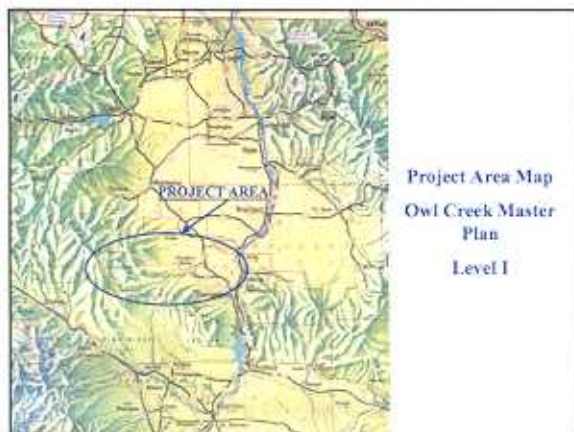




Intro: 2003 Level Study

A little background:

- District Formed: 1935±
- Anchor Contract: 1955
- Revised Interim Contract: 1992
- Upper, Middle, Lower Areas
- Transferred or "Exchange Water" 78.93 CFS

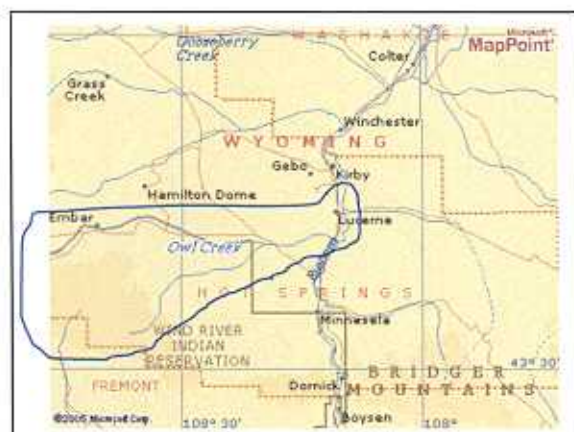


NW Thermopolis

Drainage Area = 509 mi²

West of Highway = 478 mi²

12,500 AMSL – 4300 AMSL



Drainage Area = 509 mi²

West of Highway = 478 mi²

Wind River Indian Reservation (WRIR) –
South of Owl Creek & South Fork of Owl Creek

OWL CREEK BASIN RUNOFF

<u>Location</u>	<u>Avg. Runoff</u>	<u>Lowest 10%</u>
South Fork Supply	24,300 Acre-Ft.	10,300 Acre-Ft.
South Fork Supply (Below Anchor Reservoir)	16,300 Acre-Ft.	8,300 Acre-Ft.
North Fork	10,427 Acre-Ft.	3,000 Acre-Ft.
Red Creek	?	?
Mud Creek	?	?



Gauging Station, above Anchor Dam on South Fork Owl Creek

Gauge on South Fork Owl Creek above
Anchor Reservoir

- Accuracy of Gauge in question
- For accurate section need:

- Quiescent, uniform flow

OR

- Construct Flow-Discharge Curve

LOWER (LUCERNE) WATER SUPPLY

Lucerne Pump Plant
44 CFS – Upper Canal
40 CFS – Lower Canal

DIRECT from Big Horn River

Upper Canal feeds Relift Pump Plant

- Relift Pump Plant 33 CFS
- Discharge into Dempsey Canal

IRRIGATED LANDS

- Upper Area
- Middle Area
- Arapaho Ranch
- 43 Diversions
- Lower (Lucerne Area)

	10,274 AC
Sub-Total	12,574 AC
Total	17,000 AC

Upper and Middle Area CIR – 2 Acre-Ft. / Acre

Diversion Requirement: 3.7 Acre-Ft / Acre

WRIR Water Duty: 4.3 Acre-Ft. / Acre

Lucerne CIR

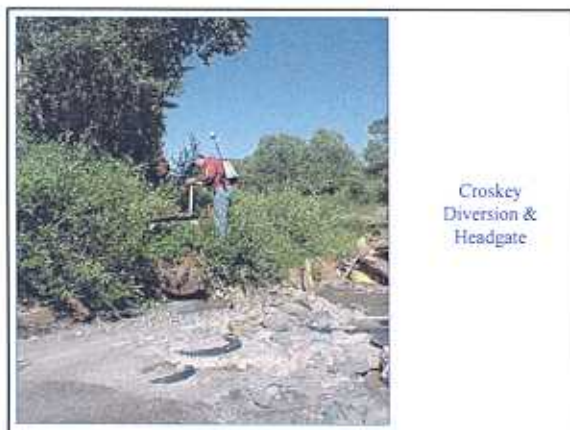
Upper & Middle Area of Owl Creek
Estimated Diversion Requirement
Compared to Average Water Supply (Ac/Ft)

Total Est. Supply	25,320
Max. Diversion	81,546
Excess / Deficit (-)	-56,226
Mean Diversion	46,079
Excess / Deficit (-)	-20,759
Min. Diversion	10,642
Excess / Deficit (-)	14,678

Total Estimated Supply

Mean Diversion Requirement

Average Deficiency ~ 21,000 Acre-Ft.



Inventory of diversion

- Information organized into GIS Database

- Location nodes on GIS maps

- Example of Wyoming Modified Headgate



18 Reservoir Sites Evaluated

- Historic Sites
- Off Channel
- On Channel
- Anchor Reservoir
- Intra-basin diversion

Coordinate with WRIR for siting

Site	Capacity	Distinguishing Characteristics
1 (Hamilton Dome)	Site 1 12,568 Acre-Feet	<ul style="list-style-type: none"> • efficient, off stream storage • low capacity (up to 11,200 AC-FT via diverted flows from North Fork Owl Creek) • highest environmental rank and generally the most favorable site, except for storage capacity
Sites 2/5	Site 2 26,640 Acre-Feet Site 5 11,554 Acre-Feet	<ul style="list-style-type: none"> • highest efficiency and likely lowest cost of all sites (particularly Site 2) • poorest environmental ranking of all realized sites • potentially adverse geologic structure (particularly Site 2)
Sites 8/18	Site 8 12,860 Acre-Feet Site 18 N/A	<ul style="list-style-type: none"> • second (Site 8) and third (Site 18) highest environmental rankings • good proximity to irrigated lands • Site 18 is the most favorable site geologically • Potential for Karst-associated problems (Site 8)
17 (Confluence)	Site 17 20,278 Acre-Feet	<ul style="list-style-type: none"> • highest potential storage capacity • greatest potential supply • greatest potential flood protection • potentially adverse geologic structure

These six sites:

- Survived Level I evaluation
- Recommended for further study in Level II

ENVIRONMENTAL IMPACT RANKING		
Site #	Points	Ranking
1	7	Best
8	13	↑ ↓
18	15	
17	19	
2/5	23	

Environmental Impact on Sites

ANCHOR DAM

General

- Project PSMBP-Owl Creek
- Dam typeConcrete thin arch
- Original construction1957-1960 (still in construction status)

Hydraulics


- Total storage to EL. 6441 17,354 acre-ft
- Service spillway
- Capacity at EL. 6451.5 ...13,500 cfs
- Outlet works
- Capacity at EL. 6441500 cfs

Dimensions

- Crest Elevation..... 6452.5 ft
- Structural Height 208 ft
- Crest Length 660 ft
- Base Width 54.2 ft
- Volume of Concrete 69,350 cu yd

Hydrology

- Drainage area 131 sq mi
- Maximum water surface: 6463.3 ft



Planning in 1940's & 1950's

Missouri River Basin – pick-sloan program

- 3.06 Acre-Ft. / Acre

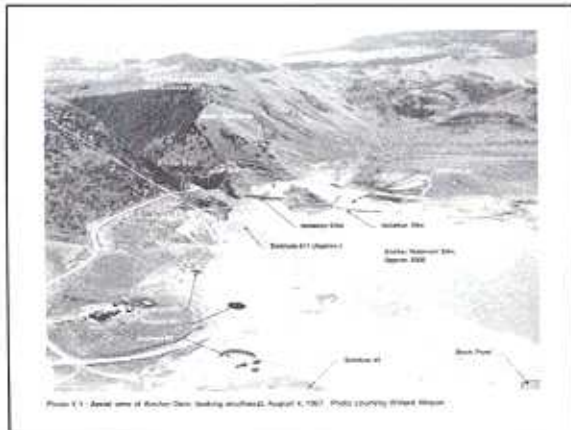
- 2300 Acres on Arapaho Ranch

- Design Capacity 17,354 Acre-Ft.

Operated under Interim Contract

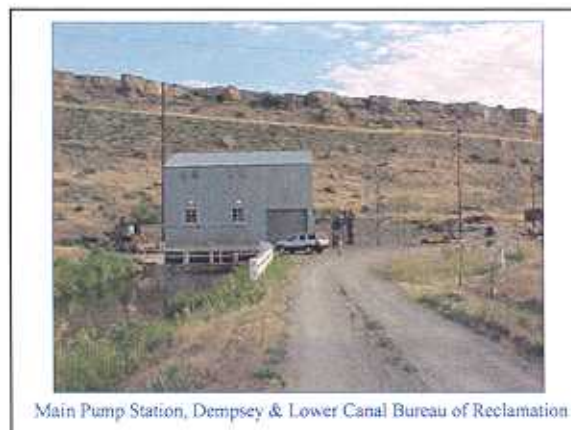
- WL 6400 AMSL

- 5000 Acre-Ft.



Discussion on sinkholes

Discussion on USBR efforts to fill sinkholes
and locate future sinkholes



Lucerne Pump Station

- 44 CFS – Upper Canal

- 40 CFS – Lower Canal

Completed in 1957

Operated under Interim Agreement

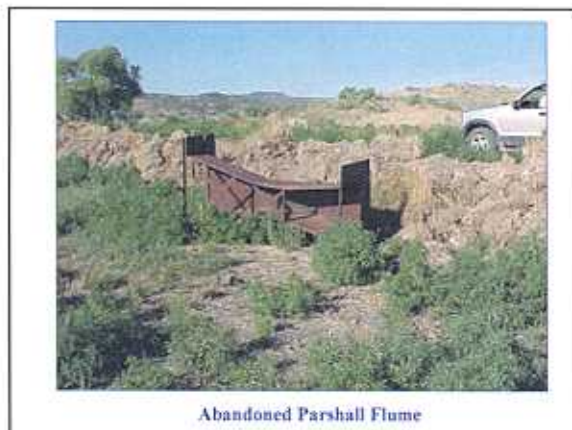


Relift Pump Plant 33 CFS



Important issue on Lucerne canals:

- Seepage
- Rehabilitation Plan



Water Conservation and Measurement
Wyoming Modified Measuring Device
