City of Palmer

231 W. Evergreen Avenue
Palmer, Alaska 99645
Phone 907-745-3271
Fax 907-745-0930

SPECIAL CITY COUNCIL MEETING
5:30 P.M. TUESDAY, FEBRUARY 15, 2011
PALMER CITY COUNCIL CHAMBERS
231 W. EVERGREEN AVENUE, PALMER

SPECIAL CITY COUNCIL MEETING
5:30 P.M. TUESDAY, FEBRUARY 15, 2011
CITY COUNCIL CHAMBERS
231 W. EVERGREEN AVENUE, PALMER
www.cityofpalmer.org

MAYOR DELENA JOHNSON
COUNCIL MEMBER RICHARD BEST
COUNCIL MEMBER KEVIN BROWN
COUNCIL MEMBER EDNA DEVRIES
COUNCIL MEMBER KEN ERBEY
COUNCIL MEMBER BRAD HANSON
COUNCIL MEMBER KATHRINE VANOVER

CITY ATTORNEY MICHAEL GATTI
CITY CLERK JANETTE BOWER
CITY MANAGER DOUG GRIFFIN

A. Call to Order

B. Roll Call

C. Pledge of Allegiance

D. Audience Participation

E. New Business
   1. Southwest Utility Extension Update
      a. Committee of the Whole

F. Adjournment

Southwest Utility System Extension

Program Update
for
Phases IIa & IIb
Reservoir 4 and Trunk Road Water Main

City of Palmer, Alaska

Prepared by:

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February 11, 2011

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1.0 INTRODUCTION

The Southwest Utility System Extension (SWX) is a multi-phased program to extend water and sewer utilities to the southern and western portions of the City of Palmer's Utility Service Area. Phase I extended the water and sewer systems approximately six miles to the area of the Mat-Su Regional Hospital. Phase IIa will add 1 million gallons of water storage capacity by constructing a reservoir near Mat-Su College on Trunk Road. Although originally part of Phase IIa, the portion of the project to extend the water main along Trunk Road from the end of the Phase I pipe to the reservoir site has now been designated as Phase IIb and is 90 percent complete.

The City received one Alaska Department of Environmental Conservation (ADEC) municipal matching grant of $ 2,401,210 and another of $ 1,750,000 to help with funding of the Phase IIa and Phase IIb projects. An additional municipal matching grant of $ 2,500,000 is currently in the Governor's proposed SFY 2012 budget. These grants will fund up to 70 percent of the cost of a project with the remaining 30 percent of the project cost provided by the grantee. Additional project funding and the required matching funds will come from the City of Palmer's utility fund or other sources yet to be determined.

2.0 BACKGROUND

2.1 Expanded Utility Service Area

In 2003, Valley Hospital partnered with Triad Hospitals and began looking for a location for a new medical center. One proposed site was near the intersection of the Parks and Glenn Highways. The central location was desirable for providing medical services to the entire Mat-Su Valley; however it was six miles from the nearest public water and sewer system. Palmer developed a concept for connecting the hospital to the city water and sewer system by extending pipelines west from the Springer area directly to the proposed medical center site. Similarly, Wasilla proposed a connection to their system.

Since the medical center site is well outside the boundaries of either city, the Mat-Su Borough commissioned a study to determine the best method for providing water and sewer to the proposed medical center. The study found that the least expensive method was to install and operate on-site systems; however Triad was not interested in the risk associated with operating a $115 million medical facility on a well and septic system. The study also found that the capital costs for connecting to the Wasilla systems or the Palmer systems were nearly the same, but that the combined capital, operation and maintenance cost for the Wasilla connection was approximately 10 percent more costly than a Palmer connection. Additionally, the abundant water supply and the wastewater treatment expansion capacity of the Palmer system made the Palmer system more favorable.

Both Palmer and Wasilla applied to the Regulatory Commission of Alaska (RCA) for an expansion of each city's utility service area to include the medical center site. In March 2004,

Triad announced their preference for Palmer to provide utility services and, in April 2004, the RCA approved the new boundary of the Palmer Service Area (PSA) for water and sewer utilities. The expansion added 17.9 square miles to the PSA, increasing it from 13.2 square miles to 31.1 square miles - more than doubling the size. See Figure 1.

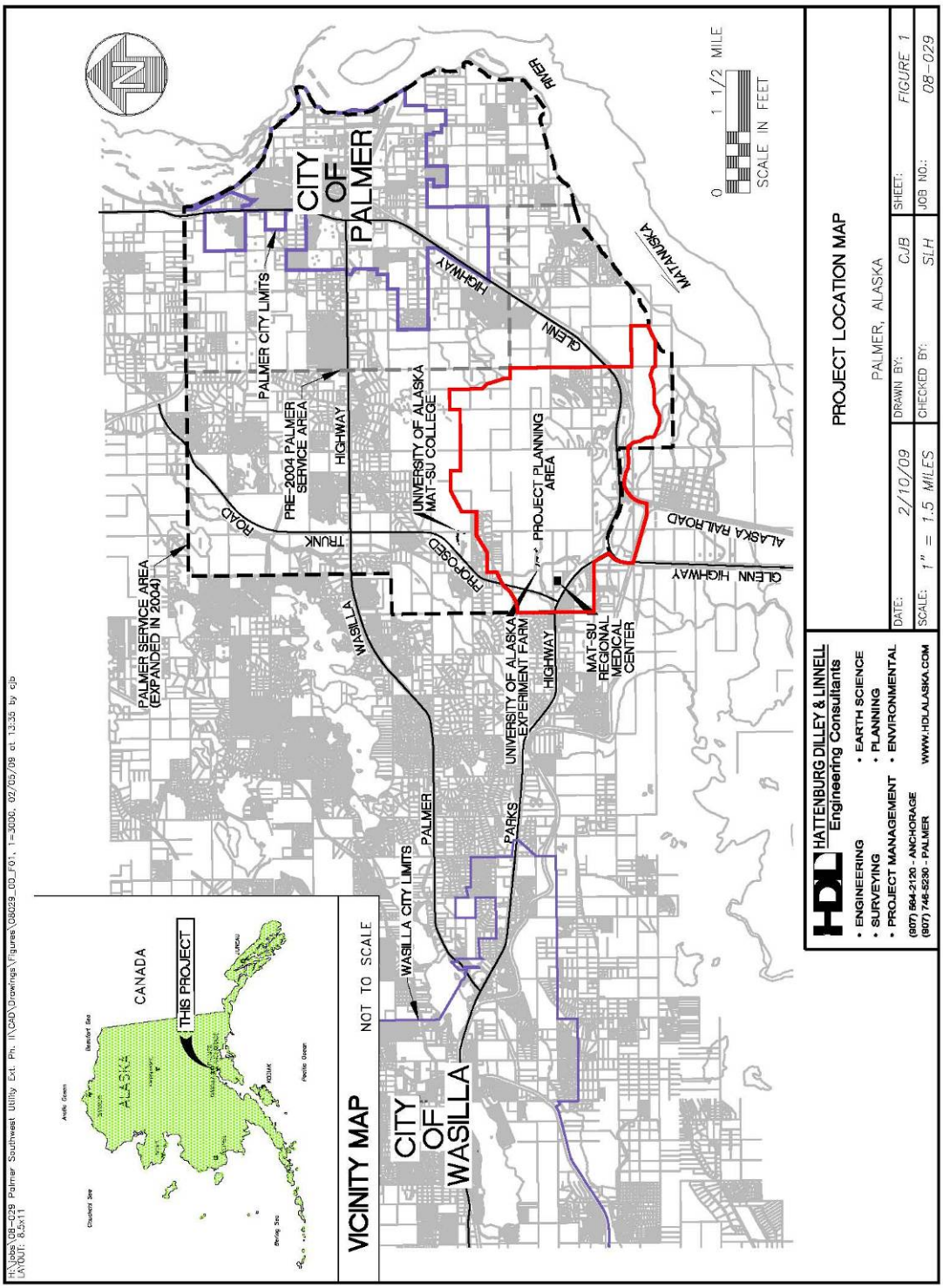


Figure 1: Project Location Map

2.2 Southwest Utility Extension Phase I

The initial project cost estimate to extend water and sewer utilities "cross-country" in a straight line to the medical center was approximately $6.5 million. Funding for the project was anticipated to be 75 percent by a USDA Rural Utilities grant with the remainder coming from low-interest loans from ADEC. In June 2004, Palmer contracted with Hattenburg Dilley & Linnell (HDL) to provide professional engineering services for the project.

HDL prepared the *Preliminary Engineering Report for Phase I of the Palmer Service Area Southwest Utility Extension* (HDL, 2004) (*Phase I PER*). The first step of the study was to develop a phased long-term strategy that would address both the short-term utility need (medical center) and the long-term utility needs (water distribution and sewer collection for residential and commercial customers) in the new PSA. To accomplish this, a build-out analysis was performed to determine the future capacity requirements of the southern and western portions of the PSA. This was presented in the *Phase I PER* and is reproduced here in a reduced scale as Figure 2 (for full scale figures, see Appendix A).

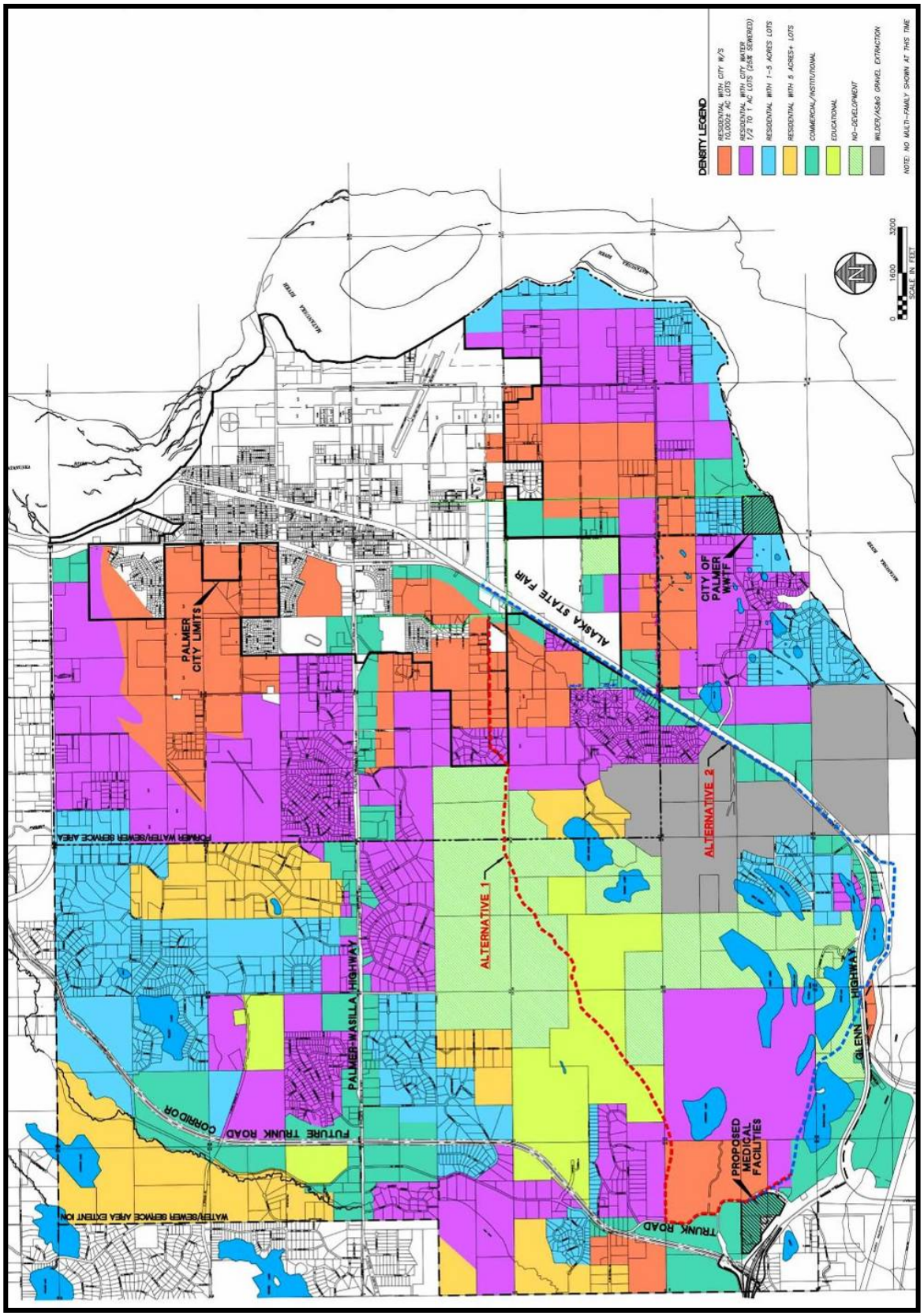


Figure 2: *Phase I PER* Figure 8.0 Estimated Ultimate Land Use Development

The next step was to review the existing planning documents, including the *Water and Wastewater Utility Plan* prepared in 1999 by NHawthorne Engineering. From this *1999 Utility Plan*, a phased development plan was prepared and presented in Table 9.0 of the *Phase I PER*. It is reproduced here as Figure 3. The development plan was also presented graphically in the *Phase I PER* and is reproduced here as Figure 4 on the following page. The time periods for the phases of the thirty-year planning period were: Phase I – Years 2005-2010; Phase II – Years 2010-2025; and Phase III – Years 2025-2035. (Note: The development plan was later updated with the *Phase IIa PER*.)

Table 9.0 Proposed Phased Development Plan

Water System	
• Extend Water Mains to Southwest PSA	Phase I
• Addition to the existing Reservoir 1, Zone 1 (1.0 to 1.5 million gallons)	Phase II
• New Reservoir in Zone 1 Near Hospital	Phase II
• Constant Pressure Booster Pump Station to Zone 2	Phase II
• Land Acquisition for New Reservoir in Zone 2	Phase II
• Water Extension Up Trunk Road	Phase II
• New Reservoir in Zone 2	Phase II
• Upsize Well Pumps	Phase II
• Additional wells and pipe network	Phase II
• Loop Water system Along Palmer-Wasilla Highway And Trunk Road to Complete Network	Phase III
• New Mains, Reservoir, Booster Pumps in Zone 3	Phase III
Sewer System	
• Extend Sewer to Southwest PSA	Phase I
• Land Acquisition for WWTF Expansion (high priority)	Phase II
• Additional Sewer Lagoon	Phase II
• Extend Sewer Up Old Trunk Road	Phase II
• Upsize Sewer Lift Station Pumps	Phase II
• Upsize Sewer Interceptor to the Wastewater Treatment Plant	Phase II
• Construct Enclosed Extended Aeration Wastewater Treatment Plant	Phase II
• Upsize Force Mains	Phase III
• Extend Sewer North to Colony Schools	Phase III
• Construct Wastewater Pretreatment Near New Hospital Site	Phase III

Figure 3: *Phase I PER* Table 9.0 Proposed Phased Development Plan

The original water and sewer extension project became referred to as the Southwest Utility System Extension (SWX Phase I) project. The originally proposed route across the Anchorage Sand & Gravel pit was determined not to be feasible due to active gravel extraction, lack of easement and high groundwater. Several alternative routes were considered and the final route along the Glenn Highway was selected using an extensive matrix of decision factors. Of the leading two routes, the most significant benefit of the chosen route was the ability to obtain right of way or easement quickly due to the fewer easements .

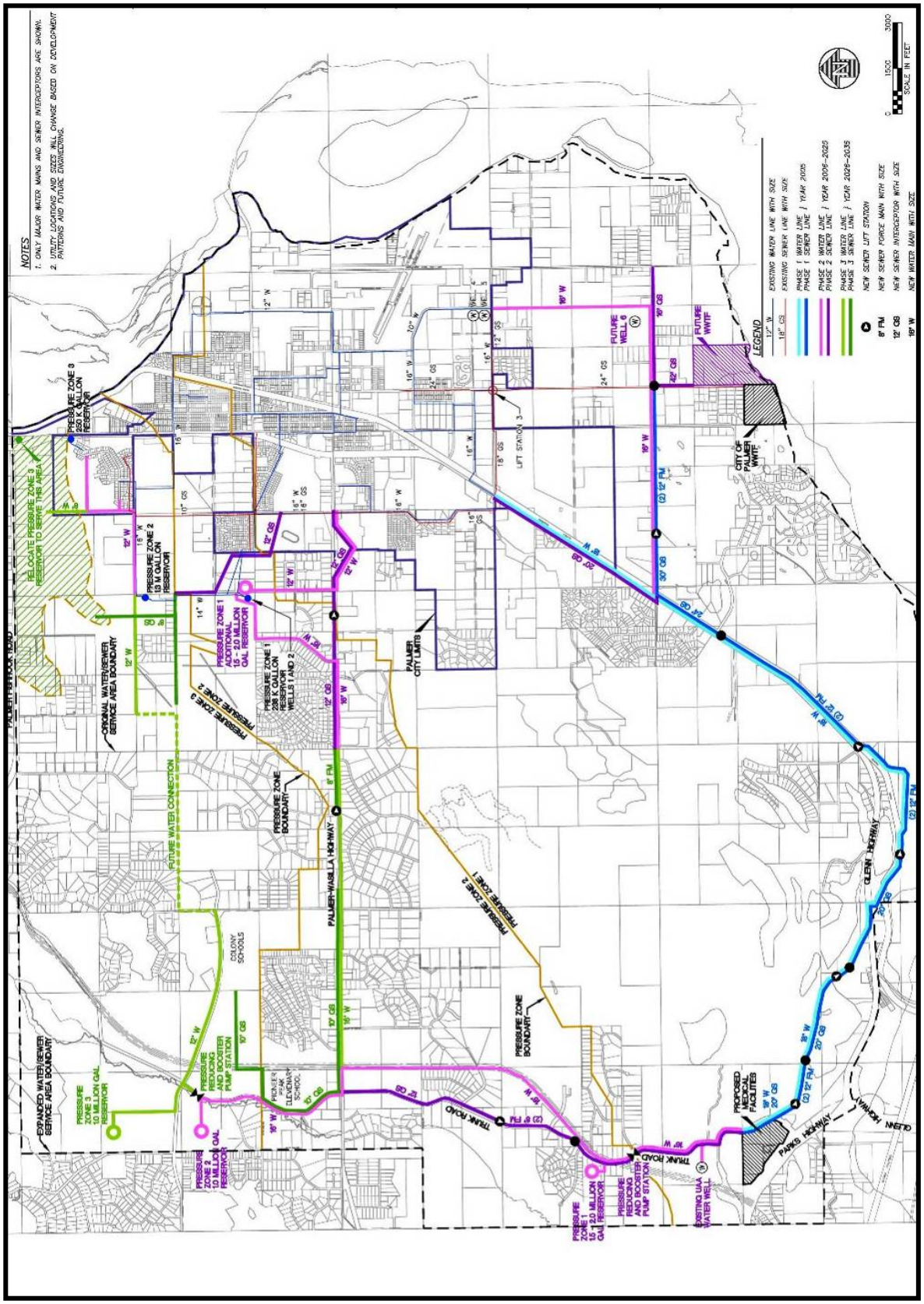


Figure 4: *Phase I PER* Figure 9.0 Water & Sewer Phased Utility Plan

Design of the 16.4 miles of pipeline and 3 sewer lift stations was completed in April 2005; construction began in July 2005 and was substantially complete in October 2006. The final project cost was $13.5 million. Funding for the project came from a combination of federal and state grants (81.4%), DEC low-interest loans (17%) and City utility reserves (1.6%). The Final Project Cost and Funding Summary is Figure 5 and 6 on the following pages.

2.3 Southwest Utility Extension Phases IIa and IIb

The SWX Phase I project resulted in a six-mile, one-way water pipeline. In the event of a shutdown for maintenance or a failure in the line, the water supply to customers in the area of the medical center is interrupted. A reservoir in the western portion of the PSA to provide water during an interruption of supply from the wells is an integral part of the complete system.

Although the extension of utilities to an expanded PSA was not included in the *1999 Utility Plan*, the need for additional storage was discussed in depth. Based on forecasted development, population growth, and reduction in water use per capita through steel water main replacement, the *1999 Utility Plan* recommended adding 2 million gallons of storage to Pressure Zone 1 by 2010 to meet the industry-standard recommendation of 48 to 72 hours of storage. The phased development plan in the *Phase I PER* modified this recommendation to divide the additional storage between two new reservoirs; one at the existing Reservoir 1 and one in the Trunk Road area (Reservoir 4).

In July 2008, the City contracted with HDL to provide engineering services for SWX Phase II – Trunk Road Water Main and Reservoir 4 (AM 08-054). The first task was to determine a preferred location for the new reservoir. To operate the reservoir as part of Pressure Zone 1, the water surface elevation in the new tank must equal the water surface elevation in the existing Pressure Zone 1 reservoir (Reservoir 1). The *Southwest Utility Extension Phase IIa – Water Improvements Preliminary Engineering Report* (2009, HDL) *(Phase IIa PER)* includes a site selection analysis which identified two suitable reservoir sites; one near Timber Way which would require an elevated reservoir, or "tower," and one on Mat-Su College property which could use an at-grade tank. The *Phase IIa PER* determined that, although the Timber Way location would require less pipeline, the College location was not only less expensive, but the at-grade tank would be easier to maintain and has less seismic considerations than the elevated tank.

The City began discussing the possibility of constructing a reservoir on the University of Alaska (UA), Mat-Su College Campus in December 2008. City staff met with UA staff several times to work out what a deal might look like. It was determined that it would work best for both parties for the sale to be in exchange for benefits received from the project rather than for a negotiated price. In May 2009, a public meeting was held at Mat-Su College to discuss and gather public input on the proposed project; all of the written comments received were in favor of the project.

City of Palmer
Department of Public Works

Palmer Southwest Utility System Extension Project

Final Project Costs and Funding Summary

September 11, 2007

Construction			
Original Construction Contract Amount			$10,336,205
Change Order 1 (West Glenn Reroute)	$305,961	2.7%	
Change Order 2 (Misc. Additional Work)	21,360	0.2%	
Change Order 3 (Misc. Additional Work)	96,012	0.8%	
Change Order 4 (Misc. Additional Work)	17,679	0.2%	
Change Order 5 (LS 4 Dewatering)	42,561	0.4%	
Change Order 6 (Rock Ex & Misc Add'l Work)	160,920	1.4%	
Change Order 7 (Additional Traffic Control)	332,807	2.9%	
Change Order 8 (Contract time extension)	0	0.0%	
Change Order 9 (Misc. add'l work & reconcile qtys)	64,552	0.6%	Pending
	1,041,852	9.2%	
Subtotal Construction			$11,378,057
	Original Engineer's Estimate		*$11,219,000*
Administration, Legal, Engineering, Right-of-Way			
City Administration	56,916	0.4%	
Legal	73,684	0.5%	
Right-of-Way Acquisitions	169,252	1.3%	
RR Flagging, Engineering & Construction	57,972	0.4%	
DOT Inspection Costs	29,894	0.2%	
MEA Line Extensions	22,445	0.2%	
Engineering & ROW Services	858,681	6.3%	
Construction Management & Inspection	803,841	5.9%	
Final Amendment - Add'l Eng & ROW Services	79,508	0.6%	Pending
	2,152,192	15.9%	
Subtotal Administration, Engineering, Right-of-Way			$2,152,192
	Original Budget Estimate		*$2,312,051*
Total Project Cost			**$13,530,249**

Project Funding	**Available**	**Expended**	
USDA FFY 2004 RD Grant	$2,400,000	$2,400,000	17.7%
USDA FFY 2005 RD Grant	4,893,000	4,893,000	36.2%
Revenue Bond (ADEC Loan-Sewer)	1,518,000	1,518,000	11.2%
Revenue Bond (ADEC Loan-Water)	782,000	782,000	5.8%
ADEC Grant	1,800,000	1,800,000	13.3%
State Legislative Grant	2,000,000	1,916,935	14.2%
City Utility Reserves (cash)	1,300,000	220,314	1.6%
Subtotal	14,693,000	$13,530,249	
Total Funding			**$13,530,249**

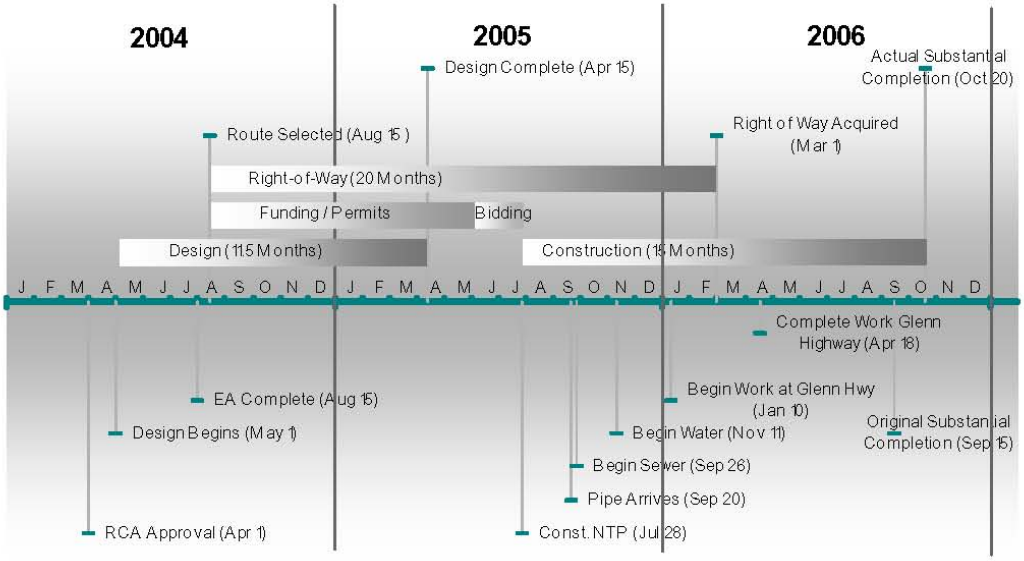
HDL HATTENBURG DILLEY & LINNELL Engineering Consultants

Figure 5: Final Project Cost and Funding Summary (Page 1)

City of Palmer
Department of Public Works

Palmer Southwest Utility System Extension Project

Schedule



Project Facts

Project Length:	7.4 miles
Water Pipe:	6.4 miles
Sewer pipe:	10.0 miles
Total Length of Pipe on Job:	16.4 miles
Earthwork Moved:	500,000 cubic yards
Engineering and Inspection Man-hours:	14,000
Construction Man-hours:	64,800
Number of Sewer Lift Stations:	3
Largest Pipe Diameter:	36 inches
Number of Agency Permits/Approvals Required:	16
Number of Property Easements:	24
Length Within the Alaska Railroad Right-of-Way:	2.0 miles
Sewer Main Extension Capacity:	158,000 gallons per day
Water Main Extension Capacity:	320,000 gallons per day

HDL HATTENBURG DILLEY & LINNELL Engineering Consultants

Figure 6: Final Project Cost and Funding Summary (Page 2)

In June of 2009, HDL began design of the pipeline along Trunk Road to the College reservoir site and began a geotechnical investigation and surveying of the site. Additionally, City staff and HDL began a conversation with Alaska DOT&PF to discuss coordination of the proposed pipeline with DOT&PF's Trunk Road Reconstruction Phase 1 project. Construction had started on the DOT&PF project and it appeared that there might be an opportunity for cost savings if the work was coordinated.

In July 2009, HDL submitted an amendment request for scope and budget for the additional work to design the longer pipeline, a booster pumping station, and an access road and distribution main to the college. This amendment was approved (AM 09-049) and was issued in February 2010.

When it became apparent that the Trunk Road water main extension would be constructed separately from the reservoir, the water main extension became known as Southwest Utility Extension Phase IIb.

After several meetings and discussions with DOT&PF and their Trunk Road contractor, Scarsella Brothers, the City was authorized by DOT&PF in March 2010 to contract directly with Scarsella Brothers to construct the Phase IIb project. (Allowing another contracting agency to work with an existing contractor within a State right-of-way during an active project is very unusual.) Staff negotiated with Scarsella Brothers and Council approved the contract on March 16, 2010 (AM 10-021). This resulted in an approximately $800,000 cost savings to the City versus constructing the pipeline in the same location following completion of the DOT&PF project. The water main extension project was funded by ADEC grant #67116 and City matching funds.

Construction on Phase IIb – Trunk Road Water Extension began in June 2010. In July 2010, Council authorized a budget amendment for unanticipated design and surveying and for adding construction administration services for the Phase IIb project (AM 10-047). Design of Phase IIa project (Reservoir 4) continued through August 2010 when 95% complete design documents were submitted to the City.

City staff has continued working with UA staff to negotiate a purchase agreement acceptable to both parties and has an agreement ready for council consideration and is preparing legislation to bring to the Council.

3.0 CURRENT PROJECTS

3.1 Description

The components of the Phase IIa – Reservoir 4 project are shown in Figure 7 and include:

- 1 million gallon welded steel tank, approximately 74-foot diameter x 40-feet high
- 1,400 linear feet of 18-inch HDPE transmission main to extend the Phase IIb pipeline from Trunk Road to the reservoir site and from the booster pumping station to the college access road

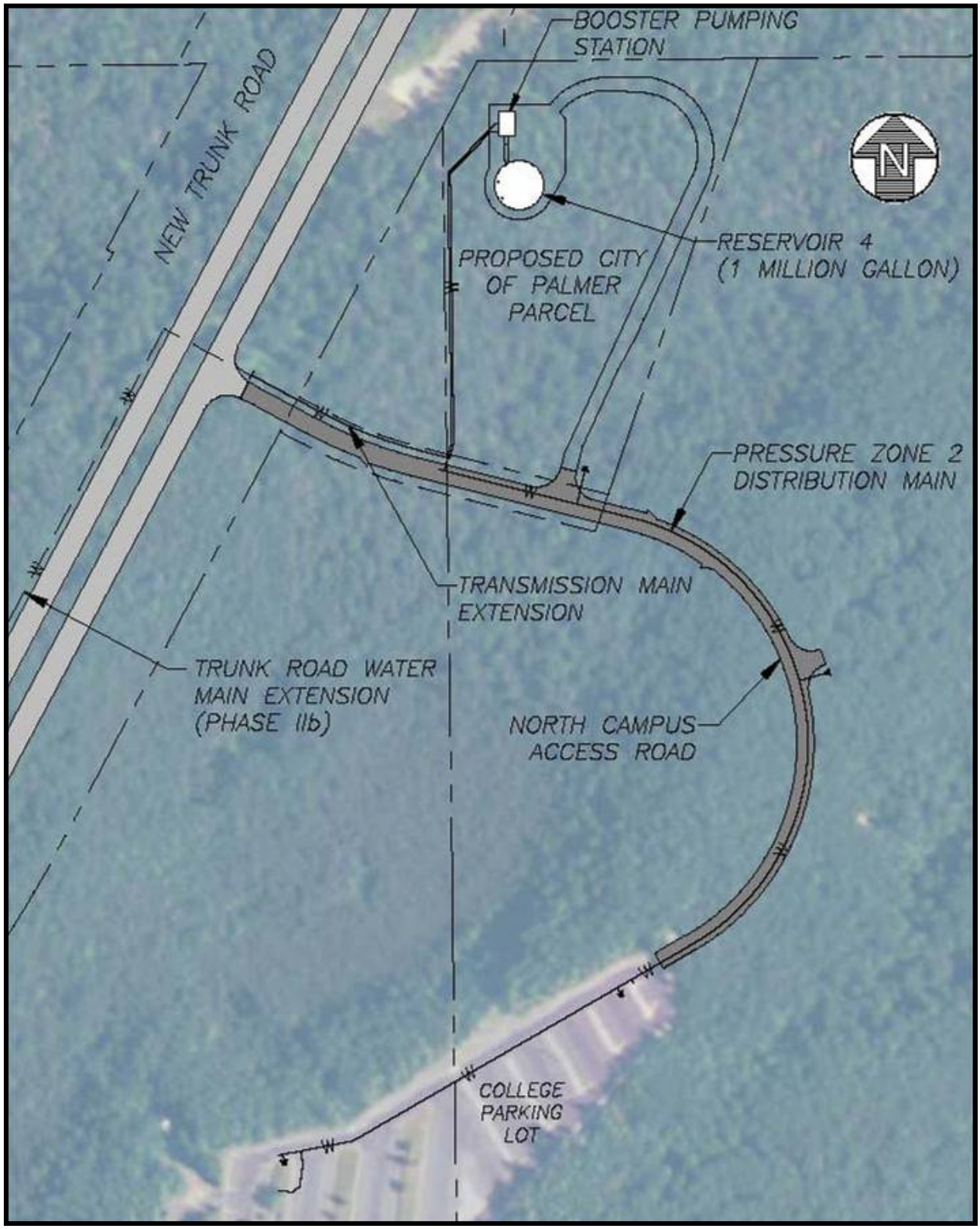


Figure 7: Phase IIa Overall Project Plan

- Booster pumping station to increase pressure to serve Pressure Zone 2 customers, including Mat-Su College and proposed development near Palmer-Wasilla Highway
- 1,800 linear feet of 12-inch diameter ductile iron water main in Pressure Zone 2, from the reservoir to the Mat-Su College parking lot and providing for future extensions south and west, hydrants, valves and related work
- 1,500 linear feet of 24-foot wide roadway along the new pipeline, from Trunk Road to the Mat-Su College parking lot.

The Phase IIb – Trunk Road Water Extension project (which is currently approximately 90% complete) consists of:

- 10,000 linear feet of 18-inch diameter HDPE water main from the end of the Phase 1 pipe near the medical center to the edge of the Trunk Road right of way near the reservoir site, 1,200 linear feet of 12-inch HDPE branch lines along Trunk Road, casings for future crossings of Trunk Road, hydrants, valves and related work.

3.2 Status

The construction of SWX Phase IIb – Trunk Road Water Extension is approximately 90% complete. Work was stopped in August 2010 due to coordination issues with the DOT&PF Trunk Road Reconstruction project. It is anticipated to begin again in May 2011 following ground-thaw and is required to be completed in July 2011.

The Phase IIa – Reservoir 4 design documents are 95% complete and have been reviewed by the City and UA. The necessary plat to create the new 5-acre parcel has been approved by MSB and UA and is ready for signatures and recording. The required access easements to the site are prepared and are ready for signatures and recording. The land purchase agreement, temporary construction permit and subdivision agreement are acceptable to UA, have been reviewed by the City's attorney, and are ready for submission to the Council.

Adequate funding for the entire project has not yet been secured. To continue making progress, it is planned to divide the Phase IIa project into at least two smaller projects. The initial project will clear the site, excavate and relocate on-site approximately 225,000 cubic yards of gravel to construct the reservoir site and the north campus access road, and install the Pressure Zone 2 distribution water main from the reservoir to the eastern edge of the college parking lot. To maxmize the available funding, a series of four additive alternates will be used during bidding: (1) install the transmission main from Trunk Road to the future Booster Pump Station, (2) install the distribution main across the existing paved college parking lot to the Mat-Su College point of connection, (3) install guardrail along the new road, and (4) pave the north campus access road. If funding for these additive alternates is not available at the time of bidding, they will be incorporated into future bid packages. This initial project is referred to as SWX Phase IIa – Site Preparation for Future Reservoir 4.

The SWX Phase IIa work that is not completed with the initial project will be performed under a future contract. If necessary, the work could be further divided into two projects; one that constructs the booster pumping station, which will make water available to Pressure Zone 2 customers, and a second that constructs the reservoir.

The proposed agreement with UA requires that the City deliver water for connection to the Mat-Su College water system by December 1, 2013. City staff is concerned about entering into this agreement with this strict deadline without assurances that total project funds, including grant matching funds, will be available.

3.3 Purpose and Need

The purposes and needs of the SWX Phase IIa and IIb projects are to:

1) *Provide additional storage capacity for Pressure Zone 1.*

   The need for additional capacity for Pressure Zone 1 was identified in the *1999 Utility Plan*, which discussed adding storage near the existing Reservoir 1. Although not adjacent to Reservoir 1, the proposed Reservoir 4 will increase the additional storage for all of Pressure Zone 1 to a total of 1.2 million gallons. This is approximately 51 hours of storage at today's estimated 560,000 gallons per day average usage for all of Pressure Zone 1, which accounts for approximately 70 percent of the overall usage. In 20 years, the average daily usage of just the southwestern portion of Pressure Zone 1 is forecast to be approximately 500,000 gallons per day; Reservoir 4 will provide approximately 48 hours of storage in the event that this portion of the PSA is isolated from Reservoir 1. An additional reservoir will be needed near Reservoir 1 to provide adequate storage for the long-term growth of all of Pressure Zone 1.

2) *Provide water supply to the southwest portion of PSA in the event of shut down of the SWX Phase I pipeline.*

   In the event of a shutdown anywhere in the six-mile long SWX Phase I pipeline, for any reason, there is no water available to the customers in the southwest portion of the PSA. This presents a public health and safety risk. The proposed project will allow for a segment of the pipeline to be isolated without interruption of service.

3) *Extend safe public drinking water and firefighting water to residential and commercial customers along Trunk Road.*

   Residents and businesses along Trunk Road currently obtain water from individual or community wells. Several instances of elevated arsenic levels in the groundwater has prompted many potential customers to inquire about connecting to the water system as it is extended north on Trunk Road. Additionally, the Matanuska-Susitna Borough Regional Landfill is located in the middle of the Palmer Service Area. The original landfill cell is not lined and there is a direct hydraulic connection to the groundwater

table, which is used as a drinking water source for surrounding homes that have private residential wells. Possible groundwater contamination is a significant concern. This project will provide the backbone water utility to the area, which will allow new customers to extend branch mains into subdivisions or to connect existing community systems, providing a source of safe, reliable drinking water.

Although not an intended purpose, the project will also make water available for potential Pressure Zone 2 customers, which include Mat-Su College, several subdivisions with existing community water systems, and residences with private systems both north and south of the reservoir, as well as undeveloped property. City staff has already had discussions with a large land developer with property in Pressure Zone 2. The developer is making plans to extend the Zone 2 main on behalf of the City so that the property can be served.

3.4 Financial Status

Funding for the Phase IIa and IIb projects that has been identified is:

Funding to Date

Source	Amount	Note
ADEC Municipal Matching Grant #67116	$ 2,401,210	Accepted 11/18/08 by Resolution 08-024
City Water and Sewer Fund (30% City Match for #67116)	$ 1,029,090	Appropriated 3/16/10 by Resolution 10-023
ADEC Municipal Matching Grant #67119	$ 1,750,000	Accepted 11/23/10 by Resolution 10-052
City Water and Sewer Fund (30% City Match for #67119)	$ 750,000	Appropriated 11/23/10 by Resolution 10-052
Total Phase IIa & IIb Funding to Date	**$ 5,930,300**	

Additional funding is anticipated from an SFY 2012 ADEC municipal matching grant of $ 2,500,000, which will require a match of $ 1,071,428, for a total additional funding of $ 3,571,428. The source of the matching funds has not been identified at this time.

The total combined project funding would then be **$ 9,501,728**.

The cost of the projects to date (expended and committed) are:

Costs to Date

Item	Amount
Construction: Phase IIb – Trunk Road Water Extension	2,125,000
Design, Environmental, Permitting, Surveying (HDL)	710,000
Construction Administration (HDL)	63,000
City Administration @ 5% of grant funds	208,000
Total Phase IIa & IIb Costs to Date	**$ 3,106,000**

Anticipated remaining project costs have been estimated using the construction cost estimates submitted with the 95% construction drawings in September, an amendment proposal from HDL, and standard percentages for construction administration, city administration and a project contingency. These costs are:

Anticipated Remaining Phase IIa & IIb Project Costs

Item	Amount
Phase IIa – Site Preparation for Reservoir 4	
Construction (per the 95% complete design cost estimate)	2,100,000
Add'l design to create separate bid package (per HDL proposal)	63,000
Construction Administration (per HDL proposal)	132,000
Phase IIa – Construct Reservoir 4	
Construction (per the 95% complete design cost estimate)	3,900,000
Add'l design to create bid package for remaining items (estimated)	40,000
Construction Administration (estimated at 8%)	312,000
Subtotal Remaining Project Costs	$ 6,547,000
City Administration @ 5% of grant funds	125,000
Project Contingency @ 10%	655,000
Total Anticipated Remaining Phase IIa & IIb Project Costs	**$ 7,327,000**

Therefore, the cost to date and the anticipated remaining project costs total **$ 10,433,000.**

The complete project is therefore underfunded by approximately $ 931,000. Further, the source of the $1,071,428 match for the anticipated SFY 2012 grant has not been identified. Therefore, the total unfunded project cost is approximately **$ 2,002,000**.

4.0 FUTURE PROJECTS

Several future water system projects are identified and described in the SWX *Phase I PER* and updated in Section 4.2.2, Table 4 and Figure 4 of the *Phase IIa PER* (see Appendix B). These projects are needed to meet the demands of future growth and should be planned for accordingly. The projects described in the *Phase IIa PER* are abbreviated below for reference:

1. Install a Pressure Zone 1 reservoir in the southwest portion of PSA to provide water for areas served by SWX as well as additional storage for all of Zone 1 – *this project*.
2. Evaluate connecting the UA Experiment Farm well and/or the well at the Mat-Su Regional Medical Center to the system.
3. Install a new Pressure Zone 1 reservoir near Reservoir 1.
4. Extend water main north along Trunk Road in Pressure Zone 2.
5. Add a new Pressure Zone 2 reservoir near the Palmer-Wasilla Highway.
6. Replace existing pumps in Wells 4 and 5 with larger pumps.
7. Complete the loop by extending the water system along the Palmer-Wasilla Highway in Pressure Zone 2.
8. Construct new water mains and a new reservoir in Pressure Zone 3 to meet future demands in the area.

APPENDIX A

Full-size Figures

WATER/SEWER SERVICE AREA EXTENTION

FUTURE TRUNK ROAD CORRIDOR

FORMER WATER/SEWER SERVICE AREA

PALMER CITY LIMITS

PALMER-WASILLA HIGHWAY

MATANUSKA RIVER

ALTERNATIVE 1

ALASKA STATE FAIR

TRUNK ROAD

ALTERNATIVE 2

CITY OF PALMER WWTF

PROPOSED MEDICAL FACILITIES

GLENN HIGHWAY

ALASKA RAILROAD

ONE INCH

0 1600 3200

SCALE IN FEET

N

DENSITY LEGEND

- RESIDENTIAL WITH CITY W/S 10,000± AC LOTS
- RESIDENTIAL WITH CITY WATER 1/2 TO 1 AC LOTS (25% SEWERED)
- RESIDENTIAL WITH 1-5 ACRES LOTS
- RESIDENTIAL WITH 5 ACRES+ LOTS
- COMMERCIAL/INSTITUTIONAL
- EDUCATIONAL
- NO-DEVELOPMENT
- WILDER/AS&G GRAVEL EXTRACTION

NOTE: NO MULTI-FAMILY SHOWN AT THIS TIME

REVISIONS		
MARK	DATE	DESCRIPTION
1		
2		
3		
4		
5		

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MATANUSKA VALLEY MEDICAL CENTER UTILITY EXTENSION

CITY OF PALMER

PALMER, ALASKA

SHEET TITLE
ESTIMATED ULTIMATE LANDUSE DEVELOPMENT

SHEET
FIGURE 8.0

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RWB/RFH	SLH
DATE:	SCALE:
07/29/04	AS NOTED

JOB NUMBER
04-016

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PALMER FISHHOOK ROAD

EXPANDED WATER/SEWER SERVICE AREA BOUNDARY

PRESSURE ZONE 3 1.0 MILLION GAL RESERVOIR

ORIGINAL WATER/SEWER SERVICE AREA BOUNDARY

RELOCATE PRESSURE ZONE 3 RESERVOIR TO SERVE THIS AREA

PRESSURE ZONE 3 250 K GALLON RESERVOIR

PRESSURE ZONE 2 13 M GALLON RESERVOIR

FUTURE WATER CONNECTION

PRESSURE ZONE 2 1.0 MILLION GAL RESERVOIR

PRESSURE REDUCING AND BOOSTER PUMP STATION

COLONY SCHOOLS

PRESSURE ZONE 3 PRESSURE ZONE 2

PRESSURE ZONE 1 ADDITIONAL 1.5 - 2.0 MILLION GAL RESERVOIR

PIONEER PEAK ELEMENARY SCHOOL

PRESSURE ZONE BOUNDARY

PRESSURE ZONE 1 238 K GALLON RESERVOIR WELLS 1 AND 2

PALMER-WASILLA HIGHWAY

PALMER CITY LIMITS

WELL 4

WELL 5

LIFT STATION 3

TRUNK ROAD

PRESSURE ZONE 2 PRESSURE ZONE 1

PRESSURE ZONE BOUNDARY

PRESSURE ZONE 1 1.5 - 2.0 MILLION GAL RESERVOIR

PRESSURE REDUCING AND BOOSTER PUMP STATION

TRUNK ROAD

EXISTING UAA WATER WELL

FUTURE WELL 6

FUTURE WWTF

CITY OF PALMER WWTF

PROPOSED MEDICAL FACILITIES

PARKS HIGHWAY

GLENN HIGHWAY

GLENN HIGHWAY

NOTES

1. ONLY MAJOR WATER MAINS AND SEWER INTERCEPTORS ARE SHOWN.
2. UTILITY LOCATIONS AND SIZES WILL CHANGE BASED ON DEVELOPMENT PATTERNS AND FUTURE ENGINEERING.

LEGEND

- 12" W — EXISTING WATER LINE WITH SIZE
- 18" GS — EXISTING SEWER LINE WITH SIZE
- PHASE 1 WATER LINE / PHASE 1 SEWER LINE } YEAR 2005
- PHASE 2 WATER LINE / PHASE 2 SEWER LINE } YEAR 2006–2025
- PHASE 3 WATER LINE / PHASE 3 SEWER LINE } YEAR 2026–2035
- NEW SEWER LIFT STATION
- 8" FM — NEW SEWER FORCE MAIN WITH SIZE
- 12" GS — NEW SEWER INTERCEPTOR WITH SIZE
- 16" W — NEW WATER MAIN WITH SIZE

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SCALE IN FEET

REVISIONS

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MATANUSKA VALLEY MEDICAL CENTER UTILITY EXTENSION

CITY OF PALMER

PALMER, ALASKA

SHEET TITLE
WATER AND SEWER PHASED UTILITY PLAN

SHEET
FIGURE 9.0

DRAWN BY:	CHECKED BY:
RFH	SLH
DATE: 07/29/04	SCALE: AS NOTED

JOB NUMBER: 04-016

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APPENDIX B

Excerpts from *Phase IIa PER*
Section 4.2 Growth

4.1.3 System Operations and Maintenance (O&M) Concerns

All water mains are periodically shut down for basic operation and maintenance (O&M); this includes exercising of valves and flushing hydrants. Because there is no secondary loop connecting the southwest portion of the Palmer Service Area to the system, a shut down of service to southwest customers including the Mat-Su Regional Medical Center would be required to do maintenance. Adding a reservoir to this area will provide an important backup water supply to serve customers while O&M is being performed on the line.

Wells located west and north of the Glenn Highway have had a history of production problems. Palmer's Well 1 is in this area and has shown a lowering static water level over the years when it was used as the main City production well. This suggests that aquifer recharge does not equal the withdrawal needs. These wells generally are in smaller aquifers and exhibit lower recharge rates than wells 4 and 5 located in the large unconfined aquifer east of the Glenn Highway.

4.2 GROWTH

4.2.1 Necessary Growth Capacity

HDL analyzed and developed a long-range phased plan for delivering services to the expanded service area as part of Phase I of the Southwest Utility Extension. In order to determine the required water and sewer line capacities to meet growth projections, HDL developed a land-based model for the study area and forecast water and sewer needs from the anticipated ultimate "build-out", (Figure 3, Page 15). The model identifies lands that are anticipated to be developed for commercial, educational, industrial, and residential purposes. A phased utility plan (Figure 4, Page 16) was developed to meet projected growth for the 5-year, 20-year and 30-year planning horizons. Water and sewer demands were assigned to the model based on the type of development. The Phased Utility Plan has been updated to reflect recent growth statistics and construction activities in the area.

4.2.2 Facilities Needed for Future Growth

Standard engineering practice involves sizing facilities for future growth. The portion of the project discussed in this report is part of Phase II of the multi-phase plan discussed above. It will provide adequate storage capacity for the southwest portion of the Palmer Service Area for the next twenty years, based on current growth models. The following is a list of recommended facilities needed to meet future growth demands:

1. Add a new reservoir in the southwest portion of the Palmer Service Area. There is currently no water storage in the southwest portion of the Palmer Service Area. This area is isolated from the main piping network by approximately 6 miles. In order to maintain adequate water service during periodic O&M shutdowns, or in the case of a catastrophic event, redundant storage must be added. By analyzing the southwest portion separately, and accounting for future growth in the area, we estimate that 1 million gallons of water storage is needed (See Section 5.1 for additional information.) This will provide storage to meet fire flow requirements along with providing for growth in the area for the next twenty years.
2. Evaluate connecting the UA Experiment Farm well and/or the well at the Mat-Su Regional Medical Center to the system. The City is negotiating an agreement to acquire the well at MSRMC and has expressed interest in connecting this well to the system. Connection of this additional water source would provide a backup water supply to the southwest portion of the Palmer Service Area. Recharge rate of these aquifers is not known so extended tests and monitoring may be required. A cost estimate to connect the MSRMC well, along with drilling logs for these wells are included in Appendix C of this report.
3. Add a new Pressure Zone 1 reservoir near Reservoir 1. The existing Reservoir 1 in Pressure Zone 1 has a capacity of 238,000 gallons. The current usage for pressure zone 1 is estimated at approximately 600,000 gallons per day. While the 1.3 MG Reservoir 2 can provide water to Zone 1 through pressure-reducing valves, this is a) inefficient, as water must be pumped the additional elevation to Zone 2, and b) subject to risk by relying on the single transmission main connecting the Zone 1 and Zone 2 reservoirs and the booster pumping system. To meet existing and future growth, an additional water storage reservoir should be constructed near the Reservoir 1 site, with a capacity of approximately 2 million gallons.
4. Extend water main north along Trunk Road to provide water to Pressure Zone 2 customers and construct a booster pumping station.
5. Add a new reservoir to the system in Pressure Zone 2 to handle anticipated growth on the northern end of Trunk Road, near the Palmer-Wasilla Highway.
6. Replace existing pumps in Wells 4 and 5 with larger pumps. Upsizing pumps in Wells 4 and 5, along with the increased pipe sizes and networks, can increase the water system's capacity.
7. Loop the water system down the Palmer-Wasilla Highway in Pressure Zone 2 with a connection to the proposed Trunk Road Zone 1 reservoir for redundancy of water supply lines as the area grows.
8. Construct new water mains and a new reservoir in Pressure Zone 3 to meet future demands in the area.

PALMER FISHHOOK ROAD

EXPANDED WATER/SEWER SERVICE AREA BOUNDARY

PRESSURE ZONE 3 1.0 MILLION GAL. RESERVOIR

PRESSURE ZONE 2 1.0 MILLION GAL. RESERVOIR

PRESSURE REDUCING AND BOOSTER PUMP STATION

COLONY SCHOOLS

PIONEER PEAK ELEMENARY SCHOOL

PRESSURE ZONE BOUNDARY

PALMER-WASILLA HIGHWAY

ORIGINAL WATER/SEWER SERVICE AREA BOUNDARY

FUTURE WATER CONNECTION

RELOCATE PRESSURE ZONE 3 RESERVOIR TO SERVE THIS AREA

PRESSURE ZONE 3 250 K GALLON RESERVOIR

PRESSURE ZONE 2 1.3 M GALLON RESERVOIR

PRESSURE ZONE 1 ADDITIONAL 1.5-2.0 MILLION GALLON RESERVOIR

PRESSURE ZONE 1 238 K GALLON RESERVOIR WELLS 1 AND 2

PALMER CITY LIMITS

PRESSURE ZONE 1 1.0 MILLION GALLON RESERVOIR W/ PRESSURE REDUCER/ BOOSTER PUMP STATION

TRUNK ROAD

UNIVERSITY OF ALASKA MAT-SU COLLEGE

UNIVERSITY OF ALASKA EXPERIMENTAL FARM

EXISTING MAT-SU REGIONAL MEDICAL CENTER WATER WELL

PARKS HIGHWAY

GLENN HIGHWAY

LIFT STATION 3

WELL 4

WELL 5

FUTURE WELL 6

FUTURE WWTF

CITY OF PALMER WWTF

NOTES

1. ONLY MAJOR WATER MAINS AND SEWER INTERCEPTORS ARE SHOWN.
2. UTILITY LOCATIONS AND SIZES WILL CHANGE BASED ON DEVELOPMENT PATTERNS AND FUTURE ENGINEERING.

LEGEND

- 12" W — EXISTING WATER LINE WITH SIZE
- 18" GS — EXISTING SEWER LINE WITH SIZE
- PHASE I WATER LINE / PHASE I SEWER LINE } COMPLETED IN 2006
- PHASE II WATER LINE / PHASE II SEWER LINE } YEAR 2011–2025
- PHASE III WATER LINE / PHASE III SEWER LINE } YEAR 2026–2035
- NEW SEWER LIFT STATION
- 8" FM — NEW SEWER FORCE MAIN WITH SIZE
- 12" GS — NEW SEWER INTERCEPTOR WITH SIZE
- 16" W — NEW WATER MAIN WITH SIZE

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SCALE IN FEET

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PALMER SOUTHWEST UTILITY EXTENSION PHASE II

CITY OF PALMER

PALMER, ALASKA

SHEET TITLE: WATER AND SEWER PHASED UTILITY PLAN

SHEET: FIGURE 4

DRAWN BY: CJB | CHECKED BY: DWL

DATE: 2/10/09 | SCALE: AS NOTED

JOB NUMBER: 08-029

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4.2.2.1 Phased Capacity Increases

An extensive review of facilities needed to accommodate future growth in the Palmer Service Area was performed as part of the Preliminary Engineering Report for Phase I of the Southwest Utility Extension. Table 5 is an updated version of the Phased Development Plan from that study.

The time periods for the three phases of this planning period are: Phase I – 2005-2010; Phase II – Years 2011-2025; and Phase III – Years 2026-2035. Anticipated future phased capacity increases for the Palmer water system and when they should occur are as follows in Table 4.

Table 4 Proposed Phased Development Plan

Water System	
• Extend Water Mains to Southwest PSA	Completed in 2006
• New Reservoir in Zone 1 Near Hospital (1 million gallons)	Phase II (This Project)
• Additional wells and pipe network	Phase II
• Addition to the existing Reservoir 1, Zone 1	Phase II
• Water Extension Up Trunk Road	Phase II
• Constant Pressure Booster Pump Station to Zone 2	Phase II
• New Reservoir in Zone 2	Phase II
• Upsize Well Pumps	Phase II
• Loop Water system Along Palmer-Wasilla Highway And Trunk Road to Complete Network	Phase III
• New Mains, Reservoir, Booster Pumps in Zone 3	Phase III

4.2.2.2 Anticipated New Customers

Significant tracts of property located near the Mat-Su Regional Medical Center remain undeveloped. Additional development of the medical campus is expected to continue as the population of the region expands. As this property is developed, it will place additional demands on the existing water delivery system. The following are properties that could potentially be developed in the future.

- The University of Alaska (UA) oversees approximately 840 acres of land near Trunk Road currently being used for an experimental farm. UA may market this land for development. The availability of City water service to this property could greatly affect its marketability and development of this property could dramatically increase demand on the system.