Executive Summary

Sinclair Water Supply Project
Level II Feasibility Study

A Wyoming Water Development Commission Project

July 2001

prepared by

PNPC Civil Engineers
Saratoga, Wyoming

in association with

STATES WEST WATER RESOURCES CORPORATION

TST INC. of DENVER Consulting Engineers
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</table>
PREAMBLE

The Town of Sinclair (Town) owns the Sinclair Municipal Water System and the Sinclair Oil Corporation Refinery (Refinery) operates and maintains the municipal water system under a long term agreement.

The Sinclair Oil Corporation (Refinery) is the largest water user and their participation in the Level II report process was essential for a meaningful study. The Refinery was involved in the initial scoping process and throughout the study evaluating alternatives, participating in discussions and providing general comments and suggestions. Initially the Refinery stated they did not need additional water in the foreseeable future, they would utilize internal water conservation and water reuse to accommodate increased refining capacity.

We must understand the entire energy industry, including the refining sector, is in a state of continual change. The Refinery’s short and long term plans are confidential and specifics were not divulged during the preparation of this study. Estimating future process and potable water needs is a guess at best because the Refinery’s water needs can be subject to dramatic changes resulting from energy industry developments.

The Draft Level II Report was distributed for comment in May 2001 with the Final Level II Report to be completed by June 1, 2001. Review comments were received from several sources including the U.S. Environmental Protection Agency (EPA). The final report deadline was extended to accommodate a June 13, 2001 meeting with the Town, Refinery and EPA to discuss EPA’s comments on the Draft Report and review the status of the EPA Administrative Order pertaining to the Sinclair water system.

The June 13, 2001 meeting resulted in an agreement that included having the Town and Refinery submit a compliance schedule and project funding scenario for EPA approval by July 16, 2001.

In their July 16, 2001 letter, the Town and Refinery made public their intent to construct a conventional water treatment plant at the River Water Treatment Plant (RWTP) to treat all water from the North Platte River to Safe Drinking Water Act standards. This treatment option was not one of the alternatives proposed for investigation as part of this Level II study and is not discussed in this report. Consequently the treatment alternatives developed and presented in this report will most likely never be constructed. The water storage, transmission, and distribution system improvements recommended remain applicable with the change in treatment plant location.

The funding discussions and economic analysis presented in this report indicate the Refinery will contribute the water treatment plant costs as part of the local project funding.
EXECUTIVE SUMMARY

INTRODUCTION

PROJECT SCOPE

The scope of this study is to identify and evaluate alternative methods to provide a safe, adequate water supply for the Town of Sinclair. Following are several concerns expressed by the Town.

a. Inability of existing system to consistently provide ≤0.5 NTU water has resulted in the system being placed under an EPA Administrative Order.
b. Sinclair’s residents experience low water pressure and delivery volumes.
c. The ability to meet upcoming Safe Drinking Water Act water quality requirements is a major concern.

LEGAL OPERATING CONDITIONS

EPA Administrative Order
The Town of Sinclair and the Refinery are currently under an U. S. Environmental Protection Agency (EPA) Administrative Order for violations of turbidity standards of the SDWA regulations. These violations indicate that the existing processes cannot consistently remove the suspended particles from the water supply. Rawlins water is used during periods of high river turbidity.

Water Agreement
The relationship between the Town of Sinclair and the Refinery relative to the operation and ownership of the water system is contained in a Water Agreement executed in 1967 that expires in 2017. Some of the Water Agreement details include:

• The Town of Sinclair owns the water rights and the water system
• Refinery operates the water system and provides water to the Town at no cost to the Town
• The Refinery does not pay the Town for water it uses
• Refinery is to pay all operation and maintenance costs and make up to $15,000/year of capital improvements to the system. Operation and maintenance costs can be applied to the $15,000 annual capital improvement amount.
• Refinery is to operate the water system “to comply with valid orders and requirements of the State Board of Health of Wyoming or other governmental body or representative having jurisdiction in the premises”.

Sinclair Level II
BACKGROUND

The Town of Sinclair is an incorporated municipality with a population of approximately 470 residents. The water system is a shared operation with the Sinclair Oil Corporation (Refinery). Under the terms of a 1967 agreement between the Town and the Refinery the Town agreed to furnish the refinery with a water supply for the operation of its industrial process. In exchange the refinery donated to the Town the potable water system that included the pretreatment facilities, water treatment plant, storage tank and distribution pipelines. In addition the refinery also agreed to operate and maintain the water system. Approximately 7% of the total water processed is used for potable water for the Town of Sinclair and for potable usage within the refinery. The remainder or majority of the total water processed is used within the refinery processes as boiler water or for other industrial uses.

SERVICE AREA

The project service area is the Town of Sinclair, which includes the Refinery, CIG Compressor Station, Sinclair Golf Course, Peterson Livestock, and the homes located at the River Pump Station.

POPULATION PROJECTION

The 2000 population for Sinclair was 423 people, a decrease of 77 people from the 1990 census. The estimated 2001 population is 470. The Level I study used a design population of 625 for the year 2030. This growth rate is approximately 1%, which is a reasonable projection.

WATER DEMAND

Water is supplied to the Town and the Refinery from the River Water Treatment Plant (RWTP) and intermittently from the City of Rawlins. Water is metered at RWTP discharge to the transmission lines. The transmission lines supply process water to the refinery and the pressure sand filters. The transmission lines also supply partially treated water to Peterson Livestock, houses at the RWTP, and the golf course clubhouse. A meter was installed on the Peterson Livestock service in early 2001; the other services are not metered.

The available meter data from January 1998 through February 2001 was tabulated and estimates made of filter backwash volumes and Refinery potable water consumption in an attempt to estimate the potable water needs of the Town and Refinery. There are many data gaps resulting from malfunctioning meters and remote readout equipment.
WATER USAGE PROJECTIONS

For the purpose of this study, it is assumed that the Town and Refinery potable water consumption will follow historic usage patterns and the following potable water consumption values are used in this study:

<table>
<thead>
<tr>
<th>Design Population</th>
<th>625</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Daily Water Consumption</td>
<td>371 gpcd</td>
</tr>
<tr>
<td>Maximum Daily Water Consumption</td>
<td>750 gpcd</td>
</tr>
<tr>
<td>Design Average Daily Water Consumption</td>
<td>231,875 gpd</td>
</tr>
<tr>
<td>Maximum Daily Water Consumption</td>
<td>468,750 gpd</td>
</tr>
<tr>
<td>161 gpm</td>
<td>326 gpm</td>
</tr>
</tbody>
</table>

OPERATION AND INFRASTRUCTURE ALTERNATIVES

Two basic water system alternatives were investigated along with several sub-alternatives within these basic alternatives. The fundamental difference in the two is who will be treating the potable water used by the Town and Refinery. In Alternative 1, the Town/Refinery will continue to treat and provide potable water. Alternative 2 has Rawlins providing potable water to the Town and Refinery.

Both alternatives include identical distribution system improvements, a new storage tank and a transmission line connecting the storage tank to the Town distribution system. The River Water Treatment Plant (RWTP) will continue to provide process water to the Refinery in both alternatives.

PRELIMINARY COST ESTIMATES

Preliminary cost estimates were prepared for both alternatives using projected 2002 costs.

Alternative 1 – Town/Refinery to Provide Potable Water

<table>
<thead>
<tr>
<th>Improvement Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>New potable water treatment plant</td>
<td>$1,357,000</td>
</tr>
<tr>
<td>Distribution system improvements</td>
<td>854,000</td>
</tr>
<tr>
<td>350,000 gallon water storage tank &amp; transmission lines</td>
<td>1,347,000</td>
</tr>
<tr>
<td>Chemical water main cleaning</td>
<td>300,000</td>
</tr>
<tr>
<td>Replace all water services</td>
<td>300,000</td>
</tr>
<tr>
<td>Water meters on all services</td>
<td>230,000</td>
</tr>
<tr>
<td>Remove existing 75,000 gal storage tank and pressure sand filters</td>
<td>40,000</td>
</tr>
</tbody>
</table>

$4,428,000
Alternative 2 – Rawlins to Provide Potable Water

**Improvement Description**  
- Increase capacity of Rawlins raw water pipeline (14” to 16”)  
- 12” transmission, Rawlins to 350,000 gallon storage tank  
- Distribution system improvements  
- 350,000 gallon water storage tank & transmission lines  
- Chemical water main cleaning  
- Replace all water services  
- Water meters on all services  
- Remove existing 75,000 gal storage tank and pressure sand filters

<table>
<thead>
<tr>
<th>Improvement Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase capacity</td>
<td>300,000</td>
</tr>
<tr>
<td>12” transmission</td>
<td>1,672,000*</td>
</tr>
<tr>
<td>Distribution system</td>
<td>854,000</td>
</tr>
<tr>
<td>350,000 gallon water</td>
<td>1,347,000</td>
</tr>
<tr>
<td>Chemical water main</td>
<td>300,000</td>
</tr>
<tr>
<td>Replace all services</td>
<td>300,000</td>
</tr>
<tr>
<td>Water meters on all</td>
<td>230,000</td>
</tr>
<tr>
<td>Remove existing 75,000</td>
<td>40,000</td>
</tr>
<tr>
<td></td>
<td>$5,043,000</td>
</tr>
</tbody>
</table>

* Potential for cost sharing with the City of Rawlins

**PREFERRED ALTERNATIVE**

The two alternatives previously presented were discussed with the Sinclair Council, the Refinery, City of Rawlins staff and WWDC staff. The City of Rawlins did not express an interest in discussing Alternative 2 or pursuing golf course irrigation water with Sinclair. The Sinclair Council and Refinery preferred to not become involved with Rawlins and selected Alternative 1 – Town/Refinery To Provide Potable Water as the preferred alternative. The proposed water system improvements are shown on Figure 1.

**POTABLE WATER TREATMENT**

A new 0.5 MGD potable water treatment plant will be constructed in the vicinity of the existing elevated storage tank and pressure sand filter building. The treatment plant will include chemical addition, coagulation, sedimentation, filtration, and disinfection.

**DISTRIBUTION SYSTEM**

Evaluation of the existing system revealed that distribution system improvements are needed to provide adequate water service and fire protection.

The existing distribution system has remaining useful life and total system replacement is not recommended at this time. The Town should seriously consider replacement of the older cast iron mains when replacing sewer mains or reconstructing streets containing older water mains.

Mechanical and/or chemical removal of the mineral deposits in the older mains is proposed.
LEGEND

PROPOSED

EXISTING

- 4" WATER MAIN
- 6" WATER MAIN
- 8" WATER MAIN
- 10" WATER MAIN
- 12" WATER MAIN

PRESSURE SAND FILTERS (TO BE REMOVED)

75,000 GAL STORAGE TANK (TO BE REMOVED)

TO SINCLAIR REFINERY

FROM RAWLINS

TO SINCLAIR REFINERY

PROPOSED TREATMENT FACILITY

FROM RIVER WATER TREATMENT PLANT

PROPOSED WATER TANK

12" W

PMPC

CIVIL ENGINEERS

FILE NO. FIGURE 1. DWG.

DATE: 5-7-01 TOWN OF SINCLAIR, WYOMING

SHEET 5
The proposed system can provide 1,000 gpm for fire flow (does not include dead end lines) throughout the Town of Sinclair under maximum day demands.

TRANSMISSION LINE

A new transmission line is needed to connect the new storage with the distribution system. A new 12” transmission line will be constructed from the new storage tank to the northwest corner of town and run east in Washington Avenue to 7th Street. 10” transmission lines will connect the new 12” main to the distribution system in 7th, 9th, and 11th Streets. Easements will be required from the Refinery for the transmission line construction, access, and operation and maintenance.

WATER STORAGE TANK

The minimum recommended water tank size is 350,000 gallons to meet the design average daily demand and provide storage for a two hour duration 1,000 gpm fire. The storage tank will be designed to float on the system and located at an elevation that will increase the static system pressure by 10 psi.

WATER SERVICES

Water service flow tests indicated flow restrictions exist in the older service lines and house plumbing. Water services should be replaced from the main to the street right of way line with a minimum 1” service size. Steel pipe should not be used for new services.

WATER METERS

Installing water meters is one of the most effective means of reducing water consumption and providing the required revenues to adequately manage the water system. Meters also provide a means to compare the amount of water produced with the amount of water sold to consumers, thereby providing a means of determining the amount of water loss in the transmission/distribution system. Meters are the only equitable way to run a water system. Water meter installation is a requirement of several funding agencies.
COST SUMMARY

<table>
<thead>
<tr>
<th>Improvement Description</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>0.5 MGD potable water treatment plant</td>
<td>$1,357,000</td>
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<tr>
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<td>Water meters on all services</td>
<td>$230,000</td>
</tr>
<tr>
<td>Remove existing 75,000 gal storage tank and pressure sand filters</td>
<td>$40,000</td>
</tr>
<tr>
<td></td>
<td><strong>$4,428,000</strong></td>
</tr>
</tbody>
</table>

ECONOMIC ANALYSIS AND PROJECT FINANCING

An ability to pay analysis was prepared to assist the WWDC in determining a fair and equitable financing plan for the water system improvements and to provide information which can be used to determine the conditions and level of state assistance.

REFINERY PARTICIPATION

The Refinery is presently reviewing its situation in Sinclair and evaluating its long term water needs and commitments. A decision is expected in the near future and Refinery representatives will be meeting with Sinclair to review their decision and evaluate the impacts on the water system.

It is essential for the Refinery to participate significantly in the water system improvements for the Town to obtain any grant funding.

GRANT & LOAN FUNDING OPTIONS

Grant and loan options available to the Town are limited by the current water rates, lack of water meters, the perception that the Refinery is unreasonably benefiting from the water system operation and the high median family income of Sinclair’s residents. State and Federal loan and grant were investigated from the following agencies.

Grant Programs
- Wyoming Water Development Commission (WWDC)
- State Lands and Investments Board (SLIB)
- Abandoned Mine Lands Program (AML)
- Wyoming State Revolving Fund (SRF)
Local Funding Sources

1% Capital Facilities Tax
Sinclair has $400,000 plus accrued interest available for water system improvements from the November 4, 1997 Capital Facilities Tax.

User Fees
The Town’s current residential water rate is $5.00 per month and $10.00 per month for general commercial accounts. The Town normally bills 204 residential and 6 commercial accounts a month. Five of the residential accounts are for Refinery owned homes. The Refinery is not billed for water used in the refinery. Four commercial accounts are billed at $10.00 per month. CIG is metered and is billed at $1.00/1,000 gal with a $50.00 monthly minimum. Petersen Livestock is metered and billed $0.90/1,000 gallons. The Refinery is billed a $100 annual fee for golf course irrigation. The water billings totaled $16,046 in FY 2000 and are estimated at $18,674 for FY 2001.

Presently the Town doesn’t have any water related expenses and all water revenues are deposited in the Water Maintenance Account. Most likely, this will change if water meters are installed and the Town/Refinery Water Agreement is renegotiated.

The Sinclair Town Council is considering water rate increases.

Water Fund Reserves
The Sinclair Council has discussed pledging $400,000 of Town reserves for use in the water system improvement.

Refinery Participation
Presently under discussion with the Refinery.

Bond Issue
Probably not a viable funding source in Sinclair.

FUNDING STRATEGIES

Several funding strategies have been discussed with Sinclair, the Refinery and WWDC staff in the course of this study. The Refinery has expressed interest in constructing the water treatment facilities and removing the elevated water tank and pressure sand filters using Refinery forces and Refinery contractors. The two following strategies are premised on the Refinery constructing the water treatment facilities and removing the existing water tank and pressure sand filters. Strategy No. 1 anticipates the Refinery’s construction and demolition costs will be recognized as part of the 50% local funding match. Strategy No. 2 anticipates the Refinery’s construction and demolition costs are
not recognized as part of the 50% local funding match. Both strategies will require raising the current water rates.

**Funding Strategy No. 1**

Assumptions
- Refinery’s construction is recognized as part of the local match
- Refinery will construct the necessary water treatment facilities
- Refinery will dispose of the abandoned water tank, pressure sand filters and building
- $2,214,000 local funding required
  - $817,000 Town
  - $1,397,000 Refinery

Local Funding Sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
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<td>1% Capital Facilities Tax</td>
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<tr>
<td>Town Reserves</td>
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<td>Refinery</td>
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<td>$2,214,000</td>
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</tbody>
</table>

Grant Funding Sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
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<tr>
<td>WWDC</td>
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<tr>
<td>SL&amp;I</td>
<td>1,541,000</td>
</tr>
<tr>
<td></td>
<td>$2,214,000</td>
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</table>

**Funding Strategy No. 2**

Assumptions
- Refinery’s construction is not recognized as part of the local match
- Refinery will construct the necessary water treatment facilities
- Refinery will dispose of the abandoned water tank, pressure sand filters and building
- $2,913,000 local funding required
  - $1,516,000 Town
  - $1,397,000 Refinery

Local Funding Sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
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<tbody>
<tr>
<td>1% Capital Facilities Tax</td>
<td>$400,000</td>
</tr>
<tr>
<td>Town Reserves</td>
<td>400,000</td>
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<tr>
<td>State Revolving Fund Loan</td>
<td>716,000</td>
</tr>
<tr>
<td>Refinery</td>
<td>1,397,000</td>
</tr>
<tr>
<td></td>
<td>$2,214,000</td>
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Grant Funding Sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
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<tbody>
<tr>
<td>WWDC</td>
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<tr>
<td>SL&amp;I</td>
<td>842,000</td>
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<tr>
<td></td>
<td><strong>$1,515,000</strong></td>
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State Revolving Fund Loan
- $716,000 loan principal
- 4% interest
- 20 year term
- $52,684 annual principal and interest payment
- $18,674 estimated FY 2001 Town water user revenue
- $34,010 additional annual water revenue needed just for debt service

IDENTIFICATION OF PERMITS FOR CONSTRUCTION

Permits needed for construction will probably include:
- DEQ/WQD permit to construct
- SEQ permits
- Corps of Engineers permit to cross Sugar Creek
- Tank and pipeline easements and rights-of-ways
- U.S. Fish and Wildlife consultation and establishment of potential annual depletion costs under Section 7 of the Endangered Species Act.