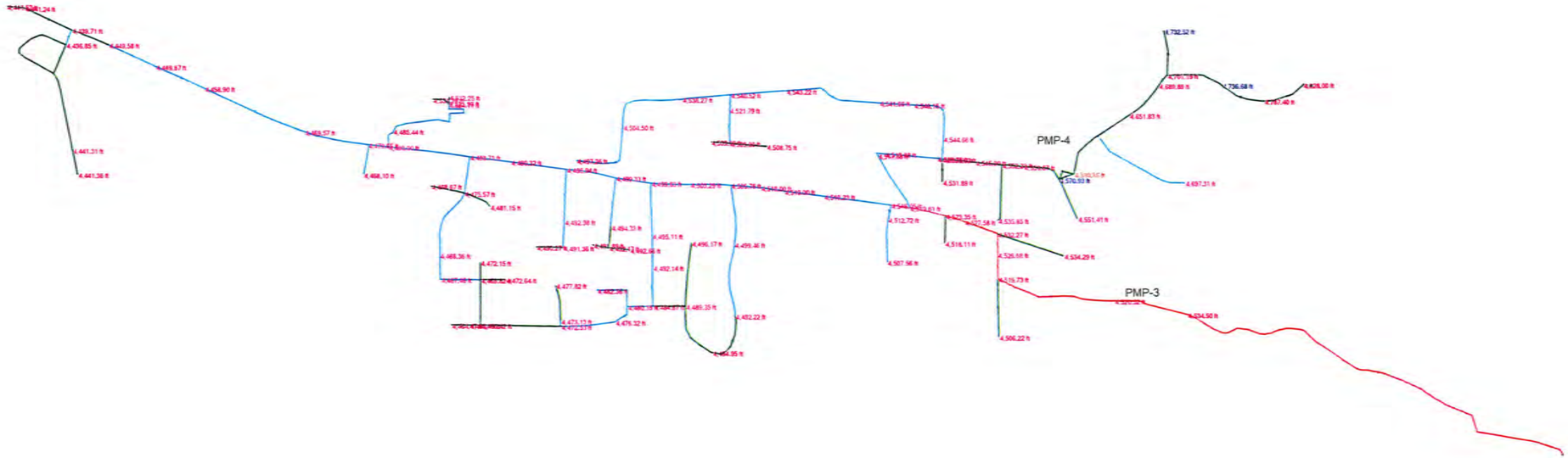
1. Pressurized Irrigation System Design – New developments should be required to submit design calculations demonstrating that the secondary water system meets the established design criteria.
2. Pressurized Irrigation System Installation – These new developments should also be required to install secondary piping. The piping should be C-900 PVC water line with valving approved for secondary water applications. The new piping should also be placed within the street or City right-of-way to allow for adequate access during necessary maintenance.
3. Provide Water Rights – The developments should be responsible for obtaining and providing water rights to the City.

6.2.2.5 Water Rights

It is recommended that the City aggressively work to preserve its existing water rights. Some water right changes will need to be made if the proposed system is implemented.

Appendix A – Hydraulic Modeling

Scenario: tank on hill



Uintah Pressurized Irrigation System Study

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
25	J-1	4,525.90	0	4,639.28	49.1
26	J-x	4,532.25	25	4,639.28	46.3
30	J-2	4,509.00	0	4,637.96	55.8
31	J-3	4,509.00	40	4,637.72	55.7
34	J-5	4,492.66	25	4,651.28	68.6
36	J-6	4,523.35	0	4,668.09	62.6
37	J-7	4,518.11	48	4,667.62	64.7
40	J-9	4,507.56	367	4,659.59	65.8
42	J-10	4,434.15	7	4,620.28	80.5
45	J-12	4,472.53	0	4,635.59	70.5
46	J-13	4,477.82	57	4,634.40	67.7
49	J-15	4,732.52	33	4,822.05	38.7
51	J-16	4,480.00	63	4,645.88	71.8
52	J-17	4,531.28	55	4,638.89	46.6
54	J-18	4,472.15	5	4,635.42	70.6
55	J-19	4,464.47	10	4,634.47	73.6
57	J-20	4,472.64	5	4,635.42	70.4
58	J-21	4,481.15	65	4,647.81	72.1
60	J-22	4,499.83	0	4,657.59	68.3
61	J-23	4,491.89	40	4,651.19	68.9
63	J-24	4,552.23	0	4,662.65	47.8
64	J-25	4,551.41	3	4,662.55	48.1
67	J-27	4,697.31	79	4,817.98	52.2
69	J-28	4,499.33	58	4,655.69	67.7
70	J-29	4,490.27	5	4,650.09	69.1
72	J-30	4,488.71	0	4,649.79	69.7
73	J-31	4,468.10	220	4,643.35	75.8
75	J-32	4,489.35	67	4,645.96	67.8
76	J-33	4,505.76	0	4,659.32	66.4
79	J-35	4,476.32	0	4,641.57	71.5
81	J-36	4,495.94	0	4,653.37	68.1
82	J-37	4,468.67	64	4,647.72	77.5
84	J-38	4,540.52	0	4,642.18	44.0
85	J-39	4,497.26	266	4,631.06	57.9
87	J-40	4,531.89	5	4,662.78	56.6
88	J-41	4,508.75	56	4,637.12	55.5
90	J-42	4,516.05	0	4,664.54	64.2
91	J-43	4,496.17	42	4,645.12	64.4
96	J-46	4,479.65	0	4,644.57	71.4
97	J-47	4,441.36	5	4,618.20	76.5
100	J-49	4,535.85	32	4,662.18	54.7
112	J-52	4,537.20	0	4,662.79	54.3
119	J-54	4,535.75	0	4,662.86	55.0

Uintah Pressurized Irrigation System Study

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
122	J-55	4,538.02	0	4,662.78	54.0
131	J-57	4,570.93	25	4,662.55	39.6
135	J-58	4,614.86	31	4,822.47	89.8
139	J-59	4,701.19	51	4,822.44	52.5
155	J-63	4,519.61	0	4,665.34	63.1
178	J-69	4,492.17	0	4,651.39	68.9
190	J-72	4,475.57	0	4,648.72	74.9
197	J-74	4,469.82	71	4,635.42	71.6
208	J-77	4,466.42	37	4,634.67	72.8
216	J-79	4,524.11	0	4,639.29	49.8
228	J-82	4,436.85	0	4,621.59	79.9
243	J-86	4,736.68	26	4,822.43	37.1
247	J-87	4,787.40	26	4,822.43	15.2
250	J-88	4,689.89	3	4,822.44	57.3
253	J-89	4,651.83	60	4,822.45	73.8
256	J-90	4,559.67	43	4,662.61	44.5
259	J-91	4,545.00	36	4,662.71	50.9
262	J-92	4,544.66	23	4,660.74	50.2
265	J-93	4,548.15	32	4,655.22	46.3
268	J-94	4,519.08	45	4,663.67	62.6
271	J-95	4,541.60	45	4,652.23	47.9
274	J-96	4,517.68	159	4,664.09	63.3
277	J-97	4,543.22	159	4,644.79	43.9
280	J-98	4,521.79	53	4,640.03	51.2

Uintah Pressurized Irrigation System Study

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
283	J-99	4,538.27	11	4,637.38	42.9
287	J-101	4,504.50	77	4,635.55	56.7
290	J-102	4,485.44	272	4,644.07	68.6
300	J-106	4,532.27	0	4,672.31	60.6
303	J-107	4,534.29	67	4,670.03	58.7
305	J-108	4,519.73	0	4,675.87	67.6
308	J-109	4,506.22	71	4,673.79	72.5
310	J-110	4,526.68	52	4,673.94	63.7
313	J-111	4,527.58	24	4,669.60	61.4
316	J-112	4,512.72	58	4,664.05	65.5
319	J-113	4,510.23	62	4,662.17	65.7
322	J-114	4,510.00	28	4,660.15	65.0
325	J-115	4,510.00	367	4,660.82	65.3
329	J-117	4,499.46	102	4,652.95	66.4
332	J-118	4,492.22	102	4,648.64	67.7
335	J-119	4,484.95	112	4,647.34	70.3
338	J-120	4,484.87	24	4,645.98	69.7
341	J-121	4,492.14	48	4,649.22	68.0
344	J-122	4,495.11	64	4,650.06	67.0
347	J-123	4,503.29	42	4,658.43	67.1
350	J-124	4,494.33	40	4,652.03	68.2
353	J-125	4,492.98	139	4,651.29	68.5
356	J-126	4,491.36	75	4,650.10	68.7
359	J-127	4,490.32	91	4,651.24	69.6

Uintah Pressurized Irrigation System Study

Current Time: 0.000 hours

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
362	J-128	4,468.36	83	4,644.72	76.3
365	J-129	4,467.46	54	4,639.66	74.5
368	J-130	4,465.71	36	4,634.49	73.0
371	J-131	4,473.13	37	4,635.26	70.1
374	J-132	4,469.57	80	4,641.88	74.6
378	J-134	4,458.90	85	4,630.67	74.3
381	J-135	4,449.87	484	4,626.24	76.3
384	J-136	4,449.58	35	4,624.43	75.6
387	J-137	4,441.31	55	4,618.21	76.5
390	J-138	4,432.77	67	4,620.24	81.1
393	J-139	4,439.71	0	4,623.44	79.5
396	J-140	4,441.24	0	4,622.98	78.6
398	J-141	4,441.52	34	4,622.82	78.4
400	J-142	4,534.50	104	4,530.25	-1.8
406	J-143	4,580.86	0	4,822.53	104.6
438	J-150	4,520.52	0	4,685.76	71.5
467	J-158	4,482.36	120	4,639.30	67.9
469	J-159	4,480.35	0	4,644.42	71.0
496	J-161	4,828.00	0	4,822.43	-2.4

Uintah Pressurized Irrigation System Study

Current Time: 0.000 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
Polyline	58.91	J-1	J-x	4.0	HDPE	13	0.32	0.000
816	58.91	J-1	J-x	4.0	HDPE	13	0.32	0.000
65E	200.62	J-2	J-3	4.0	HDPE	40	1.02	0.001
1C7	281.03	J-6	J-7	4.0	HDPE	48	1.22	0.002
785	464.42	J-59	J-15	4.0	HDPE	33	0.83	0.001
79A	1,055.19	J-58	J-27	4.0	HDPE	79	2.02	0.004
P-5	234.82	J-40	J-52	4.0	HDPE	-5	0.13	0.000
P-14	51.26	J-54	J-52	14.0	HDPE	1,214	2.53	0.001
P-15	35.28	J-52	J-55	14.0	HDPE	447	0.93	0.000
P-17	586.09	J-24	J-49	4.0	HDPE	32	0.82	0.001
P-20	444.34	J-57	J-25	4.0	HDPE	3	0.08	0.000
P-32	383.20	J-2	J-41	4.0	HDPE	56	1.42	0.002
P-37	380.21	J-6	J-63	18.0	HDPE	5,505	6.94	0.007
P-40	192.68	J-63	J-42	18.0	HDPE	4,087	5.15	0.004
P-48	653.17	J-32	J-43	4.0	HDPE	42	1.06	0.001
P-51	372.99	J-22	J-28	14.0	HDPE	2,353	4.90	0.005
P-55	167.94	J-69	J-23	4.0	HDPE	40	1.02	0.001
P-57	521.54	J-28	J-36	14.0	HDPE	2,191	4.57	0.004
P-63	378.29	J-30	J-72	8.0	HDPE	393	2.51	0.003
P-64	352.48	J-72	J-37	4.0	HDPE	64	1.62	0.003
P-66	307.90	J-72	J-21	4.0	HDPE	65	1.66	0.003
P-70	177.74	J-18	J-74	4.0	HDPE	-5	0.13	0.000
P-73	258.21	J-20	J-74	4.0	HDPE	-5	0.13	0.000
P-76	467.44	J-74	J-77	4.0	HDPE	47	1.20	0.002
P-80	562.78	J-12	J-35	4.0	HDPE	-130	3.32	0.011
P-83	182.53	J-79	J-17	4.0	HDPE	55	1.41	0.002
P-84	16.14	J-79	J-1	4.0	HDPE	25	0.64	0.001
P-85	849.10	J-30	J-16	12.0	HDPE	1,488	4.22	0.005
P-88	213.49	J-16	J-46	10.0	HDPE	1,072	4.38	0.006
P-89	313.00	J-46	J-31	6.0	HDPE	220	2.50	0.004
P-96	321.95	J-82	J-10	4.0	HDPE	77	1.97	0.004
P-101	598.60	J-59	J-86	14.1	HDPE	51	0.10	0.000
P-103	472.76	J-86	J-87	14.1	HDPE	25	0.05	0.000
P-106	142.07	J-88	J-59	14.1	HDPE	135	0.28	0.000
P-107	384.78	J-58	J-89	14.1	HDPE	198	0.41	0.000
P-108	433.43	J-89	J-88	14.1	HDPE	138	0.28	0.000
P-109	231.88	J-24	J-90	14.0	HDPE	378	0.79	0.000
P-110	426.00	J-90	J-57	14.0	HDPE	336	0.70	0.000

Uintah Pressurized Irrigation System Study

Current Time: 0.000 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-111	311.61	J-55	J-91	14.0	HDPE	447	0.93	0.000
P-112	279.00	J-91	J-24	14.0	HDPE	410	0.86	0.000
P-113	212.19	J-52	J-92	8.0	HDPE	763	4.87	0.010
P-115	606.77	J-92	J-93	8.0	HDPE	739	4.72	0.009
P-118	536.46	J-94	J-54	14.0	HDPE	1,214	2.53	0.001
P-119	356.97	J-93	J-95	8.0	HDPE	707	4.51	0.008
P-121	629.32	J-63	J-96	14.0	HDPE	1,418	2.96	0.002
P-122	124.67	J-96	J-94	12.0	HDPE	1,259	3.57	0.003
P-123	1,003.03	J-95	J-97	8.0	HDPE	662	4.23	0.007
P-124	585.41	J-97	J-38	8.0	HDPE	503	3.21	0.004
P-125	158.33	J-38	J-98	4.0	HDPE	148	3.78	0.014
P-126	342.39	J-98	J-2	4.0	HDPE	96	2.44	0.006
P-127	505.30	J-38	J-99	6.0	HDPE	355	4.03	0.009
P-129	831.60	J-99	J-101	8.0	HDPE	344	2.19	0.002
P-130	804.55	J-101	J-39	6.0	HDPE	266	3.02	0.006
P-131	192.68	J-16	J-102	6.0	HDPE	353	4.00	0.009
P-132	1,092.02	J-102	J-79	4.0	HDPE	80	2.05	0.004
P-133	219.51	J-69	J-5	4.0	HDPE	25	0.65	0.001
P-134	830.61	J-77	J-12	4.0	HDPE	-36	0.91	0.001
P-139	726.48	J-106	J-107	4.0	HDPE	67	1.72	0.003
P-142	599.44	J-108	J-109	4.0	HDPE	71	1.81	0.003
P-143	251.09	J-108	J-110	18.0	HDPE	5,696	7.18	0.008
P-144	214.90	J-110	J-106	18.0	HDPE	5,644	7.12	0.008
P-145	366.74	J-106	J-111	18.0	HDPE	5,577	7.03	0.007

Uintah Pressurized Irrigation System Study

Current Time: 0.000 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-146	206.47	J-111	J-6	18.0	HDPE	5,553	7.00	0.007
P-147	149.79	J-42	J-112	8.0	HDPE	425	2.71	0.003
P-148	441.39	J-112	J-9	6.0	HDPE	367	4.16	0.010
P-149	699.64	J-42	J-113	18.0	HDPE	3,662	4.62	0.003
P-152	314.79	J-114	J-33	18.0	HDPE	3,205	4.04	0.003
P-153	409.45	J-113	J-115	18.0	HDPE	3,600	4.54	0.003
P-154	247.24	J-115	J-114	18.0	HDPE	3,233	4.08	0.003
P-155	612.52	J-33	J-117	6.0	HDPE	373	4.23	0.010
P-157	751.82	J-117	J-118	6.0	HDPE	270	3.07	0.006
P-159	545.16	J-118	J-119	6.0	HDPE	168	1.91	0.002
P-160	608.24	J-119	J-32	4.0	HDPE	56	1.44	0.002
P-161	332.92	J-32	J-120	8.0	HDPE	-52	0.33	0.000
P-163	400.50	J-120	J-121	6.0	HDPE	-325	3.69	0.008
P-165	330.91	J-121	J-122	8.0	HDPE	-373	2.38	0.003
P-166	539.68	J-122	J-22	6.0	HDPE	-437	4.96	0.014
P-167	408.62	J-22	J-123	18.0	HDPE	-2,790	3.52	0.002
P-168	422.60	J-123	J-33	18.0	HDPE	-2,832	3.57	0.002
P-169	510.76	J-28	J-124	4.0	HDPE	105	2.68	0.007
P-170	214.47	J-124	J-69	4.0	HDPE	65	1.67	0.003
P-171	535.90	J-36	J-125	6.0	HDPE	219	2.49	0.004
P-173	273.88	J-125	J-126	4.0	HDPE	80	2.05	0.004
P-174	279.11	J-126	J-29	4.0	HDPE	5	0.13	0.000
P-175	581.91	J-36	J-127	14.0	HDPE	1,972	4.11	0.004
P-176	429.10	J-127	J-30	14.0	HDPE	1,881	3.92	0.003

Uintah Pressurized Irrigation System Study

Current Time: 0.000 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-178	725.82	J-128	J-72	6.0	HDPE	-265	3.00	0.006
P-179	412.48	J-74	J-129	4.0	HDPE	-128	3.26	0.010
P-180	257.04	J-129	J-128	4.0	HDPE	-181	4.63	0.020
P-181	113.35	J-77	J-130	4.0	HDPE	46	1.17	0.002
P-182	189.29	J-130	J-19	4.0	HDPE	10	0.26	0.000
P-183	56.85	J-12	J-131	4.0	HDPE	94	2.41	0.006
P-184	373.18	J-131	J-13	4.0	HDPE	57	1.45	0.002
P-185	674.57	J-46	J-132	10.0	HDPE	852	3.48	0.004
P-187	1,138.81	J-132	J-134	8.0	HDPE	772	4.92	0.010
P-189	557.29	J-134	J-135	8.0	HDPE	687	4.38	0.008
P-191	537.66	J-135	J-136	6.0	HDPE	203	2.30	0.003
P-193	813.71	J-10	J-137	4.0	HDPE	60	1.53	0.003
P-194	260.82	J-137	J-47	4.0	HDPE	5	0.13	0.000
P-195	431.48	J-10	J-138	4.0	HDPE	10	0.26	0.000
P-196	583.32	J-138	J-82	4.0	HDPE	-57	1.45	0.002
P-197	415.44	J-136	J-139	6.0	HDPE	168	1.90	0.002
P-198	164.40	J-139	J-82	4.0	HDPE	134	3.43	0.011
P-199	534.57	J-139	J-140	4.0	HDPE	34	0.86	0.001
P-200	184.85	J-140	J-141	4.0	HDPE	34	0.86	0.001
P-201	4,378.97	R-1	J-142	18.0	HDPE	5,871	7.40	0.008
P-206	497.43	J-143	J-58	14.0	HDPE	308	0.64	0.000
P-219	676.43	J-142	PMP-3	18.0	HDPE	5,767	7.27	0.008
P-224	1,257.55	J-150	J-108	18.0	HDPE	5,767	7.27	0.008
P-225	96.68	J-150	PMP-3	18.0	HDPE	-5,767	7.27	0.008

Uintah Pressurized Irrigation System Study

Current Time: 0.000 hours

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-236	233.48	J-35	J-159	4.0	HDPE	-130	3.32	0.012
P-237	485.66	J-159	J-158	4.0	HDPE	120	3.06	0.011
P-238	274.71	J-159	J-120	6.0	HDPE	-250	2.84	0.006
P-240	454.34	J-161	J-87	14.1	HDPE	0	0.00	0.000
P-242	18.77	J-161	T-6	6.0	HDPE	0	0.00	0.000
P-243	91.79	J-57	PMP-4	14.0	HDPE	308	0.64	0.000
P-244	115.45	PMP-4	J-143	14.0	HDPE	308	0.64	0.000
P-245	84.16	PRV-1	J-57	14.0	HDPE	0	0.00	0.000
P-246	76.12	PRV-1	J-143	14.0	HDPE	0	0.00	0.000

Appendix B – Water Rights

TABULATION OF WATER RIGHTS

SUBDIVISION WEBER RIVER AND SMALL TRIBUTARIES FROM GATEWAY TO LAKE

Right No.	Application No.	Certificate No.	Date of Priority	Name of Ditch	Name of Owner	Right Number References	Point of Diversion is in Section	T	R	Pe
A 1			1850	Mill Race Canal	Weber Canal Water Company	3, 13	19	5 N	1 W	Irrig
2			1850		Oregon Short Line Railroad Company	66, 77	29	6 N	1 W	Apr.
3			1850	Pincock Springs Ditch	Weber Canal Water Company	1, 13	5	5 N	1 W	Irrig
4			1850	Riverdale Mill Race	Associated Farmers Milling Company		19	5 N	1 W	Jan.
[illegible]			1850	Pipeline	Kendall, Timothy		21	5 N	1 W	Jan.
6			1850	Pipeline	Kendall, F. W.		21	5 N	1 W	Jan.
[illegible]			1850	Pipeline	Kendall, Ira N.		21	5 N	1 W	Jan.
8			1850	Unnamed Ditch	Hill, Archie T.		1	4 N	1 W	Irrig
9			1850	Pipeline	United States Army Arsenal		36	5 N	1 W	Jan.
A 10			1851	Riverdale Bench Canal	Riverdale Bench Canal Company	24, 26	28	5 N	1 W	Irrig
A 11			1851	B. L. Bybee Ditch	Pioneer Irrigation Canal Company		27	5 N	1 W	Irr
? 12			1852	Old Wilson Canal	Jenkins, Rose	101, 939, 982	25	6 N	2 W	Irr
A 13			1852	Weber Canal	Weber Canal Water Company	1, 3	18	5 N	1 W	Irr
A 14			1852	Jones Ditch	Jones Ditch Company		26	5 N	1 W	Irr
A 15			1852	South Weber Ditch	South Weber Irrigation Company		26	5 N	1 W	Irri
16			1852	Pipeline	Bybee, Byron L.	49, 57	25	5 N	1 W	Irr
A 17			1852	Uintah Central Canal	Uintah Central Canal Company		25	5 N	1 W	Irr
A 18			1853	Wilson Lane Canal	Old Wilson Irrigation Company	979	30	6 N	1 W	Irr
A 19			1853	Stimpson and Hinchcliff Ditch	Stimpson & Hinchcliff Ditch Company Mutual Association		20	5 N	1 W	Irr
20			1853	Pipeline	Anderson, Andrew A.		23	5 N	1 W	Irr
21			1853	Unnamed Ditch	Stoddard, W. R.		23	5 N	1 W	Irri
22			1853	Mountain Stream Ditch	Uintah Mountain Stream Irrigation Co.		23	5 N	1 W	Irri
A 23			1854	South Slaterville Ditch	South Slaterville Irrigation Company	985	24	6 N	2 W	Irr
24			1854	Parker & Company Ditch	Riverdale Bench Canal Company	10, 26	7	5 N	1 W	Irri
A 25			1856	Bambrough Ditch	Bambrough Irrigation Company	37	25	5 N	1 W	Irri
A 26			1857	Riverdale Bench Canal	Riverdale Bench Canal Company	10, 24	28	5 N	1 W	Irri
27			1857	Unnamed Ditch	Birt, Chas. T.		29	5 N	1 W	

A—See Paragraph 10.
?—There is some question as to this right being in good standing, due to non-use.

TABULATION OF WATER RIGHTS

SUBDIVISION WEBER RIVER AND SMALL TRIBUTARIES FROM GATEWAY TO LAKE

Period of Use	Purpose of Use	Used to Irrigate Land in	Acres Irrigated	Water Allotment in Second Feet			REMARKS	Right No.
				Flood	High	Low		
rigation Season	Irr. Stk.	Sec. 5, 6, 7, 8, T. 5 N., R. 1 W., and 31, 32, T. 6 N., R. 1 W.	209.00	5.22	4.18	2.61	Diverted from Weber River	1
pr. 15 to Sept. 15	Railroad and Irrigation	Sec. 32, T. 6 N., R. 1 W.	14.00	0.27	0.27	0.27	Diverted from Weber River	2
rigation Season	Irr. Stk.	Secs. 5, 6, 7, 8, T. 5 N., R. 1 W., 31 32, T. 6 N., R. 1 W.	Supplementary to Right No. 1				Diverted from Pincock Springs	3
an. 1 to Dec. 31	Power	Returned to River on Sec. 6, T. 5 N., R. 1 W.		42.00	42.00	42.00	Diverted from Weber River	4
an. 1 to Dec. 31	Irr. Dom. Stk.		0.50	0.02	0.02	0.02	Diverted from Jones Hollow Springs	5
an. 1 to Dec. 31	Irr. Dom. Stk.		0.50	0.02	0.02	0.02	Diverted from Kendall Spring	6
an. 1 to Dec. 31	Irr. Dom. Stk.		0.50	0.02	0.02	0.02	Diverted from Lewis Hollow Spring	7
rrigation Season	Irr. Dom. Stk.	Sec. 1, T. 4 N., R. 1 W.	7.00	0.10	0.10	0.08	Diverted from Spring Area	8
an. 1 to Dec. 31	Irr. Dom. Stk. Etc.	Arsenal Area	10.00	0.43	0.43	0.43	Diverted from Harbertson Springs, Nos. 1, 2	9
rrigation Season	Irr. Stk.	Secs. 6, 7, 12, 13, 18, 19, T. 5 N., R. 1 W.	330.30	8.26	6.61	4.13	Diverted from Weber River	10
rrigation Season	Irr. Stk.	Secs. 27, 28, T. 5 N., R. 1 W.	100.00	2.86	2.22	1.33	Diverted from Weber River	11
rrigation Season	Irrigation	Secs. 24, 25, T. 6 N., R. 2 W.	12.00	0.17	0.17	0.15	Diverted from Weber River	12
rrigation Season	Irr. Stk.	Secs. 4, 5, 7, 8, 18, T. 5 N., R. 1 W., and 32, 33, T. 6 N., R. 1 W.	432.00	10.80	8.64	5.40	Diverted from Weber River	13
rrigation Season	Irr. Stk.	Secs. 27, 28, T. 5 N., R. 1 W.	73.60	2.10	1.64	0.98	Diverted from Weber River	14
rrigation Season	Irr. Dom.	Secs. 20, 28, 29, T. 5 N., R. 1 W.	378.00	9.45	7.56	4.72	Diverted from Weber River	15
rrigation Season	Irrigation	Sec. 25, T. 5 N., R. 1 W.	2.00	0.033	0.033	0.033	Diverted from Hammer Spring	16
rrigation Season	Irr. Dom. Stk.	Secs. 21, 26, 27, T. 5 N., R. 1 W.	246.00	7.03	5.47	3.28	Diverted from Weber River	17
rrigation Season	Irr. Stk.	Secs. 24, 25, 30, T. 6 N., R. 1 W.	275.10	6.88	5.50	3.44	Diverted from Weber River	18
rrigation Season	Irr. Stk.	Secs. 18, 19, T. 5 N., R. 1 W.	60.00	1.71	1.33	0.80	Diverted from Weber River	19
rrigation Season	Irr. Dom. Stk. Power	Sec. 26, T. 5 N., R. 1 W.	8.90	0.15	0.15	0.11	Diverted from Springs Tributary to Anderson's Spring Fork, also 0.4 sec. ft. used for power from Jan. 1, to Dec. 31, 0.27 sec. ft. is returned to the natural channel	20
rrigation Season	Irrigation	Sec. 26, T. 5 N., R. 1 W.	3.00	0.05	0.05	0.05	Diverted from Borg Springs, also .06 sec. ft. from unnamed springs and used for domestic and stock purposes from Jan. 1, to Dec. 31.	21
rrigation Season	Irr. Dom. Stk.	Secs. 20, 23, T. 5 N., R. 1 W.	52.50	2.10	2.10	0.66	Diverted from Mountain Stream and Stubbs Springs and 13.5 Ac. Ft. Diverted from Mountain Stream Oct. 1, to July 1; Stored on Sec. 23, T. 5 N., R. 1 W. and used as a supplementary supply.	22
rrigation Season	Irr. Dom. Stk.	Secs. 10, 11, 13, 14, 15, 23, 24, T. 6 N., R. 2 W.	959.30	23.98	19.19	11.99	Diverted from Weber River	23
rrigation Season	Irr. Stk.		Supplementary to Rights No. 10 & No. 23				Diverted from Patterson or Fife Slough	24
rrigation Season	Irr. Dom. Stk.	Secs. 28, 29, 33, 34, 35, T. 5 N., R. 1 W.	187.50	5.36	4.17	2.50	Diverted from Weber River	25
rrigation Season	Irr. Stk.	Secs. 6, 7, 12, 13, 18, 19, T. 5 N., R. 1 W.	330.30	8.26	6.61	4.13	Diverted from Weber River	26
rrigation Season	Irr. Dom. Stk.	Sec. 29, T. 5 N., R. 1 W.	2.00	0.033	0.033	0.033	Diverted from Spring	27

UINTAH CENTRAL CANAL COMPANY

WATER RIGHT: **35-8017** APPLICATION/CLAIM NO.: CERT. NO.:
CHANGES: a13159 Certificate a1834 (Issued: 09/29/1989)

OWNERSHIP

NAME: Uintah Central Canal Company
ADDR: c/o Rulon Dye
1943 East 6600 South
Uintah UT 84405
INTEREST: 100% REMARKS:

DATES, ETC.

LAND OWNED BY APPLICANT? Yes COUNTY TAX ID#:
FILED: 04/06/1984|PRIORITY: / /1852|PUB BEGAN: 08/02/1984|PUB ENDED: |NEWSPAPER:
ProtestEnd:09/15/1984|PROTESTED: [No]|HEARNG HLD: |SE ACTION: [ ]|ActionDate: |PROOF DUE:
EXTENSION: |ELEC/PROOF:[ ]|ELEC/PROOF: |CERT/WUC: 09/29/1989|LAP, ETC: |LAPS LETTER:
RUSH LETTR: |RENOVATE: |RECON REQ: |TYPE: [ ]
PD BOOK: [35-]|MAP: [ ]|PUB DATE:
Type of Right: Decree Source of Info: Certificate Status:

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**********MAP VIEWER**********

FLOW: SOURCE: Weber River
COUNTY: Weber COMMON DESCRIPTION:

POINT OF DIVERSION -- SURFACE:
(1) N 1250 ft E 2950 ft from SW cor, Sec 25, T 5N, R 1W, SLBM
Diverting Works: Concrete inlet, pipe & canal Source: Weber River

Stream Alt Required?: No

USES OF WATER RIGHT****** *ELU -- Equivalent Livestock Unit (cow, horse, etc.)* ******** *EDU -- Equivalent Domestic Unit or 1 Family***

SUPPLEMENTAL GROUP NO. 208854. Water Rights Appurtenant to the following use(s):
35-212(CERT),8017

IRRIGATION: Sole Supply: UNEVALUATED acres Group Total: 246.0 Div Limit: 0.0 acft. PERIOD OF USE: 03/01 TO 10/31

STOCKWATER: Sole Supply: UNEVALUATED ELUs Group Total: 200.0000 Div Limit: PERIOD OF USE: 01/01 TO 12/31

DOMESTIC: Sole Supply: UNEVALUATED EDUs Group Total: 30.0000 Div Limit: PERIOD OF USE: 01/01 TO 12/31
Mar 16, 2007 -- admin decision to convert PERSONS/5 to FAMILIES and not use PERSONS.

(Orig Per:
150)

```
  ###PLACE OF USE:       *-------NORTH WEST QUARTER------*-------NORTH EAST QUARTER------*-------SOUTH WEST QUARTER------*-------SOUTH
EAST QUARTER------*   Section
                        *  NW   |  NE   |  SW   |  SE   *  NW   |  NE   |  SW   |  SE   *  NW   |  NE   |  SW   |  SE   *  NW   |  NE
|  SW   |  SE   *   Totals
 Sec 21 T  5N R  1W SLBM *X      |X      |X      |X      *X      |X      |X      |X      *X      |X      |X      |X      *X      |X
|X      |X      *      6.5000
 Sec 26 T  5N R  1W SLBM *X      |X      |X      |X      *X      |X      |X      |X      *X      |X      |X      |X      *X      |X
|X      |X      *    119.2000
 Sec 27 T  5N R  1W SLBM *X      |X      |X      |X      *X      |X      |X      |X      *X      |X      |X      |X      *X      |X
|X      |X      *    120.3000

GROUP ACREAGE TOTAL:    246.0000
```

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 21 T 5N R 1W SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sec 26 T 5N R 1W SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sec 27 T 5N R 1W SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

OTHER COMMENTS

FLOW: FLOOD: [illegible]

END OF DATA

CHANGE: **a13159** WATER RIGHT: 35-8017 CERT. NO.: a1834 COUNTY TAX ID#: AMENDATORY? No
BASE WATER RIGHTS: 35-8017
RIGHT EVIDENCED BY: Weber River Decree 17.
CHANGES: Point of Diversion [X], Place of Use [ ], Nature of Use [ ], Reservoir Storage [ ].

NAME: Uintah Central Canal Company
ADDR: c/o Rulon Dye
1943 East 6600 South
Uintah UT 84405

REMARKS:

FILED: 04/06/1984	PRIORITY: 04/06/1984	ADV BEGAN:	ADV ENDED:	NEWSPAPER:	
ProtestEnd:	PROTESTED: [No]	HEARNG HLD:	SE ACTION: [Approved]	ActionDate:01/04/1985	PROOF DUE: 08/31/1990
EXTENSION:	ELEC/PROOF: [Proof]	ELEC/PROOF:12/19/1988	CERT/WUC: 09/29/1989	LAP, ETC:	LAPS LETTER:
RUSH LETTR:	RENOVATE:	RECON REQ:	TYPE: [ ]		

Status: Certificate

H E R E T O F O R E

FLOW: 7.03 cfs

SOURCE: Weber River

COUNTY: Weber

POINT(S) OF DIVERSION ------> MAP VIEWER

Point Surface:

(1) N 1155 ft W 2045 ft from SE cor, Sec 25, T 5N, R 1W, SLBM

Dvrting Wks:

Source:

PLACE OF USE ------>

	NW¼				NE¼				SW¼				SE¼			
	N	W	E	S	N	W	E	S	N	W	E	S	N	W	E	S
Sec 21 T 5N R 1W SLBM	*	X	X	X	*	X	X	X	*	X	X	X	*	X	X	X
Sec 26 T 5N R 1W SLBM	*	X	X	X	*	X	X	X	*	X	X	X	*	X	X	X
Sec 27 T 5N R 1W SLBM	*	X	X	X	*	X	X	X	*	X	X	X	*	X	X	X

NATURE OF USE ------>

SUPPLEMENTAL to Other Water Rights: No

H E R E A F T E R

FLOW: 7.03 cfs

SOURCE: Weber River

COUNTY: Weber COM DESC: 1 Mi E of Uintah

CHANGED AS FOLLOWS: (Click Location link for WRPLAT)

Point Surface:

(1) N 1250 ft W 2250 ft from SE cor, Sec 25, T 5N, R 1W, SLBM

Dvrting Wks:

Source:

Stream Alt?: No

SAME AS HERETOFORE

SAME AS HERETOFORE

SUPPLEMENTAL to Other Water Rights: No

IRR: 246.0000 acs Sol/Sup: acs USED 04/01 - 10/31	
STK: 200.0000 Cattle or Equivalent USED 01/01 - 12/31	
DOM: 30.0000 Equivalent Domestic Units USED 01/01 - 12/31	

**********END OF DATA**********

CHANGE: **a4131** WATER RIGHT: 35-8049 CERT. NO.: a433 COUNTY TAX ID#: AMENDATORY? Yes
BASE WATER RIGHTS: ~~35-8049~~
RIGHT EVIDENCED BY: a3401 as amended by a4131
CHANGES: Point of Diversion [ ], Place of Use [ ], Nature of Use [ ], Reservoir Storage [ ].

NAME: ~~Uintah Central Canal Company~~
ADDR: co Parley Kendell
Rt. #4
Ogden UT

REMARKS:

FILED: 05/14/1962 | PRIORITY: 05/14/1962 | ADV BEGAN: | ADV ENDED: | NEWSPAPER:
ProtestEnd: | PROTESTED: [No] | HEARNG HLD: | SE ACTION: [ ] | ActionDate:09/21/1962 | PROOF DUE:
EXTENSION: | ELEC/PROOF: [ ] | ELEC/PROOF: | CERT/WUC: 04/15/1965 | LAP, ETC: | LAPS LETTER:
RUSH LETTR: | RENOVATE: | RECON REQ: | TYPE: [ ]
Status: Certificate

HERETOFORE	**HEREAFTER**
Flood High 10W .44 .27	
FLOW: 0.57 cfs	FLOW: 0.57 cfs
SOURCE: Weber River	SOURCE: Weber River
COUNTY: Weber	COUNTY: Weber COM DESC:
POINT(S) OF DIVERSION ------> MAP VIEWER	**SAME AS HERETOFORE**
Point Surface:	Point Surface: Different POD (1) N 1470 ft E 2180 ft from SW cor, Sec 25, T 5N, R 1W, SLBM Dvrting Wks: Steel headgate & Div. Strcts. Source: Weber River Stream Alt?: No
PLACE OF USE ------>	**SAME AS HERETOFORE**
--NW¼-- --NE¼-- --SW¼-- --SE¼-- N N S S | N N S S | N N S S | N N S S W E W E | W E W E | W E W E | W E W E	Sec 21 T 5N R 1W SLBM * : : : ** : : : ** : : : ** : :X:X* Sec 26 T 5N R 1W SLBM *X:X:X:X** : :X: ** : : : ** : : : * Sec 27 T 5N R 1W SLBM *X:X: :X**X:X:X:X** : : : ** : : : * Sec 28 T 5N R 1W SLBM * : : : ** :X: : ** : : : ** : : : *
NATURE OF USE ------>	**SAME AS HERETOFORE**

SUPPLEMENTAL to Other Water Rights: No		SUPPLEMENTAL to Other Water Rights: No
		IRR: 229.6000 acs Sol/Sup: acs USED 03701 1701

**********END OF DATA**********

20 acres

WATER RIGHT: **35-8049** APPLICATION/CLAIM NO.: CERT. NO.:
CHANGES: a3401 Certificate (Issued:)
a2662 Certificate (Issued:)
a4131 Certificate a433 (Issued: 04/15/1965)

Both say "Bad county" No real information

Primary right

OWNERSHIP

NAME: South Weber Irrigation Company
ADDR: 6525 South 475 East
South Weber, UT 84405
INTEREST: 100% REMARKS:

DATES, ETC.

LAND OWNED BY APPLICANT? Yes COUNTY TAX ID#:

FILED:	|PRIORITY: / /1890	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate: |PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC: |LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]	
PD BOOK: [35-]	|MAP: [ ]	|PUB DATE:		

Type of Right: Decree Source of Info: Certificate Status:

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**********MAP VIEWER**********

FLOW: 0.27 cfs SOURCE: Weber River
COUNTY: Weber COMMON DESCRIPTION: Uintah

POINT OF DIVERSION -- SURFACE:
(1) N 1470 ft E 2180 ft from SW cor, Sec 25, T 5N, R 1W, SLBM
Diverting Works: Uintah Central Canal ? Source: Weber River

Stream Alt Required?: No

USES OF WATER RIGHT****** *ELU -- Equivalent Livestock Unit (cow, horse, etc.) ******** EDU -- Equivalent Domestic Unit or 1 Family*

SUPPLEMENTAL GROUP NO. 208853. Water Rights Appurtenant to the following use(s):
35-8016(DEC),**8049**,8057(DEC)

IRRIGATION: Sole Supply: UNEVALUATED acres Group Total: 2.0 Div Limit: 0.0 acft. PERIOD OF USE: ~~03/01~~ TO 11/01

###PLACE OF USE:	*-------NORTH WEST QUARTER------*				*-------NORTH EAST QUARTER------*				*-------SOUTH WEST QUARTER------*				*-------SOUTH EAST QUARTER------*				Section
	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* Totals
Sec 25 T 5N R 1W SLBM	*				*				*				*				2.0000

GROUP ACREAGE TOTAL: 2.0000

SUPPLEMENTAL GROUP NO. 208883. Water Rights Appurtenant to the following use(s):
35-8016(DEC),8049,8057(DEC)

IRRIGATION: Sole Supply: UNEVALUATED acres Group Total: 229.6 Div Limit: 0.0 acft. PERIOD OF USE: 03/01 TO 11/01

STOCKWATER: Sole Supply: UNEVALUATED ELUs Group Total: 50.0000 Div Limit: PERIOD OF USE: 01/01 TO 12/31

DOMESTIC: Sole Supply: UNEVALUATED EDUs Group Total: 3.0000 Div Limit: PERIOD OF USE: 01/01 TO 12/31

Mar 16, 2007 -- admin decision to convert PERSONS/5 to FAMILIES and not use PERSONS.

(Orig Per:
15)

###PLACE OF USE: NORTH WEST QUARTER | NORTH EAST QUARTER | SOUTH WEST QUARTER | SOUTH EAST QUARTER

Section	NW	NE	SW	SE	Totals
Sec 21 T 5N R 1W SLBM					0.0000
Sec 23 T 5N R 1W SLBM					4.0000
Sec 26 T 5N R 1W SLBM	X	X	X	X	0.0000
Sec 27 T 5N R 1W SLBM	X	X	X	X	0.0000
Sec 28 T 5N R 1W SLBM				X	0.0000

GROUP ACREAGE TOTAL: 4.0000

This Right (35-8049) has an evaluated sole-supply total for irrigation of 0.0000 acres.

This Right (35-8049) is a member of 2 supplemental water right groups with irrigated acreage totaling 231.6000 acres.

OTHER COMMENTS

Weber River Decree No. 49
Proposed Determination No. 451 b. Pg. 152
Owner screen reflects title documents received. Water right information
obtained from certificate issued to Uintah Central Canal Company.

**********END OF DATA**********

Pioneer Irrigation Canal Company

WATER RIGHT: **35-8011** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Pioneer Irrigation Canal Company
ADDR: UT
INTEREST: 100% REMARKS:

DATES, ETC.

LAND OWNED BY APPLICANT? Yes COUNTY TAX ID#:

FILED:	|PRIORITY: / /1851	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		
PD BOOK: [35-]	|MAP: [ ]	|PUB DATE:			

Type of Right: Decree Source of Info: Proposed Determination Status:

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**********MAP VIEWER**********

FLOW: 2.86 cfs SOURCE: Weber River
COUNTY: Weber COMMON DESCRIPTION: Riverdale

POINT OF DIVERSION -- SURFACE:
(1) N 2178 ft W 136 ft from SE cor, Sec 27, T 5N, R 1W, SLBM
Diverting Works: B.L. Bybee Ditch Source: Weber River

Stream Alt Required?: No

USES OF WATER RIGHT****** *ELU -- Equivalent Livestock Unit (cow, horse, etc.)* ******** *EDU -- Equivalent Domestic Unit or 1 Family*

SUPPLEMENTAL GROUP NO. 208849.

IRRIGATION: 100.0 acres Div Limit: 0.0 acft. PERIOD OF USE: [redacted]
Used to irrigate 59.5 acres in the N1/2 Sec. 27 and 40.5 acres in Sec. 28 of

STOCKWATER: 50.0000 Stock Units Div Limit: PERIOD OF USE: 01/01 TO 12/31

###PLACE OF USE: *--------NORTH WEST QUARTER------*-------NORTH EAST QUARTER------*-------SOUTH WEST QUARTER------*-------SOUTH EAST QUARTER------* Section

	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	Totals
Sec 27 T 5N R 1W SLBM	*X	X	X	X	*X	X	X	X									49.5000

```
Sec 28 T  5N R  1W SLBM *X       |X       |X       |X       *X       |X       |X       |X
*________|________|________|________*________|________|________|________*      40.5000

GROUP ACREAGE TOTAL:      90.0000
```

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼ NW NE SW SE	NORTH-EAST¼ NW NE SW SE	SOUTH-WEST¼ NW NE SW SE	SOUTH-EAST¼ NW NE SW SE
Sec 27 T 5N R 1W SLBM	* X: X: X: X*	* X: X: X: X*	* : : : *	* : : : *
Sec 27 T 5N R 1W SLBM	* : : : *	* : : : *	* : : : *	* : : : *
Sec 28 T 5N R 1W SLBM	* X: X: X: X*	* X: X: X: X*	* : : : *	* : : : *
Sec 28 T 5N R 1W SLBM	* : : : *	* : : : *	* : : : *	* : : : *

OTHER COMMENTS

Not for official use
Weber River Decree Right No. 11
Proposed Determination No. 454 a & b, Page 153

END OF DATA

Unitah Mountain Streams Irrigation Company

WATER RIGHT: **35-8022** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Uintah Mountain Stream Irrigation Company
ADDR: c/o Claude E. Stuart
2110 East 6550 South
Ogden UT 84405
INTEREST: 100% REMARKS:

DATES, ETC.

LAND OWNED BY APPLICANT? Yes COUNTY TAX ID#:

FILED:	|PRIORITY: / /1853	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		
PD BOOK: [35-]	|MAP: [ ]	|PUB DATE:			

Type of Right: Decree Source of Info: Proposed Determination Status:

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**********MAP VIEWER**********

FLOW: 2.1 cfs SOURCE: Mountain Stream & Stubbs Springs
COUNTY: Weber COMMON DESCRIPTION:

POINTS OF DIVERSION -- SURFACE:
(1) N 1200 ft W 425 ft from SE cor, Sec 23, T 5N, R 1W, SLBM
Diverting Works: Mountain Stream Ditch Source: Mountain Stream & Stubbs Springs
(2) N 1200 ft W 425 ft from SE cor, Sec 23, T 5N, R 1W, SLBM
Diverting Works: Mountain Stream Ditch Source: Mountain Stream

Stream Alt Required?: No

USES OF WATER RIGHT****** *ELU -- Equivalent Livestock Unit (cow, horse, etc.)* ******** *EDU -- Equivalent Domestic Unit or 1 Family***

SUPPLEMENTAL GROUP NO. 208860.

IRRIGATION: 52.5 acres Div Limit: 0.0 acft. PERIOD OF USE: ~~03/01 TO 11/01~~

STOCKWATER: 110.0000 Stock Units Div Limit: PERIOD OF USE: 01/01 TO 12/31

DOMESTIC: 80.0000 EDUs Div Limit: PERIOD OF USE: 01/01 TO 12/31

###PLACE OF USE: *-------NORTH WEST QUARTER------*-------NORTH EAST QUARTER------*-------SOUTH WEST QUARTER------*-------SOUTH EAST QUARTER------* Section

* NW | NE | SW | SE * NW | NE | SW | SE * NW | NE | SW | SE * NW | NE | SW | SE * Totals

Sec 20 T 5N R 1W SLBM *X |X |X |X *X |X |X |X *X |X |X |X *X |X
|X |X * 0.0000
Sec 23 T 5N R 1W SLBM
*_____|_____|_____|_____*_____|_____|_____|_____*_____|_____|_____|_____*_____|_____|_____|X *
0.0000

GROUP ACREAGE TOTAL: 0.0000

PLACE OF USE for STOCKWATERING**********

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 20 T 5N R 1W SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sec 20 T 5N R 1W SLBM																
Sec 23 T 5N R 1W SLBM																
Sec 23 T 5N R 1W SLBM																X

Storage from 10/01 to 07/01, inclusive, in Unnamed Reservoir with a maximum capacity of acre-feet, located in:

Height of Dam: / Area Inundated:	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 23 T 5N R 1W SLBM																X

Small Dam Required?: No

OTHER COMMENTS**********

Weber River Decree No. 22
Not for official Use
Diverted from Mountain Stream and Stubbs Springs and 13.5 ac.ft. diverted from
Mountain Stream Oct. 1 to July 1; Stored on Sec. 23 T5N R1W and used as a
supplementary supply.
Proposed Determination No. 437 a,b.c. Pg. 148.

SEGREGATION HISTORY**********

This Right was Segregated from 35-8022 , with Appl#: , Approval Date: / / under which Proof is to be submitted.
This Right as originally filed:

FLOW IN	QUANTITY IN	WATER USES						
CFS	ACRE-FEET	IRRIGATED ACREAGE	STOCK (ELUs)	DOMESTIC (FAMILIES)	MUNICIPAL	MINING	POWER	OTHER
					ACRE-FEET			
2.1		52.5000	110.0000	80.0000				

domestic use is 80 persons not families; other use is storage right of 13.5 AF

The following Water Rights have been Segregated from 35-8022:
(1) WRNUM: 35-11198
APPL#:
NAME: Uintah Mountain Stream Irrigation Company
FILED: 01/15/2002 STATUS:
APPR:
other use is supplemental storage right of 13.5 AF

	CFS	ACRE-FEET	IRRIGATED ACREAGE	STOCK (ELUs)	DOMESTIC (FAMILIES)	MUNICIPAL	MINING	POWER	OTHER
						(*----------ACRE-FEET----------*)			
35-8022 currently has:	2.1		52.5000	110.0000	80.0000				

PROTESTANTS**********

NAME: Weber River Water Rights Committee
ADDR: (nonuse)
2837 East Highway 193
Layton UT 84040

NAME:
ADDR:

**********E N D O F D A T A**********

WATER RIGHT: **35-11198** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Uintah Mountain Stream Irrigation Company
ADDR: c/o Brent C. Stuart
2121 East 6450 South
Uintah, UT 84405

DATES, ETC.

LAND OWNED BY APPLICANT? COUNTY TAX ID#:

FILED: 01/15/2002	PRIORITY: / /1853	PUB BEGAN:	PUB ENDED:	NEWSPAPER:	
ProtestEnd:	PROTESTED: [No]	HEARNG HLD:	SE ACTION: [ ]	ActionDate:	PROOF DUE:
EXTENSION:	ELEC/PROOF:[ ]	ELEC/PROOF:	CERT/WUC:	LAP, ETC:	LAPS LETTER:
RUSH LETTR:	RENOVATE:	RECON REQ:	TYPE: [ ]		
PD BOOK: [35-]	MAP: [ ]	PUB DATE:			

Type of Right: Decree Source of Info: Ownership Segregation Status:

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**********MAP VIEWER**********

FLOW: [redacted] SOURCE: Mountain Stream & Stubbs Springs
COUNTY: Weber COMMON DESCRIPTION: Uintah

POINTS OF DIVERSION -- SURFACE:
(1) N 1200 ft W 425 ft from SE cor, Sec 23, T 5N, R 1W, SLBM
Diverting Works: Mountain Stream Ditch Source: Mountain Stream
(2) N 1200 ft W 425 ft from SE cor, Sec 23, T 5N, R 1W, SLBM
Diverting Works: Mountain Stream Ditch Source: Mountain Stream & Stubbs Springs

Stream Alt Required?: No

USES OF WATER RIGHT****** *ELU -- Equivalent Livestock Unit (cow, horse, etc.)* ******** *EDU -- Equivalent Domestic Unit or 1 Family***

SUPPLEMENTAL GROUP NO. 201250.

Storage from 10/01 to 07/01, inclusive, in Unnamed Reservoir with a maximum capacity of acre-feet, located in:

	NORTH-WEST¼	NORTH-EAST¼	SOUTH-WEST¼	SOUTH-EAST¼
Height of Dam:				
Area Inundated:	NW NE SW SE	NW NE SW SE	NW NE SW SE	NW NE SW SE
Sec 23 T 5N R 1W SLBM	* : : : *	* : : : *	* : : : *	* : : : X*

Small Dam Required?: No

DIVERSION & DEPLETION ESTIMATES

(All values in acre-feet, Growing Season in days)

	IRRIGATION	STOCK	DOMESTIC	MUNICIPAL	MINING	POWER	OTHER	MANUALLY EVALUATED	ACRE-FEET EXPORTED	DIVERSION DUTY	DEPLETION DUTY	GROWING SEASON	WATER-USE REPORTING
DIV:								Yes					
DEP:													

OTHER COMMENTS**********

This right represents the storage of 13.5 AF from October 1 to July 1, and used as a supplemental supply for irrigation under 35-8022. See Decree Award #22.

SEGREGATION HISTORY**********

This Right was Segregated from 35-8022 , with Appl#: , Approval Date: / / under which Proof is to be submitted.
This Right as originally filed:

FLOW IN CFS	QUANTITY IN ACRE-FEET	WATER USES						
		IRRIGATED ACREAGE	STOCK (ELUs)	DOMESTIC (FAMILIES)	MUNICIPAL	MINING	POWER	OTHER
					ACRE-FEET			

other use is supplemental storage right of 13.5 AF

PROTESTANTS**********

NAME: Weber River Water Rights Committee
ADDR: (nonuse)
2837 East Highway 193
Layton UT 84040

NAME:
ADDR:

APPLICATIONS FOR NONUSE OF WATER**********

EXT NUMBER: 1658	REQUST TO: 07/01/2005	LAST USED:	PRIOR FROM:	PRIOR TO:	
FILED: 06/23/2000	PUB BEGAN: 07/20/2000	PUB ENDED: 07/27/2000	NEWSPAPER: Standard Examiner		PROTEST END:08/16/2000
PROTESTED: [No]	HEARNG HLD:	SE ACTION: [Approved]	ActionDate:03/01/2002	PROOF DUE: 03/31/2007	PROOF SUB:
EXT NUMBER:	REQUST TO:	LAST USED: 13/ / 0	PRIOR FROM:	PRIOR TO:	
FILED: 03/30/2007	PUB BEGAN: 05/17/2007	PUB ENDED: 05/24/2007	NEWSPAPER: Standard Examiner		PROTEST END:06/13/2007
PROTESTED: [Yes]	HEARNG HLD:	SE ACTION: [Approved]	ActionDate:07/10/2007	PROOF DUE: 07/31/2012	PROOF SUB:

**********END OF DATA**********

WATER RIGHT: **35-1874** APPLICATION/CLAIM NO.: **D1346** CERT. NO.:

OWNERSHIP

NAME: Uintah Mountain Stream Irrigation Company
ADDR: c/o Claude E. Stuart
2110 East 6550 South
Ogden UT 84405
REMARKS: 0.84/1.04

NAME: Uintah Town
ADDR: Town Hall, Route 4, 2216 E. 6550 S.
Ogden UT 84403
REMARKS: 0.2/1.04

DATES, ETC.

LAND OWNED BY APPLICANT? COUNTY TAX ID#:

FILED: 11/27/1964	PRIORITY: / /1853	PUB BEGAN:	PUB ENDED:	NEWSPAPER:	
ProtestEnd:	PROTESTED: [No]	HEARNG HLD:	SE ACTION: [ ]	ActionDate:	PROOF DUE:
EXTENSION:	ELEC/PROOF: [ ]	ELEC/PROOF:	CERT/WUC:	LAP, ETC:	LAPS LETTER:
RUSH LETTR:	RENOVATE:	RECON REQ:	TYPE: [ ]		
PD BOOK: [35-]	MAP: [ ]	PUB DATE:			

Type of Right: Diligence Claim Source of Info: Diligence Claim Status:

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**********MAP VIEWER**********

FLOW: 1.04 cfs SOURCE: Cold Water & Squirrel Hole Spr. Area
COUNTY: Weber COMMON DESCRIPTION:

POINTS OF DIVERSION -- SURFACE:
(1) S 190 ft W 1170 ft from NE cor, Sec 26, T 5N, R 1W, SLBM
Diverting Works: Open Ditches and Pipelines Source: Squirrel Hole Spring Area
(2) S 270 ft W 430 ft from NE cor, Sec 26, T 5N, R 1W, SLBM
Diverting Works: Open Ditches and Pipelines Source: Cold Water Spring Area

Stream Alt Required?: No

USES OF WATER RIGHT****** *ELU -- Equivalent Livestock Unit (cow, horse, etc.)* ******** *EDU -- Equivalent Domestic Unit or 1 Family***

SUPPLEMENTAL GROUP NO. 202642.

IRRIGATION: 60.5 acres		Div Limit: 0.0 acft.	PERIOD OF USE: 04/01 TO 10/31
STOCKWATER: 37.0000 Stock Units		Div Limit:	PERIOD OF USE: 01/01 TO 12/31
DOMESTIC: 102.0000 EDUs		Div Limit:	PERIOD OF USE: 01/01 TO 12/31

###PLACE OF USE: *-------NORTH WEST QUARTER------*-------NORTH EAST QUARTER------*-------SOUTH WEST QUARTER------*-------SOUTH EAST QUARTER------* Section

	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* Totals
Sec 23 T 5N R 1W SLBM	*				*				*				*				* 2.7000
Sec 26 T 5N R 1W SLBM	* 6.4000	21.2000			* 6.8000	7.6000			* 4.2000	11.6000			*				* 57.8000

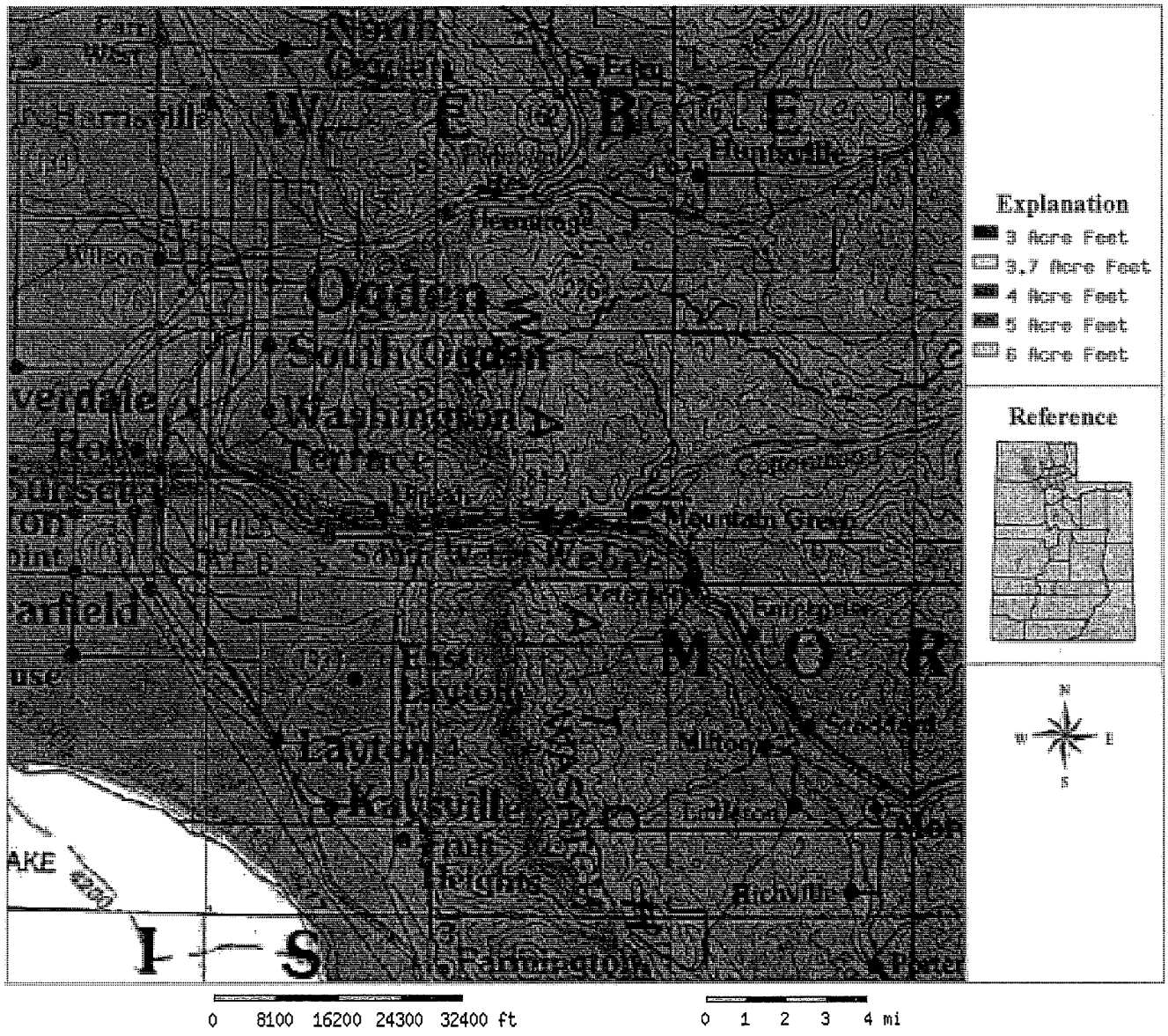
GROUP ACREAGE TOTAL: 60.5000

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 23 T 5N R 1W SLBM																X
Sec 26 T 5N R 1W SLBM	X	X		X	X	X	X									

END OF DATA

Utah Division of Water Rights



Appendix C – Information from Uintah City

UINTAH CITY

2191 East 6550 South • Uintah, UT 84405 • 801-479-4130 • Fax 801-476-7269

September 1, 2009

Franson Civil Engineers
Brent Stuart

Questions for Uintah City. Answers are highlighted in yellow

1. **Have any developments installed their own PI system already?**

   We have one system that is operated by Stu Boyd and severs the EnGedi (5 lots) and Bybee Subdivisions(4 lots)

2. **What is the City's current Zoning Plan, if they have one? Max Densities? Is there an existing map?**

   The following information is taken from the General Plan

   EXISTING LAND USES

   There are currently six land use areas allowed within Uintah City: Residential (RE20, RE50, RMH), Agricultural (AG), and Commercial (C1, C2). All of these land use areas allow for conditional uses, including home-based businesses.

   Residential

   There are approximately 635.74 acres of residential land within the city's limits, including associated streets. Lot sizes are generous ranging from 20,000 sq ft to 50,000 sq ft. All RE areas allow lots for large agrarian animals and suit the rural life style of the community. There are 17.2 acres classified as RMH, allowing for mobile homes within the community located on the west end of the city.

   The majority of the city is classified as RE20, which provides and protects residential development at a low density in a semi-agricultural or rural environment. It is also used to provide for rural amenities in larger minimum lots, in conjunction with the primary residential use. Lot sizes are a minimum of 0.459 acres. The RE50 zone serves the same purpose, as the RE20 only allowing for larger lot sizes there is currently no land zoned RE50 within the city's boarders.

   Agricultural

   The purpose of the AG areas is to designate farming areas where agricultural pursuits and the rural environment can be promoted and preserved. Currently only one area of the city has an AG, but

it is anticipated that the county A-1 areas when annexed would be placed in the AG classification.

Commercial

The purpose of the C1 and C2 areas is to provide suitable areas for the location of the various types of commercial activities needed to serve the people of Uintah and the surrounding communities. The commercial zones are situated primarily on the east side of Highway-89 with two commercial sites located on the west side of Highway-89 encompassing 10 acres of property.

LAND USE SUMMARY/PROPOSED CHANGES

Though current land use gives the appearance of a rural environment, Uintah is quickly moving into a suburban outcrop of the surrounding communities. Issues such as population growth, the need to retain water, provision of a safe pedestrian environment, protect environmentally sensitive lands, and the need to provide services to the City will force Uintah to make difficult decisions about its identity and future.

If the city is to continue to grow and provide the lifestyle that the residents currently enjoy, some changes to land use will need to be made. Uintah residents will need to be presented with nontraditional ways in which to improve their quality of life.

HOUSING CONDITIONS

Houses in Uintah on average were constructed during the 1970's with the median construction year being 1979. Construction booms also consisted of the decade of 1980 to 1990. Most houses built during this time were three bedroom homes. The current trend of building in Uintah consists of housing that is above average for the area. The average home size of three bedrooms is followed closely by two bedroom homes (Census Data 2000). Homes currently being constructed differ greatly from traditional house design in the use of materials and size.

Growth

With the understanding of the community that little to no growth is ideal to retain the community's quality of rural atmosphere, it is necessary to reduce the minimum lot size for future development and infrastructure needs of the city, i.e. sewer, curb and gutter, walking paths, or snow removal. Reduction of lot sizes in conjunction with design elements will allow for the protection of open space thus lending to the rural atmosphere of Uintah.

Reduction of Lot Size

Current developable land, 7,449,428 square feet, is based on recently annexed county land and other county lands that could be annexed in the future. This number excluded the lots above the cemetery due to access issues regarding the railroad crossing, the width of the road accessing the area, and environmental hazards,

see Section 6 Natural Hazards. The current lot size of ½ acre would allow for potential residential growth of approximately 372 lots at build out. A reduction in lot size to a 1/3 would allow for approximately 573 lots, ¼ lot size would allow for approximately 745 lots, and reduction of lot sizes to 1/8 acre lot would allow approximately 1,490 lots to be developed.

Lot Size	Lots At Build Out
Half Acre 20,000 sf	~372
Third Acre 13,000 sf	~573
Quarter Acre 10,000 sf	~745
Eighth an Acre 500 sf	~1,490

There is an existing map which is attached.

3. **Does the City have existing population projections?**
   NO

4. **What are the current City's culinary water rates?**

WATER USAGE FEES

The fees for water usage for the Uintah City Water Department shall be set as follows:

Month Fees For All Residents and/or Businesses Not Listed In Another Category	Minimum 15,000 Gallons	$13.00
	15,000 Gallons up to 35,000 Gallons	$1.10 per 1,000 Gallons
	35,000 Gallons up to 55,000 Gallons	$1.45 per 1,000 Gallons
	55,000 Gallons up to 100,000 Gallons	$1.75 per 1,000 Gallons
	Over 100,000 Gallons	$2.20 per 1,000 Gallons
	PLUS $10 for Water Tank	
Agricultural Customer Fees	Minimum 15,000 Gallons	$24.00
	15,000 Gallons up to 35,000 Gallons	$2.00 per 1,000 Gallons
	35,000 Gallons up to 55,000 Gallons	$2.60 per 1,000 Gallons
	55,000 Gallons up to 100,000 Gallons	$3.20 per 1,000 Gallons
	Over 100,000 Gallons	$4 per 1,000 Gallons
	PLUS $10 for Water Tank	
Customers With Water Services Outside City Limit	Minimum 15,000 Gallons	$36.00
	15,000 Gallons up to 35,000 Gallons	$3.00 per 1,000 Gallons
	35,000 Gallons up to 55,000 Gallons	$3.90 per 1,000 Gallons
	55,000 Gallons up to 100,000 Gallons	$4.80 per 1,000 Gallons
	Over 100,000 Gallons	$6 per 1,000 Gallons
	PLUS $10 for Water Tank	

5. **Average culinary water usage cost for summer 07 or 08, for average size lot in Uintah?**
   acre? acre?
   07 we used 9.68 cubic feet of water and 08 we used 10.70 cubic feet of water.

6. **How many houses in the City do not currently use the irrigation canals?**

Since the irrigation canals are private, the city doesn't have any records.

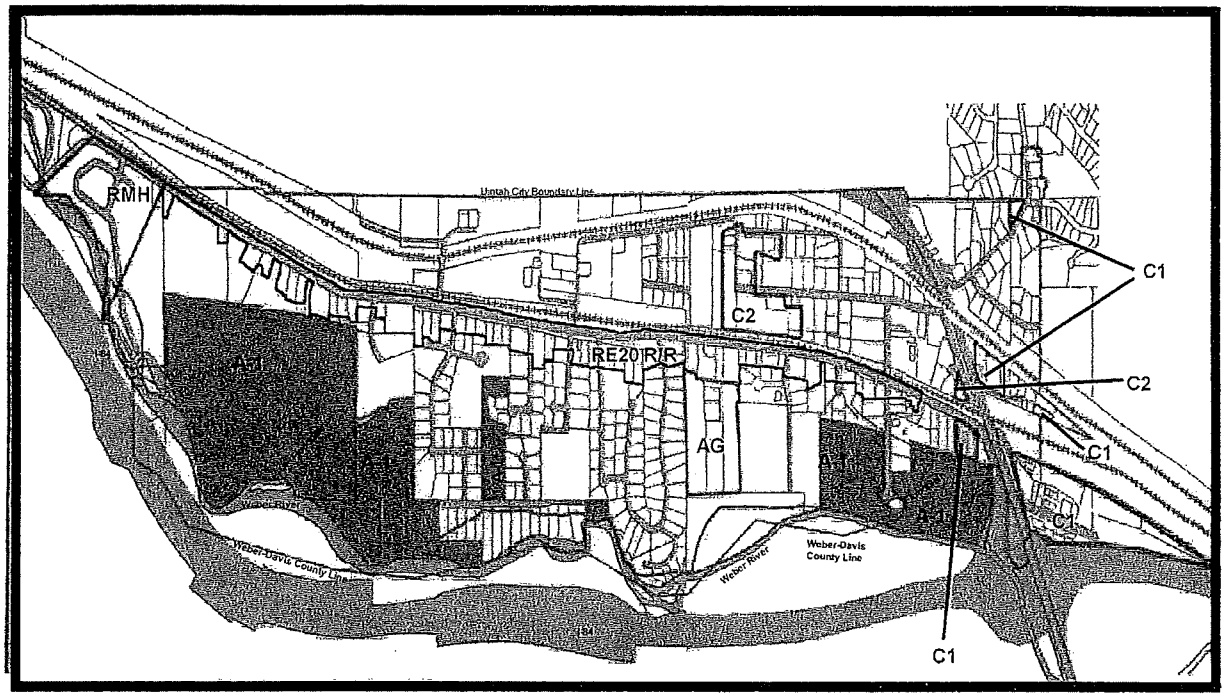
7. A boundary around total area that needs secondary irrigation (draw on map).

   See attached map.

8. Projected number of homes to connect to? We will verify at project development.

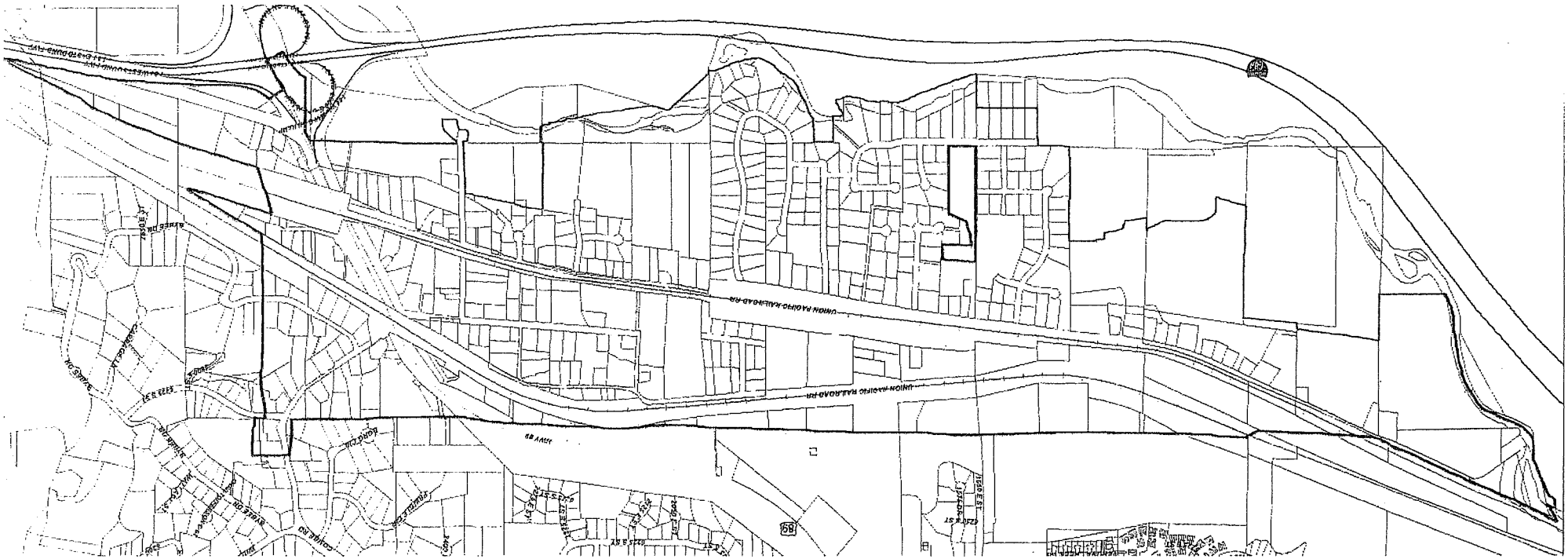
Lot Size	Lots At Build Out
Half Acre 20,000 sf	~372
Third Acre 13,000 sf	~573
Quarter Acre 10,000 sf	~745
Eighth an Acre 500 sf	~1,490

UINTAH CITY ZONING MAP



Floodplain
Uintah City Boundary
St Road Commission
Weber-Davis County Line
Weber River
Uintah City Roads
Land Outside Uintah City Boundary

A-1~Unincorporated Weber County Land and Zoning
AG~Agriculture
C1~Commercial
C2~Commercial
RMH~Mobile Home Park
RE20 R/R~Residential 20,000 Railroad PROPOSED
AREAS NOT MARKED ARE ZONED RE20~Residential 20,000 Square Feet
Zoning Map Current as of April 2006


UNION PACIFIC RAILROAD RW
UNION PACIFIC RAILROAD RW
HWY 89
89

Uintah Mountain Streams Irrigation Company (UMSIC)

- User information
  - Number of users 58 + 10 (Renters) = 68 shareholders
  - Number of shares 184
  - List of board members
- Address and main contact for company ↓
- Verify water rights on spreadsheet (3.14 cfs) Correct as far as I know.
- Outline service area on map (113 acres) - On map
- Are the various stock water units and domestic units being utilized as such?
- Water rates $25/share $75/yr per renter
- Has water quality ever been an issue? No
- Is the storage the Bybee pond? 13.2 acre feet? Yes
  - It is an unusable location, correct? Yes - and we have given up the property.

President - Mark Standing
Director - Ken Stuart
Director - Warren Downs
Watermaster - Dean Fenelius
Sec/Treas - Brent Stuart
Main Contact:
Brent Stuart
2121 E. 6450 S.
Uintah UT 84405
801-479-1027
bcstuart06@juno.com

Questions from Frandson Civil Engineers for Pioneer Canal Co.

1. Number of Users? 87

2. Number of shares? 100 stock holder shares, we have 200 Weber River Shares (1 share is 1 acre foot of water).

3. List Board Members? Jay Kendell, Scott Kendell, Lance Redd, Dave Hutchinson.

4. Address and Contacts? Jay Kendell President, 1179 East 6600 South, Uintah, Utah, 84405. Scott Kendell, 1075 East 6600 South, Uintah, Utah 84405

5. Verify Water rights on spread sheet? Filing date is 1851. Water Rights number is 35-8011. Irrigated acres is 218 (not 100), Stock water is aprox 50. Domestic water is 0.
I would think Water allotments (CFS) should be more in line with the Uintah Central Canal Co. around 7.00, high 5.00, low 3.00 as we have almost the same amount of Weber river shares. I have no way of verifying that.

6. We outlined the service area at the meeting on your map.

7. Are 50 Stock units being utilized as such? Yes we have shareholders with livestock.

8. Water Rates? Usually $20.00 per share.

9. Has water quality ever been an issue? No

JUNO Message Center

From: Don Pearson <depearso@yahoo.com>

To: Brent Stuart <bcstuart06@juno.com>, Brent Stuart <brent@hughesgc.com>

Sent: Wed, Sep 02, 2009 01:58 PM

Subject: Franson report

Report to Franson Civil Engineers from Uintah Central Canal Company

1. User information
   - 68 Users
   - 44 Â½ shares
   - Board Members
     - Jay Kendell
     - Rulan Dye
     - Dave Shurtleff
2. Main contact for company
   - Don Pearson
   - 1658 East 6525 South
   - Uintah, Utah 84405
3. I donâ€™t have the spreadsheet
4. They already have service area on map
5. We donâ€™t have only stock or domestic units utilized.
6. Water rates currently: $20/share
7. Water quality has never been an issue.

Let me know if you need anything addtional.

Don