Overview

The Special Areas Water Supply Project

Background

In the late 1980s the Special Areas Board, the Government of Alberta, the Government of Canada, the Special Areas Board, and Ducks Unlimited Canada initiated studies into the feasibility of supplying water to the County of Stettler, the County of Paintearth and the Special Areas. The Special Areas Water Supply Project (SAWSP) arose from these studies. It is a water supply system that would take water from the Red Deer River and distribute it for use throughout the Stettler County, the County of Paintearth and Special Areas 2, 3 and 4 (Figure 1.1).

The project scope was revised several times and in 2011 Cabinet decided to carry out a formal environmental impact assessment on the project. Once the studies and report are completed the project is to be reviewed by the Natural Resources Conservation Board. The Board will assess whether or not the project is in the public interest having regard for the social, economic and environmental impacts.

Alberta Transportation is responsible for conducting the studies and taking the project through the regulatory review process. The Special Areas Board, Alberta Municipal Affairs, and Alberta Agriculture and Forestry are providing support. Engineering studies have been completed for the project and environmental studies are ongoing. If the project proceeds, it would be built by Alberta Transportation and then become part of the Province's water management infrastructure operated by Alberta Environment and Parks.

Water Supply System

The diversion of water from the Red Deer River would be through a pump station northwest of Big Valley. From the pump station the water would be transported via pipeline generally eastward across Stettler County and the County of Paintearth for 97.5 km to Lehman Reservoir.

Lehman Reservoir

Lehman Reservoir is the key component in the storage and distribution of water throughout the Special Areas. There is an existing Lehman Reservoir created by a dam on sounding Creek. The SAWSP proposes the construction of a new dam downstream of the existing one. The new larger dam would create a larger reservoir with an area of approximately 630 ha and a storage capacity of 25,000 dam^3. The reservoir would have three different outlets allowing it to direct water to Berry Creek, Sounding Creek and Craig Creek.

These three creeks would be the main distribution system for the water throughout the Special Areas with a combined length in excess of 300 km. Along the creeks the water would be used for multi-use projects, stock watering and irrigation.

Oyen Tributary Reservoir

A second large reservoir, the Oyen Tributary Reservoir, is proposed off of Sounding Creek north of Oyen. This reservoir is part of a complex of water management works that address multiple water management objectives. There is an existing reservoir, the Sounding Creek Reservoir, on Sounding Creek near the proposed Oyen Tributary Reservoir. Picotte Creek water flows into Sounding Creek Reservoir. The creek's water is highly saline and unsuitable for the intended water uses. If allowed to mix with the water diverted from the Red Deer River it would degrade the water quality.

The SAWSP proposes to construct the Diversion Reservoir on Sounding Creek upstream of Picotte Creek. The Diversion Reservoir would create enough water depth to allow the water to discharge and flow 20 km down the Oyen Inlet Canal to the Oyen Tributary Reservoir. The Oyen Tributary Reservoir would have an area of 330 ha and a storage capacity of 18,000 dam^3. The reservoir would release water back to Sounding Creek downstream of Sounding Creek Reservoir. The water quality would be preserved and the water would be used for 50 km downstream.

The existing Sounding Creek Reservoir would be refurbished and downsized. It would capture and hold the poor quality water from Picotte Creek preventing it from contaminating the high quality Red Deer River water during the operating season. The water could be released into the system at times when the water is not being used for agricultural or domestic purposes.

Additional Works

<u>Channel Improvements</u>

Portions of the channels of Sounding Creek and Craig Creek are not large enough to carry the flows that would be released into them from Lehman Reservoir. Channel modification would be required to prevent erosion and flooding. An estimated 28 km of Sounding Creek could suffer significant channel impacts and would require channel enlargement and erosion control. A further 14 km of Sounding Creek and 14 km of Craig Creek could receive moderate channel impacts and may require the installation of localized erosion controls, such as willow plantings.

<u>By-Pass Canals</u>

Five by-pass canals are proposed as part of the SAWSP: Scaupshovel (4 km), Antelope Lake (8 km), Esther (13 km), Grassy East (8 km) and Craig Lake (5 km). These are all in association with existing or proposed multi-use projects. The canals by-pass the projects and allow control of the volumes of water released into the multi-use projects and delivered for use further downstream.

Multi-use Projects

Fourteen multi-use projects are proposed as part of the SAWSP. Most of these are existing projects that were built by Ducks Unlimited. These would be refurbished and expanded as part of the project, thereby increasing their size and improving their function. Each project is a shallow reservoir. The reservoir is filled to its full supply level early in the spring. The water level is then gradually reduced over the spring and summer to the reservoir's normal operating level. This operation creates a large area of marshy semi-aquatic vegetation around the margins of the reservoir. This provides ideal nesting habitat for waterfowl. Once the waterfowl have left the nests, the grassy vegetation is available for farmers to use for hay or forage. The reservoir can also provide a good location for pumping water into dugouts for livestock watering.

Uses

Stock Watering

Increased availability of water for livestock is the most significant benefit of the SAWSP. Cattle ranching is the foundation of agriculture in the Special Areas. The area grows high quality beef fed on native grasses augmented by forage crops. Water management is key to the effective management of range lands. Cattle will only range so far from a water source. This can result in the grassland near the water source being overgrazed, and that more remote from it being underutilized. A better distribution of water results in more effective use of the grassland, increased productivity and greater biodiversity. The SAWSP would allow ranchers along each of the three creek corridors the opportunity to pump water to dugouts or other water storage facilities to better manage their rangelands.

Irrigation

The soils throughout much of the Special Areas are not well suited to irrigation. There are, however, areas where the soils are suitable for irrigation. These are shown on Figure 1.1. These areas could be economically irrigated and could produce forage, hay and feed grains, thereby providing stability to ranching operations and significant economic benefit. Previous proposals for the SAWSP included irrigation of up to 8090 ha. Competing demands for water in the Red Deer River basin resulted in the reduction of irrigation to 3240 ha in the current proposal.

Allocation of water for irrigation or other uses is not part of this project. Such allocations will be through individual applications by potential water users and subject to review by Alberta Environment and Parks.

Project Costs and Implementation

The most recent engineering study estimated the cost of the project at $410.3 million including construction costs, land acquisition, construction easements and engineering. It was proposed that the construction be staged over four years. Annual operating costs were estimated to be $5.55 million of which $3.27 million would be for energy.

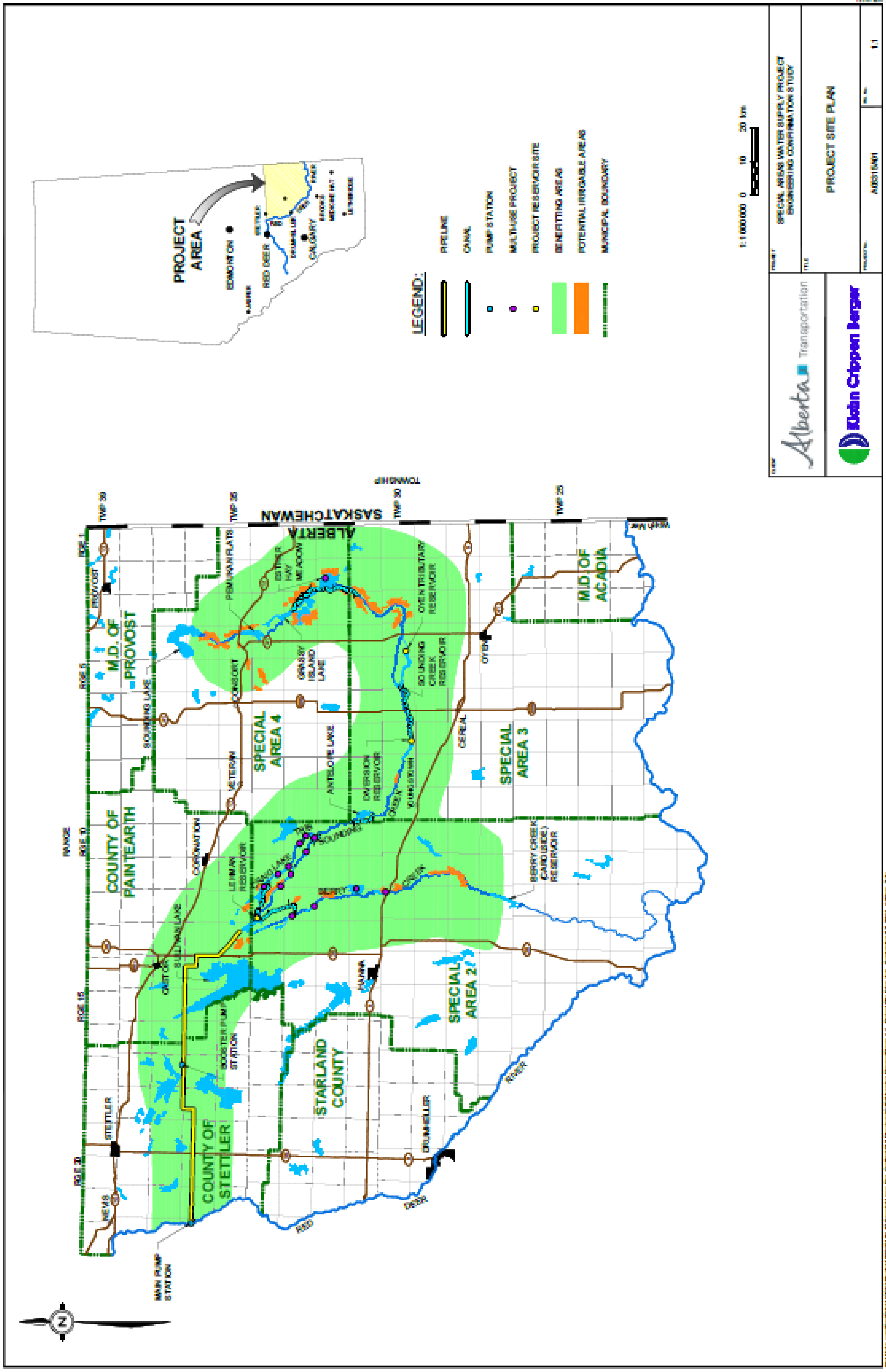
PROJECT AREA
LEGEND:
PIPELINE
CANAL
PUMP STATION
MULTI-USE PROJECT
PROJECT RESERVOIR SITE
BENEFITTING AREAS
POTENTIAL IRRIGABLE AREAS
MUNICIPAL BOUNDARY
SPECIAL AREAS WATER SUPPLY PROJECT ENGINEERING CONFIRMATION STUDY
PROJECT SITE PLAN
Alberta Transportation
Klohn Crippen Berger
SASKATCHEWAN
ALBERTA
M.D. OF PROVOST
COUNTY OF PAINTEARTH
SPECIAL AREA 4
SPECIAL AREA 3
SPECIAL AREA 2
STARLAND COUNTY
COUNTY OF STETTLER
M.D. OF ACADIA
MAIN PUMP STATION
BOOSTER PUMP STATION

Table 1 **Capacity of Major Diversions in Alberta**		
Diversion/Canal	Cubic Feet per Second	Cubic Metres per Second
Eastern Irrigation District Diversion	3400	96.3
St- Mary-Jensen Canal	3200	90.6
Jensen-Ridge Reservoir Canal	3000	85.0
Belly-St. Mary Canal	2450	69.4
Waterton-Belly Canal	1966	55.7
Carseland-Bow Headworks	1800	51.0
Western Headworks	1600	45.3
Lethbridge Northern Headworks	1500	42.5
United Irrigation District Headworks	358	10.1
Blood Indian Irrigation Diversion	325	9.2
Highwood-Little Bow Diversion	300	8.5
Willow Creek-Pine Coulee Diversion	300	8.5
Cavan Lake Headworks	195	5.5
Mountain View, Leavitt, Aetna Headworks	150	4.2
Sheerness Diversion	88	2.5
Special Areas Water Supply Project	**88**	**2.5**
Deadfish Creek Diversion	60	1.7
Buffalo Lake Diversion	50	1.4
Gull Lake Diversion	30	0.8

Table 2 **Headworks Reservoirs in Alberta**	
Reservoir	Surface Area (hectares)
McGregor Lake	5,100
St. Mary	3,765
Oldman River	2,425
Keho Lake	2,350
Travers	2,265
Milk River Ridge	1,415
Waterton	1,095
Lehman	**630**
Little Bow	530
Oyen Tributary	**330**
Payne Lake	240
Jensen	200
Cavan Lake	135
Diversion	**80**