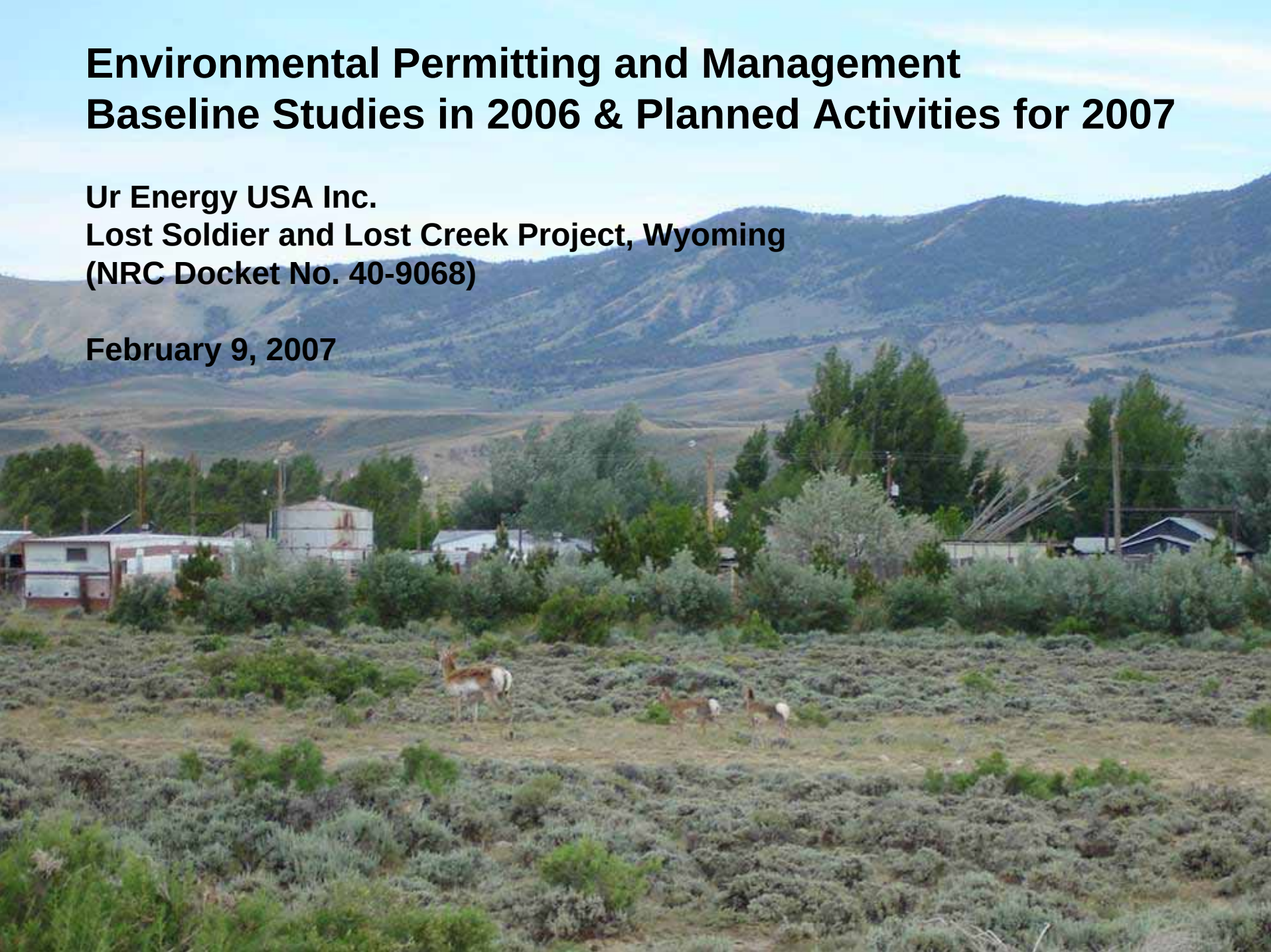
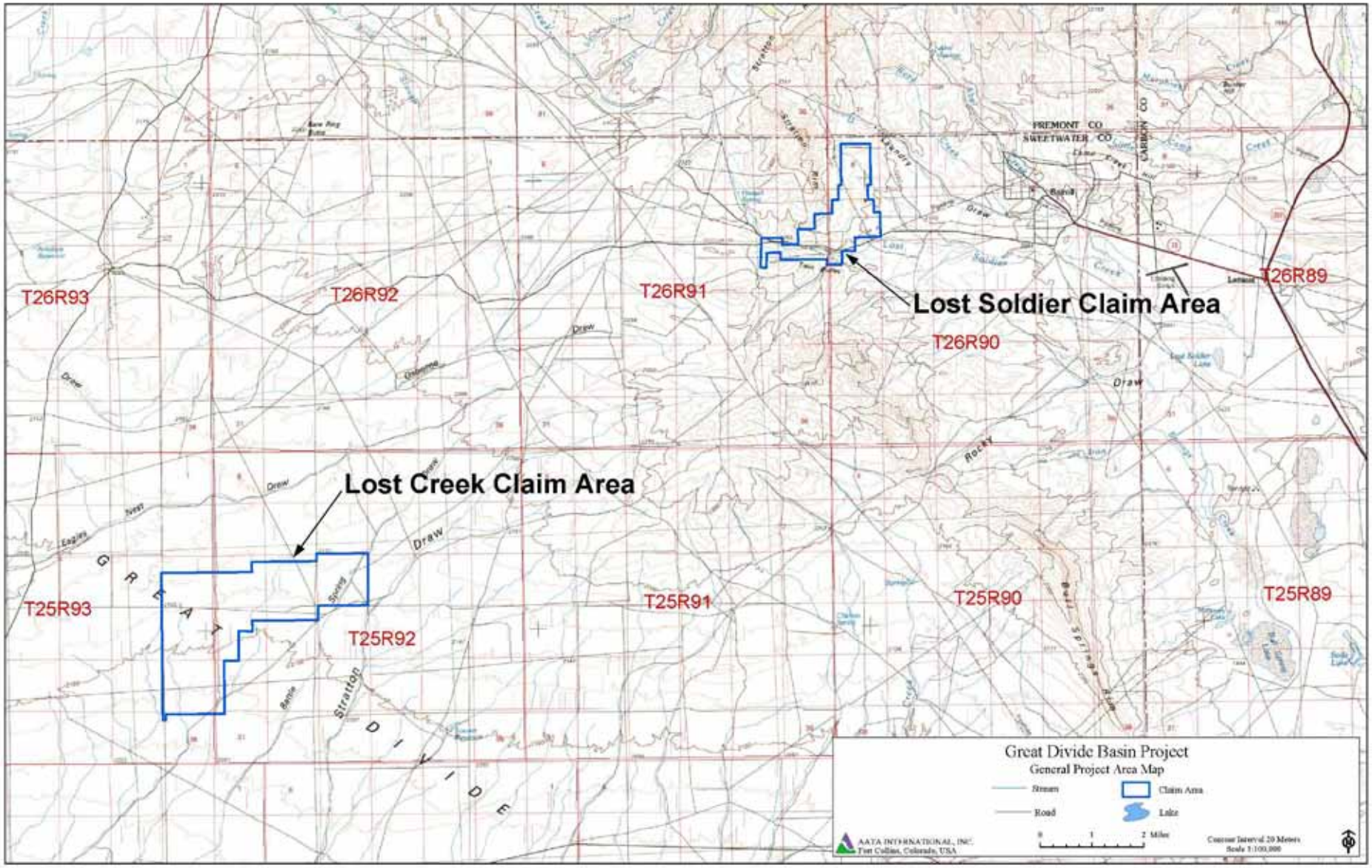
Environmental Permitting and Management
Baseline Studies in 2006 & Planned Activities for 2007

Ur Energy USA Inc.
Lost Soldier and Lost Creek Project, Wyoming
(NRC Docket No. 40-9068)

February 9, 2007



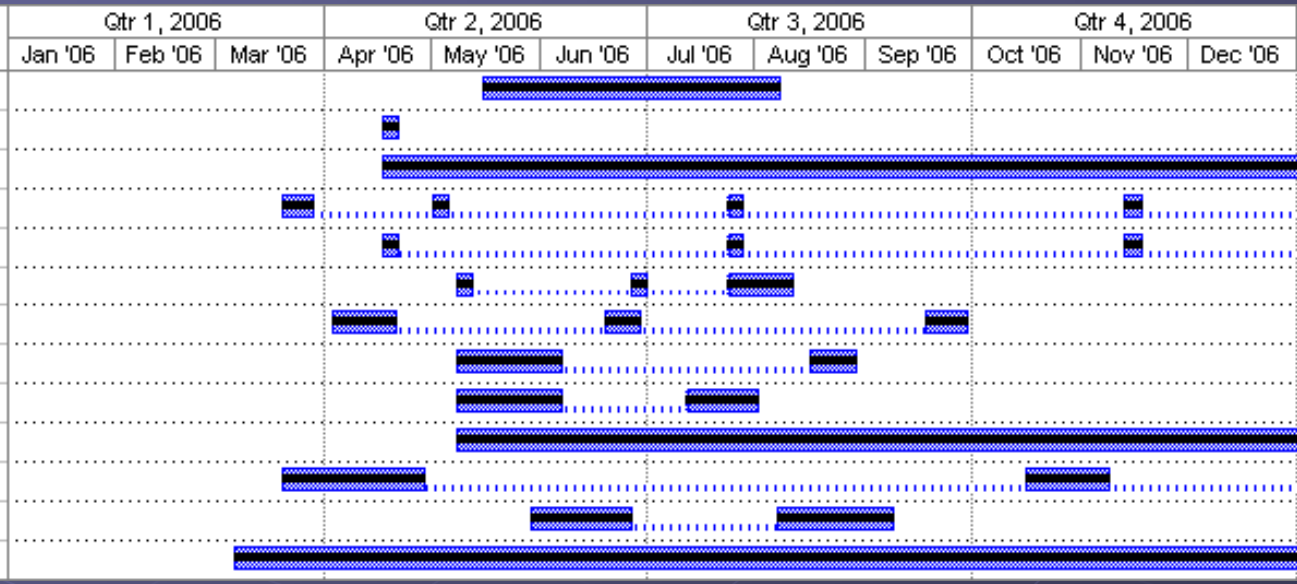
Project Location
WYOMING
Red Lodge
Powell
Lovell
Sheridan
Cody
Greybull
Buffalo
Gillette
Moorcroft
Spearfish
Sundance
Lead
Cloud Pk
13167
Worland
Thermopolis
Wright
Newcastle
Custer
Hot Spring
Jackson
Alpine
Gannett Pk
13804
Boysen Res
Shoshoni
Riverton
Pinedale
Lander
Casper
Douglas
Lusk
Afton
Big Piney
Granite Mts
Glendo Res
Fort Laramie
Torrington
Wheatland
Farson
Great Divide Basin
Seminoe Reservoir
Medicine Bow
Rawlins
Kemmerer
Rock Springs
Green River
Woodruff
Saratoga
Laramie
Cheyenne
Flaming Gorge Reservoir
Bridger Pk
11004
Kings Peak
13528
Teton Ra
Jackson Lake
Wind River Ra
Wyoming Ra
Owl Creek Mts
Bighorn
Powder
Sweetwater
North
Platte
Anthony
Teton Ra
Yellowstone Lake
BIGHORN MTS
LARAMIE MTS
MEDICINE BOW MTS
90
25
80



Lost Soldier Claim Area
Lost Creek Claim Area
T26R93
T26R92
T26R91
T26R90
T26R89
T25R93
T25R92
T25R91
T25R90
T25R89
PREMONT CO
SWEETWATER CO
CARBON CO
GREAT DIVIDE
Great Divide Basin Project
General Project Area Map
Stream
Road
Claim Area
Lake
AATA INTERNATIONAL, INC.
Fort Collins, Colorado, USA

2006 Baseline Surveys - Summary

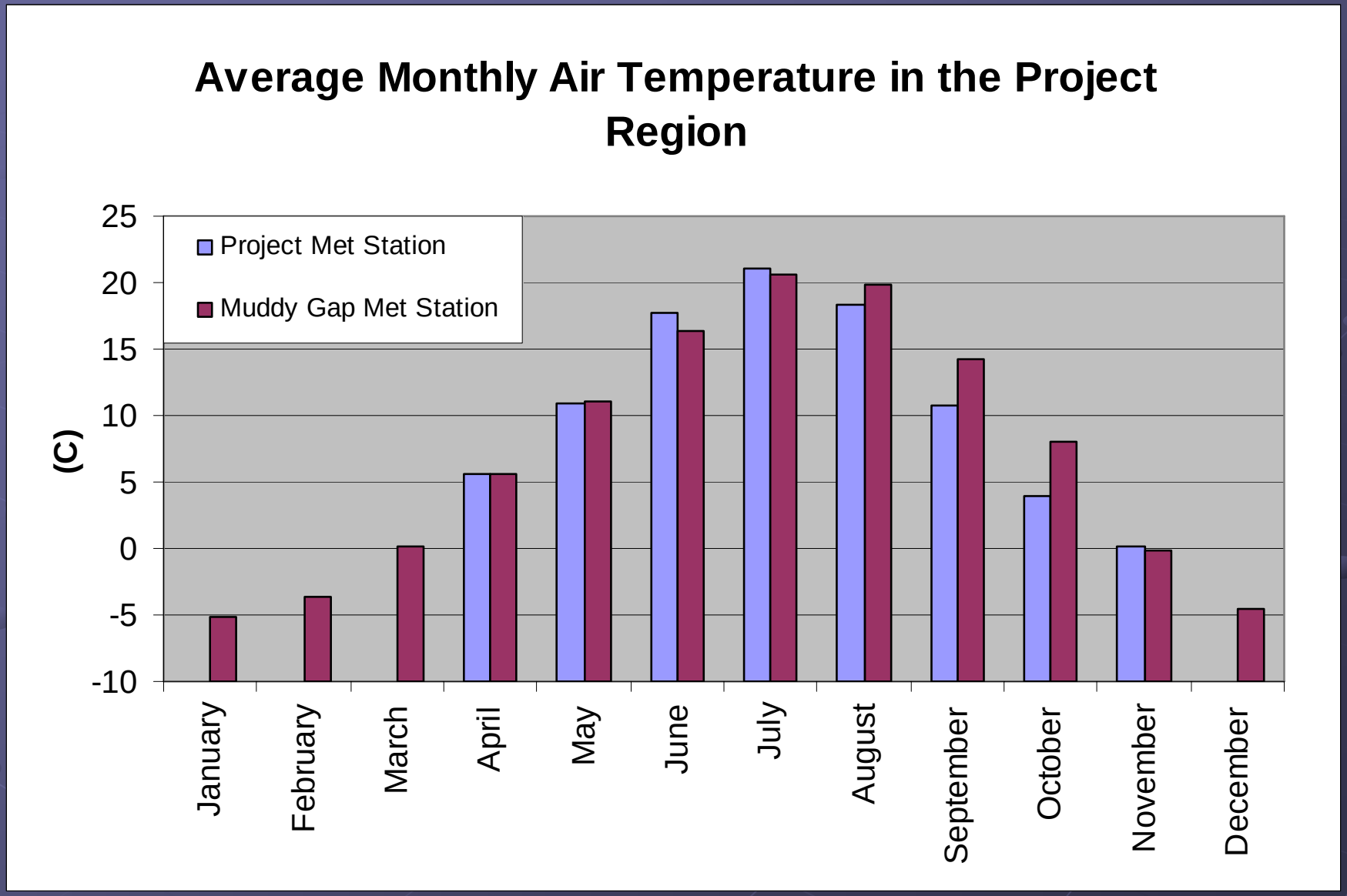
ID	Task Name
1	Archaeology Field Studies
2	Meteorology Station Installation
3	Meteorological Data Collection
4	Air Quality Studies
5	Surface Water
6	Vegetation Survey
7	Wildlife Survey
8	Wetlands Survey
9	Soil Study
10	Groundwater Study
11	Socio-Economics-Cultural
12	Radiological Survey
13	Baseline Report Preparation



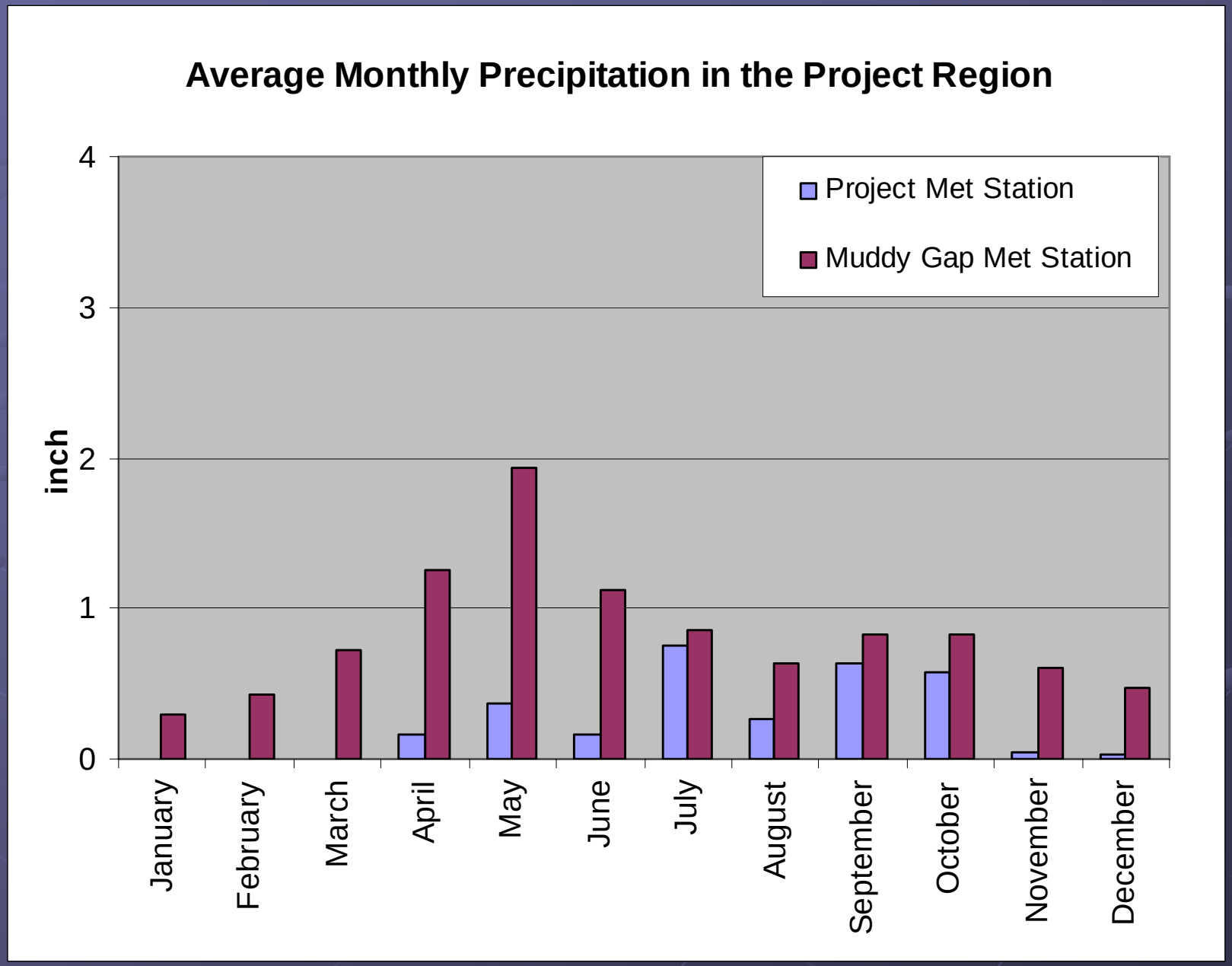
Meteorology & Air Quality

- Meteorological Station Installed at Lost Soldier (Continuous Data Collection since April 2006)
- Comparison with Regional Long-term Data from Muddy Gap, WY
- 24-hr Mini-Vol PM10 Sampling (16 Samples Collected; More in 2007)
- Passive Natural Gamma & Radon-222 Sampling Started at 10 Locations (first set will be collected in early February)

Temperature

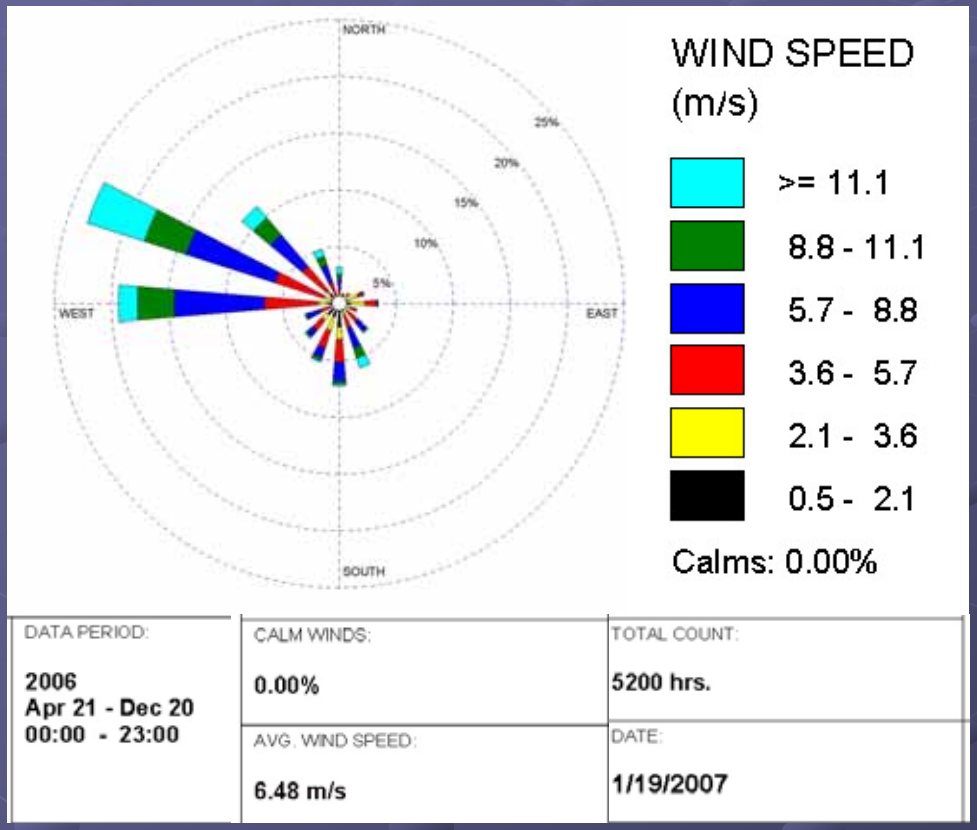


Precipitation

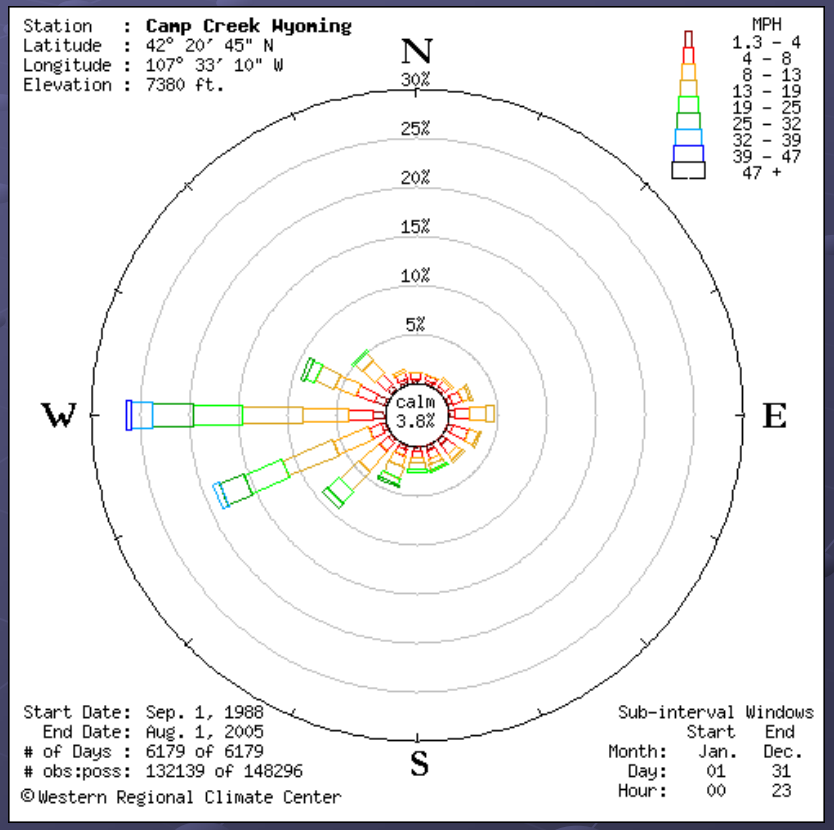


Wind

Project Met Station



Camp Creek Met Station



Air Quality – Natural Gamma & Radon

- 10 Sampling Kits Installed (1 at Bairoil)
- Pending Lab Results

Wildlife Surveys

- Big Game & Wild Horses
- Sage Grouse
- Raptors
- Breeding Birds
- Mountain Plover
- White-tailed Prairie Dog
- Black-footed Ferret
- T&E Species

Big Game & Wild Horses

- Winter / Yearlong Range for Pronghorn
- Winter Range in Part of LS for Mule Deer
- Out of Winter Range For Moose and Elk
- Wild Horses

Sage Grouse

- No Leks at Lost Soldier
- No Active Leks Within Lost Creek
- West Portion of Lost Creek is Within the 2 Mile Buffer Zone

Sand Gully Lek, 2.5 miles north of Lost Creek

Raptor Nests

- No Active Nests Within Lost Soldier Claim Area
- 1 Active Nest Near Western Boundary of Lost Creek Claim Area
- No Active Nests Within the ½ mile Buffer Zone of Either Claim Area

Migratory Birds of High Federal Interests (MBHFI)

- 5 Level I Species Recognized in Project Area
- 8 Level II Species Recognized in Project Area

Other

- White-tailed Prairie Dog (Identified at Lost Soldier; None at Lost Creek)
- Black-footed Ferret (None Present)
- No T&E Species Present

Surface Water

- Lost Soldier Creek is the Only Perennial Creek (Augmented Flow)
  - Three Sets of Quarterly Samples Collected from 6 Sampling Sites; Summary of the Three Sampling Events:

    pH 7.4 – 8.7
    Ra <0.2 – 12.5 pCi/L
    Gross Alpha <1.0 – 15.9 pCi/L
    Gross Beta 2.7 – 14.7 pCi/L

- Numerous Intermittent Draws (18 Automatic Samplers Installed)
  - No Flow Since April 2006

Soil Survey

- 36 Soil Pits for Soil Profile Characterization (16 at LC & 20 at LS)
- 54 Soil Samples were Collected and Analyzed
- 3 Soil Types Identified at Lost Creek
- 11 Soil Types Identified at Lost Soldier
- All Soils Suitable or Marginally Suitable Topsoil

Vegetation Surveys

- Completed all Field Surveys in September 2006
- 3 Major Types of Vegetation Identified (167 total species)
- LS More Diverse than LC due to Topographic Relief & Perennial Water
- Few Weeds
- No T&E Species or Species of Concern

Upland Big Sagebrush Shrubland (left)

Lowland Wet Meadow (above)

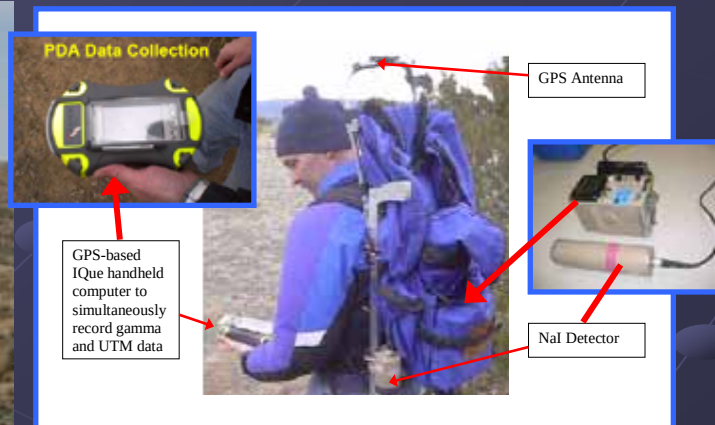
Lowland & Sideslope Big Sagebrush Shrubland (left)

Wetland & Aquatic Life

- No Wetland or Aquatic Life on the Lost Creek Property
- Man-made Wetlands Identified along Lost Soldier Creek (< 1% of the LS Claim Area; 6 Vegetation Species Identified)
- Lost Soldier- Active Beaver Population with Dams Present
- No Fish Found in Lost Soldier Creek

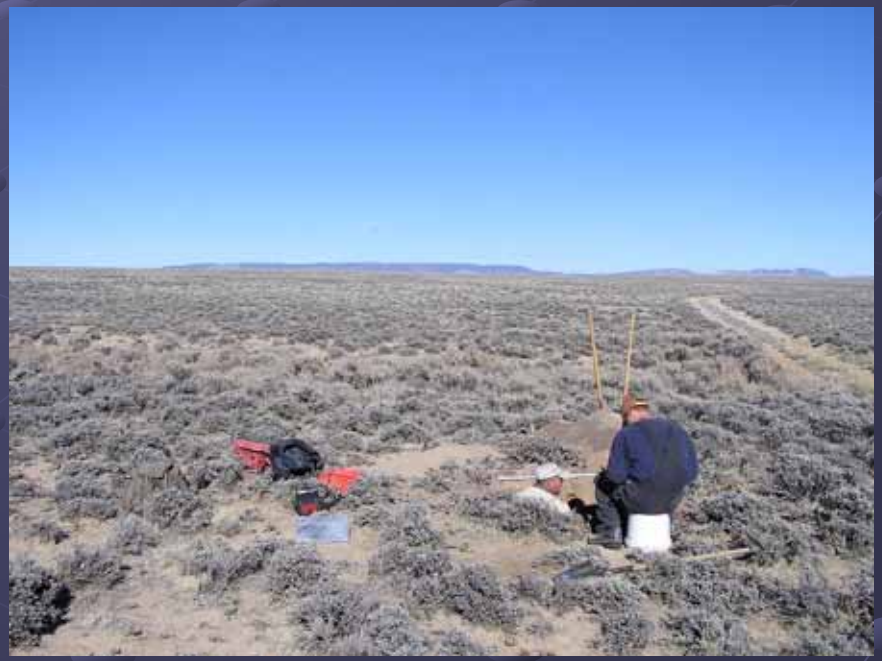
Radiological Background

- Work Plan Discussed with NRC (NRC Inspected the Survey on Site)
- Used ATV-mounted GPS-Integrated NaI Gamma Detectors
- Survey Covered the Entire Two Properties with Over 850,000 Data Points (Far Exceeded NRC Standards for Sampling Density)
- Data QA/QC (with ground-truth confirmation) showing $R^2 > 99\%$
- Soil & Passive Natural Gamma and Radon Sampling Also Conducted
- Soil Samples Showed Close Correlation with Scanning Results



Archaeological Surveys

- Conducted Existing Record Search, Prospecting, Pedestrian Survey and Excavation Site Testing per BLM Guidelines
- Artifacts Recovered were All Analyzed
- Obsidian Samples were Sourced Using XRF
- Radiocarbon Samples were Submitted to the Lab (Results Expected within 2 weeks)



SocioEconomics/Cultural

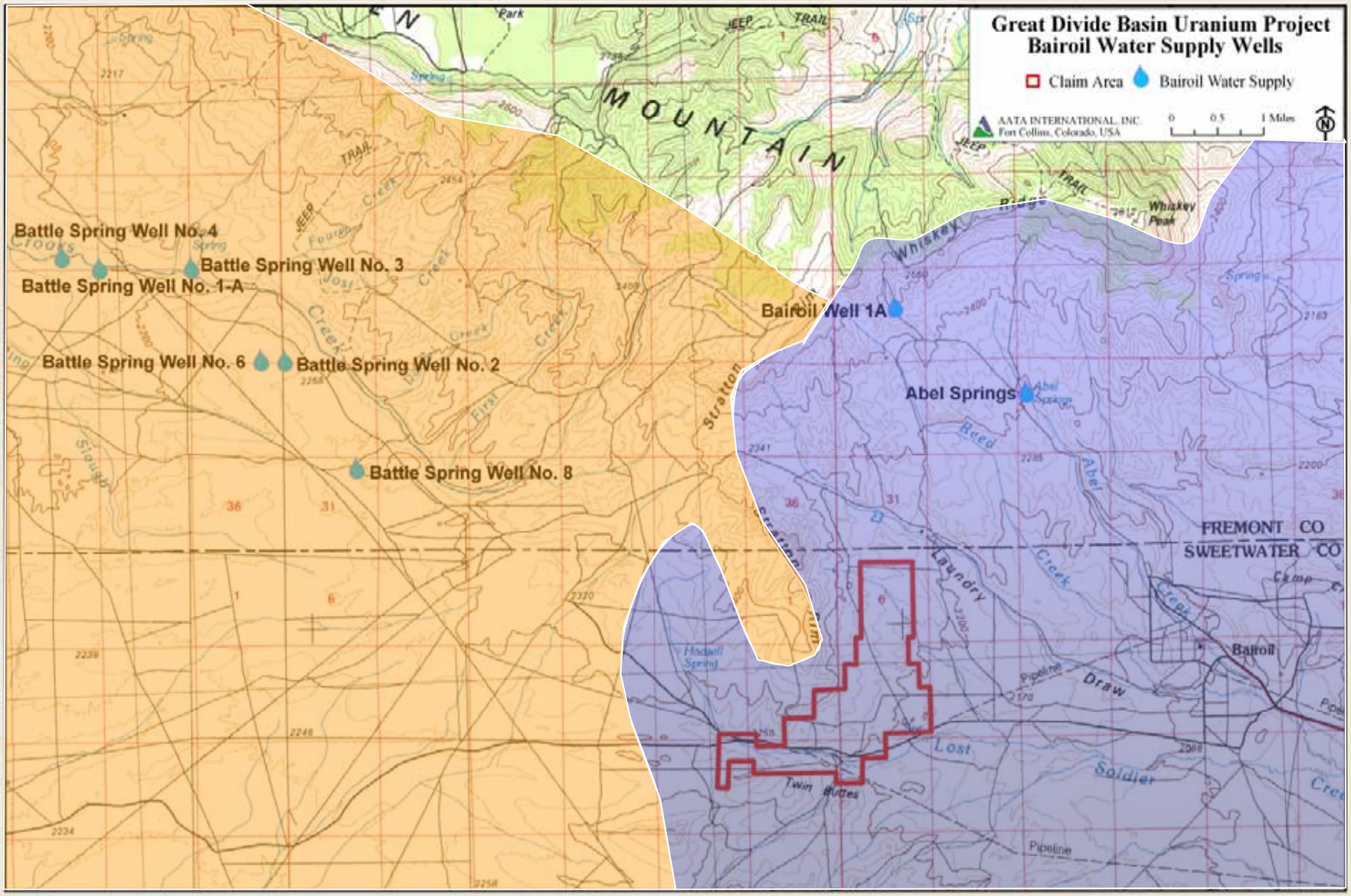
- Site Visit Completed to Both Lost Soldier & Lost Creek Claim Sites, Bairoil and Rawlins
- Visual Assessment of the Project Area was Conducted
- Recreational Amenities in the Project Area Recorded
- Met and Talked with Key Community Planners and Political Representatives in Rawlins and Bairoil
- Verified Water Supplies for Bairoil
- No Resettlement Needed for the Project
- Extensive Commercial & Industrial Development in Surrounding Communities (Mainly Oil & Gas Related)
- Lack of Labor will be an Issue

Bairoil East

Bairoil West

Bairoil Water Supply

- ✓ Main Source: Abel Springs & Bairoil Well 1A (2-3 miles upgradient)
- ✓ Backup Source: Battle Spring Wells (6-10 miles NW; Different Catchment)



CAT

2007 Schedule

- Continue Baseline Sampling & Testing
- Complete Baseline Surveys Any Newly Added Areas
- Submit WDEQ Permit to Mine Application in Mid-year for LC
- Submit NRC License Application in 3rd Quarter for LC
- Submit LS Permit / License Applications 4-6 Months after
- Submit Applications for All Other Approvals (UIC Class I, Mine Unit, etc.) for LC by the Year-end and for LS 4-6 Months Later

2006 Hydrogeologic Characterization and Baseline Groundwater Quality Program
Lost Creek - Lost Soldier
Great Divide Basin, Wyoming

February 9, 2007

Provided by:
Ur-Energy USA, Inc.

Ur Energy inc

HYDRO-ENGINEERING, LLC

Leppert Associates, Inc.

Presentation Topics:

1) Review of the 2006 Lost Creek/Lost Soldier Well Installation Program.

2) A brief description of the methodology, field data, and results from hydraulic testing at both sites.

3) A brief overview of baseline groundwater quality sampling performed at both sites.

4) A brief explanation of the site data management system being developed for the site.

5) Discuss planned activities for 2007 at both sites.

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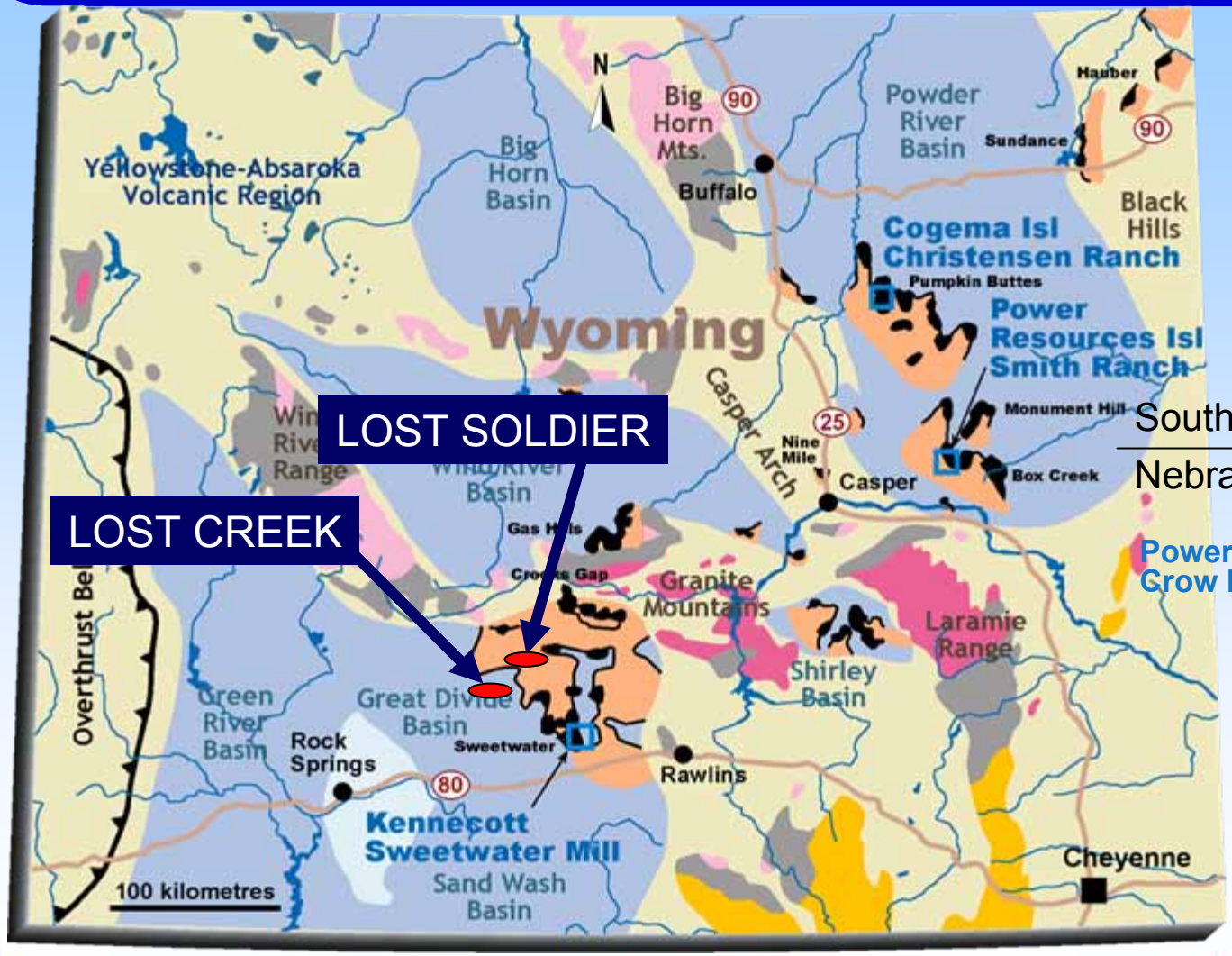
Hydrogeologic Setting:
Wyoming Uranium Geology



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Altered sands associated with roll front deposits	Altered Archean granites
Tertiary basin	Unaltered Archean granites
Tertiary intrusive center	Archean metasediments, volcanics
Proterozoic rocks, undifferentiated	Uranium deposit and roll front

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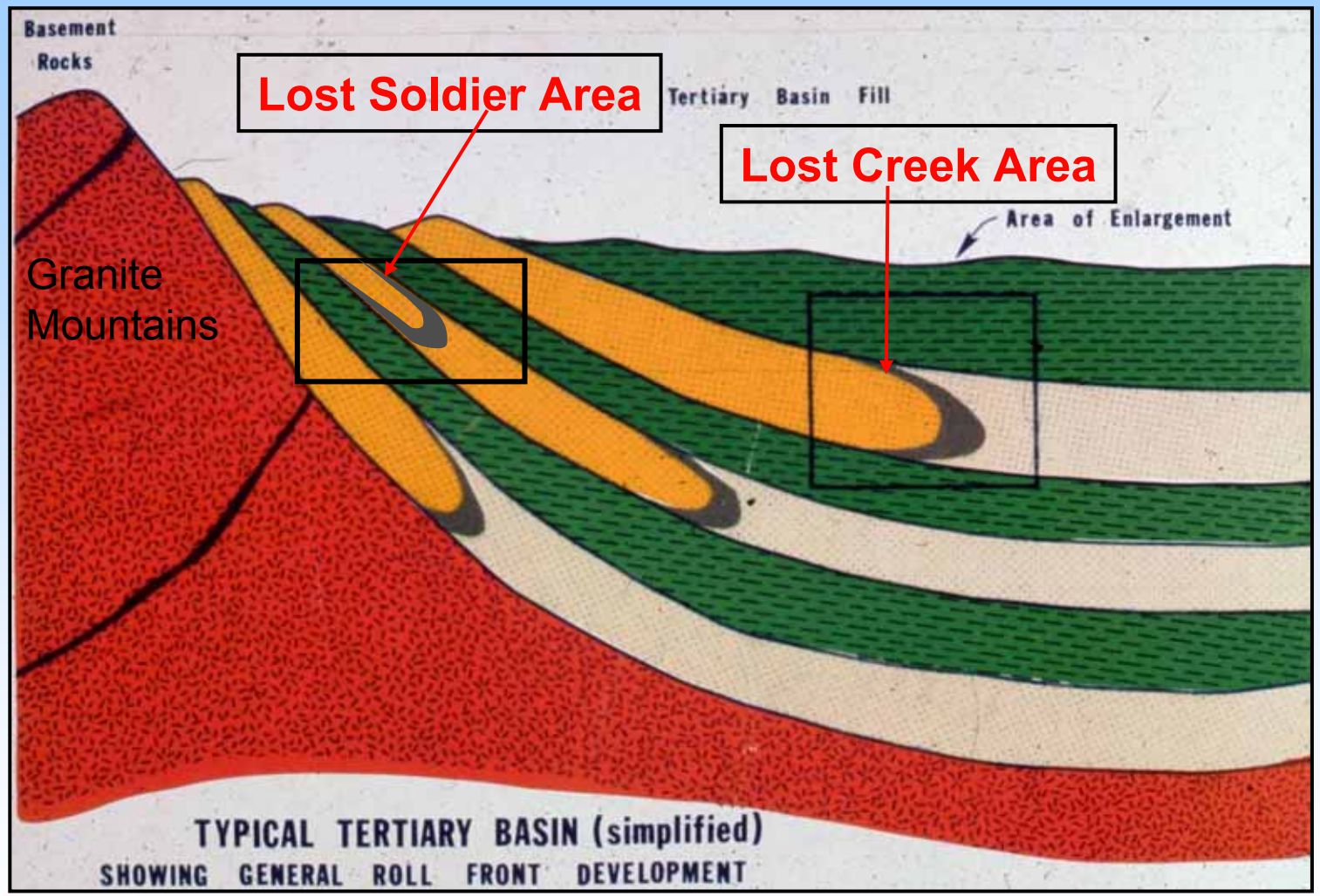
Hydrogeologic Setting:
Idealized Solution Front Formation



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Hydrogeologic Setting:
Lost Creek Potential Ore Zones

- **Major ore-bearing sand - HJ.**
- **Underlying aquifer – UKM sand.**
- **Overlying aquifer – LFG sand.**
- **Central mine area bisected by fault .**

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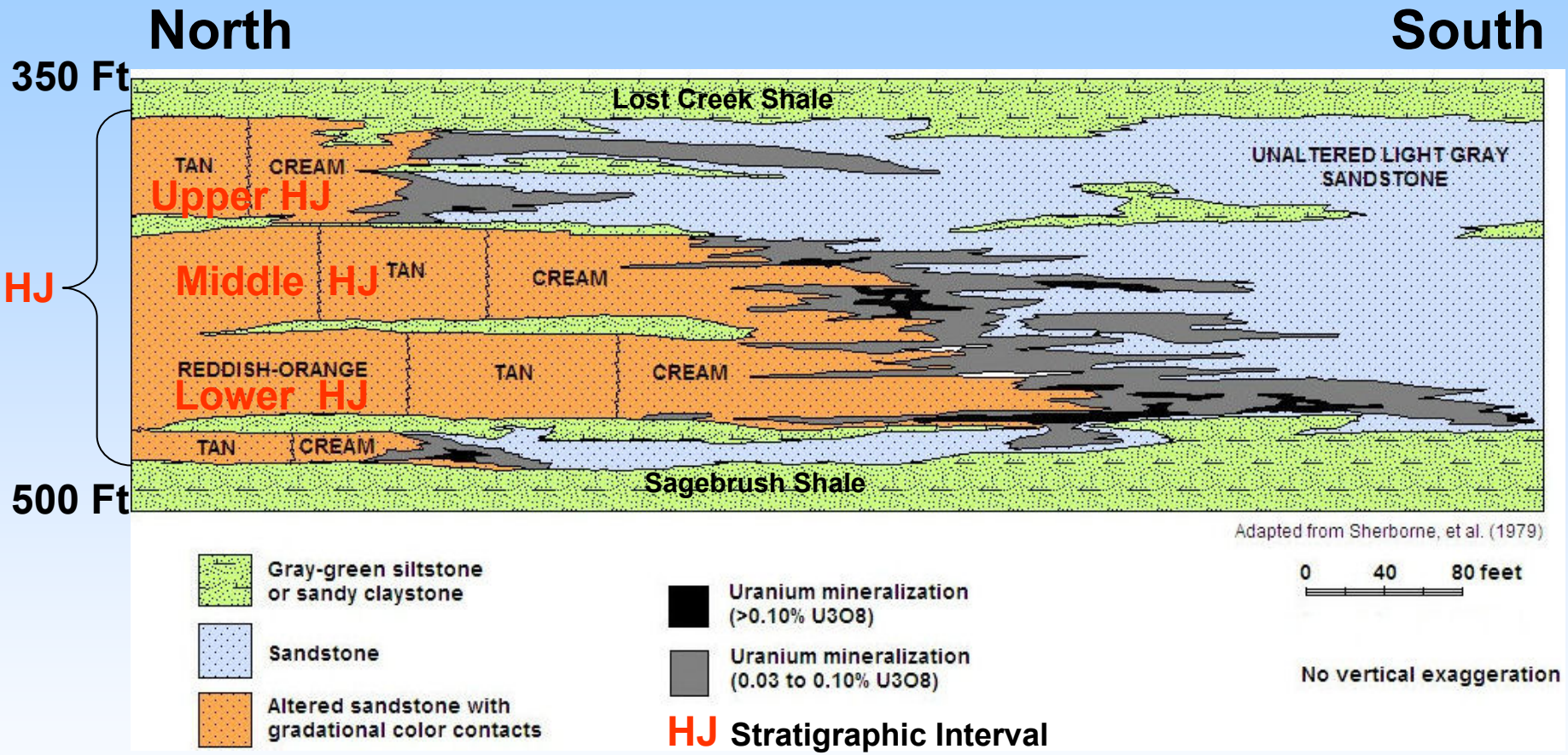
Hydrogeologic Setting:
Lost Creek Schematic Solution Front Cross-Section



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Hydrogeologic Setting:
Lost Soldier

- *Depositional Environment*: Ancient alluvial fan deposited by braided stream channels.
- *Topography*: Rolling hills

Hydro-Stratigraphy

- Sequence of unconsolidated sand lenses, separated by silt facies.
- Tens of feet thick.
- Designated as A through K.
- Lost Soldier water table is located from 46 to 150 feet bgs.
- Locally semi-confined hydraulic conditions within a particular sand lens.

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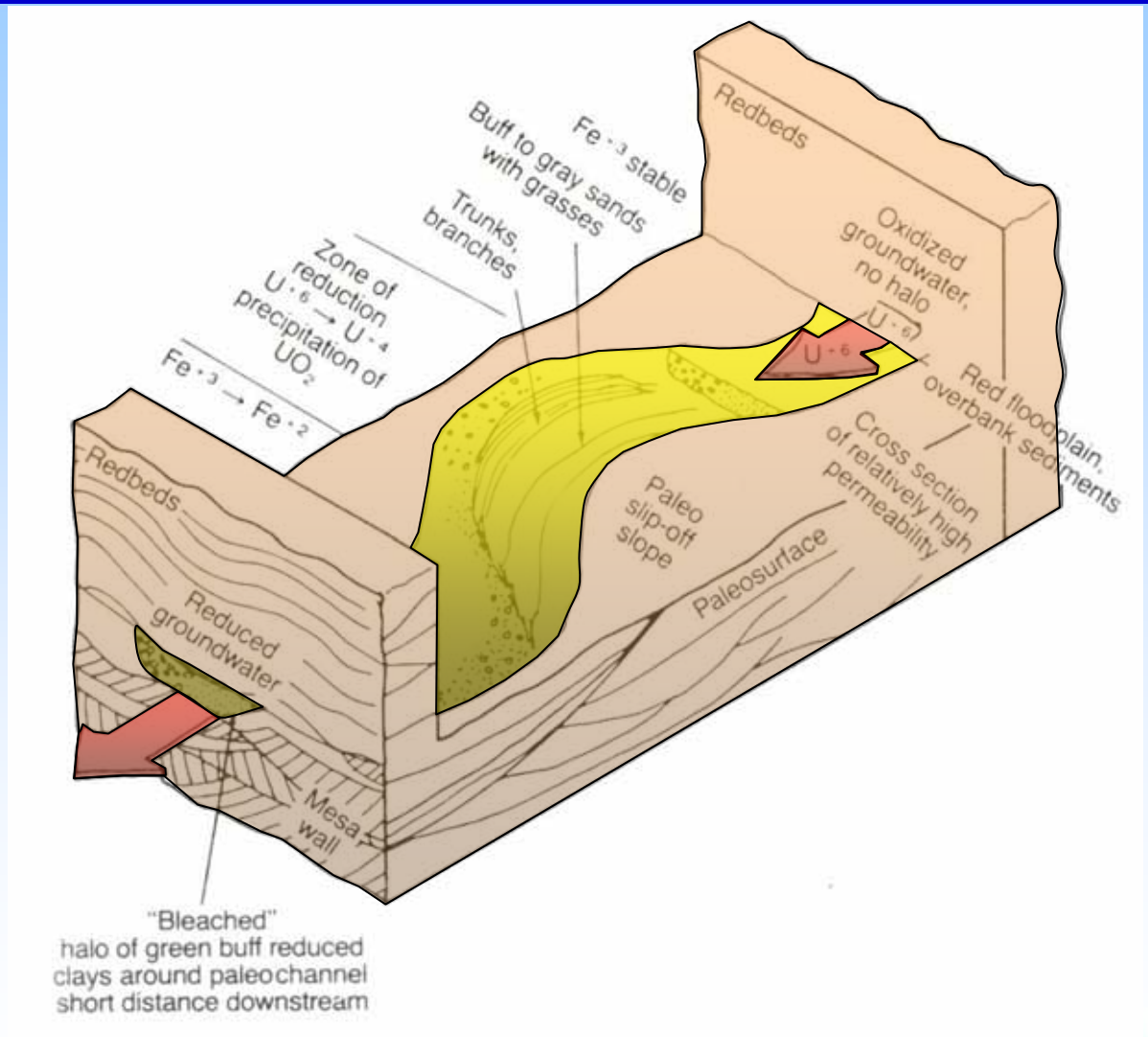
Lost Soldier Channel-Deposited Uranium Example



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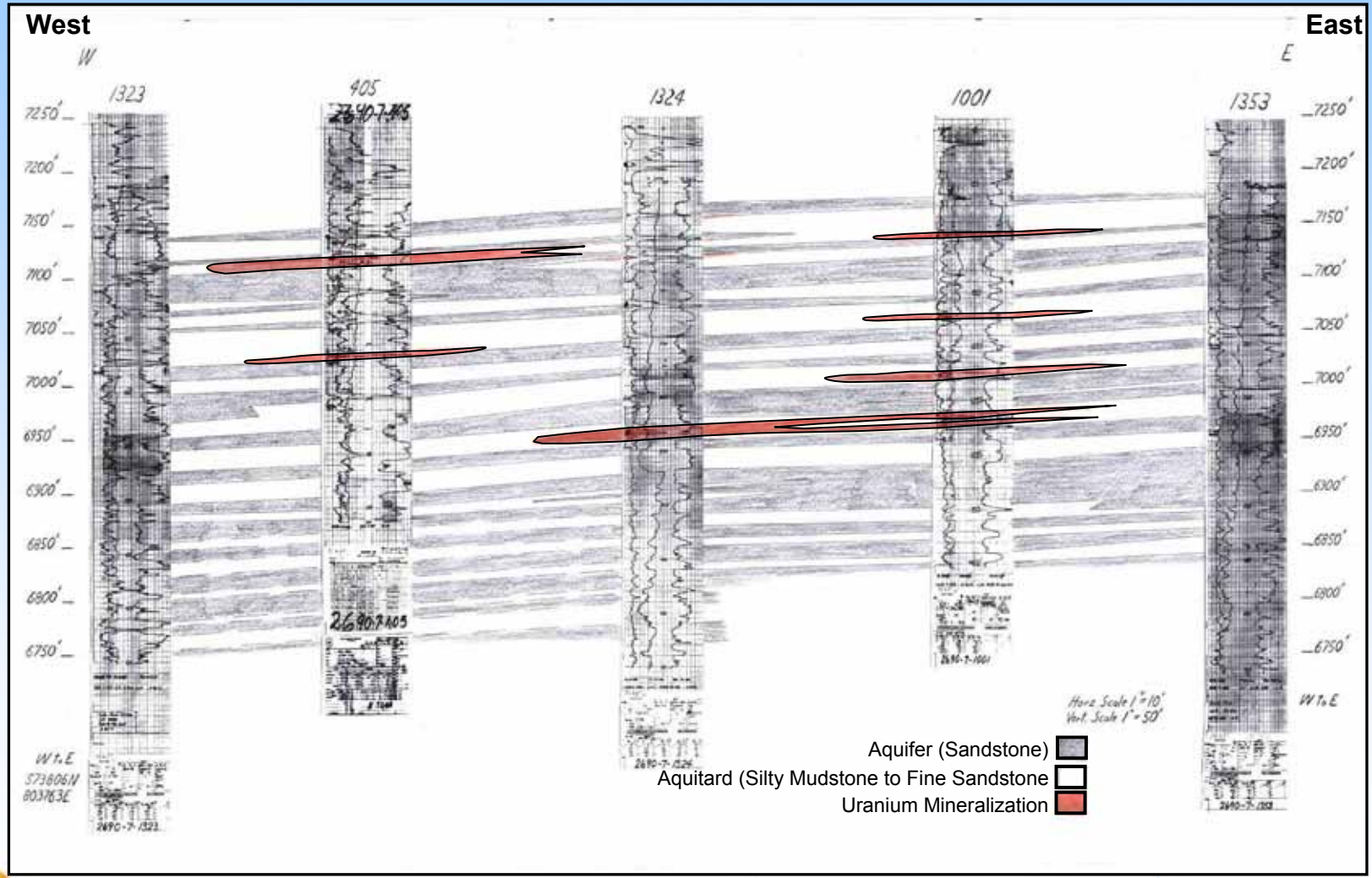
Hydrogeologic Setting:
Lost Soldier West to East Cross-Section



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2006 Well Installation Program:
Lost Creek/Lost Soldier

- **Installed monitoring/test wells in mineralized intervals of interest.**
- **Installed monitoring/test wells in underlying and overlying ore sands.**
- **Installed wells in groups or nests to evaluate vertical communication.**
- **Located monitoring/test wells over permit area.**

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2006 Lost Creek/Lost Soldier Field Program Summary

- **Drilling Program and Permits Approved by WDEQ and BLM**
- **Obtained Water Well Permits From WY State Engineer.**
- **Wells Constructed at Both Areas During the Summer/Fall.**
- **Performed 24 to 48-hour hydraulic stress tests to estimate hydraulic properties and evaluate vertical connection to adjacent sands.**
- **Conducted numerous 3-hour hydraulic stress tests on individual wells.**
- **Completed 2 quarters of baseline groundwater quality sampling.**

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2006 Well Installation Program:
Lost Creek Details

- **17 new baseline groundwater quality wells installed.**
- **Three wells completed in shallow DE sand – typical depth of 200 feet.**
- **Four new wells and one existing well (LC1W) completed in LFG sand – typical depth of 360 feet.**
- **Six wells completed in mineralized HJ sand – typical depth of 480 feet.**
- **Four wells completed in UKM sand – typical depth of 600 feet.**

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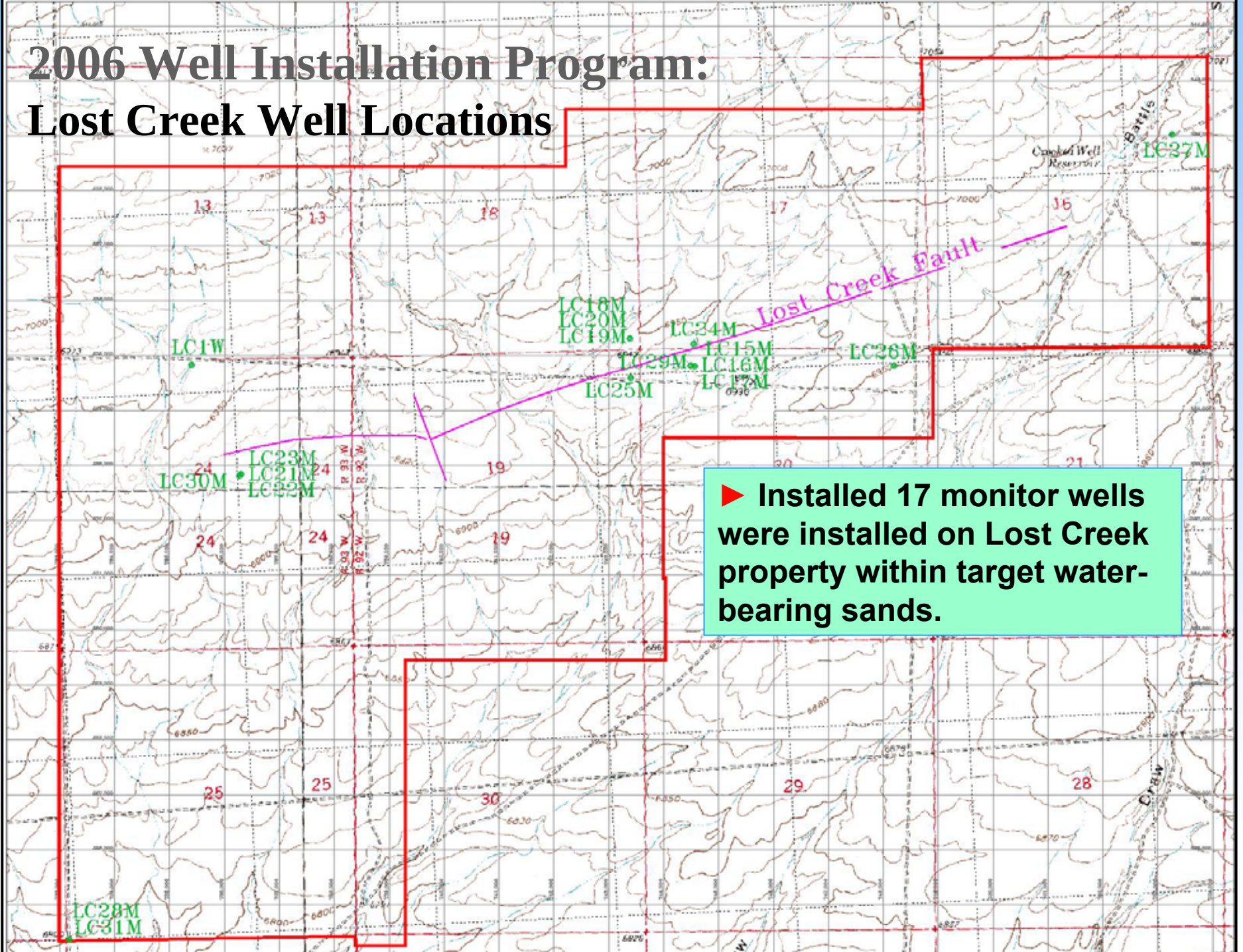
2006 Well Installation Program:

Lost Creek Well Locations



► Installed 17 monitor wells were installed on Lost Creek property within target water-bearing sands.

2006 Well Installation Program:
Lost Soldier Details

- 16 new baseline groundwater quality wells installed.
- Two existing wells.
- Wells completed in sand units A through I.
- Well construction depth from 120-380 feet bgs.
- Four wells nests (wells completed in adjacent sands).

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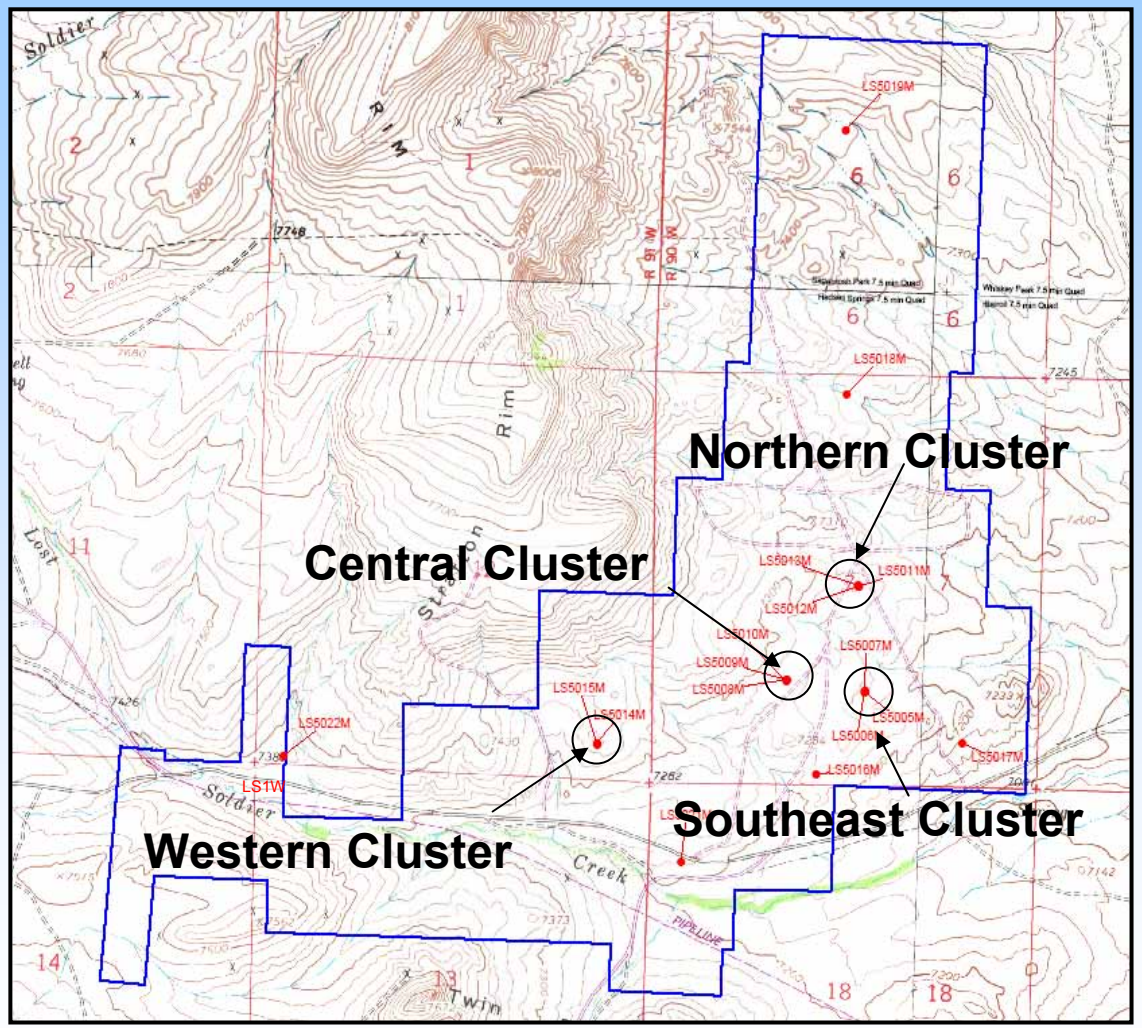
2006 Well Installation Program:
Lost Soldier Well Location

►16 monitor wells were installed on Lost Soldier property within target water-bearing sands.



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Hydraulic Stress Testing:
Specific Objectives

1) Evaluate vertical hydraulic communication between overlying and underlying water-bearing ore zones,

2) Define water-bearing zone characteristics for wells completed in different sands, and

3) Determine presence of subsurface boundary and/or leakage conditions.

Lost Creek

- 3 multi-well hydraulic stress tests
- Single-well hydraulic stress tests on selected wells and observation wells

Lost Soldier

- 5 multi-well hydraulic stress tests
- Single-well hydraulic stress tests on selected monitoring wells

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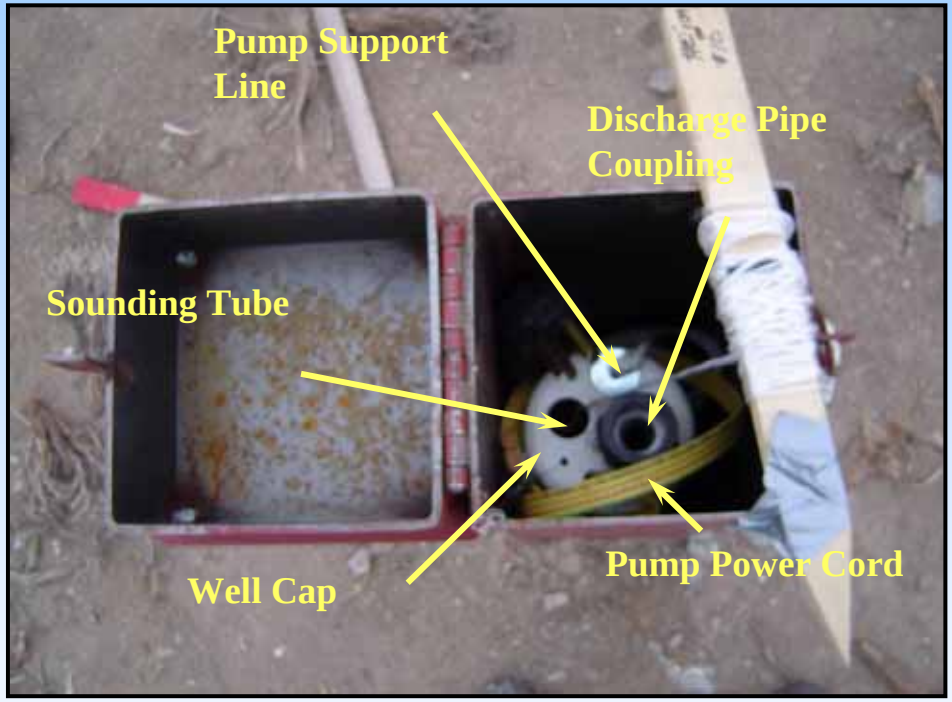
Hydraulic Stress Testing:
Equipment - Groundwater Extraction Wells



- Each of the wells are constructed similarly.
- Each is padlocked.

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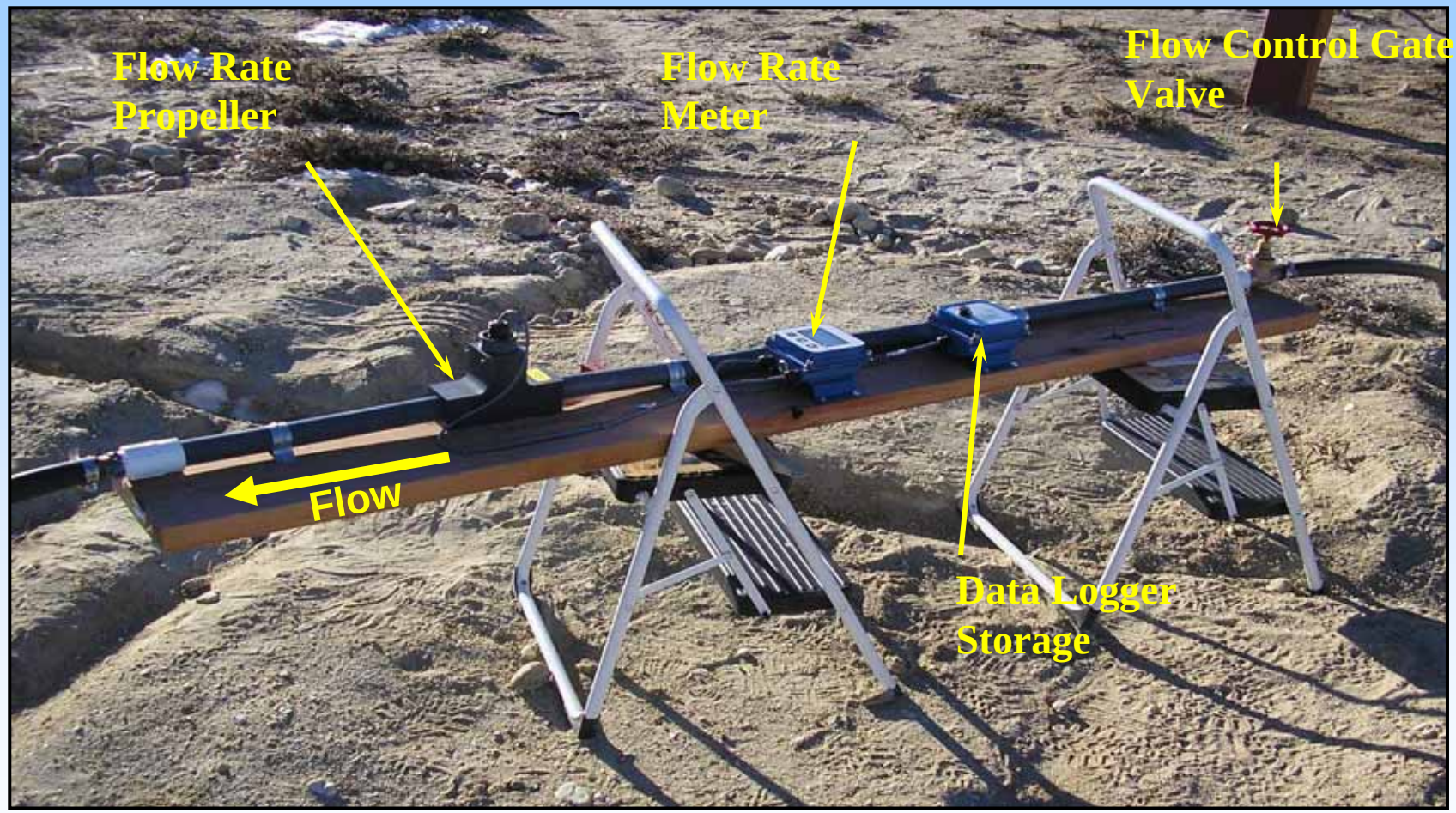
Hydraulic Stress Testing:
Equipment – Extraction Control/Metering



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Hydraulic Stress Testing:
Equipment – Pressure Transducer

- Utilize down-hole transducers to measure the hydraulic stress response.
- In-Situ Level Trolls, Heron, Instrumentation Northwest, and Drucks.
- Measure and record hydraulic pressure at regular intervals.
- Specific measurement of site barometric pressure.
- Verified electronic measurements using water level gauging.

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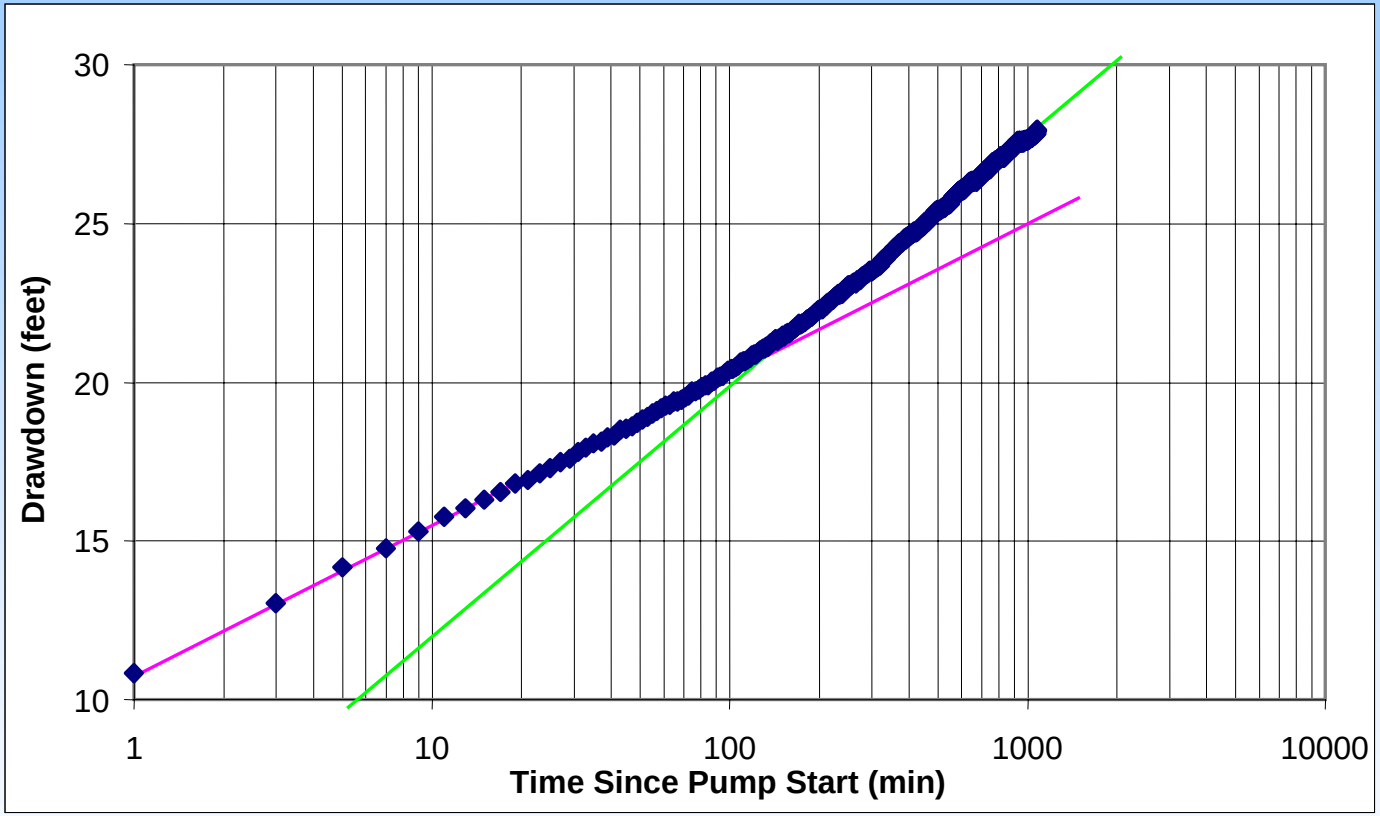
Hydraulic Stress Testing:
Lost Creek – Results LC19M (MHJ Sand)



Early Fit		Late Fit	
Discharge (gpm)	18.8	Discharge (gpm)	17.6
Delta s (ft/log cycle time)	4.76	Delta s (ft/log cycle time)	7.88
Transmissivity (gal/day/ft)	1043	Transmissivity (gal/day/ft)	589

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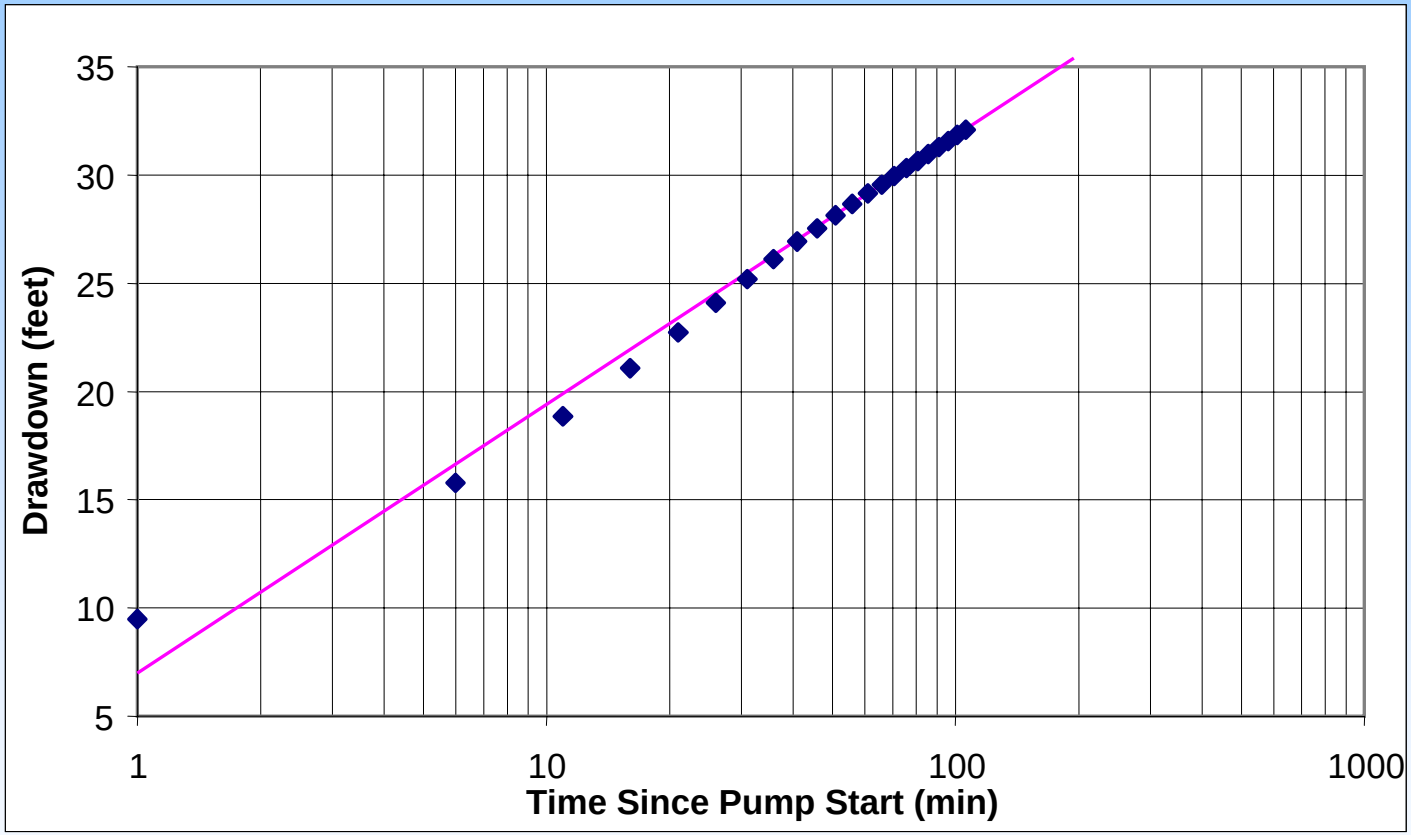
Hydraulic Stress Testing:
Lost Creek – Results LC15M (LFG Sand)



Cooper - Jacob Fit

Discharge (gpm)	14.2
Delta s (ft/log cycle time)	12.41
Transmissivity (gal/day/ft)	302

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Hydraulic Stress Testing:
Lost Creek – Summary Results

Well	Early-Time Jacob Transmissivity (gal/day/ft)	Late-Time Jacob Transmissivity (gal/day/ft)	Theis Recovery Transmissivity (gal/day/ft)
LC15M	----	302	----
LC16M	593	816	462
LC17M	675	195	----
LC18M	62	----	----
LC19M	1040	589	437
LC20M	858	520	----
LC21M	174	303	----
LC22M	330	3030	1260
LC23M	----	583	----
LC24M	----	561	----
LC25M	117	212	----
LC26M	1260	1821	----
LC27M	2230	1660	----
LC29M	10	----	----
LC30M	231	573	----
LC31M	----	1100	----

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Hydraulic Stress Testing:
Lost Creek – Historical Verification

Texas-Gulf, Inc. - Lost Creek Sept. 30, 1982 - 24-hour Pump Test Results:

- **Extraction isolated by overlying/underlying shale beds, up to 20 feet thick.**
- **Potentiometric data indicates a southwest flow direction in the ore-bearing zone.**

1) Transmissivity – 700 to 2000 gpd/ft

2) Storage coefficient – 5×10^{-4}

3) Overlying and underlying shale beds are effective confining units

4) Little or no groundwater extraction-induced leakage (vertical conductivity est. – confining bed at 2.5×10^{-6} ft/min)

5) Vertical Gradient averaged 0.14 to 0.17 ft/ft

6) Well Function – W(u,u') = 0.03

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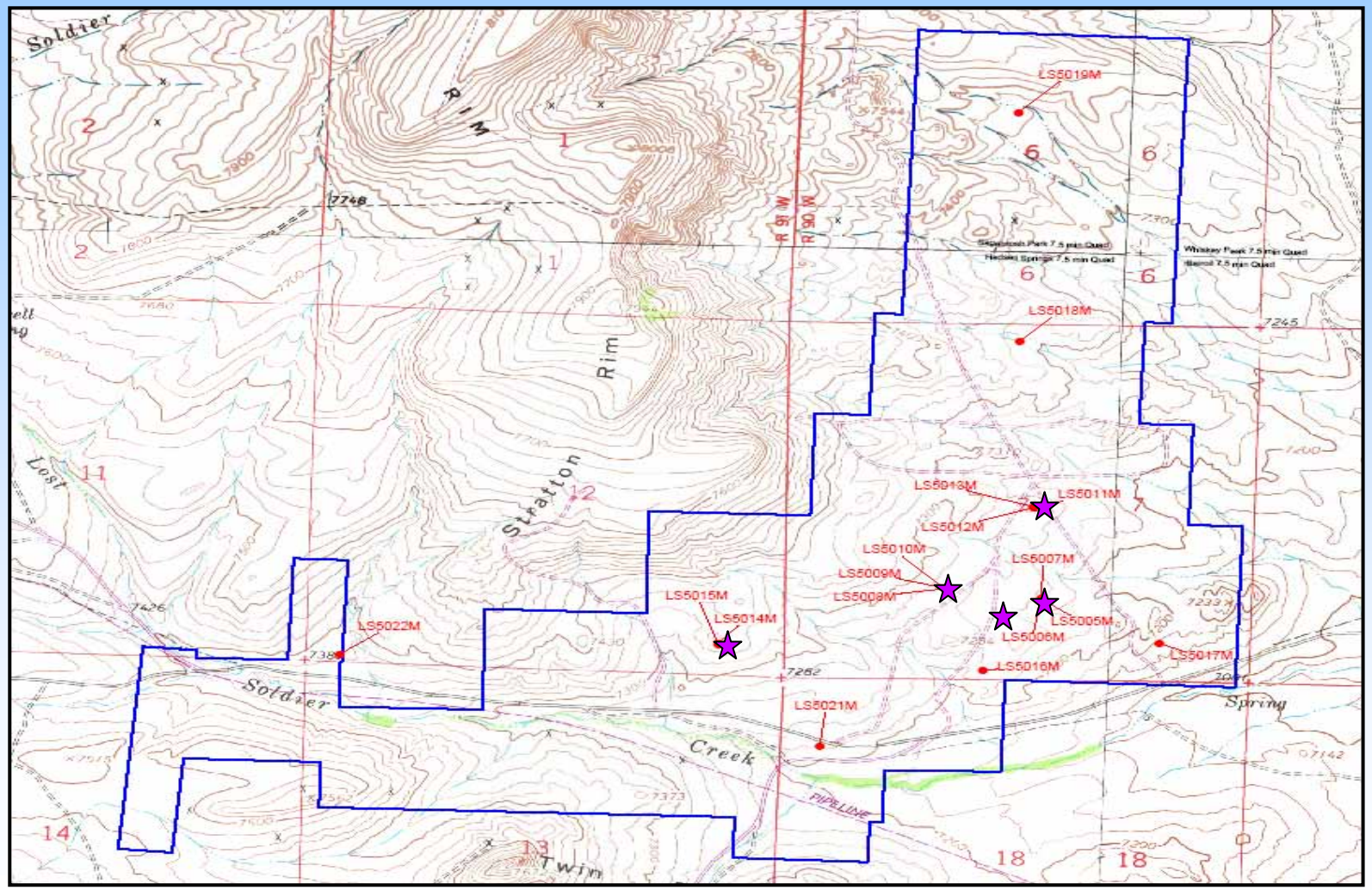
Hydraulic Stress Testing:

Lost Soldier – 48-Hour Stress Tests Completed



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Hydraulic Stress Testing:

Lost Soldier – 48-Hour Stress Test Data

HYDRAULIC STRESS TEST DATA FORM

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Location: Lost Soldier Area of Interest, Wyoming	
Well Owner: Ur-Energy USA	Pump Test Code: PT01
Pump Test Name: Pump Test 001	Well ID: LS5012M

PUMPED WELL LOCATION	X-Dir Survey (lat)	Y-Dir Survey (long)	GS Elevation (ft amsl)	Pump Region (Nest)
	42 14.382	107 37.746	7277	Northern
PUMP INFORMATION	Size (hp)	Depth (ft-mp)	Electrical Phase	Sustainable Yield (gpm)
	1/2	144	Single	9
FIELD PLACEMENT	LA Personel: MW, SW Arrival Date: 11/14/06 Departure Date:11/21/06		DATABASE	Format: Access 2000 Name: Lost Soldier PumpTest Location: LA - V:Proj068/DB
DISCHARGE:	Overland [X]	Contained [ ]		

STEP TEST

Step Name	Date	Time	Description	Value	Units
Step Test #1	15-Nov-06	12:05:00 AM	Start	2.5	gpm
Step Test #1	15-Nov-06	12:23:00 AM	End	46.35	gls
Step Test #2	15-Nov-06	12:23:00 AM	Start	5	gpm
Step Test #2	15-Nov-06	12:35:00 AM	End	55.63	gls
Step Test #3	15-Nov-06	12:35:00 PM	Start	8.75	gpm
Step Test #3	15-Nov-06	12:53:00 AM	End	150.06	gls

TRANSDUCER PLACEMENT

Well ID LS0000M	Measuring Point	S/N	Placement Depth (ft)	Placement Date	Placement Time	Pulled Date	Pulled Time
5005M	Sounding Tube	111912	95	18-Nov-06	12:44:00 PM		
5006M	Sounding Tube	111903	90	18-Nov-06	12:39:00 PM		
5007M	Casing	111797	95	18-Nov-06	12:49:00 PM		
5008M	Sounding Tube	111911	130	18-Nov-06	11:52:00 AM		
5009M	Sounding Tube	111906	130	18-Nov-06	11:46:00 AM		
5010M	Casing	111910	130	18-Nov-06	11:56:00 AM		
5011M	Casing	111931	150	18-Nov-06	1:14:00 PM		
5012M	Casing	111907	125	18-Nov-06	1:01:00 PM		
5013M	Sounding Tube	111928	140	18-Nov-06	1:08:00 PM		
5016M	Casing	111908	120	18-Nov-06	11:40:00 AM		
5017M	Sounding Tube	111924	80	18-Nov-06	11:11:00 AM		
5018M	Sounding Tube	111909	105	18-Nov-06	1:34:00 PM		
5019M	Sounding Tube	111942	110	16-Nov-06	3:34:00 PM		

CONTINUOUS PUMPING SPECIFICATIONS

Target Extraction Rate (gpm)	Pumping Start Date	Pumping Start Time	Pumping End Date	Pumping End Time
8.5	11/18/06	3:24:00 PM	11/20/06	3:35:00 PM
Stress Test Duration (hours)	**Total Extracted Volume (gallons)**	**Bucket Tests**	**Recovery End Date**	**Recovery End Time**
48.18	24,258.25	Yes	11/27/06	8:00:00 AM

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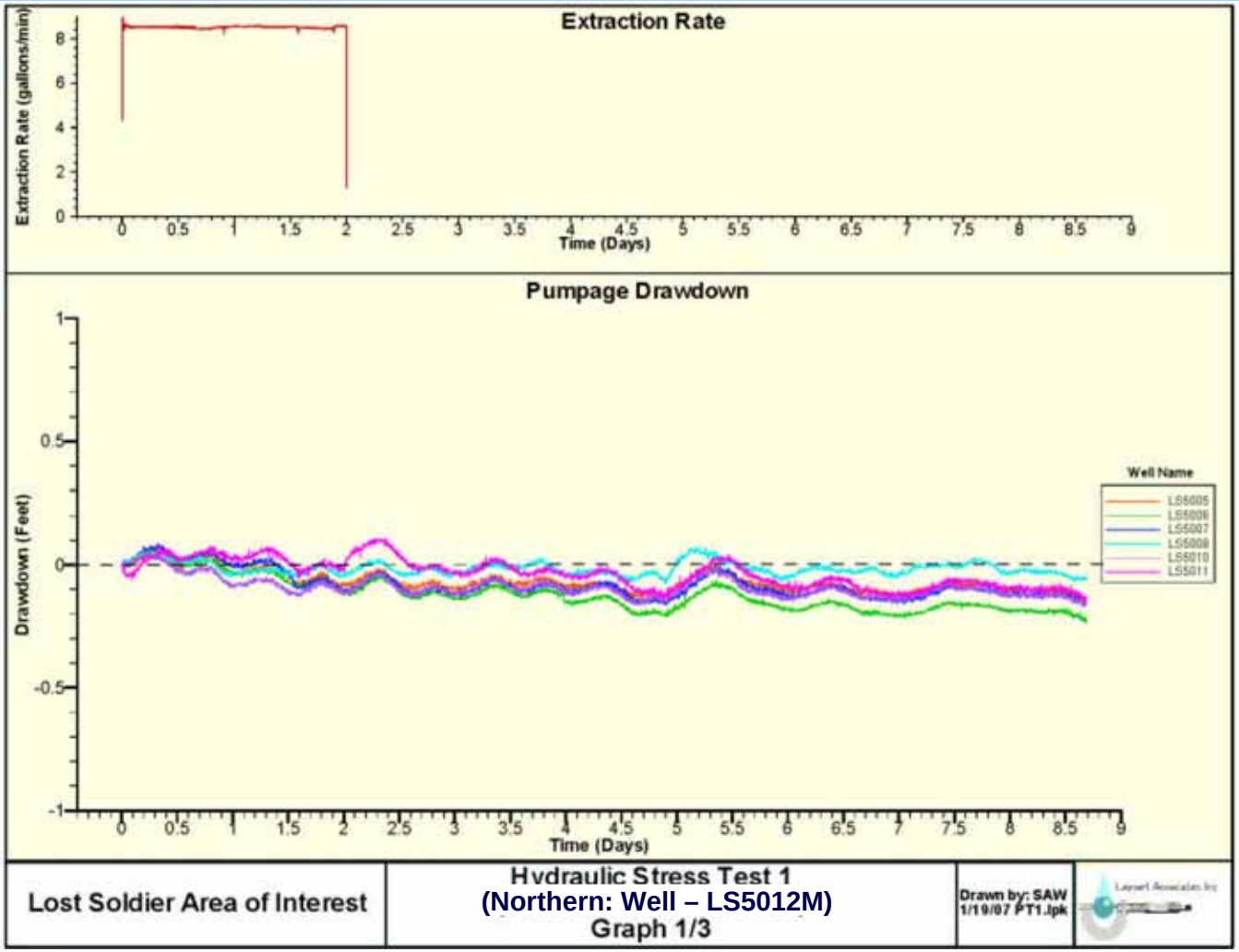
Hydraulic Stress Testing:

Lost Soldier – 48-Hour Stress Test Data (LS5012M)



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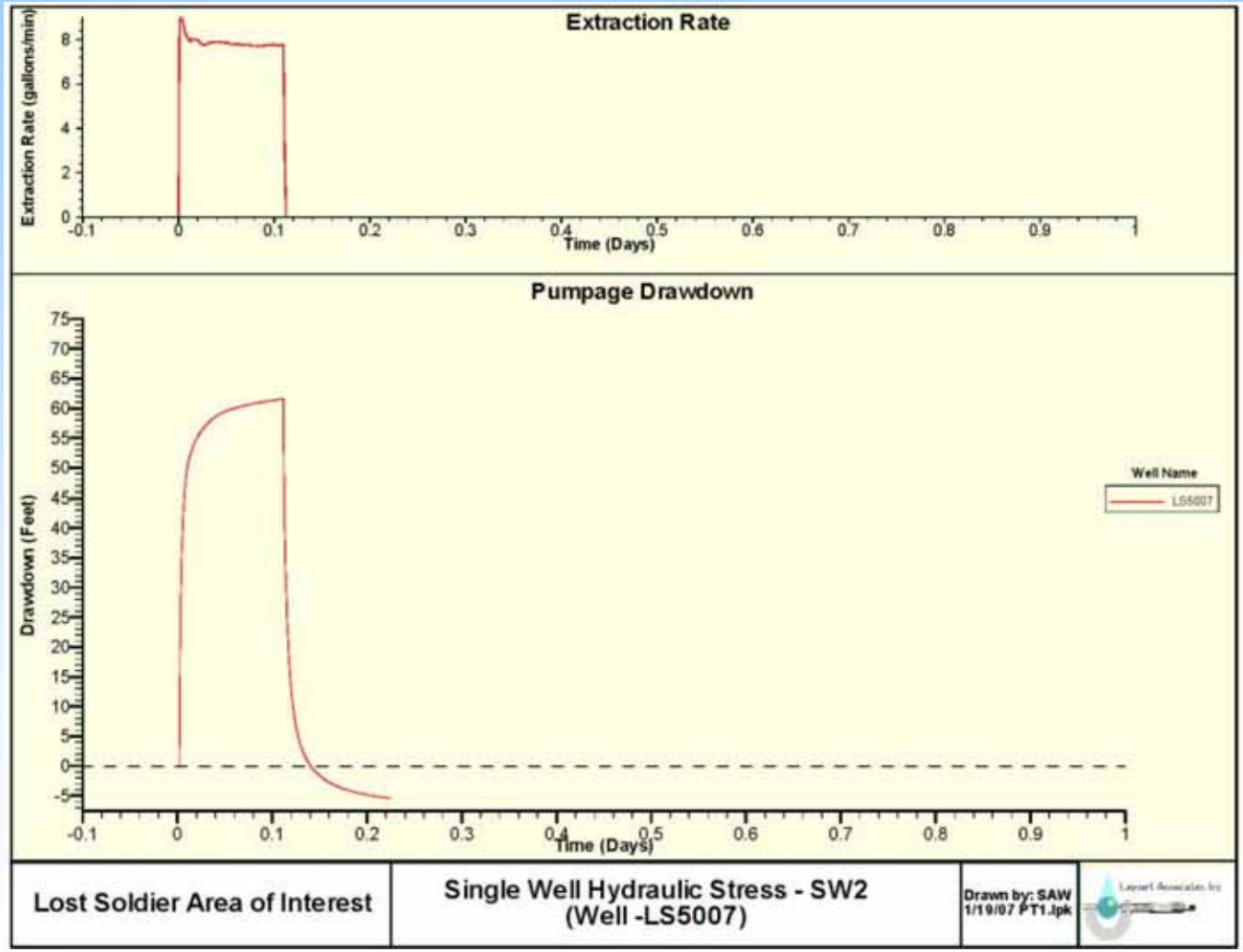
Hydraulic Stress Testing:

Lost Soldier – Single Well Stress Test Data (LS5007M)



More Data

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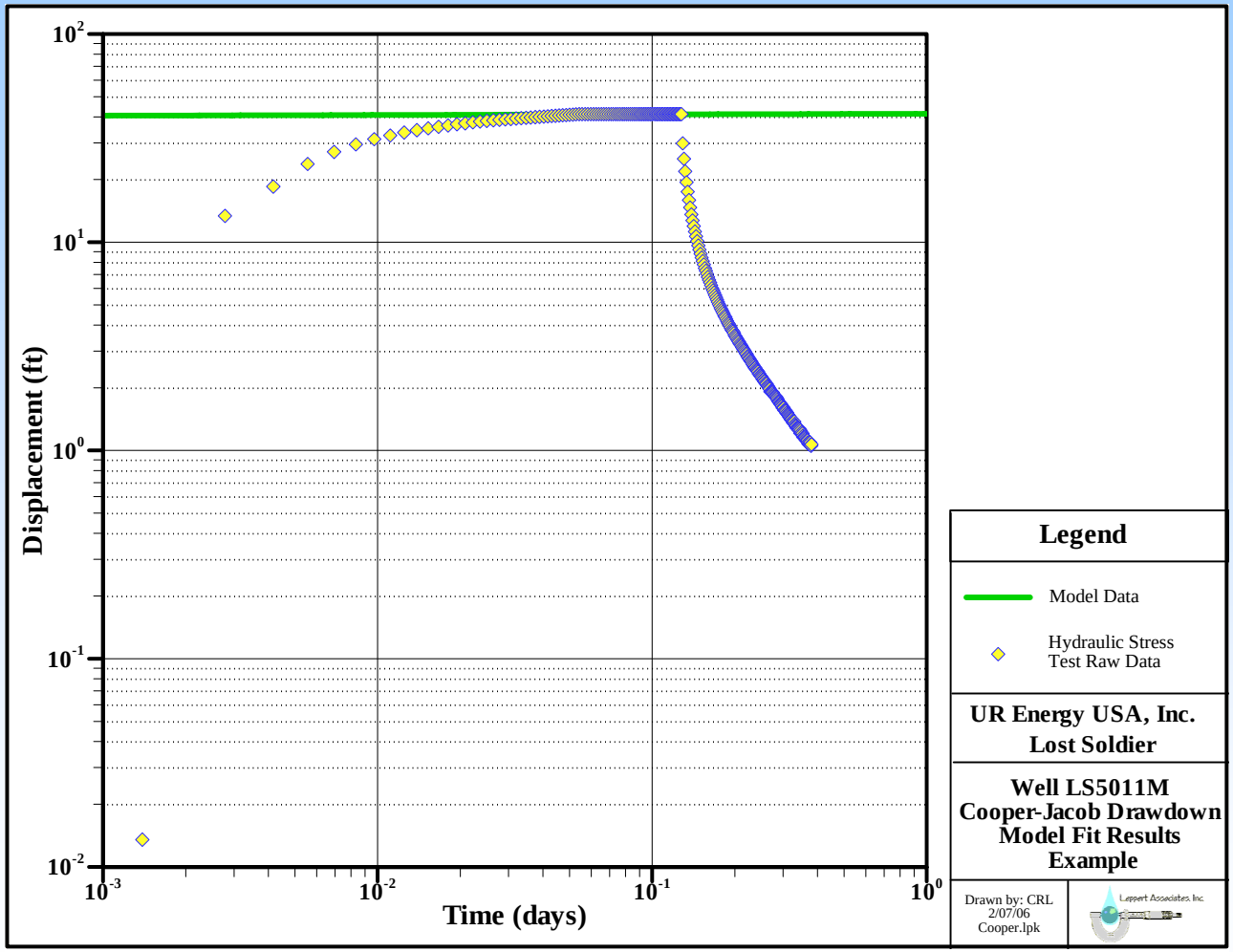
Cooper-Jacob Drawdown Model Example (LS5011M)



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Preliminary Analytical Model K Estimates

Single Well Test Priliminary Permeability Estimates

Well	Water-Bearing Thickness (ft)	Cooper-Jacob Straight Line Estimated K (m/sec)	Theis Recovery Estimated K (m/sec)
LS5007M	238	$2.4X10^{-7}$	$6.27x10^{-7}$
LS5008M	38	$2.84X10^{-5}$	4.3610^{-5}
LS5010M	202	$1.49X10^{-6}$	$1.4X10^{-6}$
LS5011M	265	$1.2X10^{-6}$	$8.3X10^{-6}$
LS5013M	156	$7.5X10^{-6}$	$6.97X10^{-6}$
LS5016M	126	$1.65X10^{-6}$	$2.88X10^{-6}$
LS5017M	188	$3.39X10^{-6}$	$3.5X10^{-6}$
LS5018M	150	$4.18X10^{-6}$	$4.8X10^{-6}$
LS5019M	150	$5.04X10^{-7}$	$1.7X10^{-6}$
LS5021M	164	$5.85X10^{-6}$	$5.77X10^{-6}$
LS5022M	277	$2.1X10^{-6}$	$2.12X10^{-6}$

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Hydraulic Stress Testing:
Lost Soldier – Estimation of Hydraulic Properties

- Used analytical well drawdown analysis for hydraulic stress tests.
- Curve matched to calculate hydrologic properties by analytical means using time, drawdown, and withdrawal rate data.
- Single well results allow for calculation of hydraulic conductivity (K).
- Used the Papadopulos-Cooper solution for the stress period response to estimate hydraulic properties.
- The Theis Recovery Analytical solution for the recovery period.

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Baseline Groundwater Quality:
Objectives

- **Determine background water quality on each property.**
- **Establish Baseline groundwater chemistry.**
- **Input into database for evaluation.**
- **Conduct quarterly sampling.**

  First sampling event completed for each site (9/06)

  Second sampling event completed (12/06).

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Baseline Groundwater Quality Delineation:
Lost Creek – Results for First Two Quarters (N=38)

- **Developed a Sampling and Analysis Plan**
- **2 Monitoring Events Completed (3rd and 4th Quarter 2006)**
- **Sampled Each of the 36 Monitoring Wells for each Monitoring Event (plus QA/QC samples).**
- **Field Parameters, pH; Specific Conductance; Temperature, Compiled for Each Event at Each Monitored Location.**
- **Samples Sent Under Chain of Custody to a Certified Analytical Laboratory (Energy Laboratories Located in Casper, Wyoming).**
- **33 Parameters Quantified (rad, metals, basic water quality).**
- **Over 2,500 Analyte Results have been Electronically Data Delivered (EDD) by the Laboratory.**
- **These Data, Including QA/QC Data have been Stored in an Electronic Database.**

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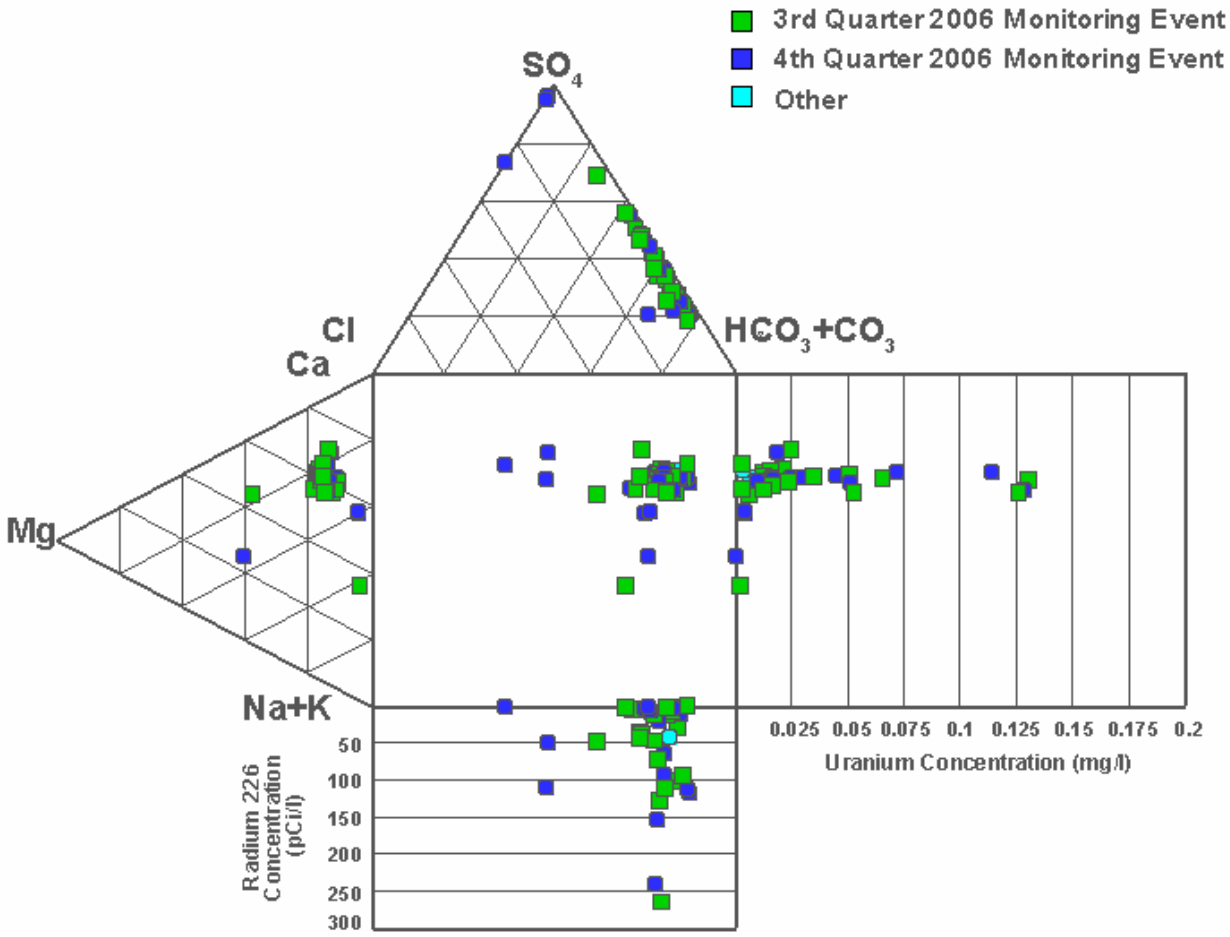

Associates, Inc.

Groundwater Quality Data Management System: General Description

- **Electronic Data Deliverable (EDD) From the Analytical Laboratory.**

- **Data Validation Program Checks: Location Names, Parameter Names, Dates, Holding Times, and that Data are within Historical Ranges.**

- **Once the Data is Validated it is Up-Loaded into a Well-Tested, Secure, Site-Specific Relational Database (Access™).**

- **Once in the Database, the Data can be Examined Using any Number of Existing LA Trend/Characteristic/Distribution Analysis Tools.**

- **Data and Analysis Graphics and Tables can be Automatically Generated for Reporting Purposes.**

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End:

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