Table 3-1
LC ISR, LLC
Lost Creek Regional Aquifer Test
Well Information

LocId	Test	Type Well	Completion Zone	GS Elevation	TOC Elevation	Easting (feet)	Northing (feet)	Top Underreamed Zone (ft bgs)	Bottom Underreamed Zone (ft bgs)	Distance from pumping well (feet)	Same side of fault as pumping well?	Casing I.D. (inches)	06/27/07 DTW	06/27/07 Elevation	DTW at End of Test	Water Elevation at End of Test
LC19M Test																
LC19M	North Test	PZ Pumping Well	HJ	6,949.32	6,950.52	743,383	535,317	412	463	0	-----	4.5	180.08	6,770.44	273.40	6,677.12
HJMP-104	North Test	Prod. Zone Monitor	HJ	6,939.76	6,941.01	742,900	534,900	405	430	638	Yes	4.5	171.81	6,769.20	208.25	6,732.76
HJMP-110	North Test	Prod. Zone Monitor	HJ	6,945.95	6,947.14	743,700	535,200	430	475	338	Yes	4.5	174.89	6,772.25	215.37	6,731.77
HJMP-111	North Test	Prod. Zone Monitor	HJ	6,948.98	6,950.32	743,850	535,370	395	440	470	Yes	4.5	176.94	6,773.38	212.50	6,737.82
HJT-104	North Test	Prod. Zone Monitor	HJ	6,938.78	6,940.11	743,660	534,900	413	463	501	Yes	4.5	169.51	6,770.60	209.95	6,730.16
UKMO-102	North Test	Prod. Zone Monitor	HJ	6,940.33	6,940.79	744,150	535,160	377	408	783	Yes	4.5	165.15	6,775.64	186.69	6,754.10
HJMP-107	North Test	Prod. Zone Monitor	HJ	6,937.13	6,938.40	743,700	534,800	443	460	606	No	4.5	183.61	6,754.79	184.95	6,753.45
HJT-105	North Test	Prod. Zone Monitor	HJ	6,938.12	6,938.78	744,450	535,030	405	436	242	No	4.5	170.09	6,768.69	175.02	6,763.76
LC16M	North Test	Prod. Zone Monitor	HJ	6,934.76	6,936.38	744,553	534,811	410	467	1284	No	4.5	178.14	6,758.24	179.61	6,756.77
UKMO-101	North Test	Prod. Zone Monitor	HJ	6,940.57	6,942.48	744,100	534,940	465	485	810	No	4.5	177.59	6,764.89	183.30	6,759.18
LC20M	North Test	Underlying Monitor	UKM	6,949.27	6,950.64	743,383	535,331	511	543	14	Yes	4.5	202.36	6,748.28	203.23	6,747.41
UKMP-102	North Test	Underlying Monitor	UKM	6,940.87	6,942.03	744,150	535,150	485	505	785	Yes	4.5	190.68	6,751.35	191.83	6,750.20
UKMP-101	North Test	Underlying Monitor	UKM	6,940.26	6,941.75	744,100	534,930	540	572	815	No	4.5	192.13	6,749.62	192.66	6,749.09
LC18M	North Test	Overlying Monitor	LFG	6,948.43	6,949.03	743,368	535,316	290	332	15	Yes	4.5	168.04	6,780.99	169.14	6,779.89
LC25M	North Test	Overlying Monitor	LFG	6,935.00	6,936.52	743,397	534,601	316	349	697	No	4.5	167.05	6,769.47	168.60	6,767.92

Table 4-1
LC ISR, LLC
Lost Creek Regional Aquifer Test
Equipment Layout

LC19M Test			
Location	**Completion Interval**	**Monitoring Equipment**	**PSI Range**
HJMP-104	HJ	In-Situ LevelTROLL 300G w/Hand Tag confirmation	30
HJMP-107	HJ	In-Situ LevelTROLL 300G w/Hand Tag confirmation	15
HJMP-110	HJ	In-Situ LevelTROLL 300G w/Hand Tag confirmation	30
HJMP-111	HJ	In-Situ LevelTROLL 300G w/Hand Tag confirmation	30
HJT-104	HJ	In-Situ LevelTROLL 300G w/Hand Tag confirmation	30
HJT-105	HJ	In-Situ LevelTROLL 300A w/Hand Tag confirmation	30*
LC16M	HJ	In-Situ LevelTROLL 300G w/Hand Tag confirmation	15
LC19M	HJ	In-Situ LevelTROLL 300G w/Hand Tag confirmation	100
UKMO-101	HJ	Hand Tags Only	-----
UKMO-102	HJ	In-Situ LevelTROLL 300A w/Hand Tag confirmation	30*
LC20M	UKM	In-Situ LevelTROLL 300G w/Hand Tag confirmation	30
UKMP-101	UKM	In-Situ LevelTROLL 300G w/Hand Tag confirmation	15
UKMP-102	UKM	In-Situ LevelTROLL 300G w/Hand Tag confirmation	15
LC18M	LFG	In-Situ LevelTROLL 300G w/Hand Tag confirmation	30
LC25M	LFG	In-Situ LevelTROLL 300G w/Hand Tag confirmation	15

* - non-vented In-Situ LevelTROLL 300

Table 4-2
LC ISR, LLC
Lost Creek Regional Aquifer Test
Distances to Pumping Well and Observed Drawdown

LC19M Test

Start Date & Time: 6/27/07 17:20
End Date & Time: 7/3/07 10:51
Duration (minutes): 8,251.5
Ave. Pumping Rate: 42.9 gpm

Completion Type	Well No.	Distance from Pumping Well (feet)	Side of Fault	Drawdown Observed at End of Test (feet)	Respond to Pumping?
Pumping Well	LC19M	0	North	93.32	Yes
Production Zone Completions	HJMP-104	638	North	36.44	Yes
	HJMP-110	338	North	40.48	Yes
	HJMP-111	470	North	35.56	Yes
	HJT-104	501	North	40.44	Yes
	UKMO-102	783	North	21.54	Yes
	HJMP-107	606	South	1.34	Yes
	LC16M	1,284	South	1.47	Yes
	UKMO-101	810	South	5.71	Yes
	HJT-105	242	South	4.93	Yes
Overlying Completions	LC18M	15	North	1.10	Yes
	LC25M	697	South	1.55	Yes
Underlying Completions	LC20M	14	North	0.87	No
	UKMP-102	785	North	1.15	Yes
	UKMP-101	815	South	0.53	No

Table 4-3
LC ISR, LLC
Lost Creek Regional Aquifer Test
Flow Rate vs. Time:

LC19M Test												
DATE/TIME	MINUTES	INCREMENTAL MINUTES	TOTALIZER 1	TOTALIZER 2	T1 INCREMENTAL	T2 INCREMENTAL	CALC. T1 RATE	CALC. T2 RATE	CALC. T1T2 AVG	INSTANTANEOUS T1 RATE	INSTANTANEOUS T2 RATE	Comments
											-----	
6/27/07 17:20	0	-----	0	0	0	0	0.0	0.0	0.0	45.2	42.3	Pump on
6/28/07 9:15	955	955	42,152	40,303	42,152	40,303	44.1	42.2	43.2	45.2	42.1	
6/28/07 12:30	1,150	195	49,270	47,147	7,118	6,844	36.5	35.1	35.8	45.2	42.6	
6/28/07 15:50	1,350	200	57,953	55,478	8,683	8,331	43.4	41.7	42.5	45.0	42.3	
6/28/07 17:30	1,450	100	62,432	59,746	4,479	4,268	44.8	42.7	43.7	45.0	42.0	
6/29/07 10:30	2,470	1020	107,195	102,548	44,763	42,802	43.9	42.0	42.9	45.3	41.9	
6/29/07 16:42	2,842	372	123,466	118,215	16,271	15,667	43.7	42.1	42.9	45.4	42.7	
6/30/07 10:30	3,910	1068	168,436	161,301	44,970	43,086	42.1	40.3	41.2	44.5	42.3	
6/30/07 12:15	4,015	105	175,835	168352.0	7,399	7,052	70.5	67.2	68.8	45.5	42.2	Not sure why the bump in rate for this interval. Numbers presented correspond with field notes.
6/30/07 16:01	4,241	226	185,792	177881.0	9,957	9,529	44.1	42.2	43.1	44.4	42.1	
7/1/07 10:30	5,350	1109	234,953	224690.0	49,161	46,809	44.3	42.2	43.3	44.2	41.8	
7/1/07 15:01	5,621	271	246,738	235952.0	11,785	11,262	43.5	41.6	42.5	44.7	41.8	
7/2/07 12:20	6,900	1279	302,802	289390.0	56,064	53,438	43.8	41.8	42.8	44.7	41.8	
7/2/07 16:11	7,131	231	312,837	299025.0	10,035	9,635	43.4	41.7	42.6	44.7	41.8	
7/3/07 10:51	8,251.5	1120	362,039	346069.0	49,202	47,044	43.9	42.0	42.9	-----	-----	Pump off at 10:51:30 on 07/03/07
						Averages:	43.9	41.9	42.9	44.9	42.1	

Table 5-1
LC ISR, LLC
Lost Creek Regional Aquifer Test
Summary of Pump Test Results

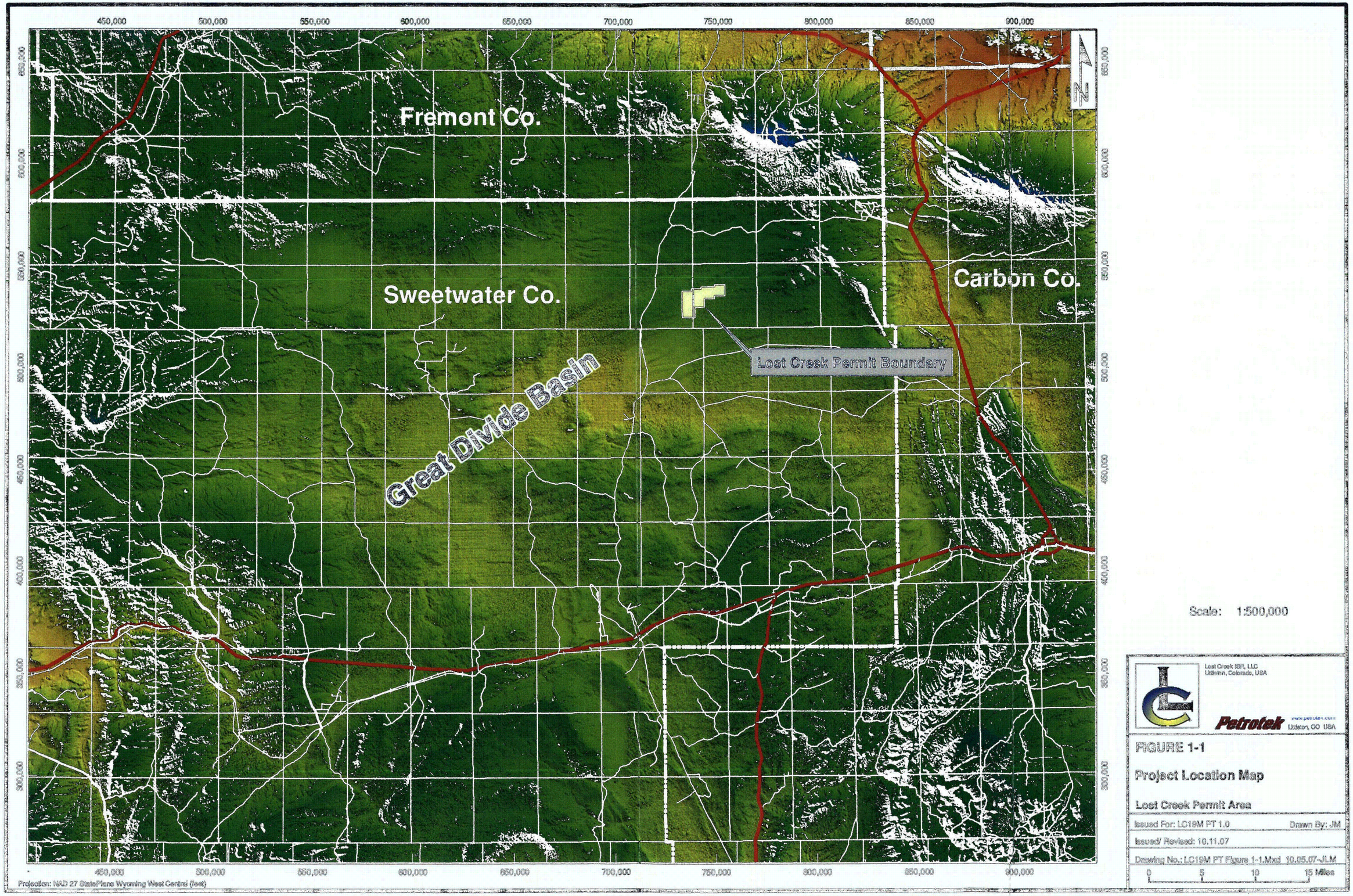
LC19M Test					
Well	Distance from Pumping Well (feet)	Analytical Results	Analytical Method: Theis Drawdown	Analytical Method: Theis Recovery	Averages
HJMP-104	638	Transmissivity (ft^2/day)	61.3	56.8	59.1
		Hyd. Cond. (ft/day)	5.1E-01	4.7E-01	4.9E-01
		Storativity	6.6E-05	-----	-----
HJMP-110	338	Transmissivity (ft^2/day)	66.4	63.0	64.7
		Hyd. Cond. (ft/day)	5.5E-01	5.3E-01	5.4E-01
		Storativity	1.3E-04	-----	-----
HJMP-111	470	Transmissivity (ft^2/day)	69.8	64.1	67.0
		Hyd. Cond. (ft/day)	5.8E-01	5.3E-01	5.6E-01
		Storativity	9.1E-05	-----	-----
HJT-104	501	Transmissivity (ft^2/day)	30.0	56.9	43.5
		Hyd. Cond. (ft/day)	2.5E-01	4.7E-01	3.6E-01
		Storativity	9.6E-05	-----	-----
UKMO-102	783	Transmissivity (ft^2/day)	75.5	76.9	76.2
		Hyd. Cond. (ft/day)	6.3E-01	6.4E-01	6.4E-01
		Storativity	1.5E-04	-----	-----
LC19M	Pumping Well	Transmissivity (ft^2/day)	-----	56.7	-----
		Hyd. Cond. (ft/day)	-----	4.7E-01	-----
		Storativity	-----	-----	-----

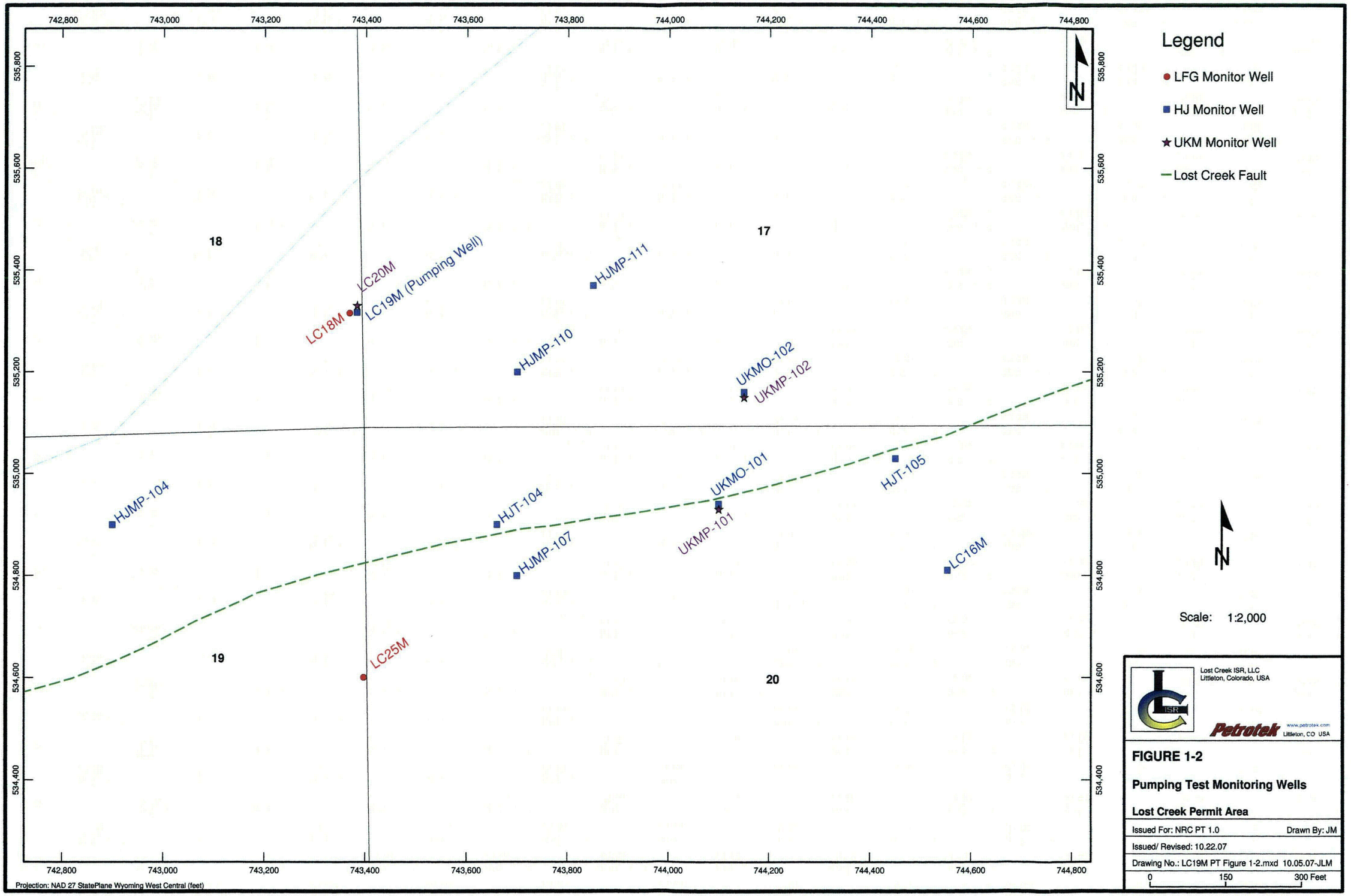
Average Transmissivity (ft^2/day) =	61.18
Average Hyd. Cond. (ft/day) =	0.51
Average Storativity =	1.1E-04

Table 5-2
LC ISR, LLC
Lost Creek Regional Aquifer Test
Summary of Transmissivity Results

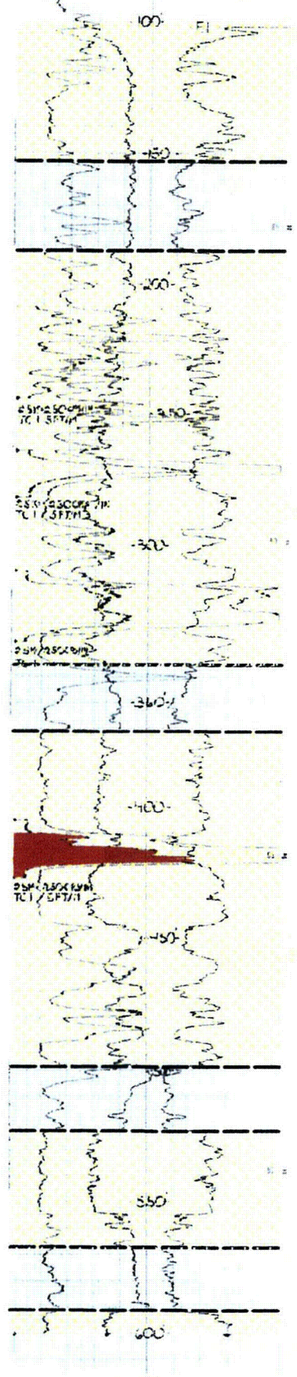
LC19M Test	
Well	Theis Transmissivity (ft^2/d)
HJMP-104	59.1
HJMP-110	64.7
HJMP-111	67.0
HJT-104	43.5
UKMO-102	76.2
LC19M	56.7

Average T = 63.3 ft^2/day


Fremont Co.
Sweetwater Co.
Carbon Co.
Great Divide Basin
Lost Creek Permit Boundary
N
Scale: 1:500,000
Lost Creek ISR, LLC
Littleton, Colorado, USA
Petrotek
www.petrotek.com
Littleton, CO USA
FIGURE 1-1
Project Location Map
Lost Creek Permit Area
Issued For: LC19M PT 1.0
Drawn By: JM
Issued/ Revised: 10.11.07
Drawing No.: LC19M PT Figure 1-1.Mxd 10.05.07-JLM
0 5 10 15 Miles
Projection: NAD 27 StatePlane Wyoming West Central (feet)


742,800
743,000
743,200
743,400
743,600
743,800
744,000
744,200
744,400
744,600
744,800
535,800
535,600
535,400
535,200
535,000
534,800
534,600
534,400
N
18
17
19
20
LC20M
LC19M (Pumping Well)
LC18M
HJMP-111
HJMP-110
UKMO-102
UKMP-102
HJMP-104
HJT-104
UKMO-101
UKMP-101
HJT-105
HJMP-107
LC16M
LC25M
Projection: NAD 27 StatePlane Wyoming West Central (feet)
Legend
LFG Monitor Well
HJ Monitor Well
UKM Monitor Well
Lost Creek Fault
N
Scale: 1:2,000
Lost Creek ISR, LLC
Littleton, Colorado, USA
Petrotek
www.petrotek.com
Littleton, CO USA
FIGURE 1-2
Pumping Test Monitoring Wells
Lost Creek Permit Area
Issued For: NRC PT 1.0
Drawn By: JM
Issued/ Revised: 10.22.07
Drawing No.: LC19M PT Figure 1-2.mxd 10.05.07-JLM
0
150
300 Feet

TT-90



DE Horizon

DE - Alternating very fine, course-grained sandstone, mudstone and siltstone. Minor host for uranium mineralization.

Shale Horizon

FG Horizon
(Overlying Aquifer)

FG - Lenticular arkosic sandstones with intervals of mudstone and siltstone. Categorized as suspended load facies. Cut and fill channels not as prominent as in HJ horizon. Minor host for uranium mineralization.

LC Shale
(Overlying Confining Unit)

LCS - Shale horizon separating FG from HJ; a virtually continuous aquiclude in Lost Creek area.

Mineralization

HJ Horizon
(Production Zone Aquifer)

HJ - Course-grained arkoses with minor matrix. Very thin lenticular intervals of fine sands. Cut and fill channels are prominent. Mixed load facies. Major host to uranium mineralization, especially in middle parts.

SB Shale
(Underlying Confining Unit)

SB Shale - Shale/mudstone separating HJ from UKM Sand. Continuous throughout Permit Area.

UKM Sand
(Underlying Aquifer)

UKM - Generally massive, coarse-grained sandstone with lenticular fine sand intervals. Mixed load facies. Host to significant uranium mineralization.

NN Shale

NN Shale - No Name Shale, separating UKM Sand from MKM Sand.

MKM Sand

MKM Sand - Similar to the UKM Sand.

Lost Creek ISR, LLC
Littleton, Colorado, USA

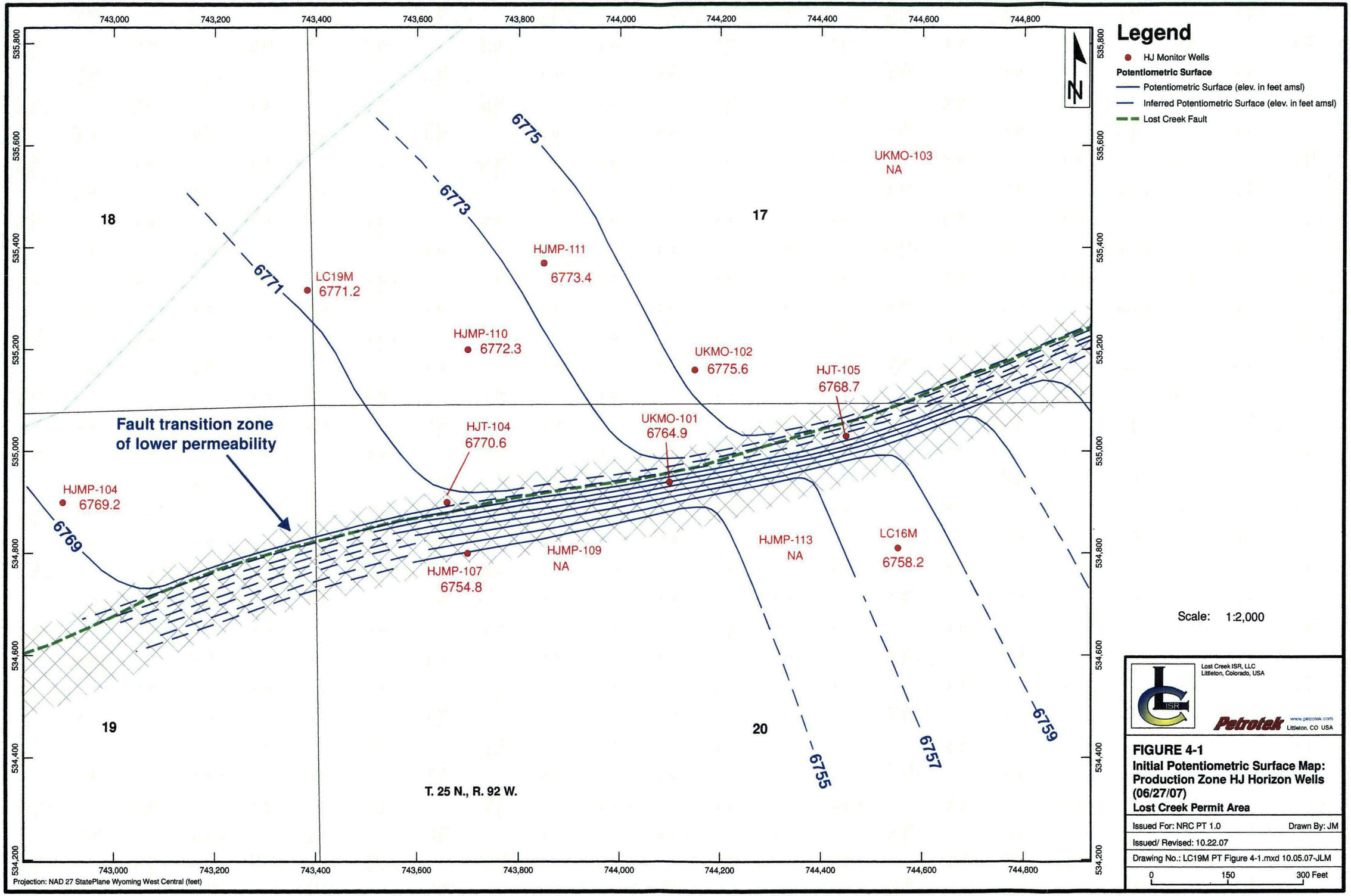
Petrotek www.petrotek.com Littleton, CO USA

FIGURE 2-1

Lost Creek Hydrostratigraphic Units

Lost Creek Permit Area

Issued For: LC19M PT 1.0	Drawn By: JM
Issued/ Revised: 10.03.07	
Drawing No.: LC19M PT Figure 2-1.mxd 10.03.07-JLM	



Scale: 1:2,000

Lost Creek ISR, LLC
Littleton, Colorado, USA

Petrotek www.petrotek.com Littleton, CO USA

FIGURE 4-1
Initial Potentiometric Surface Map: Production Zone HJ Horizon Wells (06/27/07)
Lost Creek Permit Area

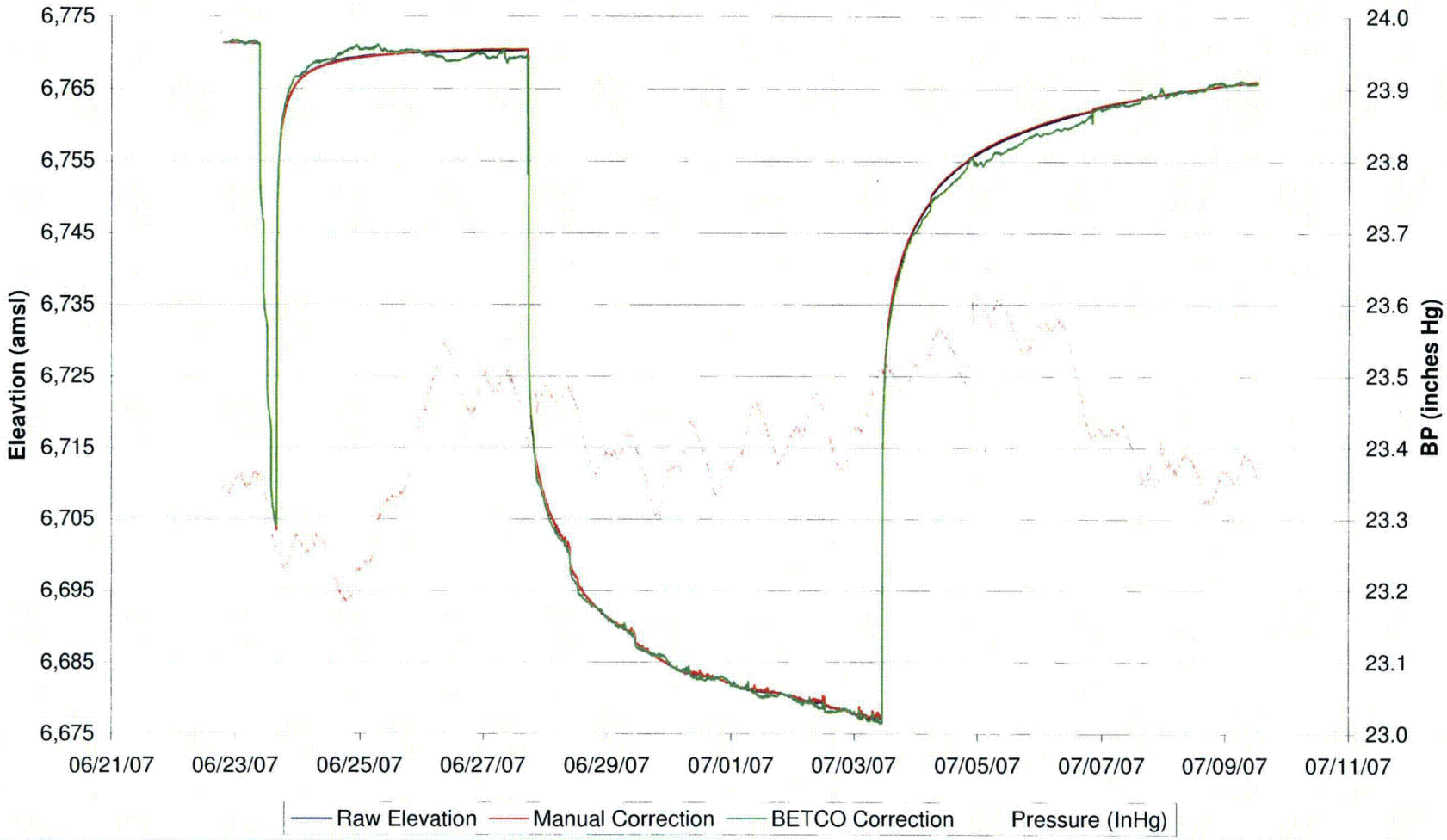
Issued For: NRC PT 1.0 | Drawn By: JM

Issued/ Revised: 10.22.07

Drawing No.: LC19M PT Figure 4-1.mxd 10.05.07-JLM

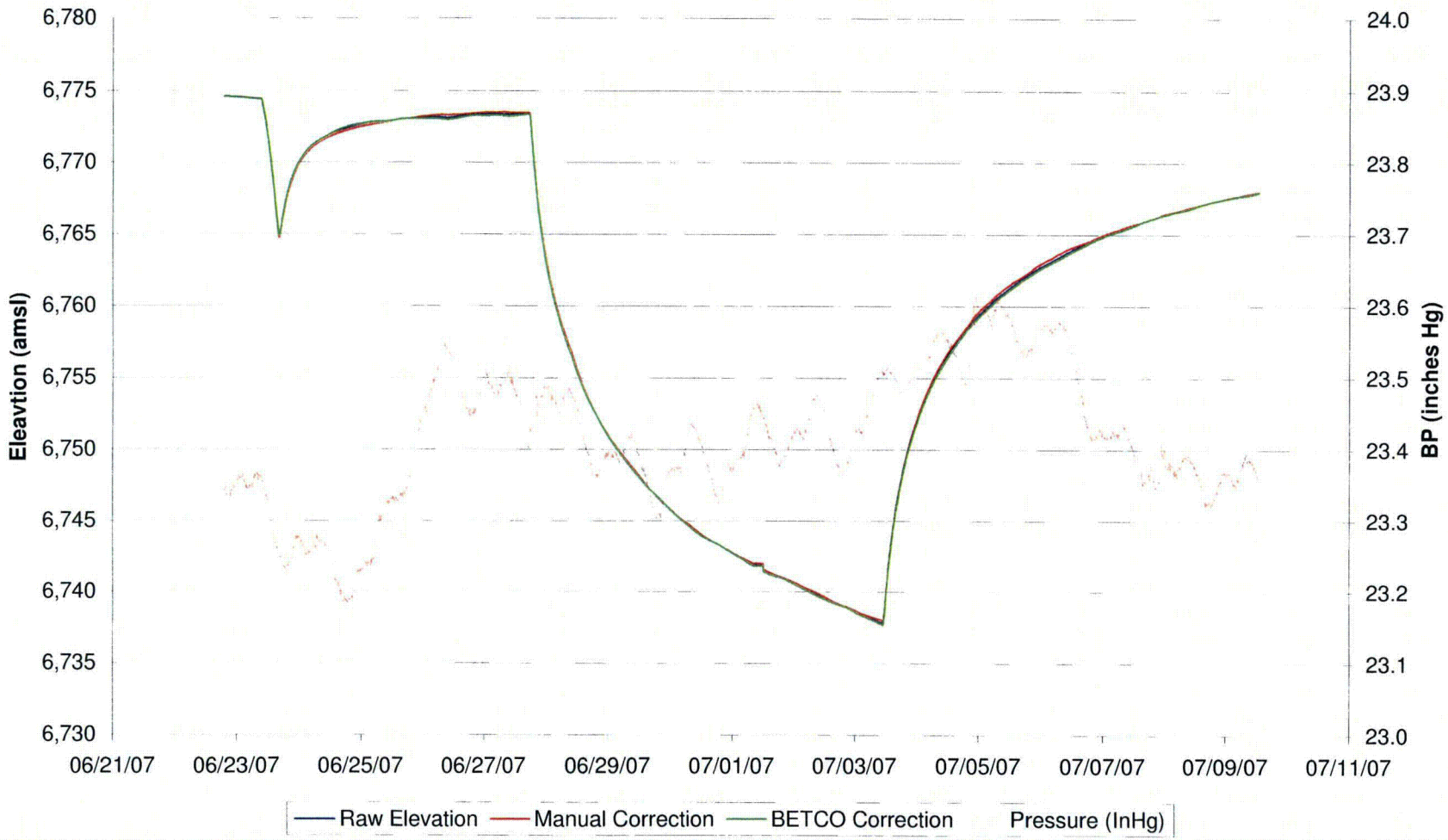
0 150 300 Feet

Figure 5-1
Comparison of Barometric Corrections to Drawdown Observed at LC19M (pumping well)
North of Lost Creek Fault



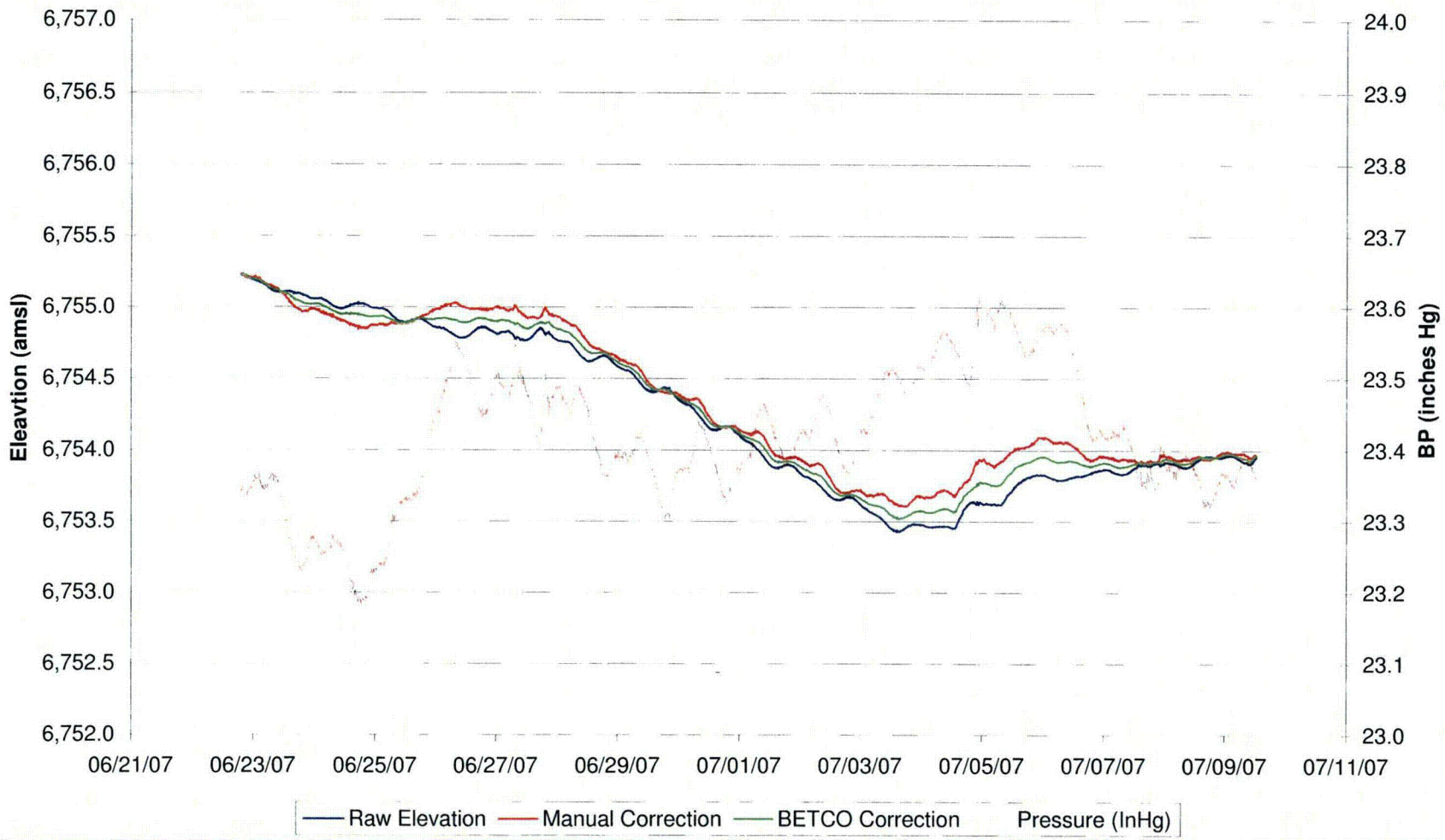
Select BP Corrections.xls

Figure 5-2
Comparison of Barometric Corrections to Drawdown Observed at HJMP-111 (HJ sand)
North of Lost Creek Fault



Select BP Corrections.xls

Figure 5-3
Comparison of Barometric Corrections to Drawdown Observed at HJMP-107 (HJ sand)
South of Lost Creek Fault



Select BP Corrections.xls

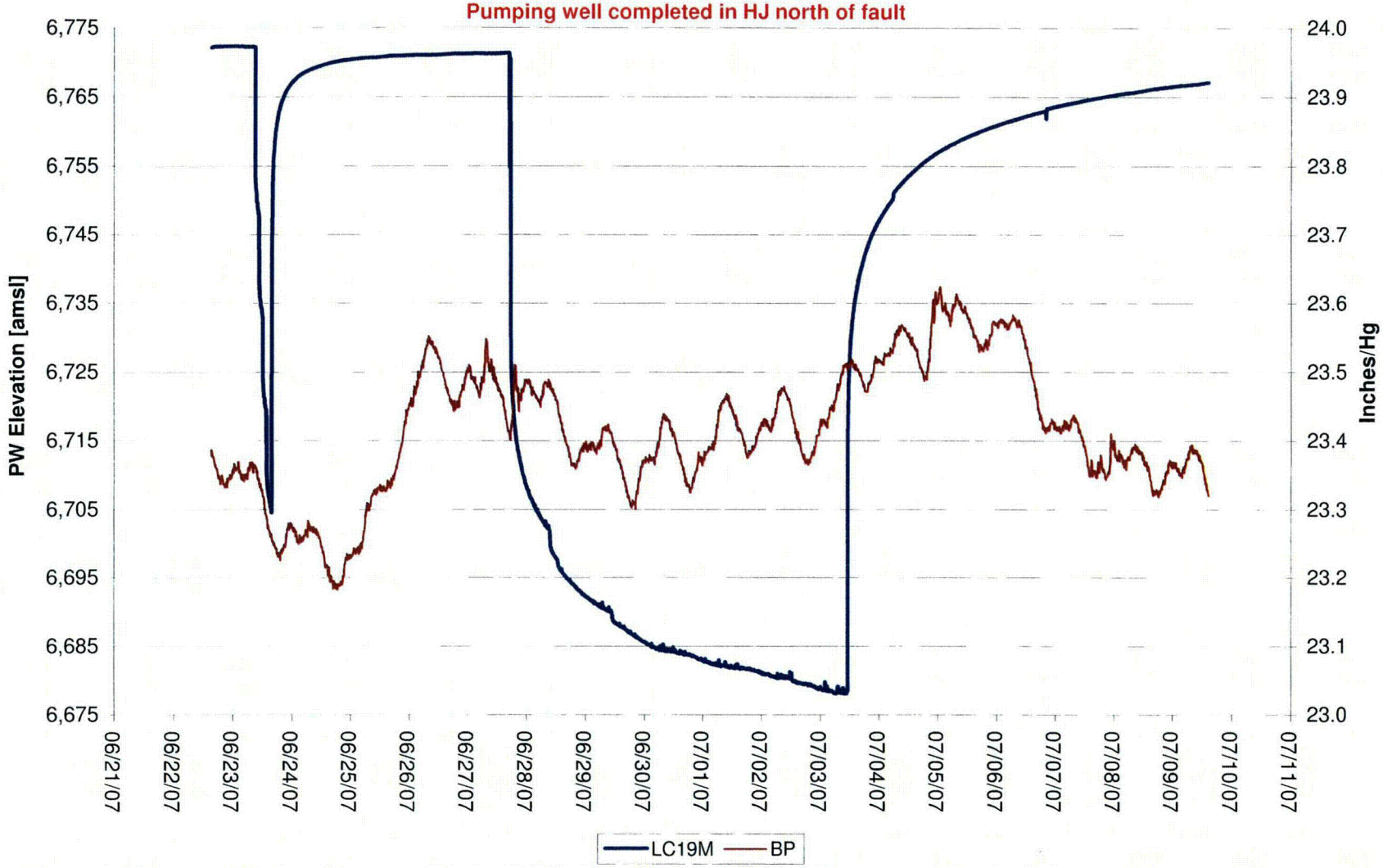


Figure 6-1
Lost Creek Regional Aquifer Test - North Test
Pumping well completed in HJ north of fault
PW Elevation [amsl]
Inches/Hg
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
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07/02/07
07/03/07
07/04/07
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07/10/07
07/11/07
LC19M
BP

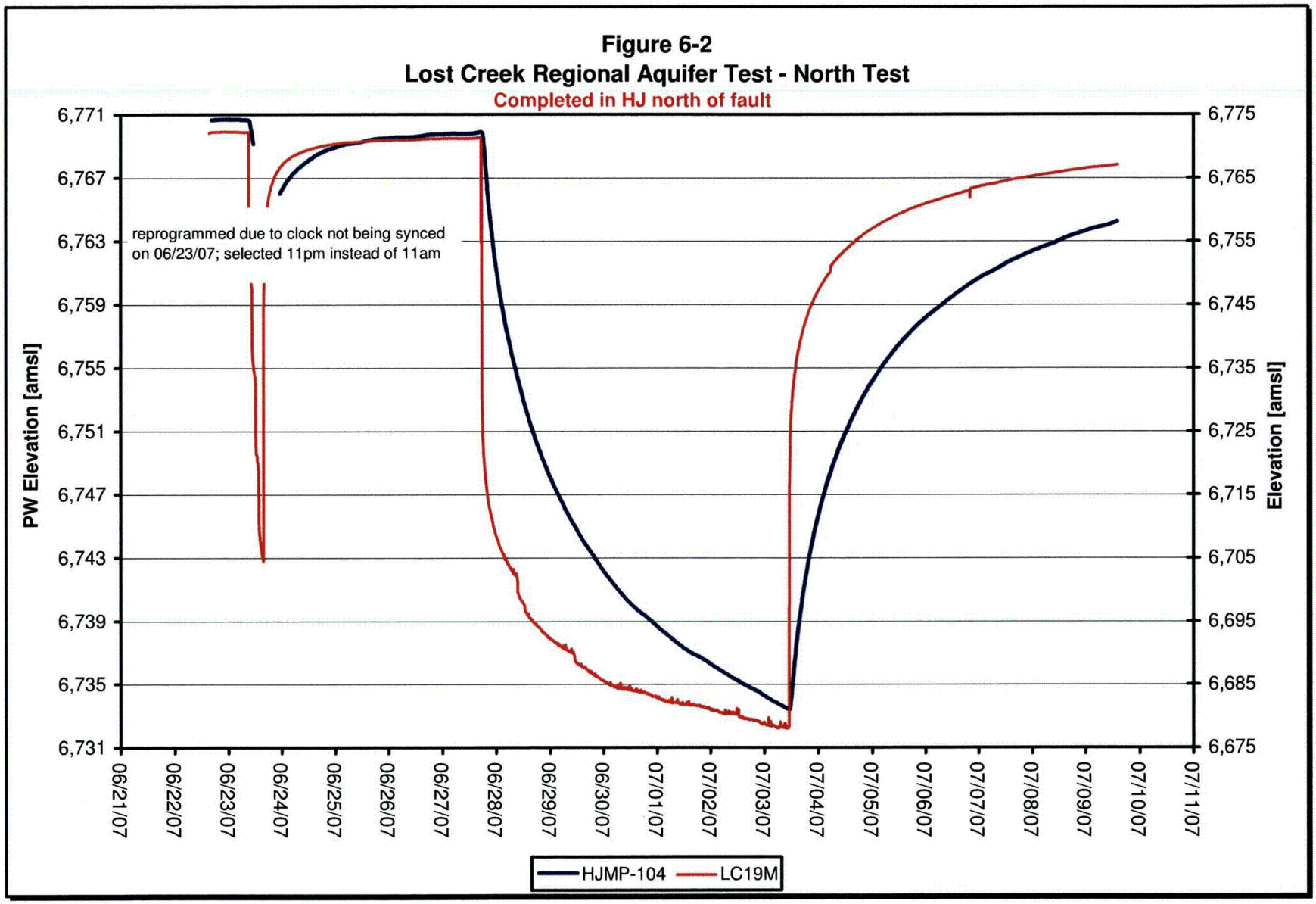
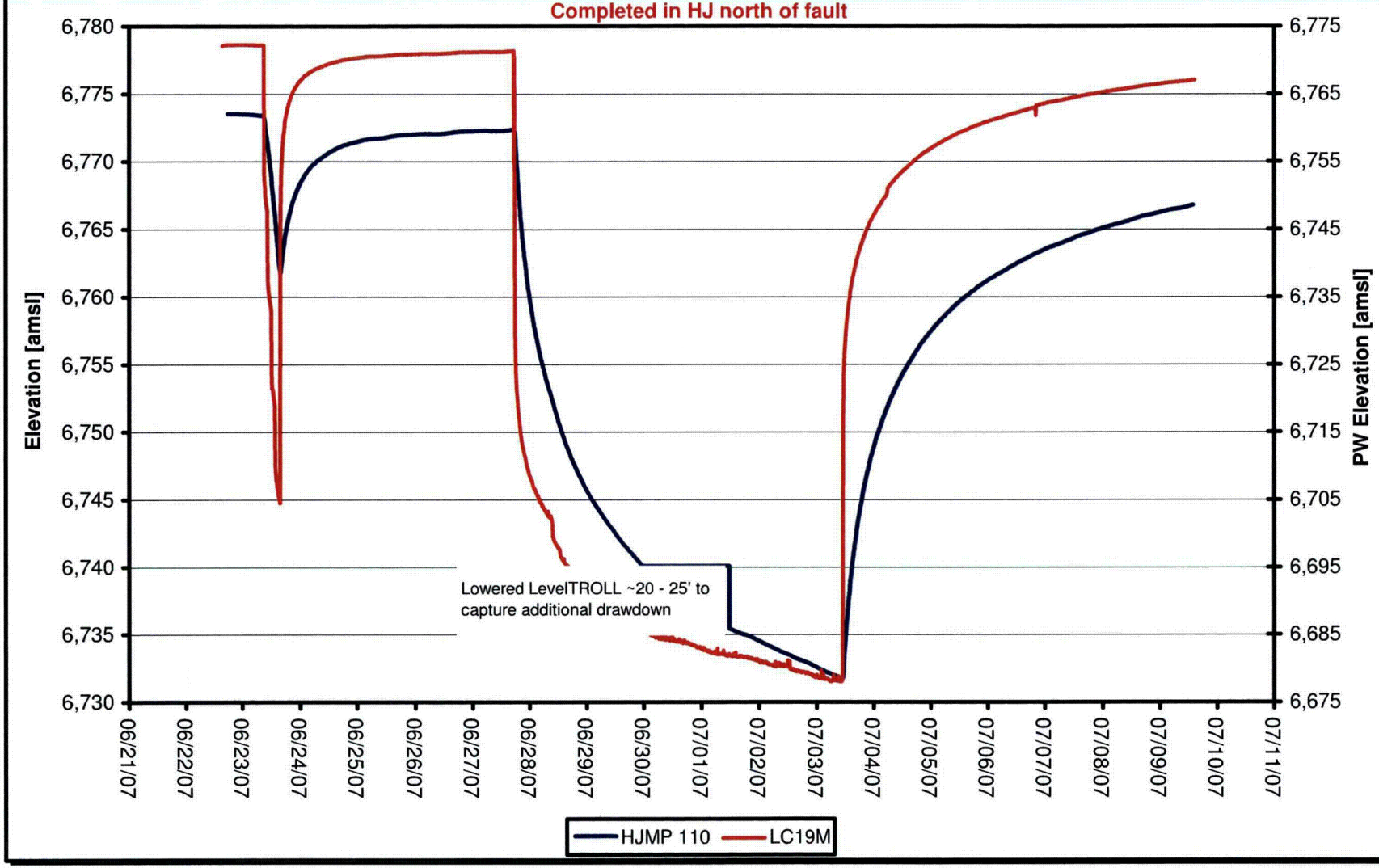


Figure 6-2
Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
reprogrammed due to clock not being synced on 06/23/07; selected 11pm instead of 11am
PW Elevation [amsl]
Elevation [amsl]
6,771
6,767
6,763
6,759
6,755
6,751
6,747
6,743
6,739
6,735
6,731
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
HJMP-104
LC19M

Figure 6-3
Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault



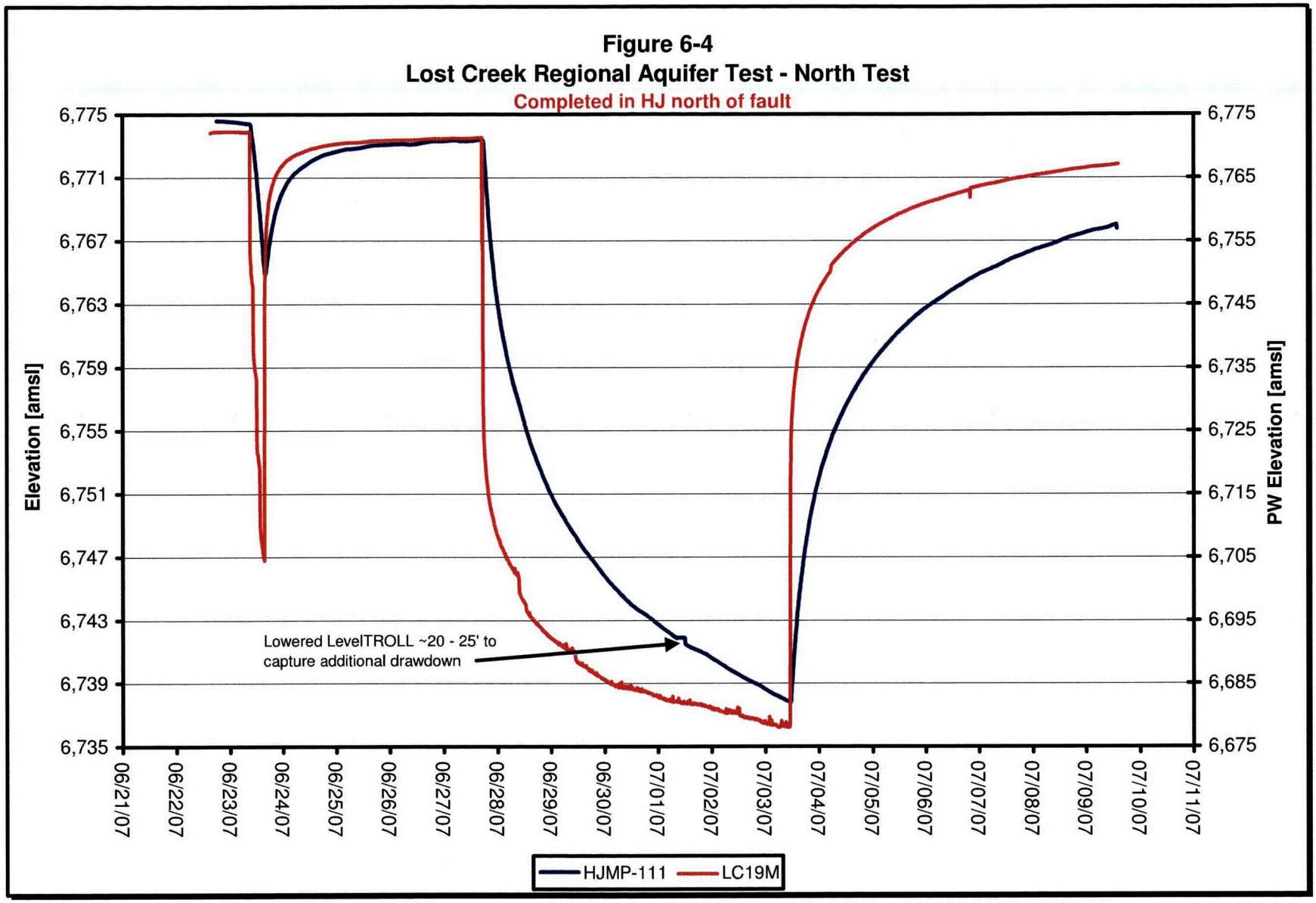


Figure 6-4
Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
Elevation [amsl]
PW Elevation [amsl]
6,775
6,771
6,767
6,763
6,759
6,755
6,751
6,747
6,743
6,739
6,735
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
Lowered LevelTROLL ~20 - 25' to
capture additional drawdown
HJMP-111
LC19M

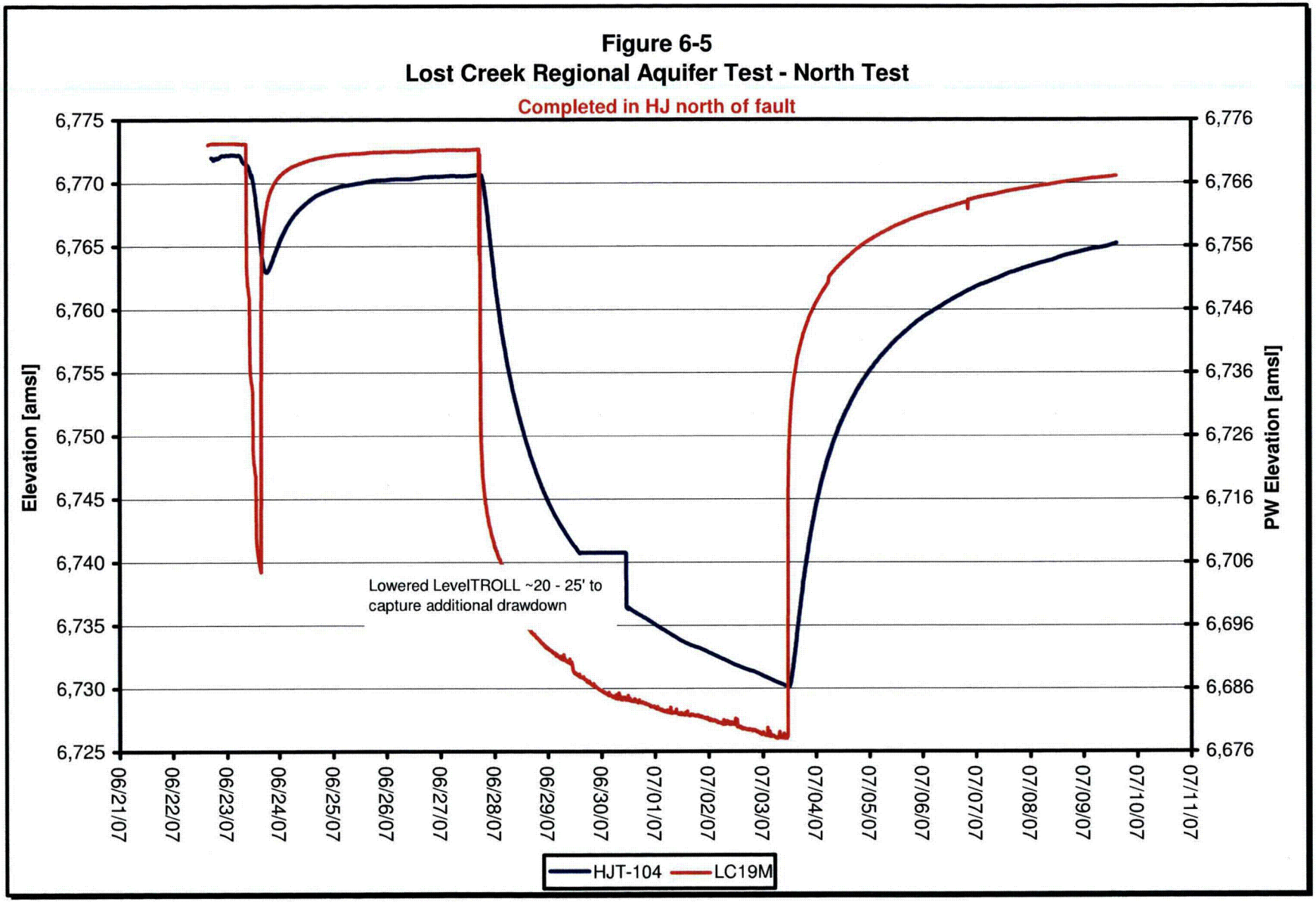


Figure 6-5
Lost Creek Regional Aquifer Test - North Test

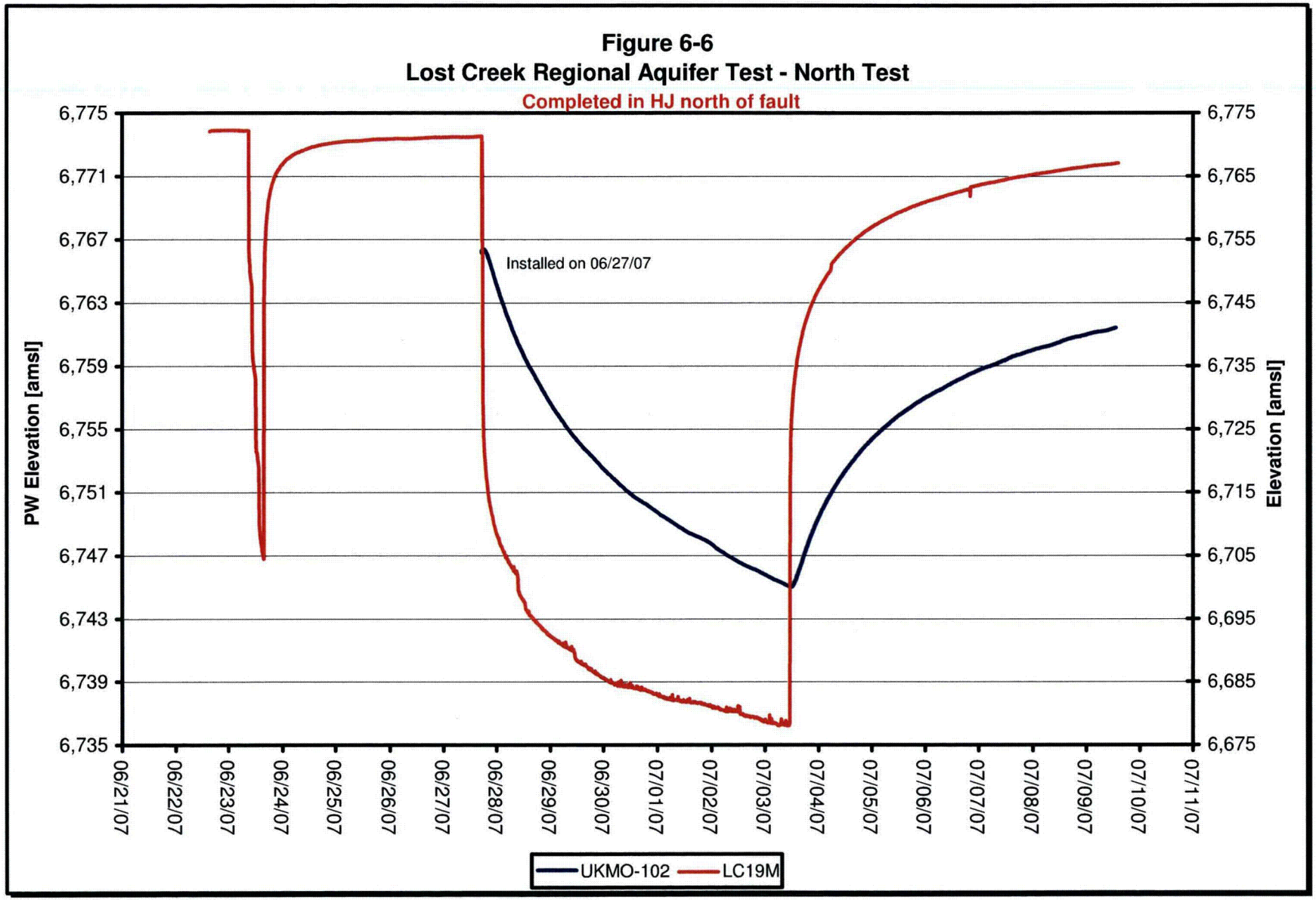
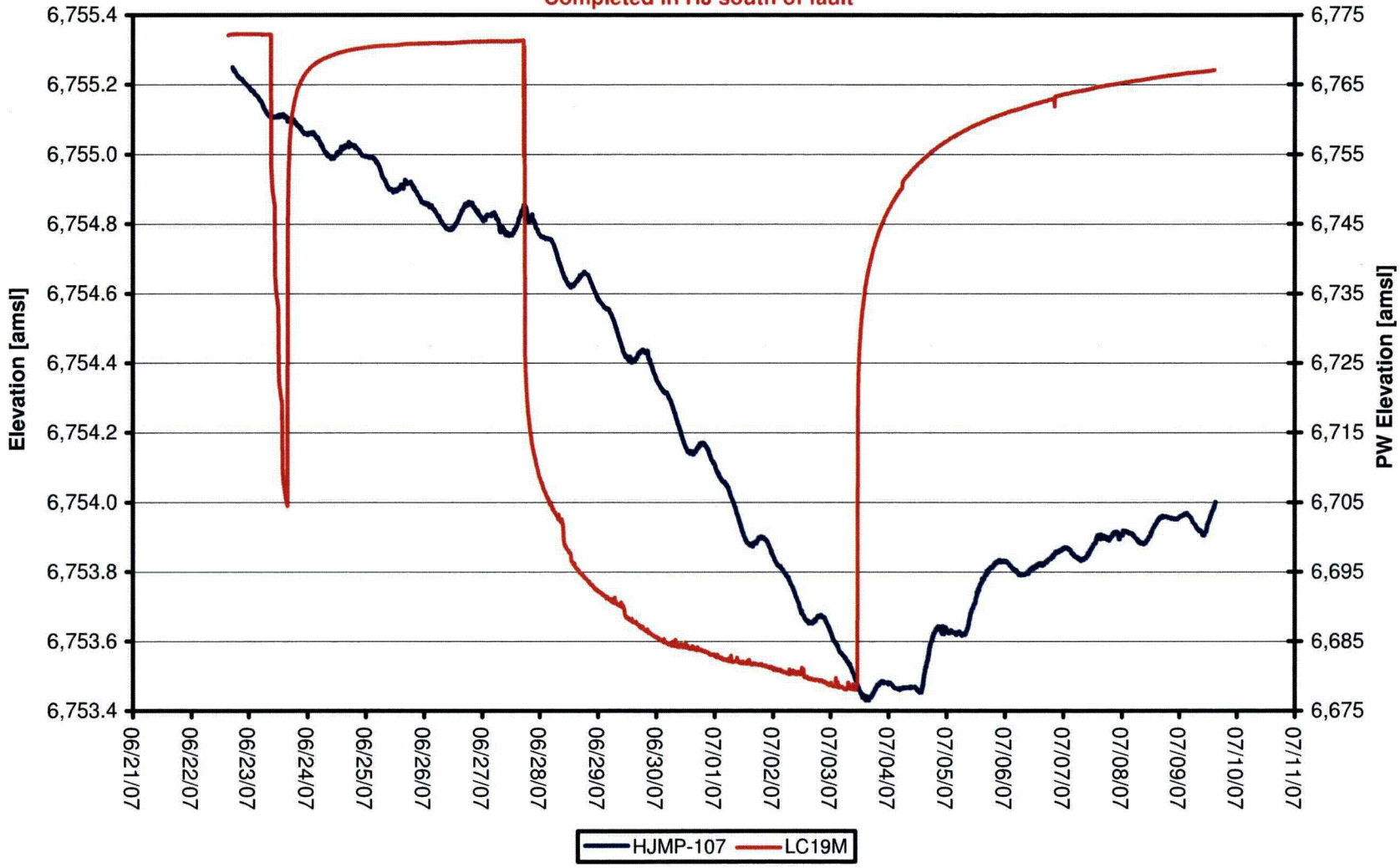


Figure 6-6
Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
Installed on 06/27/07
PW Elevation [amsl]
Elevation [amsl]
6,775
6,771
6,767
6,763
6,759
6,755
6,751
6,747
6,743
6,739
6,735
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
UKMO-102
LC19M

Figure 6-7
Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault



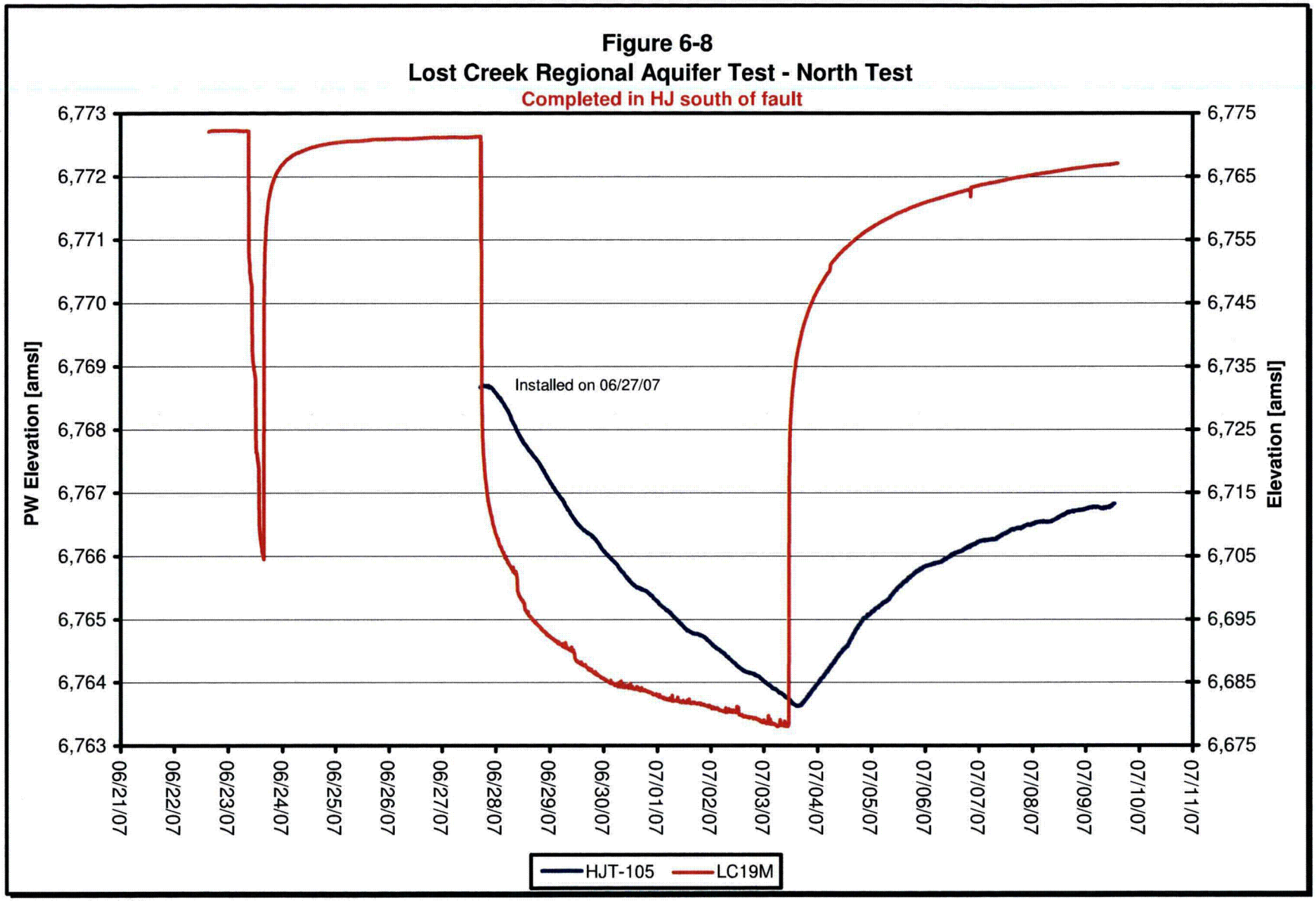


Figure 6-8
Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault
PW Elevation [amsl]
Elevation [amsl]
6,773
6,772
6,771
6,770
6,769
6,768
6,767
6,766
6,765
6,764
6,763
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
Installed on 06/27/07
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
HJT-105
LC19M

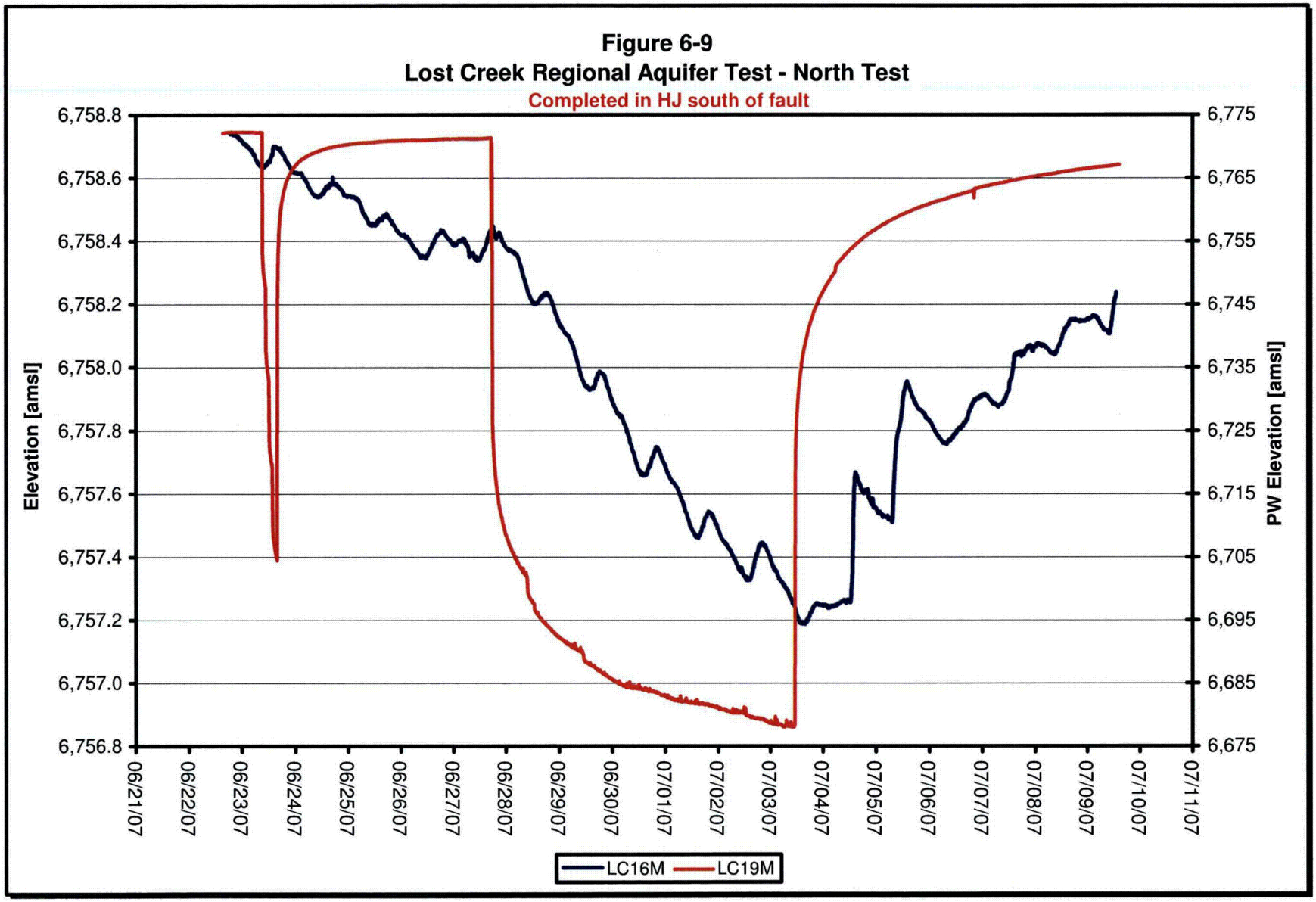


Figure 6-9
Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault
Elevation [amsl]
PW Elevation [amsl]
6,758.8
6,758.6
6,758.4
6,758.2
6,758.0
6,757.8
6,757.6
6,757.4
6,757.2
6,757.0
6,756.8
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
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07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
LC16M
LC19M

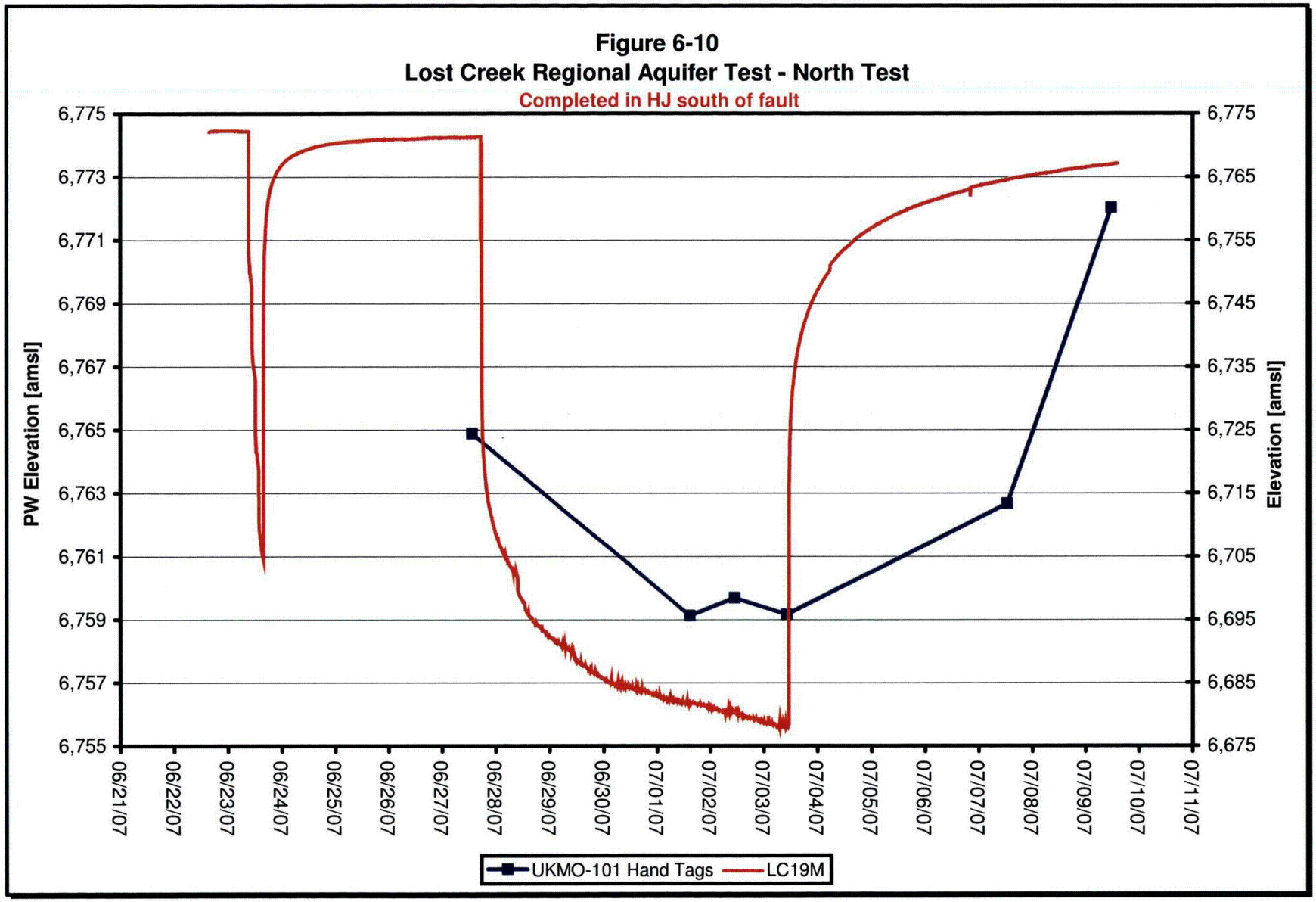


Figure 6-10
Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault
PW Elevation [amsl]
Elevation [amsl]
6,775
6,773
6,771
6,769
6,767
6,765
6,763
6,761
6,759
6,757
6,755
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
UKMO-101 Hand Tags
LC19M

Figure 6-11
Lost Creek Regional Aquifer Test - North Test

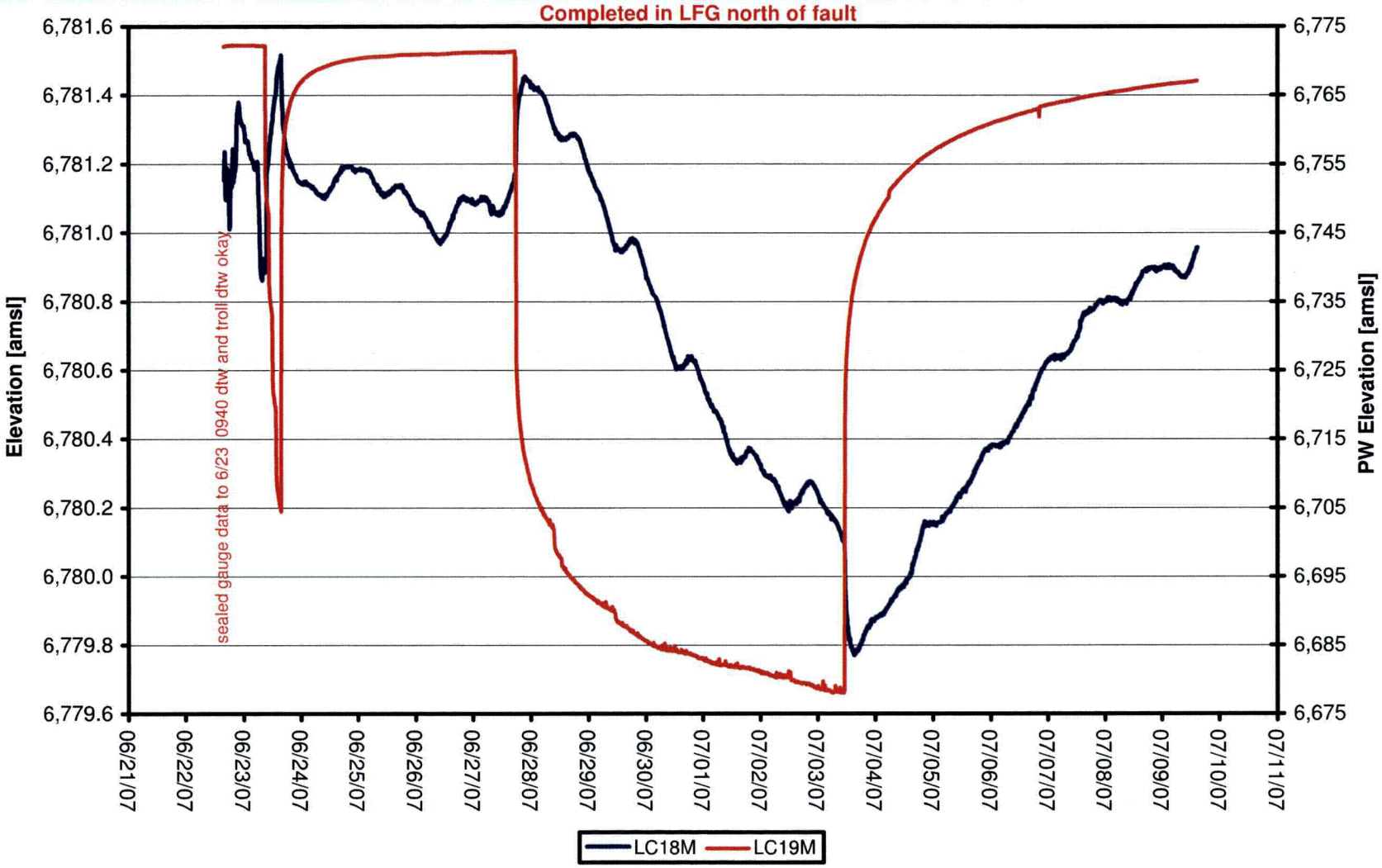
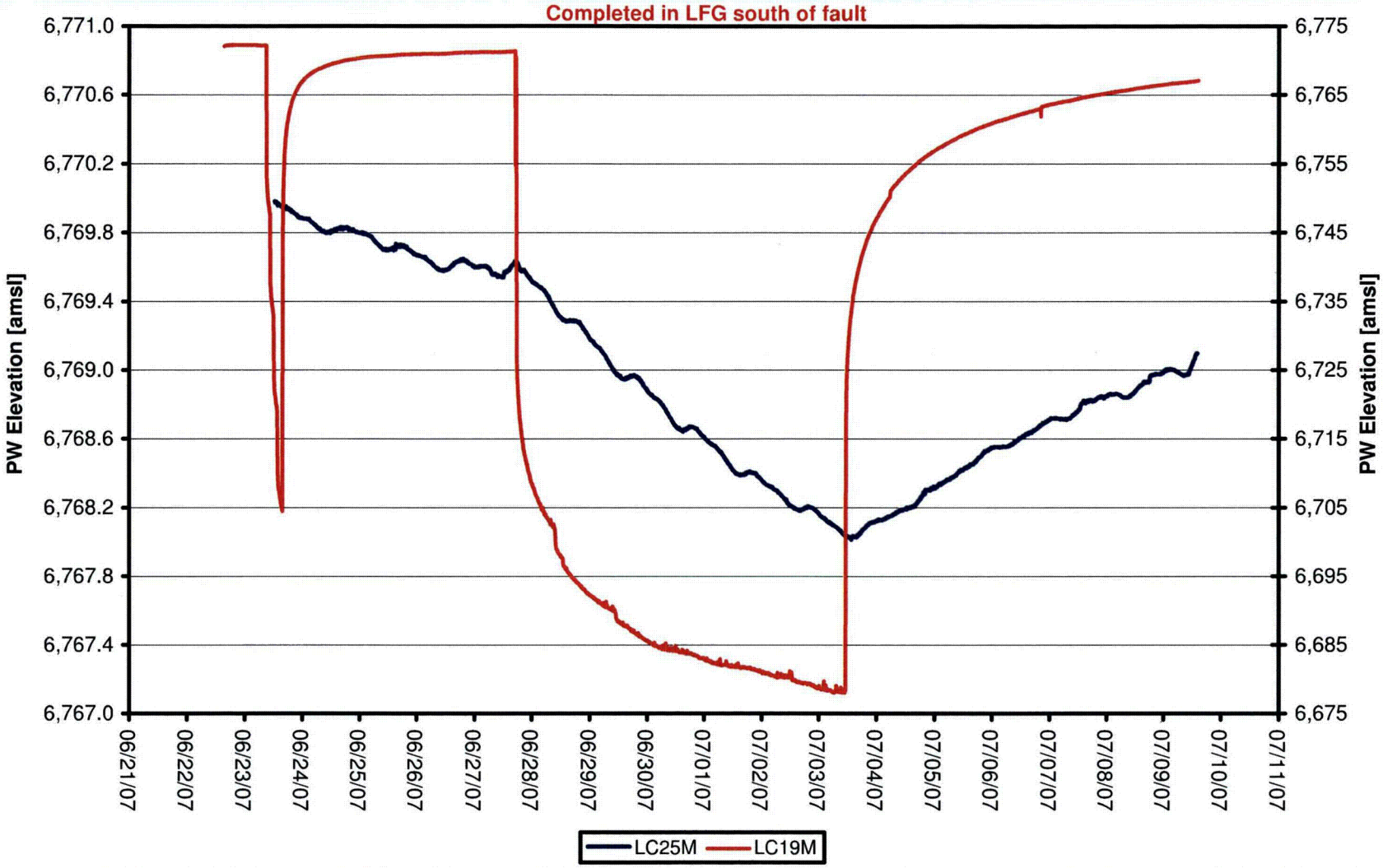


Figure 6-12
Lost Creek Regional Aquifer Test - North Test



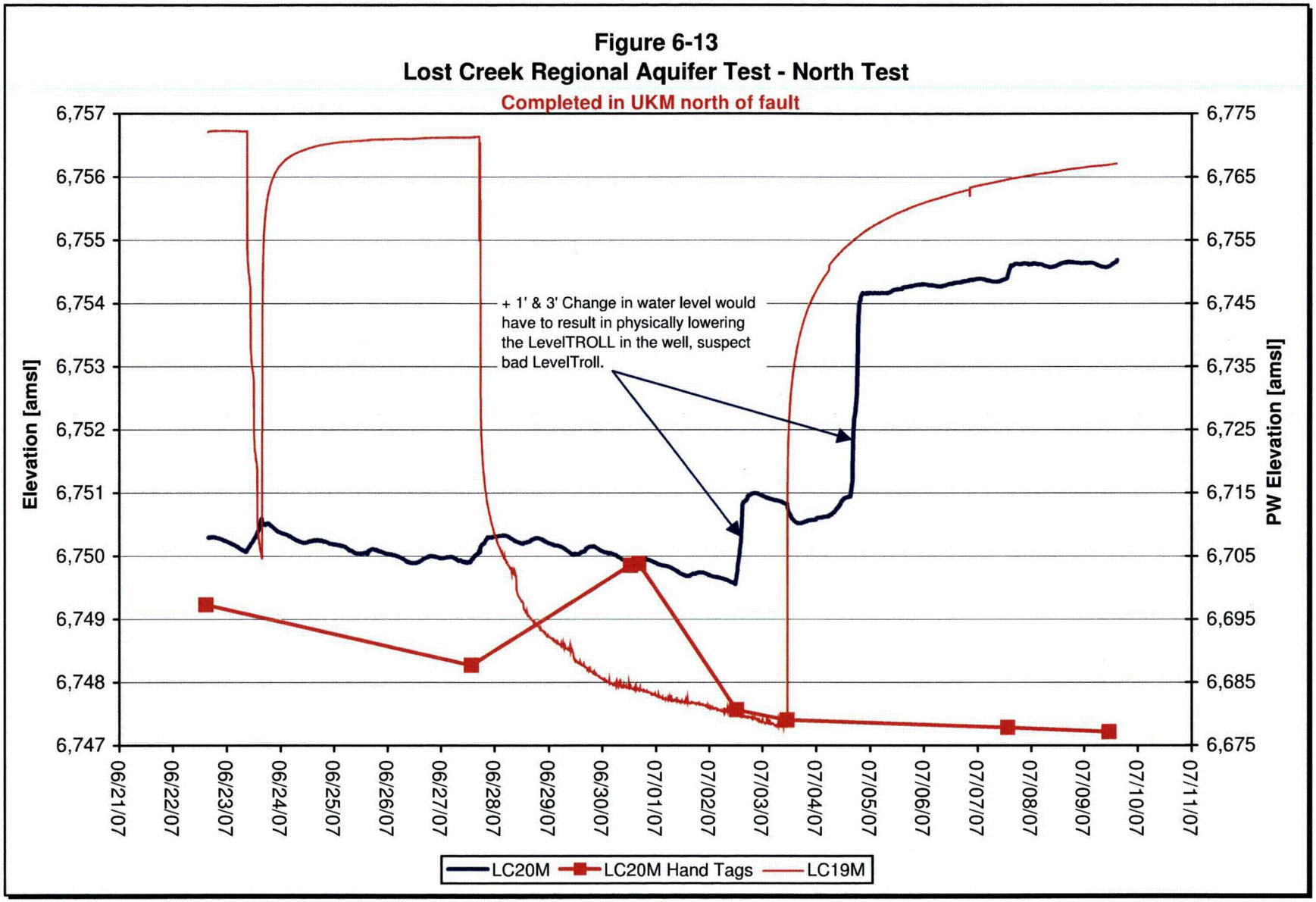


Figure 6-13
Lost Creek Regional Aquifer Test - North Test
Completed in UKM north of fault
+ 1' & 3' Change in water level would have to result in physically lowering the LevelTROLL in the well, suspect bad LevelTroll.
Elevation [amsl]
PW Elevation [amsl]
6,757
6,756
6,755
6,754
6,753
6,752
6,751
6,750
6,749
6,748
6,747
6,775
6,765
6,755
6,745
6,735
6,725
6,715
6,705
6,695
6,685
6,675
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
LC20M
LC20M Hand Tags
LC19M

Figure 6-14
Lost Creek Regional Aquifer Test - North Test

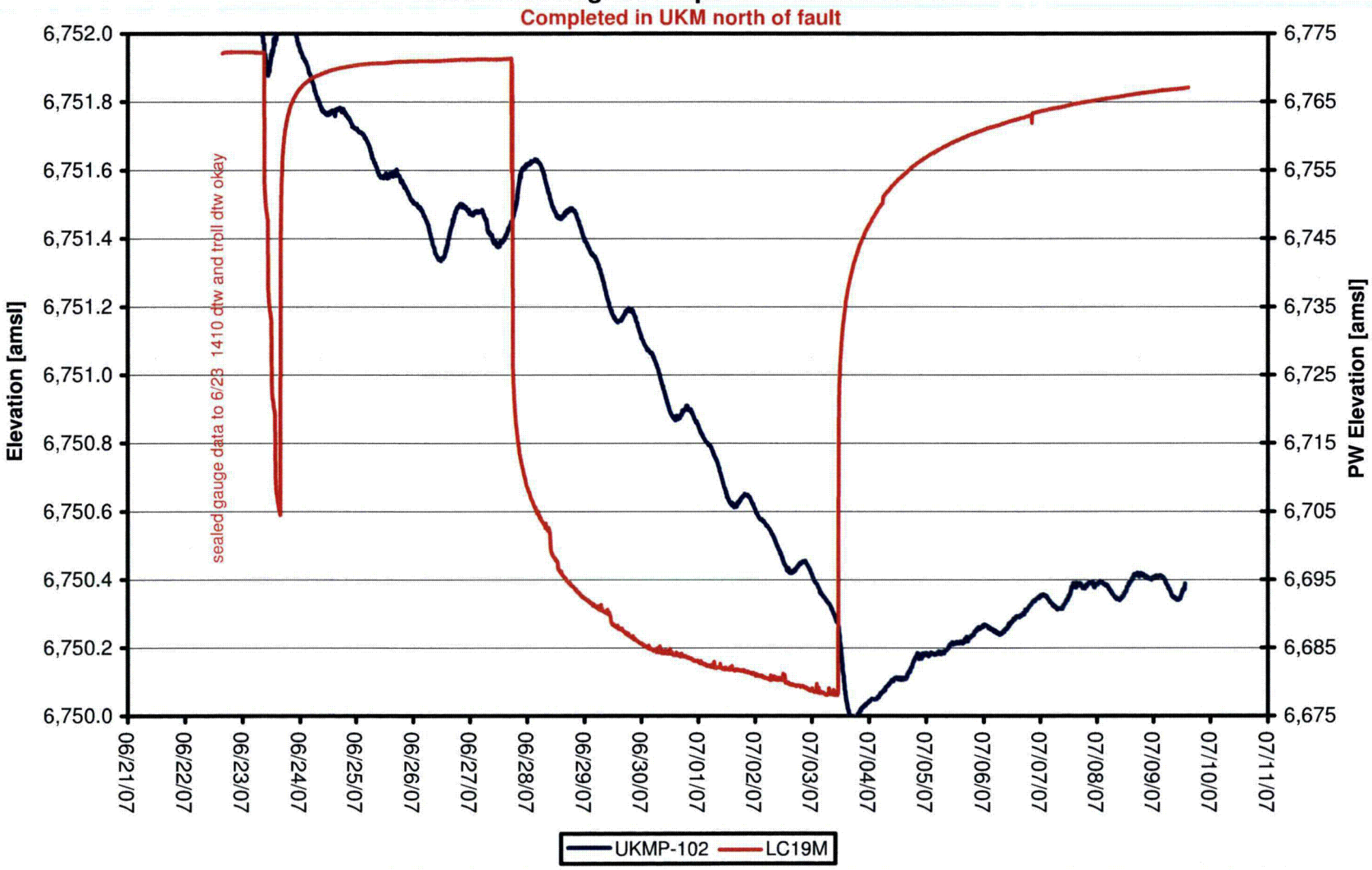
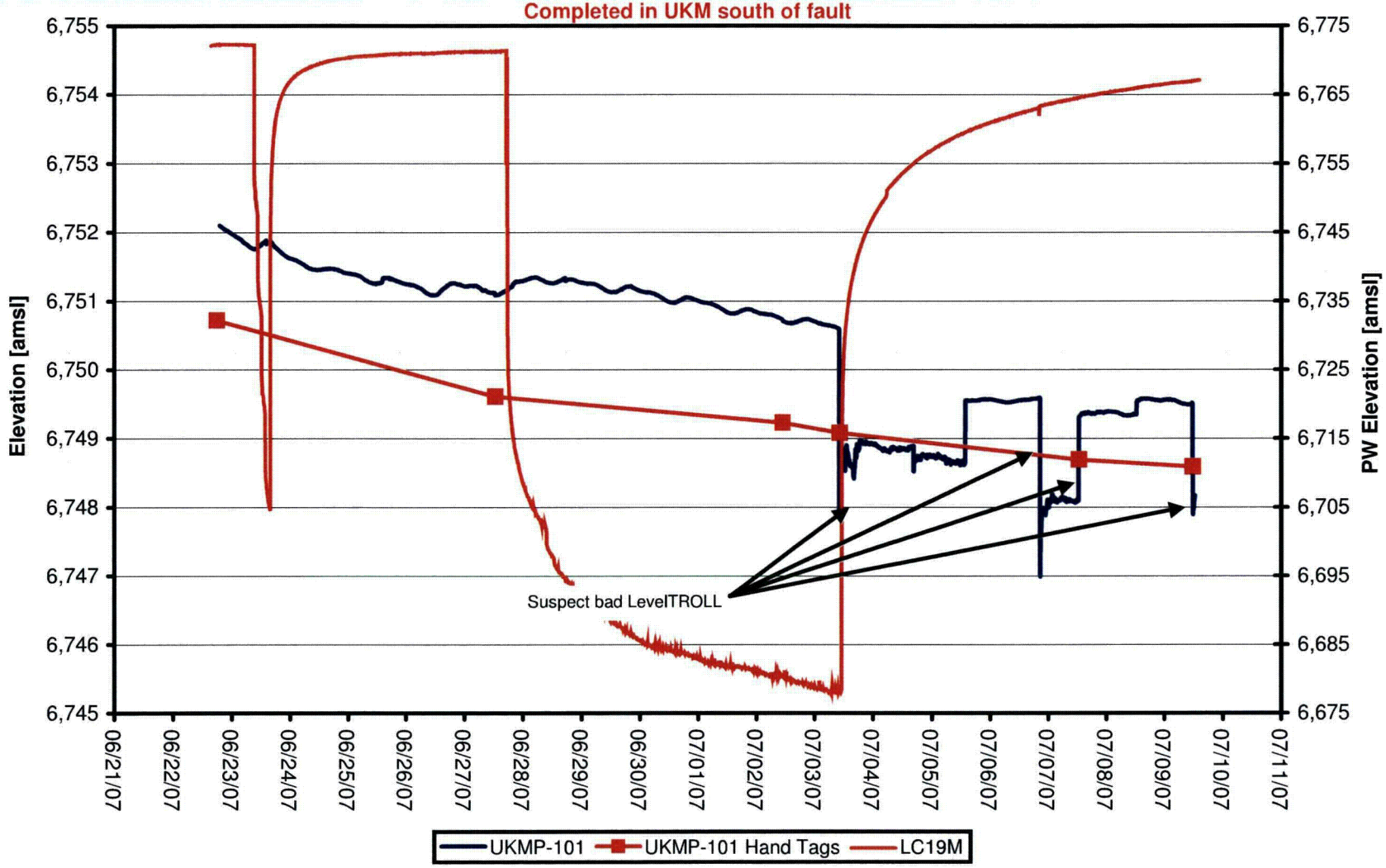
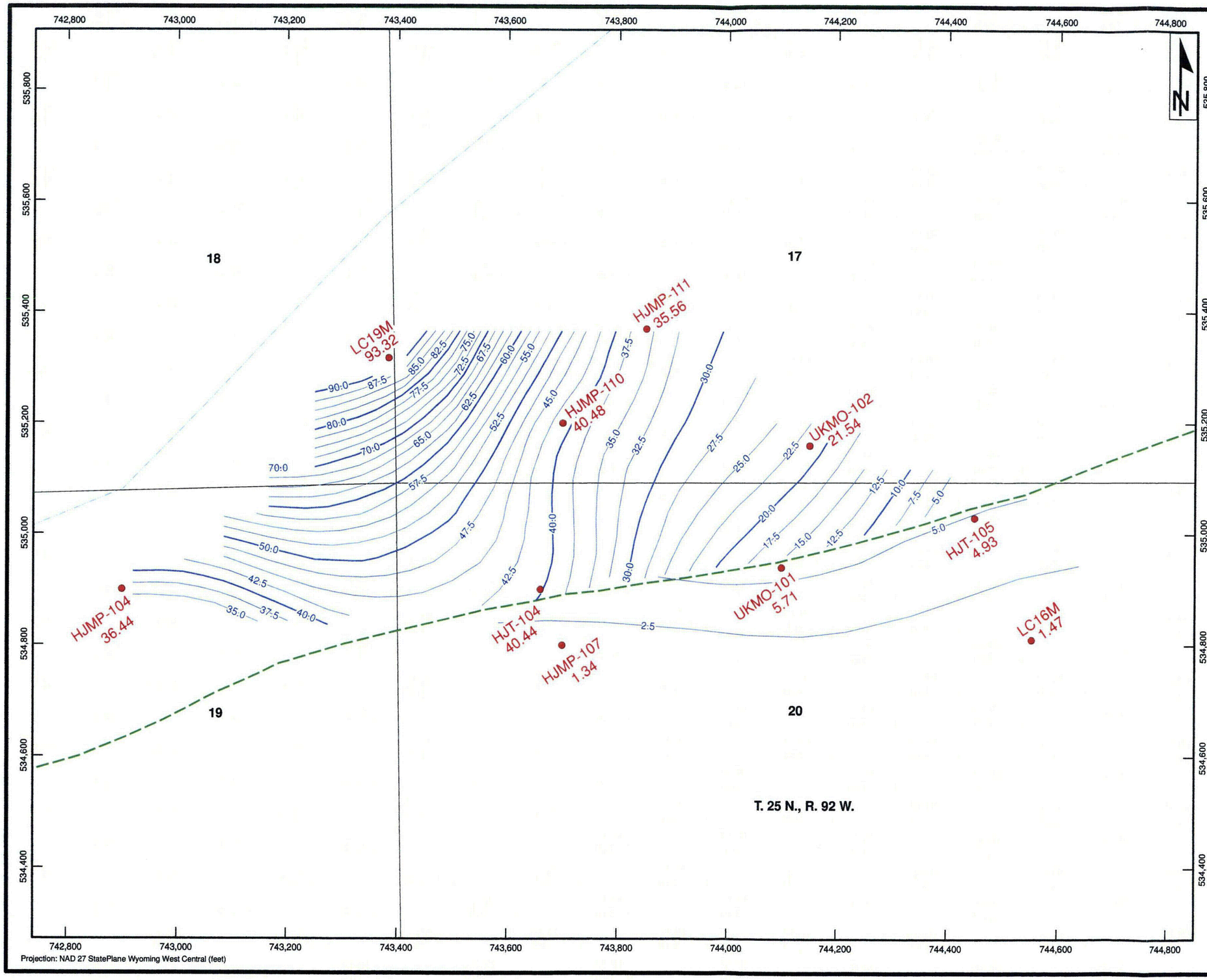


Figure 6-15
Lost Creek Regional Aquifer Test - North Test
Completed in UKM south of fault





Legend

- HJ Monitor Well
- Drawdown Contour (feet)
- Lost Creek Fault

Scale: 1:2,000

Lost Creek ISR, LLC
Littleton, Colorado, USA

Petrotek www.petrotek.com Littleton, CO USA

FIGURE 6-16

Drawdown in the HJ Aquifer at the End of the LC19M Pumping Test

Lost Creek Permit Area

Issued For: NRC PT 1.0 Drawn By: JM

Issued/ Revised: 10.22.07

Drawing No.: LC19M PT Figure 6-16.mxd 10.22.07-JLM

0 150 300 Feet

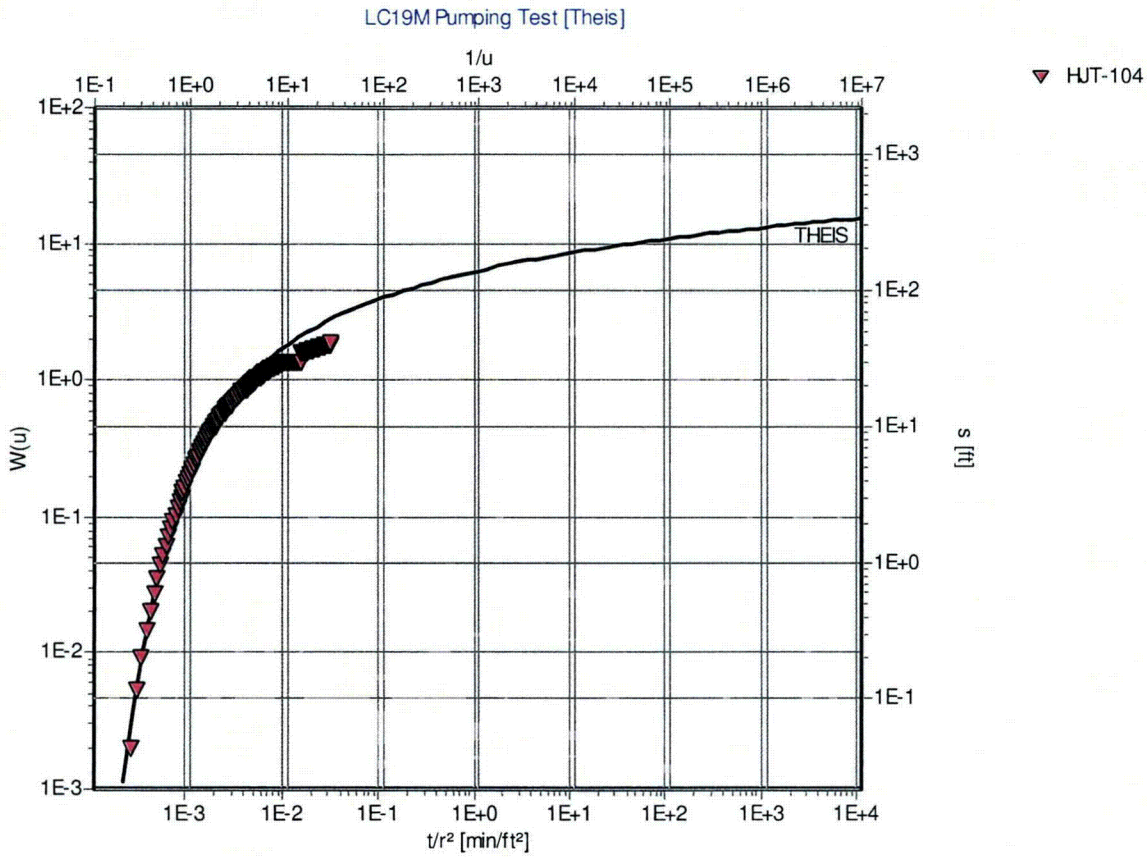
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis**

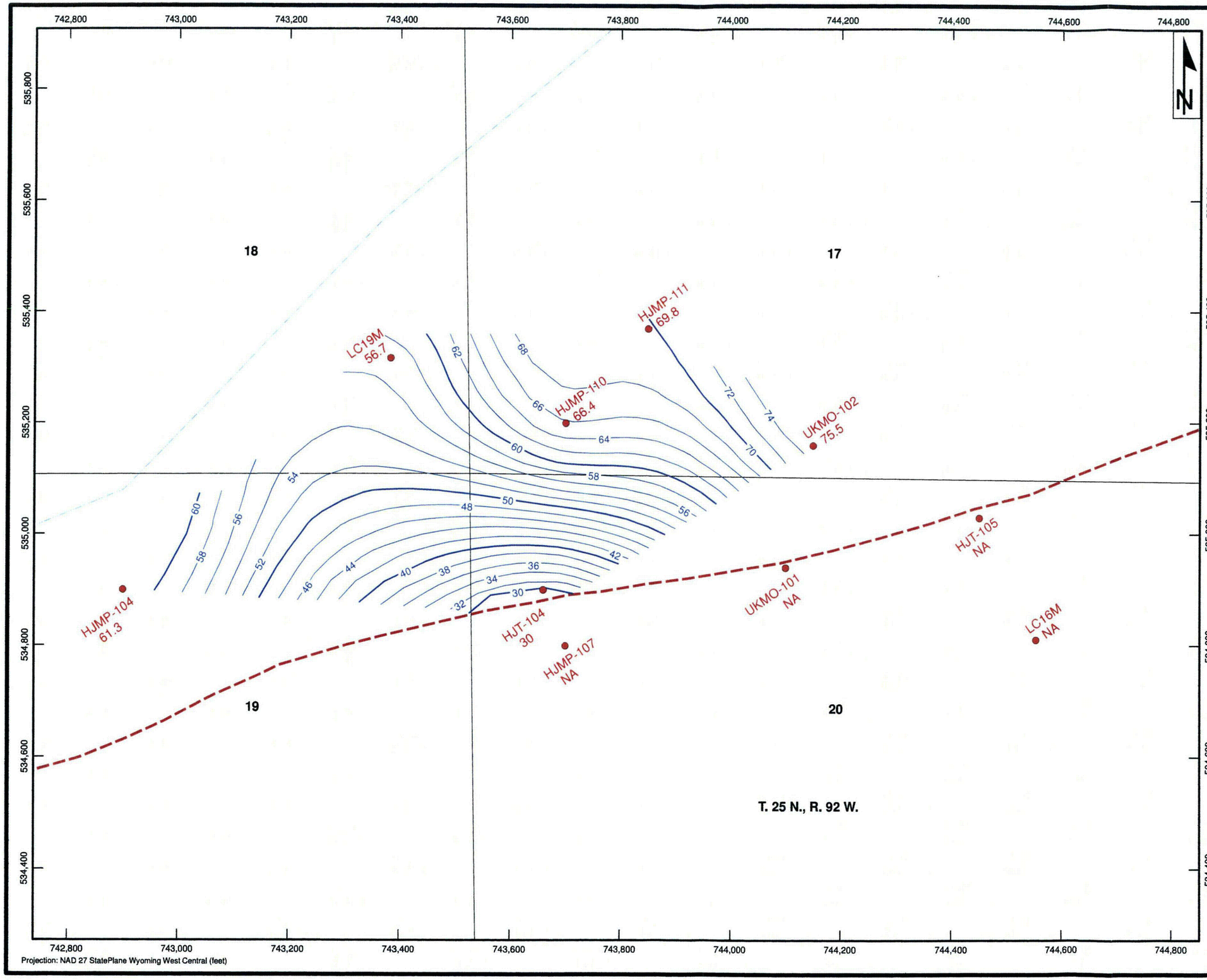
Analysis Results:	Transmissivity:	3.00E+1 [ft²/d]	Conductivity:	2.50E-1 [ft/d]
	Storativity:	9.58E-5		
Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		

Comments: HJ observation well located on north side of Lost Creek Fault. Early to middle time data was used for match due to effects of Fault on later time data.

Evaluated by: KRS

Evaluation Date: 10/3/2007

Figure 7-1
HJT-104 Theis Analysis



Legend

- LC19M_HJ_Monitor_Wells
- Lost Creek Fault

Scale: 1:2,000

Lost Creek ISR, LLC
Littleton, Colorado, USA

Petrotek www.petrotek.com Littleton, CO USA

FIGURE 7-2
Spatial Distribution of Transmissivity (ft2/day) LC19M Pumping Test
Lost Creek Permit Area

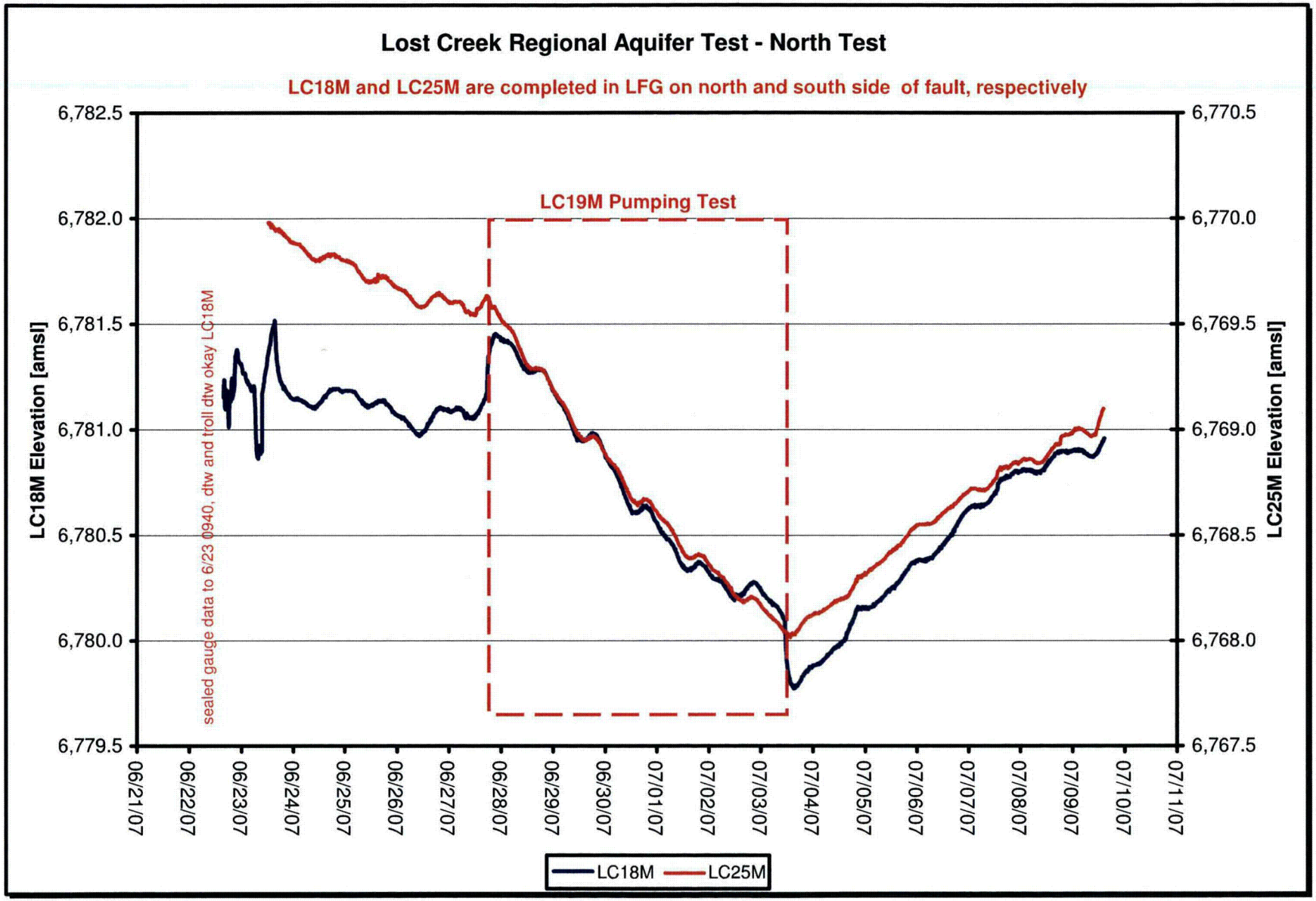
Issued For: NRC PT 1.0 Drawn By: JM

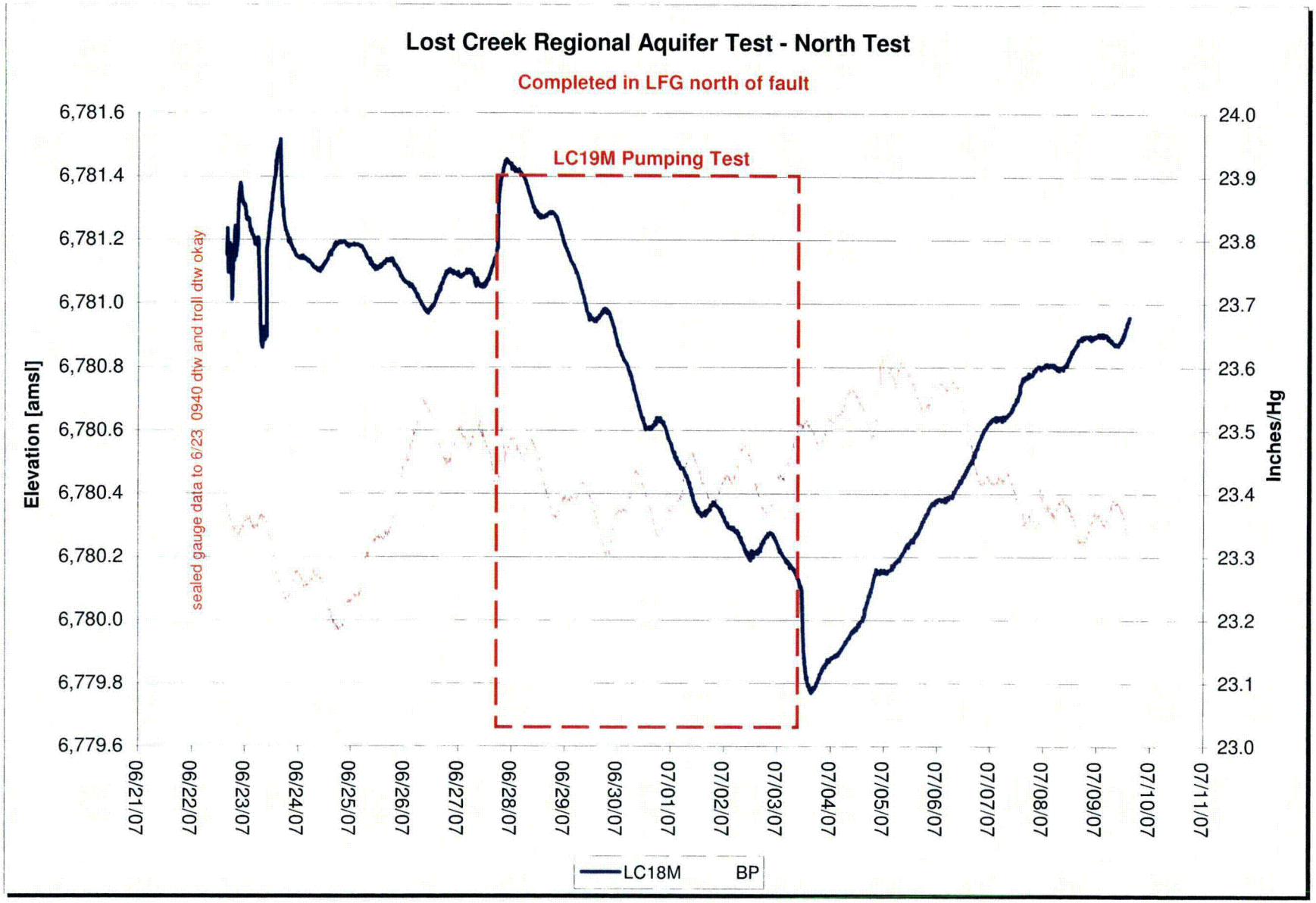
Issued/ Revised: 10.5.07

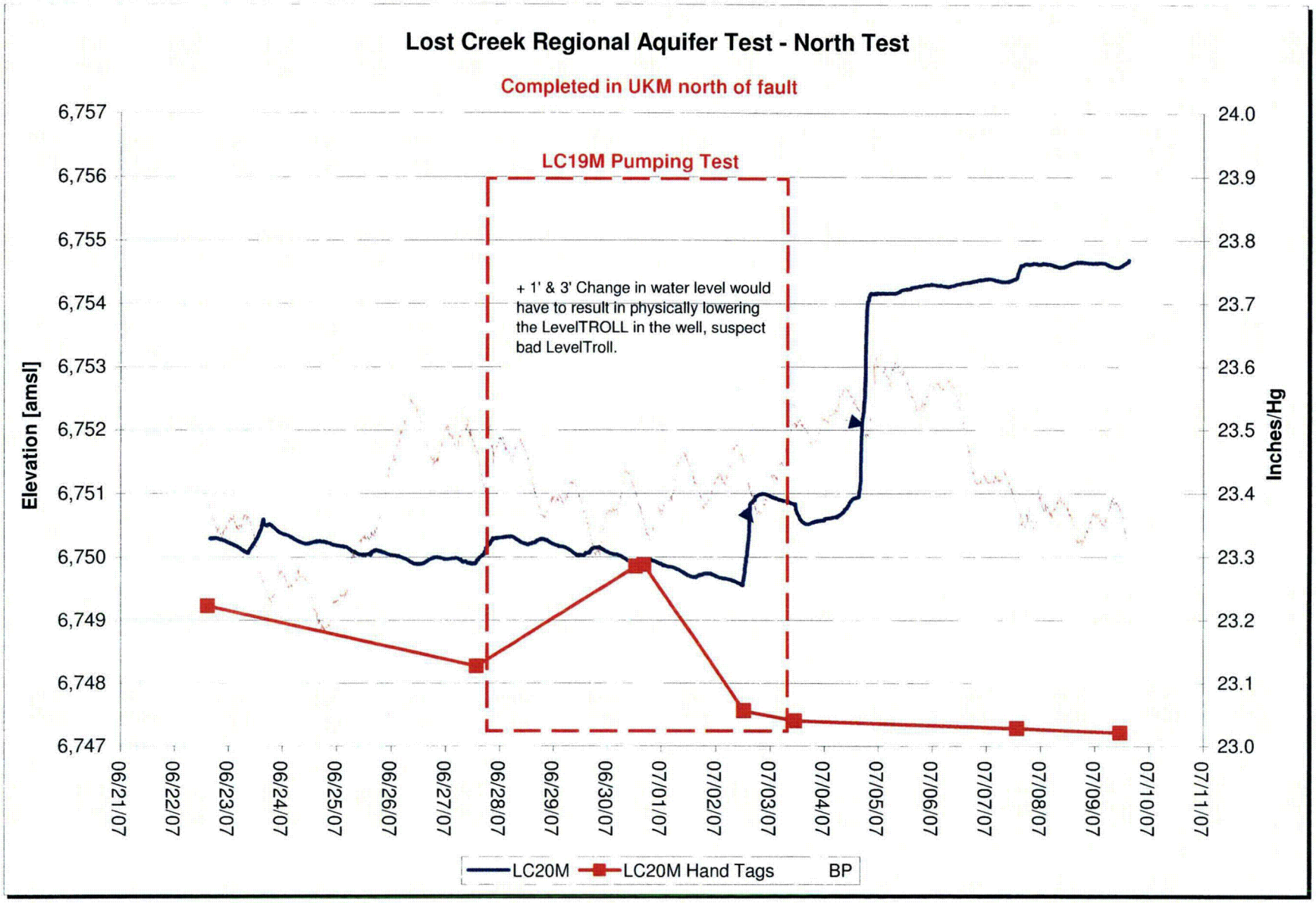
Drawing No.: LC19M PT Figure 7.2.mxd 10.05.07-JLM

0 150 300 Feet

APPENDIX B
WATER LEVEL ELEVATIONS VS BAROMOETRIC PRESSURE


Lost Creek Regional Aquifer Test - North Test
LC18M and LC25M are completed in LFG on north and south side of fault, respectively
LC19M Pumping Test
sealed gauge data to 6/23 0940, dtw and troll dtw okay LC18M
LC18M Elevation [amsl]
LC25M Elevation [amsl]
6,782.5
6,782.0
6,781.5
6,781.0
6,780.5
6,780.0
6,779.5
6,770.5
6,770.0
6,769.5
6,769.0
6,768.5
6,768.0
6,767.5
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
LC18M
LC25M


Lost Creek Regional Aquifer Test - North Test
Completed in LFG north of fault
LC19M Pumping Test
sealed gauge data to 6/23 0940 dtw and troll dtw okay
Elevation [amsl]
Inches/Hg
6,781.6
6,781.4
6,781.2
6,781.0
6,780.8
6,780.6
6,780.4
6,780.2
6,780.0
6,779.8
6,779.6
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
LC18M
BP


Lost Creek Regional Aquifer Test - North Test
Completed in UKM north of fault
LC19M Pumping Test
+ 1' & 3' Change in water level would have to result in physically lowering the LevelTROLL in the well, suspect bad LevelTroll.
Elevation [amsl]
Inches/Hg
6,757
6,756
6,755
6,754
6,753
6,752
6,751
6,750
6,749
6,748
6,747
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
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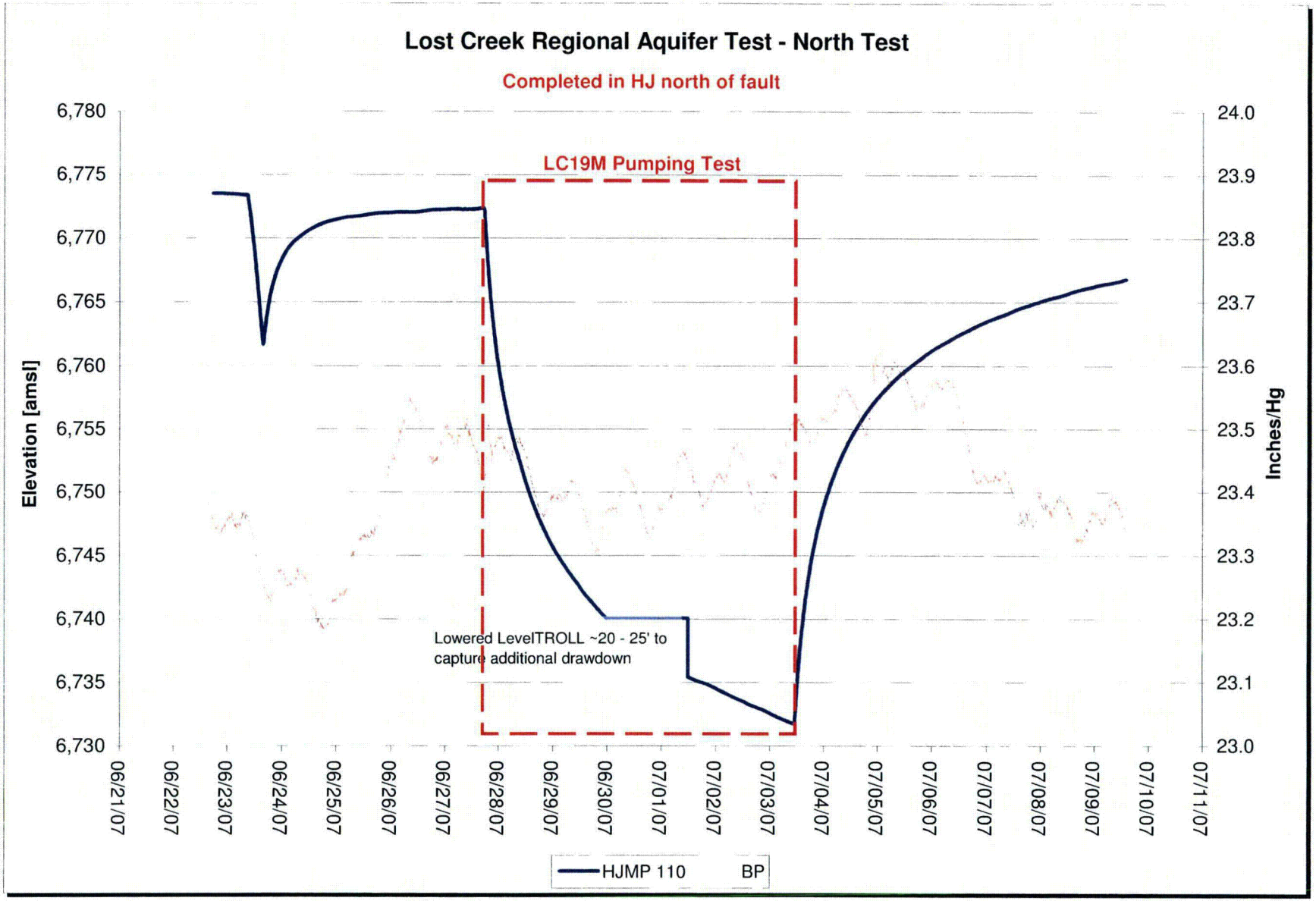
07/08/07
07/09/07
07/10/07
07/11/07
LC20M
LC20M Hand Tags
BP


Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
LC19M Pumping Test
Lowered LevelTROLL ~20 - 25' to capture additional drawdown
Elevation [amsl]
Inches/Hg
6,780
6,775
6,770
6,765
6,760
6,755
6,750
6,745
6,740
6,735
6,730
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
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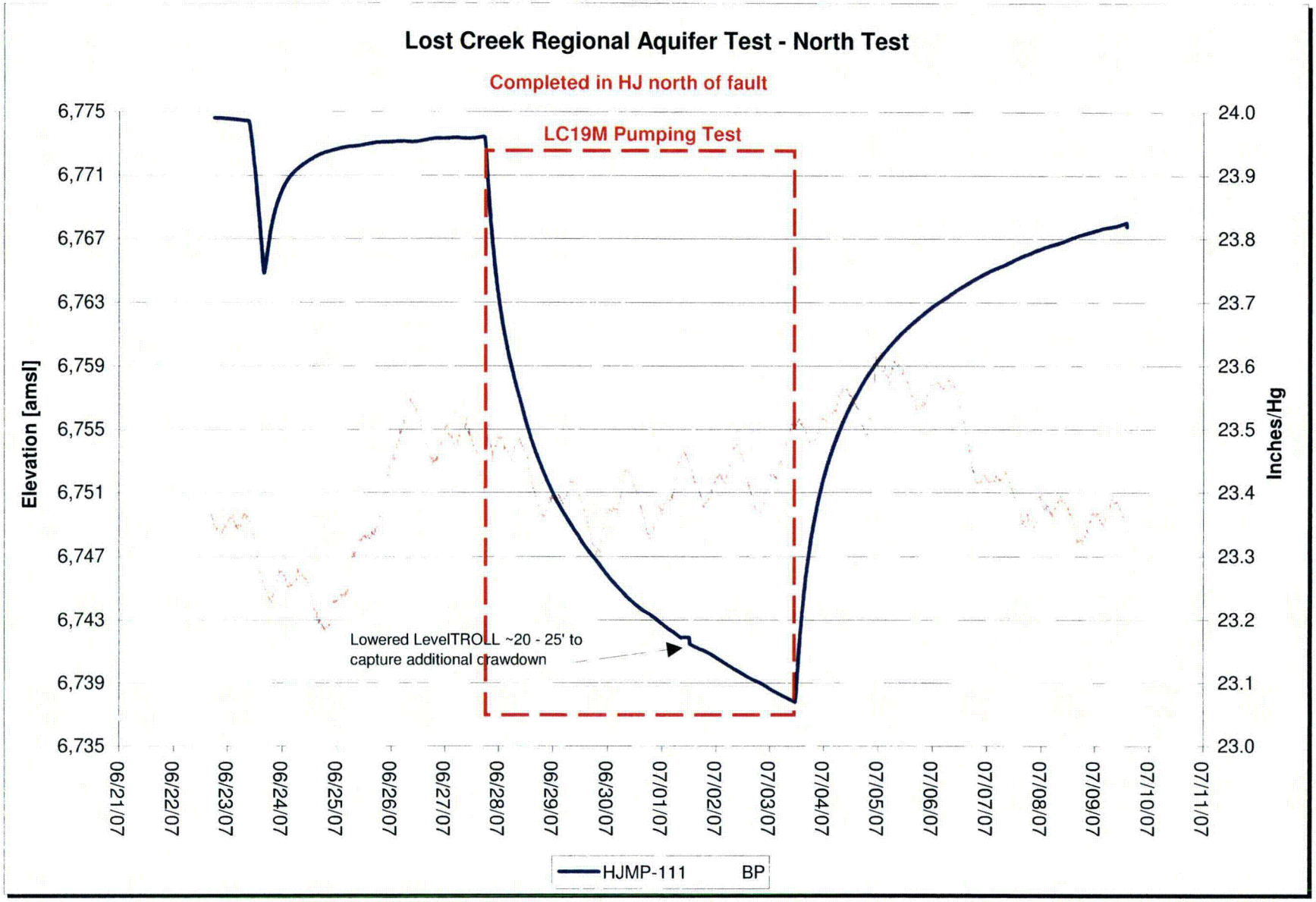
07/10/07
07/11/07
HJMP 110
BP


Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
LC19M Pumping Test
Lowered LevelTROLL ~20 - 25' to capture additional drawdown
Elevation [amsl]
Inches/Hg
6,775
6,771
6,767
6,763
6,759
6,755
6,751
6,747
6,743
6,739
6,735
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
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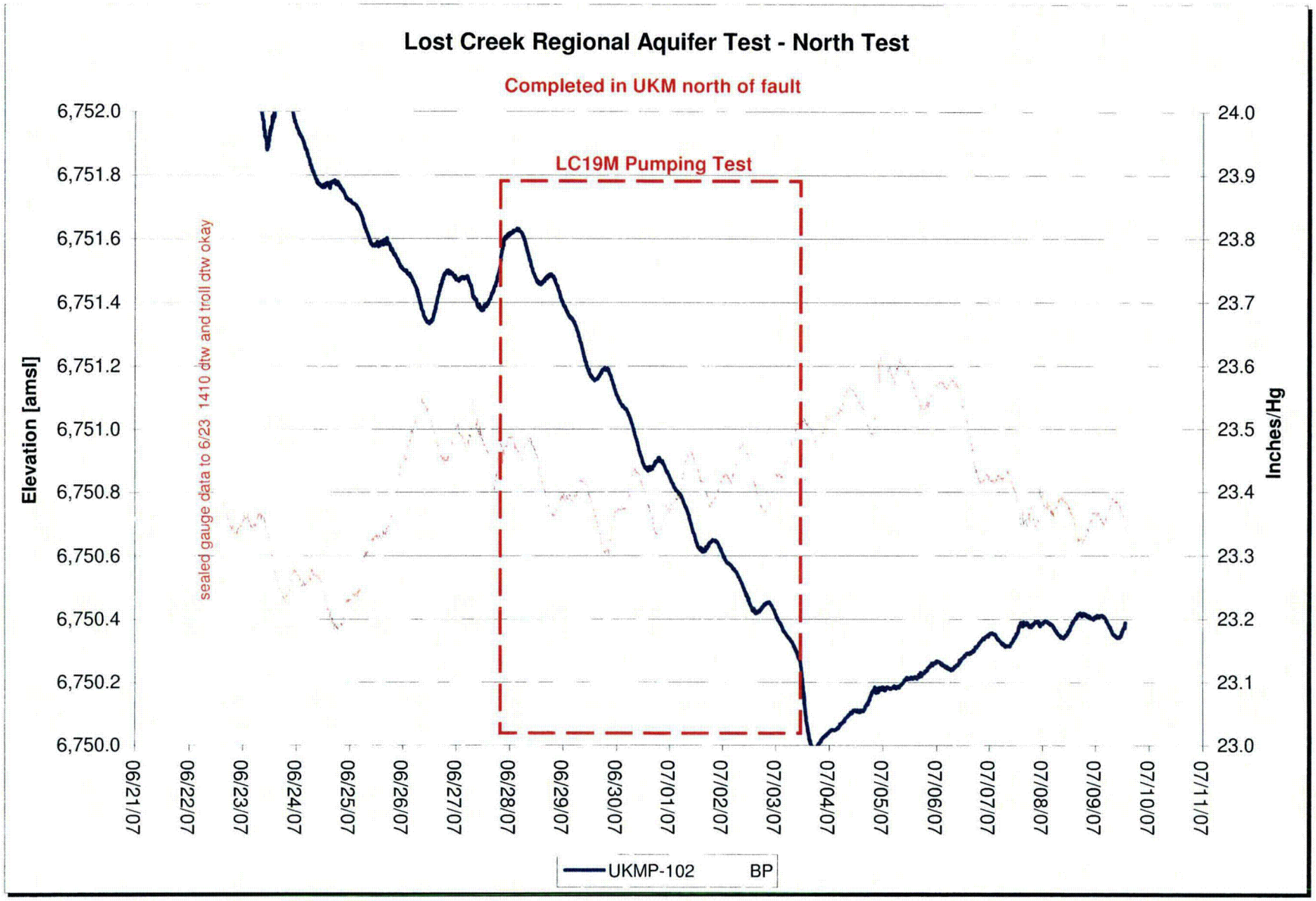
07/10/07
07/11/07
HJMP-111
BP


Lost Creek Regional Aquifer Test - North Test
Completed in UKM north of fault
LC19M Pumping Test
sealed gauge data to 6/23 1410 dtw and troll dtw okay
Elevation [amsl]
Inches/Hg
6,752.0
6,751.8
6,751.6
6,751.4
6,751.2
6,751.0
6,750.8
6,750.6
6,750.4
6,750.2
6,750.0
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
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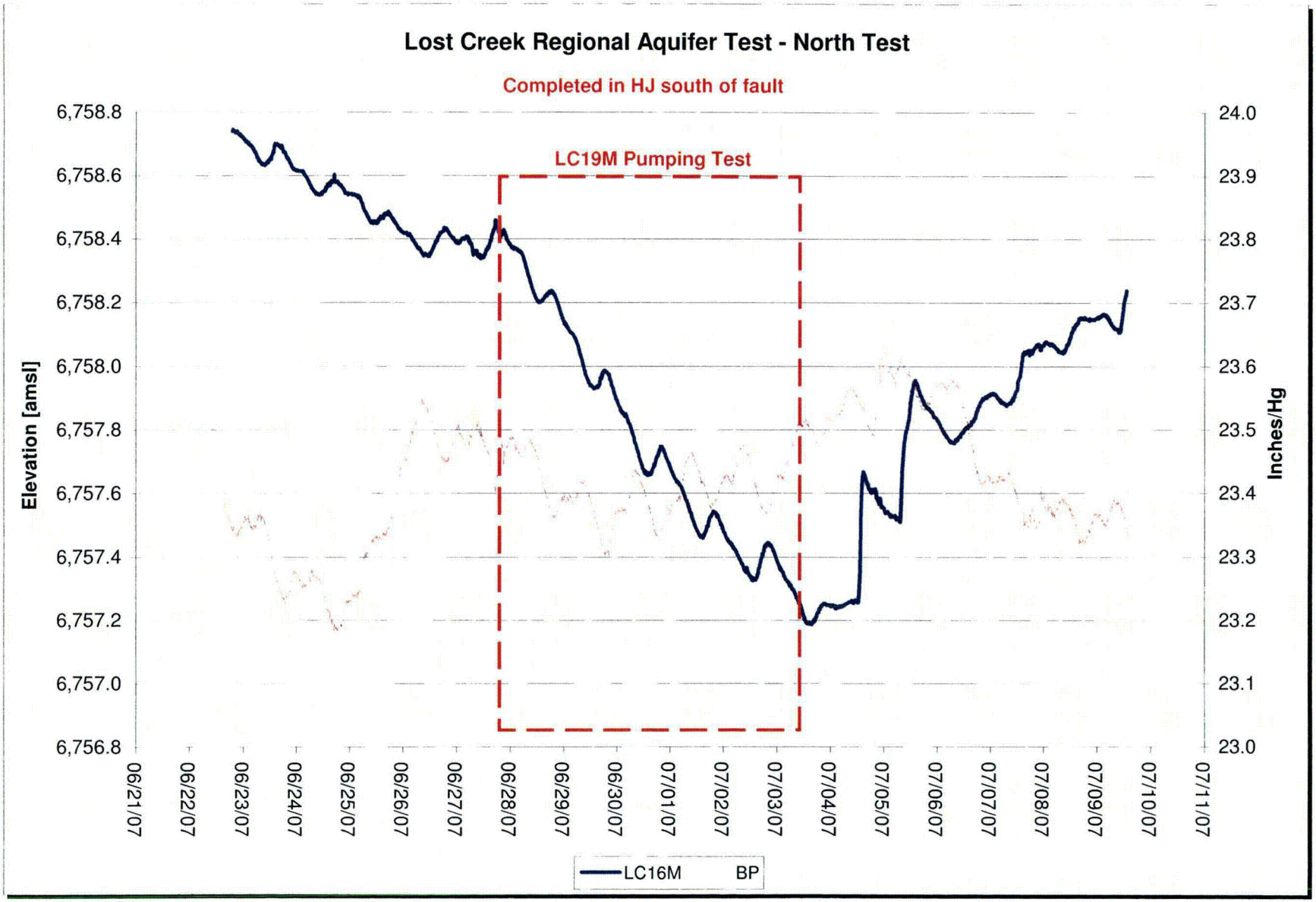
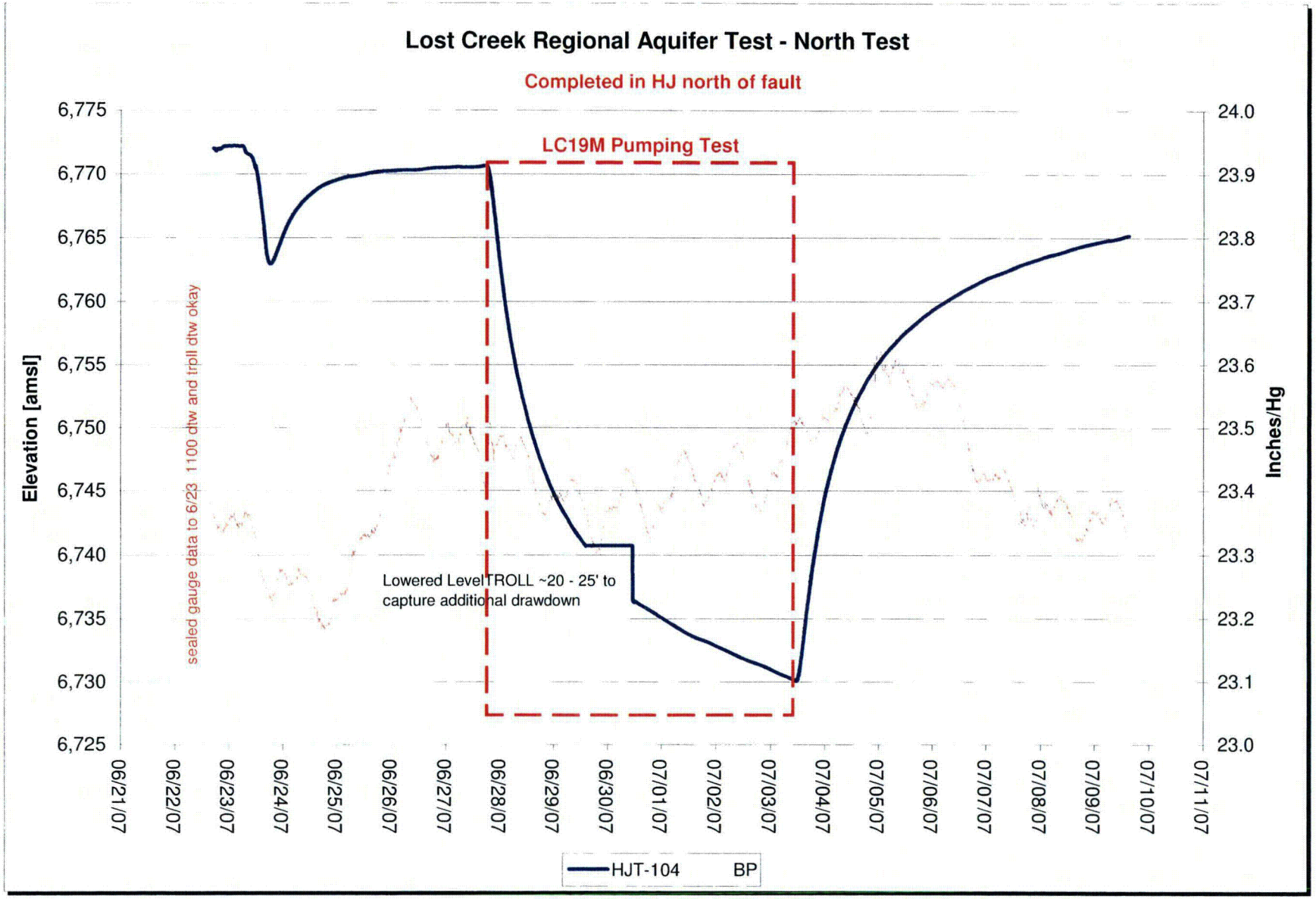
07/10/07
07/11/07
UKMP-102
BP


Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault
LC19M Pumping Test
Elevation [amsl]
Inches/Hg
6,758.8
6,758.6
6,758.4
6,758.2
6,758.0
6,757.8
6,757.6
6,757.4
6,757.2
6,757.0
6,756.8
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
LC16M
BP


Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
LC19M Pumping Test
Lowered LevelTROLL ~20 - 25' to capture additional drawdown
sealed gauge data to 6/23 1100 dtw and trpll dtw okay
Elevation [amsl]
Inches/Hg
6,775
6,770
6,765
6,760
6,755
6,750
6,745
6,740
6,735
6,730
6,725
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
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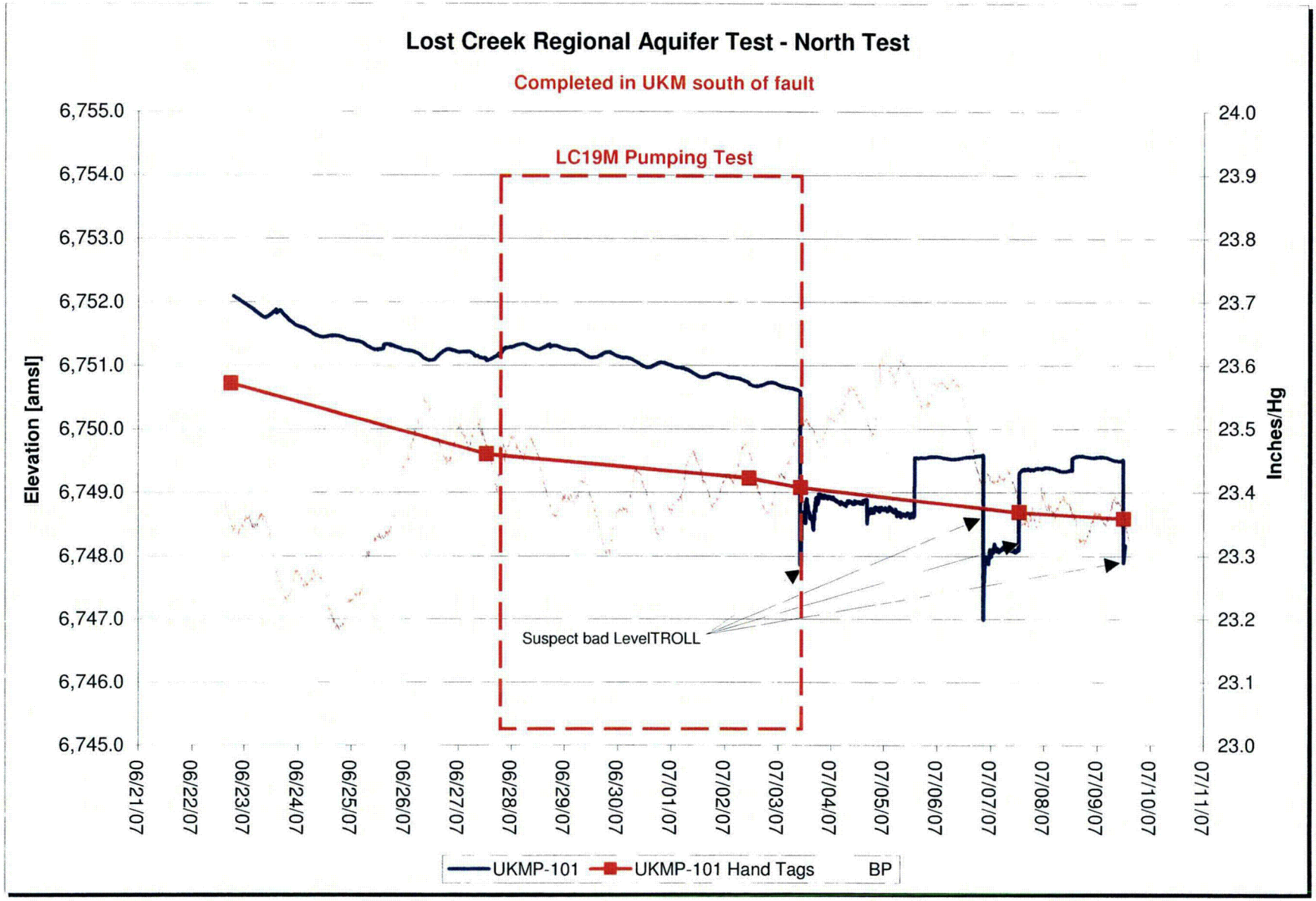
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
HJT-104
BP


Lost Creek Regional Aquifer Test - North Test
Completed in UKM south of fault
LC19M Pumping Test
Suspect bad LevelTROLL
Elevation [amsl]
Inches/Hg
6,755.0
6,754.0
6,753.0
6,752.0
6,751.0
6,750.0
6,749.0
6,748.0
6,747.0
6,746.0
6,745.0
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
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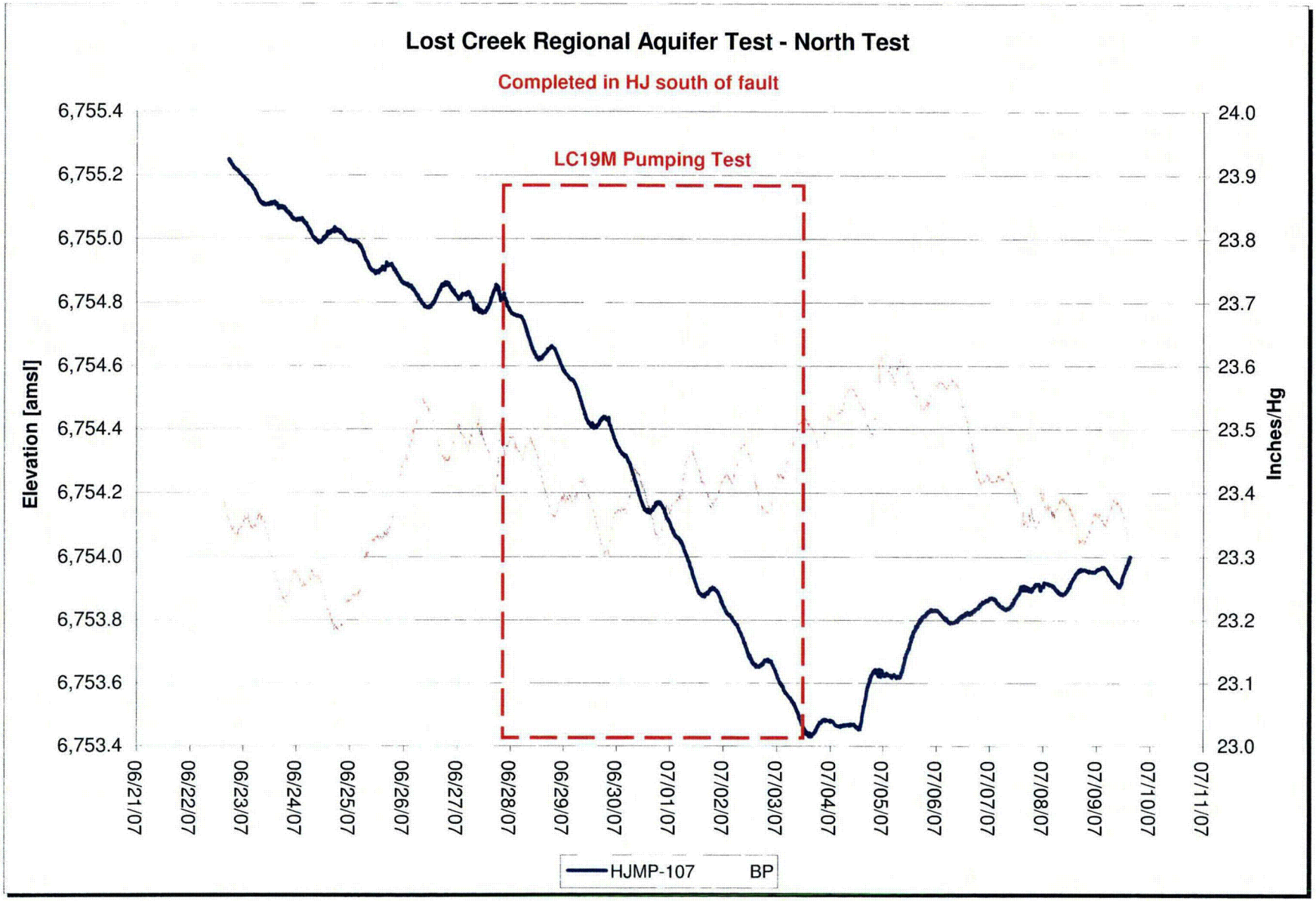
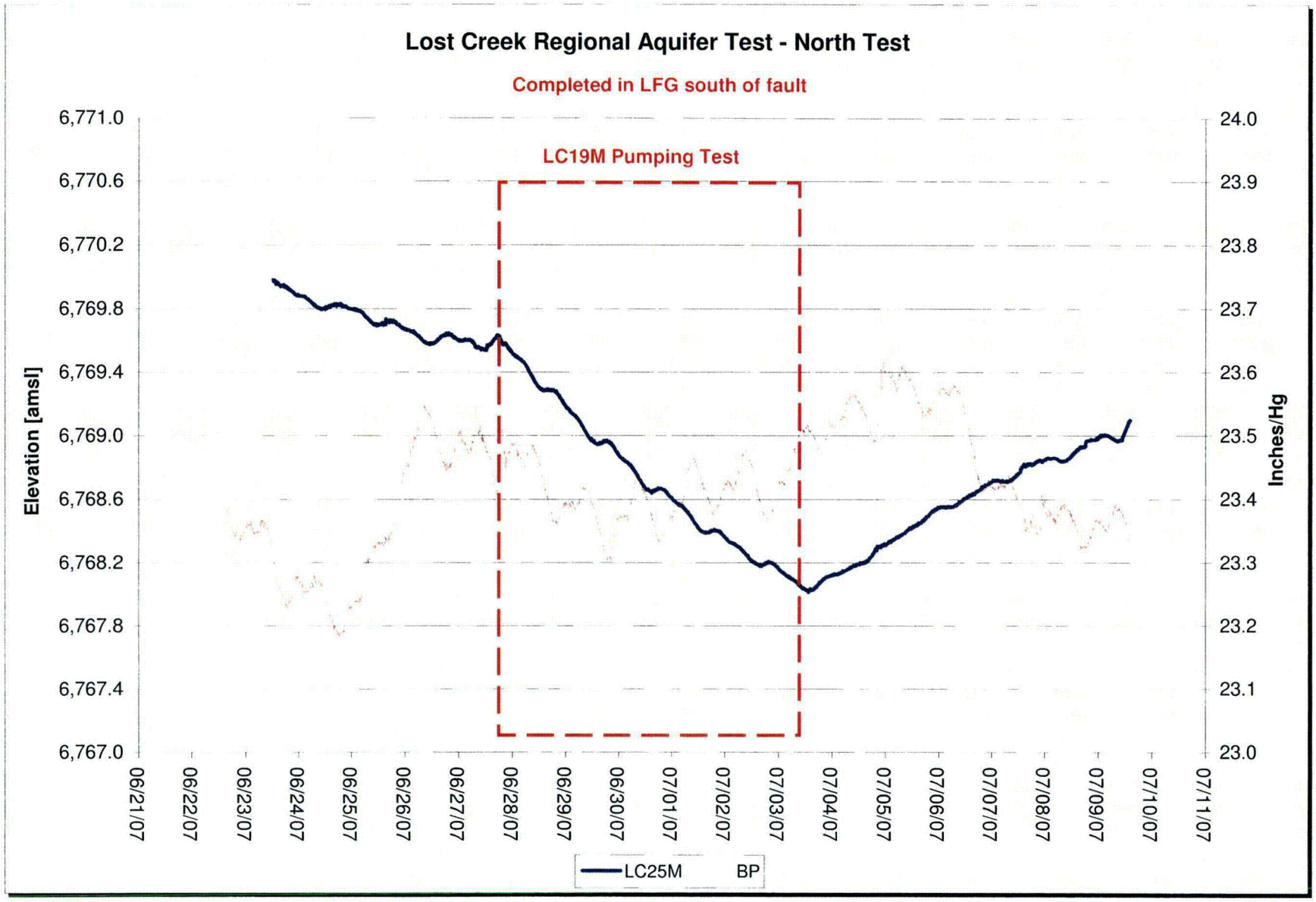
07/11/07
UKMP-101
UKMP-101 Hand Tags
BP


Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault
LC19M Pumping Test
Elevation [amsl]
Inches/Hg
6,755.4
6,755.2
6,755.0
6,754.8
6,754.6
6,754.4
6,754.2
6,754.0
6,753.8
6,753.6
6,753.4
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
HJMP-107
BP


Lost Creek Regional Aquifer Test - North Test
Completed in LFG south of fault
LC19M Pumping Test
Elevation [amsl]
Inches/Hg
6,771.0
6,770.6
6,770.2
6,769.8
6,769.4
6,769.0
6,768.6
6,768.2
6,767.8
6,767.4
6,767.0
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
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06/30/07
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07/02/07
07/03/07
07/04/07
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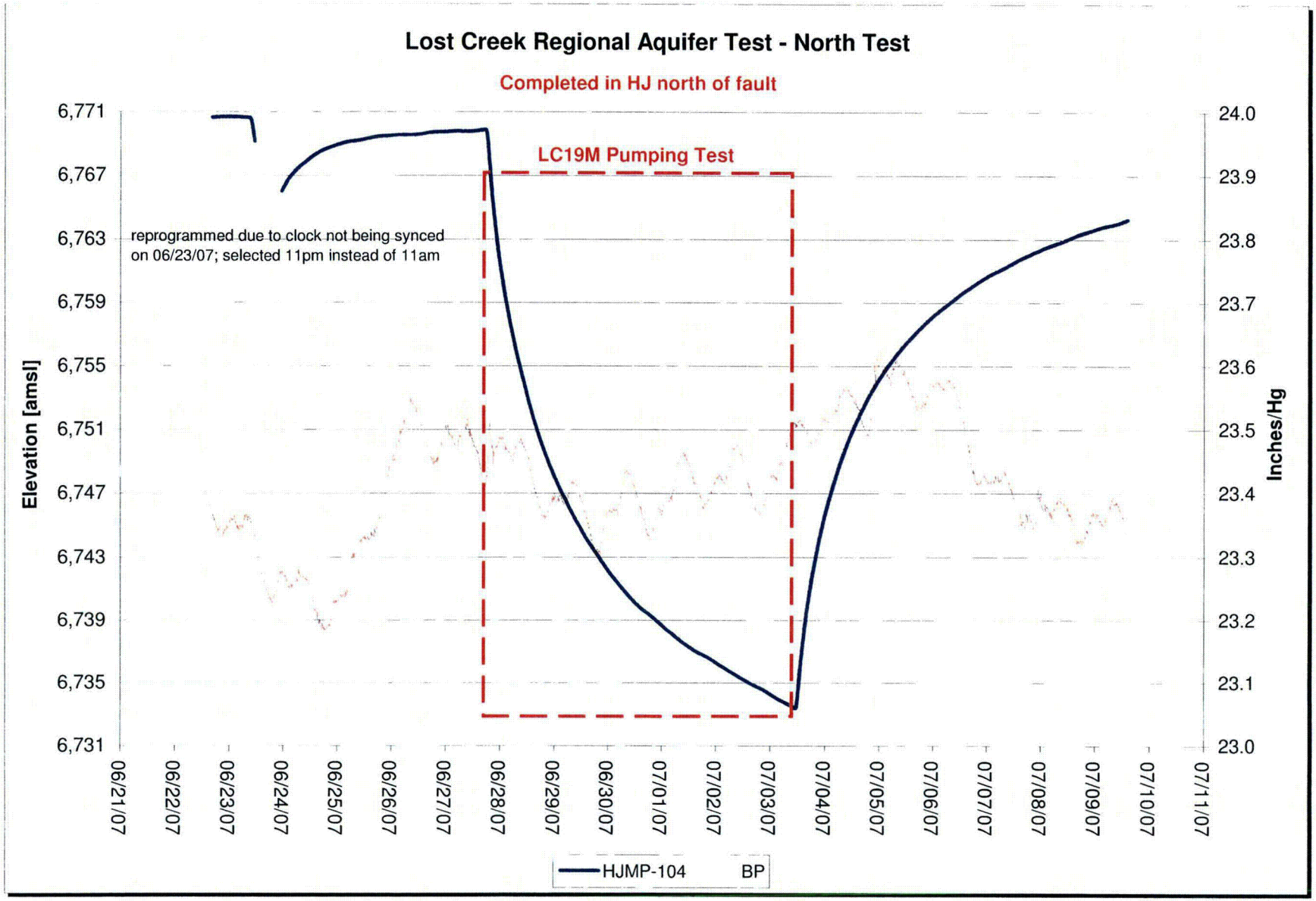
07/11/07
LC25M
BP


Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
LC19M Pumping Test
reprogrammed due to clock not being synced on 06/23/07; selected 11pm instead of 11am
Elevation [amsl]
6,771
6,767
6,763
6,759
6,755
6,751
6,747
6,743
6,739
6,735
6,731
Inches/Hg
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
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07/01/07
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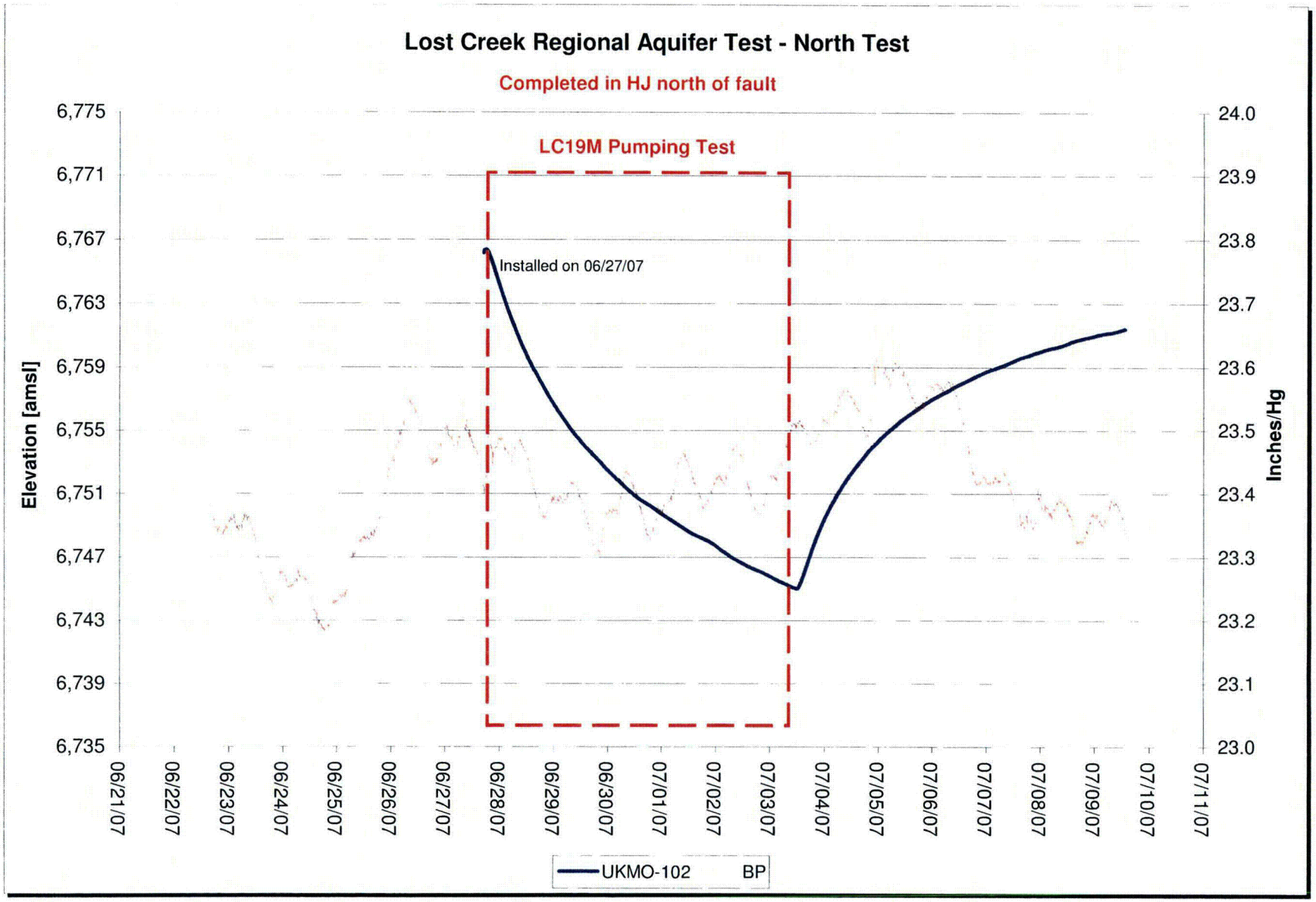
07/11/07
HJMP-104
BP


Lost Creek Regional Aquifer Test - North Test
Completed in HJ north of fault
LC19M Pumping Test
Installed on 06/27/07
Elevation [amsl]
Inches/Hg
6,775
6,771
6,767
6,763
6,759
6,755
6,751
6,747
6,743
6,739
6,735
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
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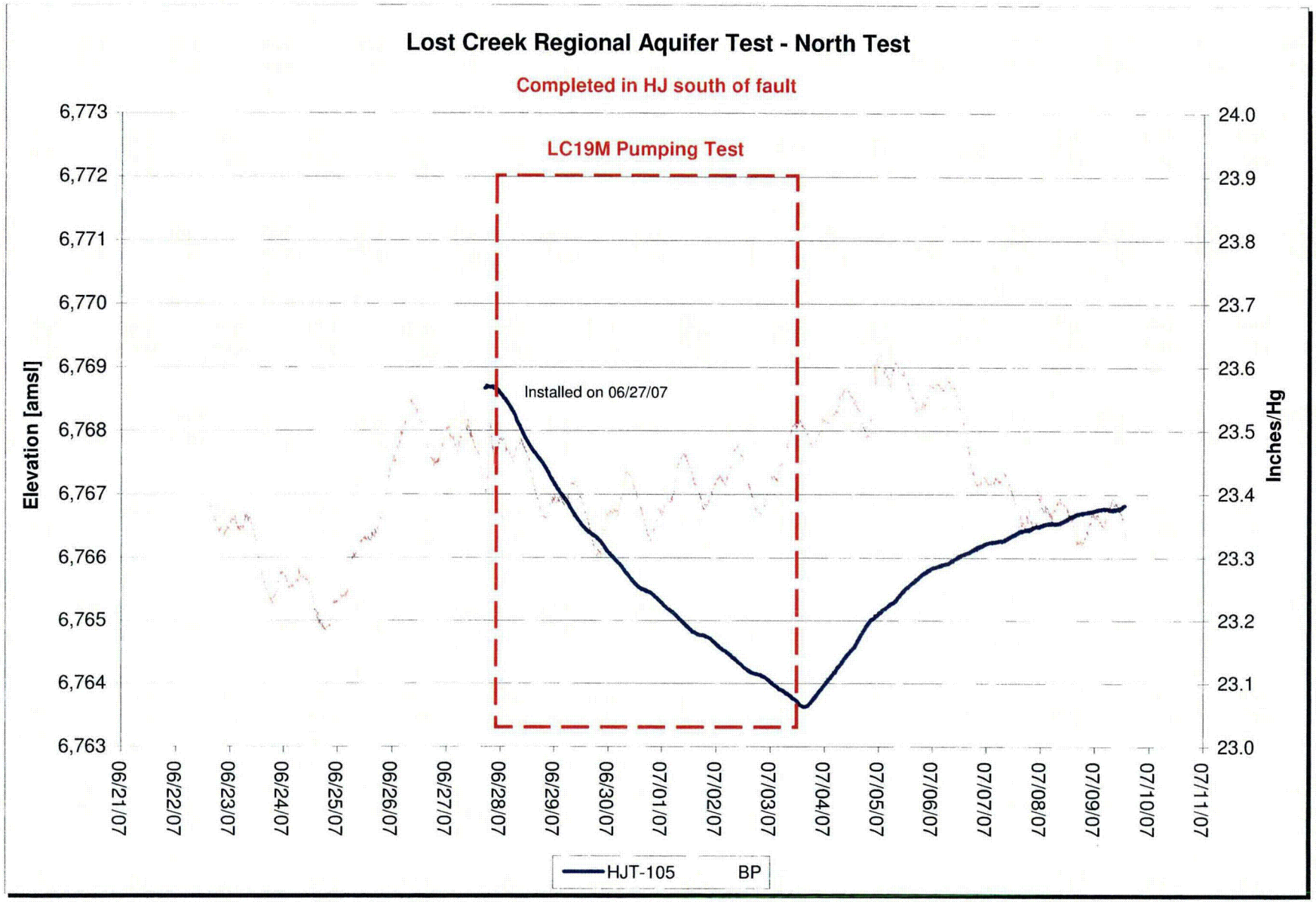
07/10/07
07/11/07
UKMO-102 BP


Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault
LC19M Pumping Test
Installed on 06/27/07
Elevation [amsl]
Inches/Hg
6,773
6,772
6,771
6,770
6,769
6,768
6,767
6,766
6,765
6,764
6,763
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
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07/03/07
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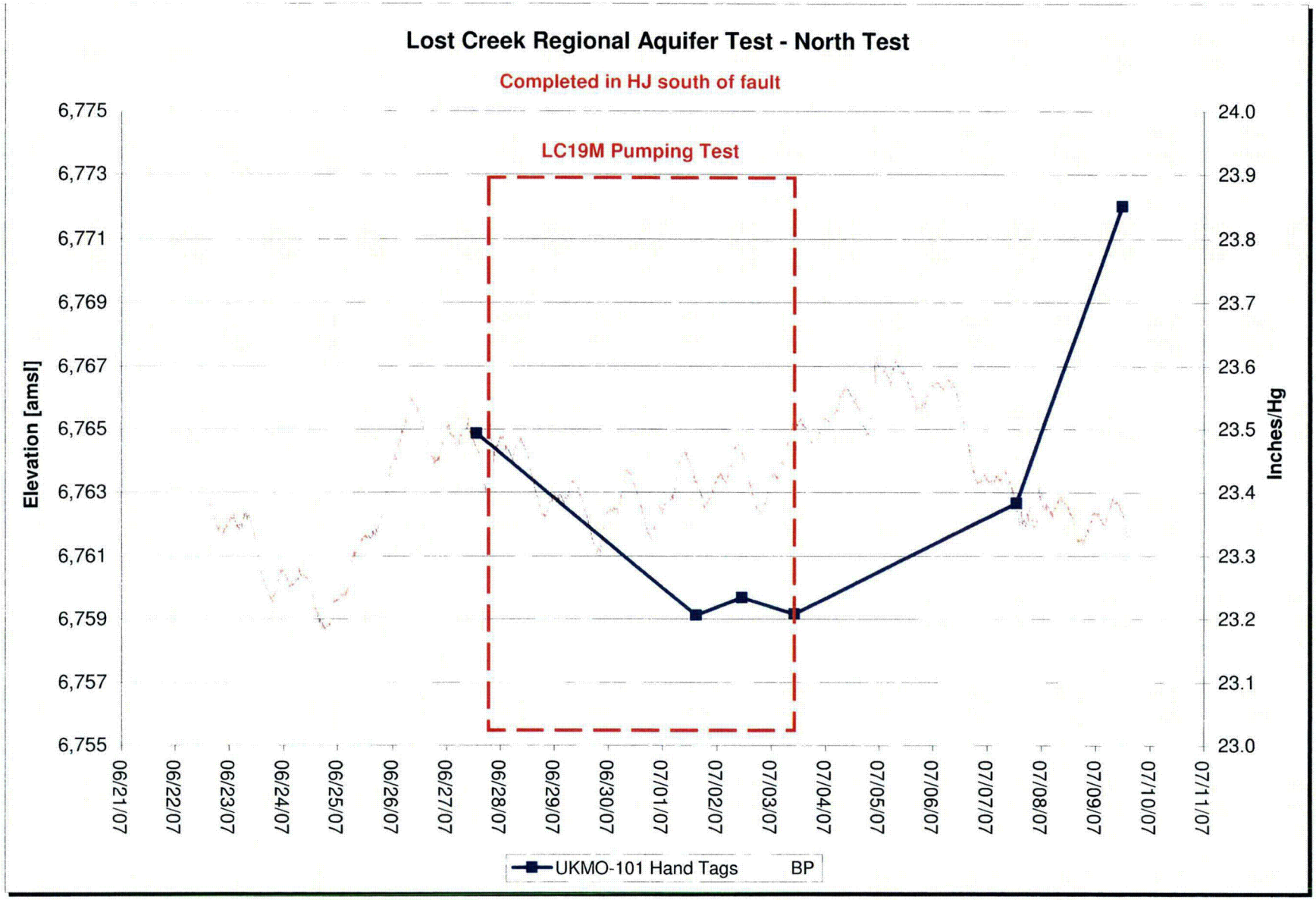
07/11/07
HJT-105
BP


Lost Creek Regional Aquifer Test - North Test
Completed in HJ south of fault
LC19M Pumping Test
Elevation [amsl]
Inches/Hg
6,775
6,773
6,771
6,769
6,767
6,765
6,763
6,761
6,759
6,757
6,755
24.0
23.9
23.8
23.7
23.6
23.5
23.4
23.3
23.2
23.1
23.0
06/21/07
06/22/07
06/23/07
06/24/07
06/25/07
06/26/07
06/27/07
06/28/07
06/29/07
06/30/07
07/01/07
07/02/07
07/03/07
07/04/07
07/05/07
07/06/07
07/07/07
07/08/07
07/09/07
07/10/07
07/11/07
UKMO-101 Hand Tags
BP

APPENDIX C
TYPE CURVE MATCHES

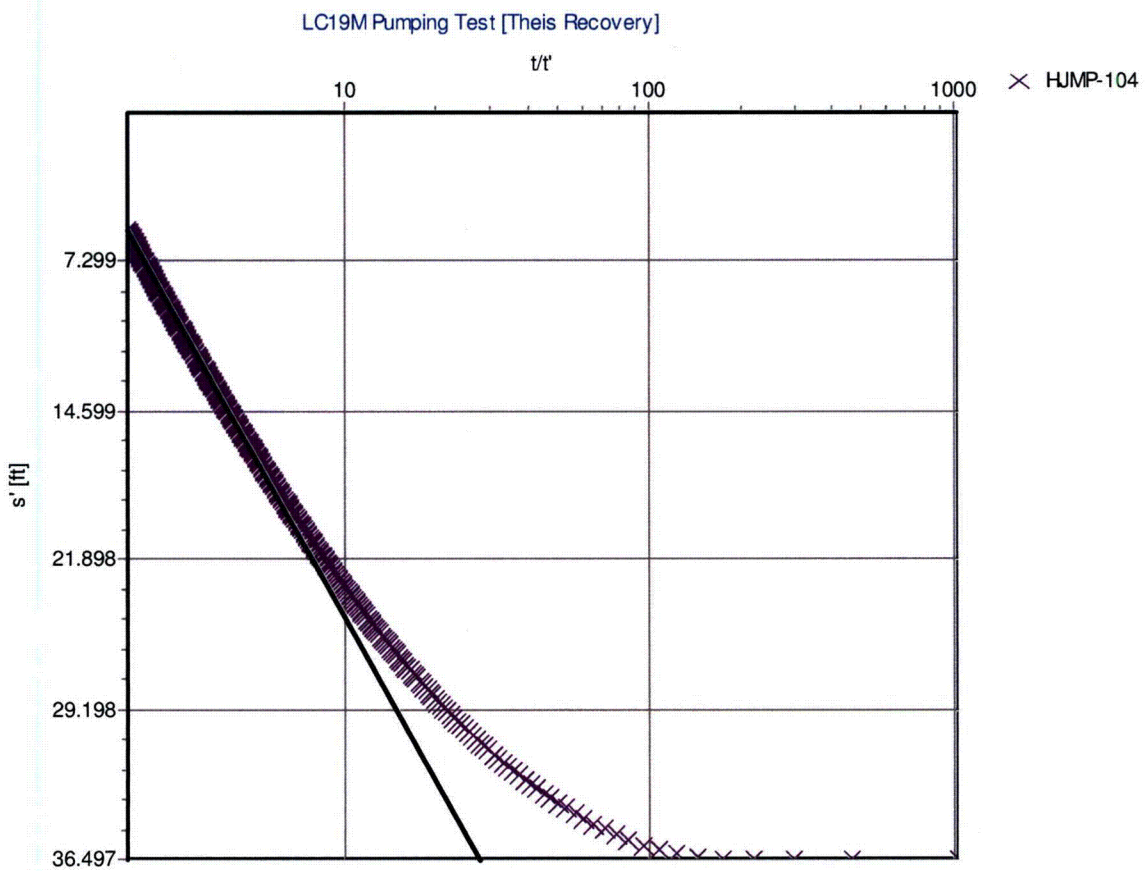
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis Recovery**

Analysis Results:	Transmissivity:	5.68E+1 [ft²/d]	Conductivity:	4.74E-1 [ft/d]

Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		
	Pumping Time	8252 [min]		

Comments: HJ observation well located on north side of Lost Creek Fault.

Evaluated by: KRS

Evaluation Date: 9/28/2007

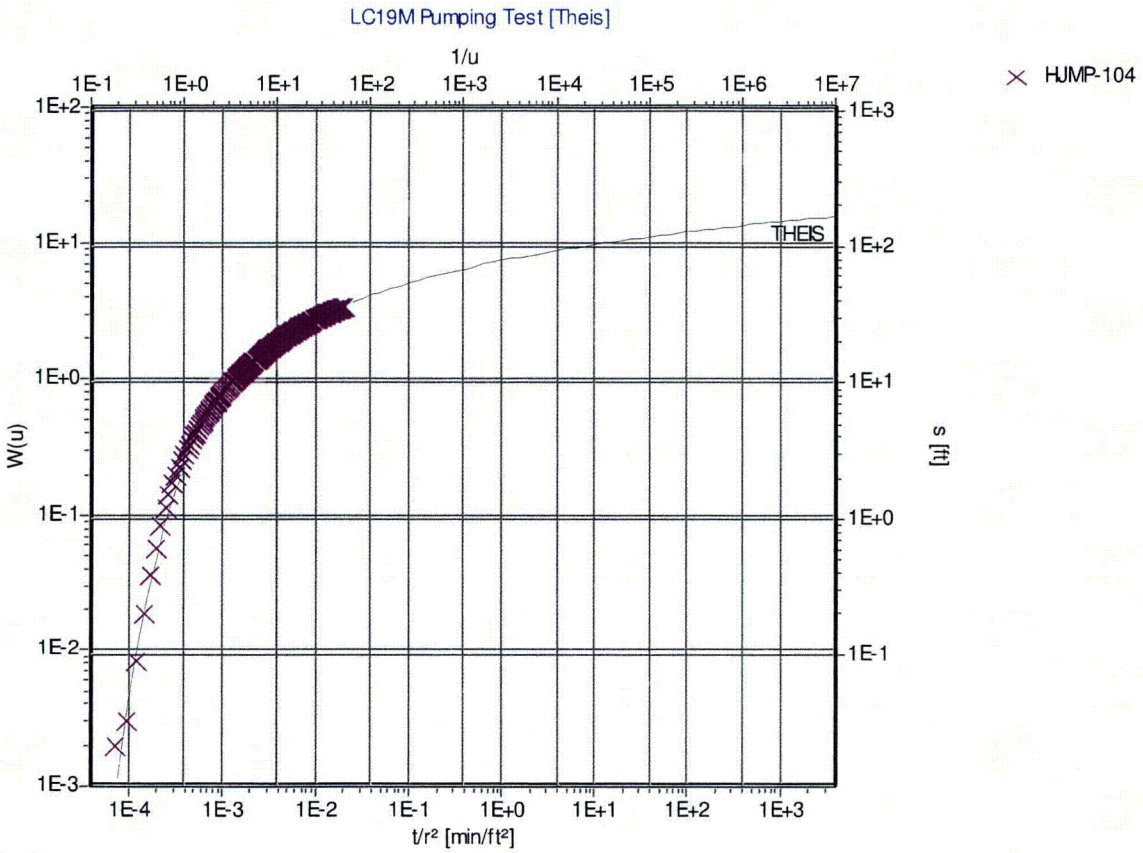
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis**

Analysis Results:	Transmissivity:	6.13E+1 [ft²/d]	Conductivity:	5.11E-1 [ft/d]
	Storativity:	6.63E-5		
Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		

Comments: HJ observation well located on north side of Lost Creek Fault.

Evaluated by: EPL

Evaluation Date: 7/5/2007

Petrotek
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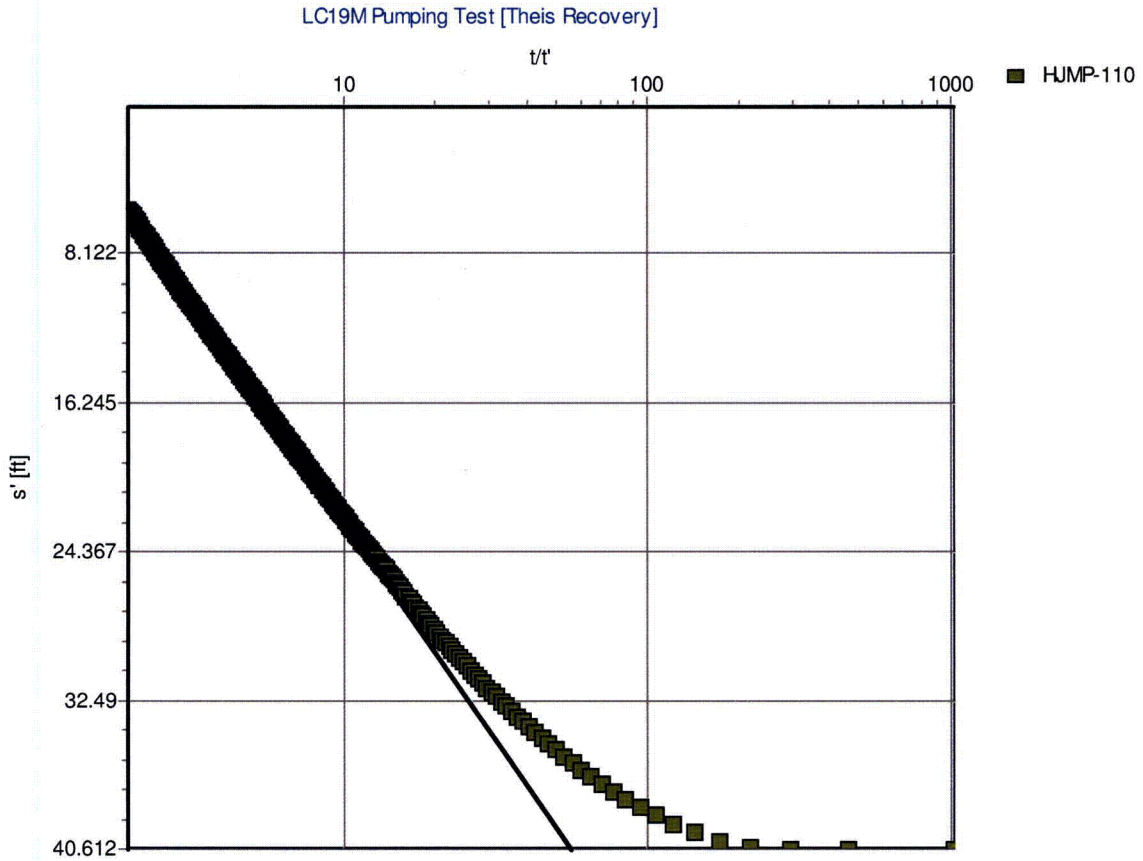
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis Recovery**

Analysis Results:	Transmissivity:	6.30E+1 [ft²/d]	Conductivity:	5.25E-1 [ft/d]

Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		
	Pumping Time	8252 [min]		

Comments: HJ observation well located on north side of Lost Creek Fault.

Evaluated by: KRS

Evaluation Date: 9/28/2007

Petrotek
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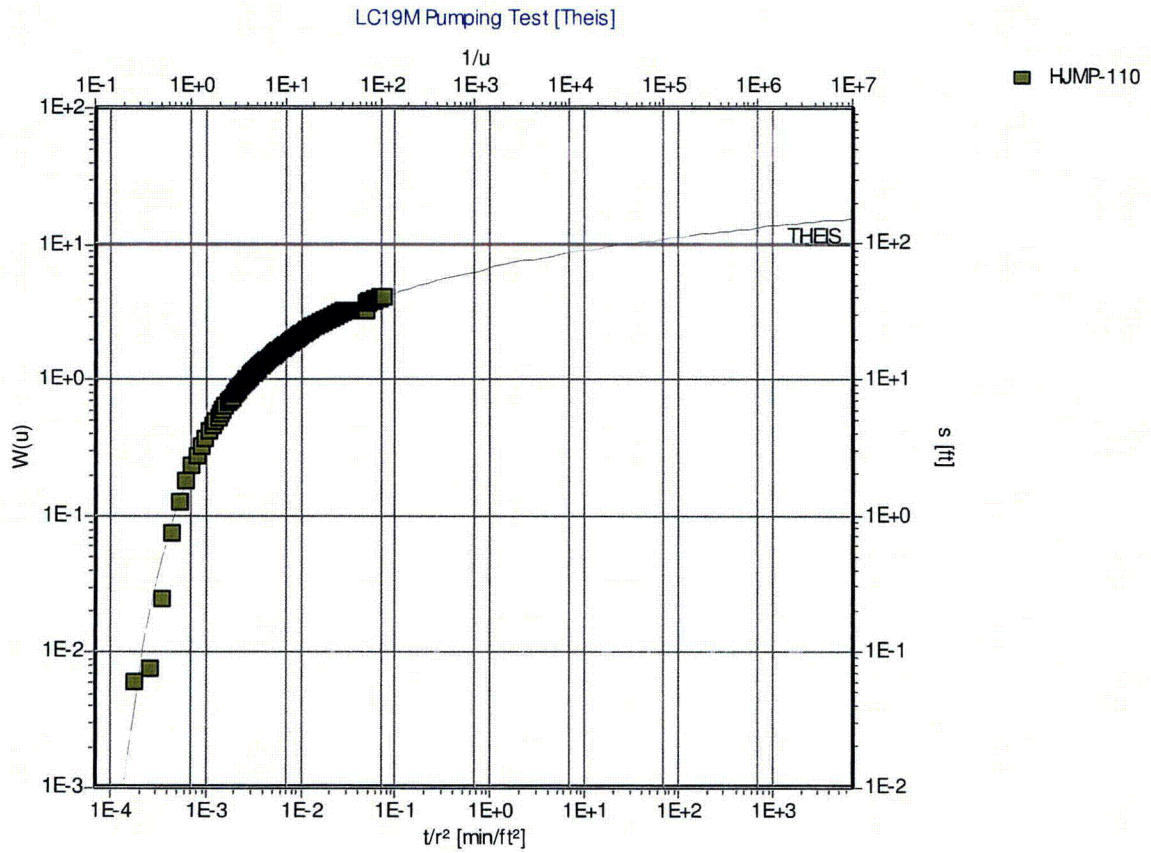
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis**

Analysis Results:	Transmissivity:	6.64E+1 [ft²/d]	Conductivity:	5.53E-1 [ft/d]
	Storativity:	1.27E-4		
Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		

Comments: HJ observation well located on north side of Lost Creek Fault.

Evaluated by: EPL

Evaluation Date: 7/5/2007

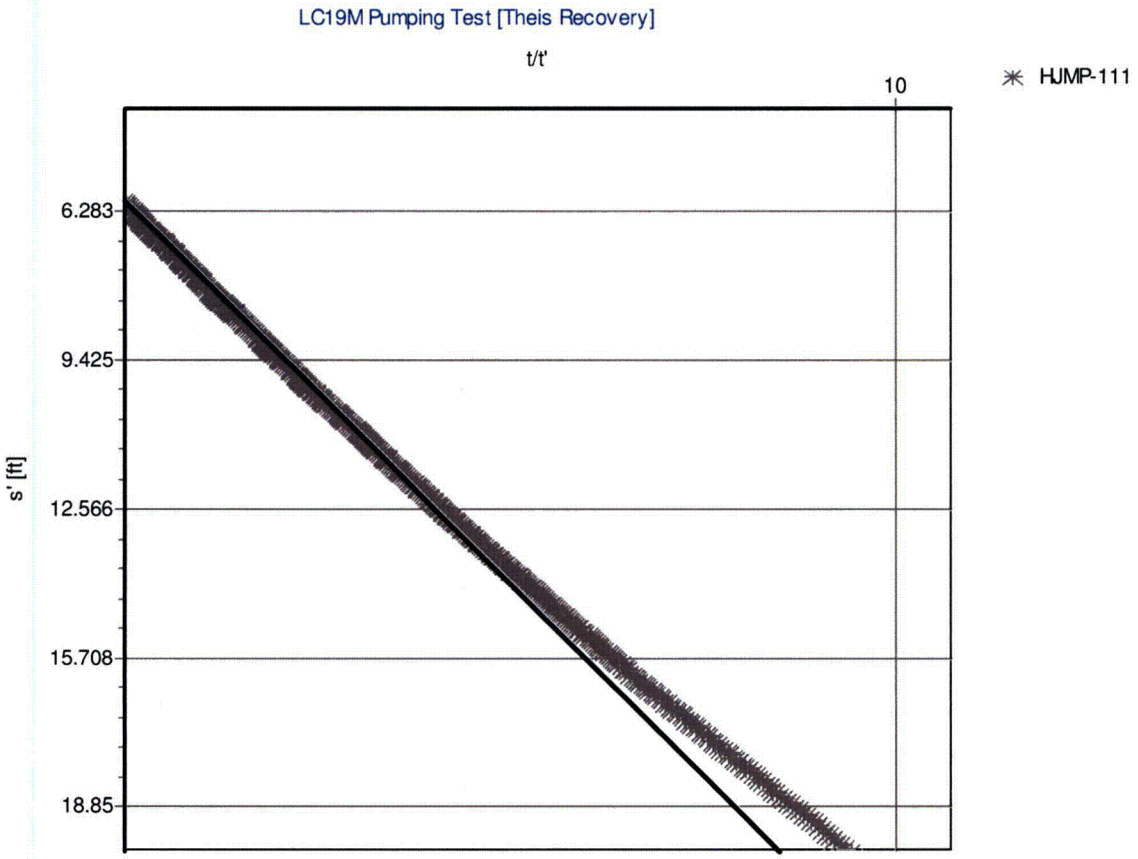
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis Recovery**

Analysis Results:	Transmissivity:	6.41E+1 [ft²/d]	Conductivity:	5.34E-1 [ft/d]

Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		
	Pumping Time	8252 [min]		

Comments: HJ observation well located on north side of Lost Creek Fault.

Evaluated by: KRS

Evaluation Date: 9/28/2007

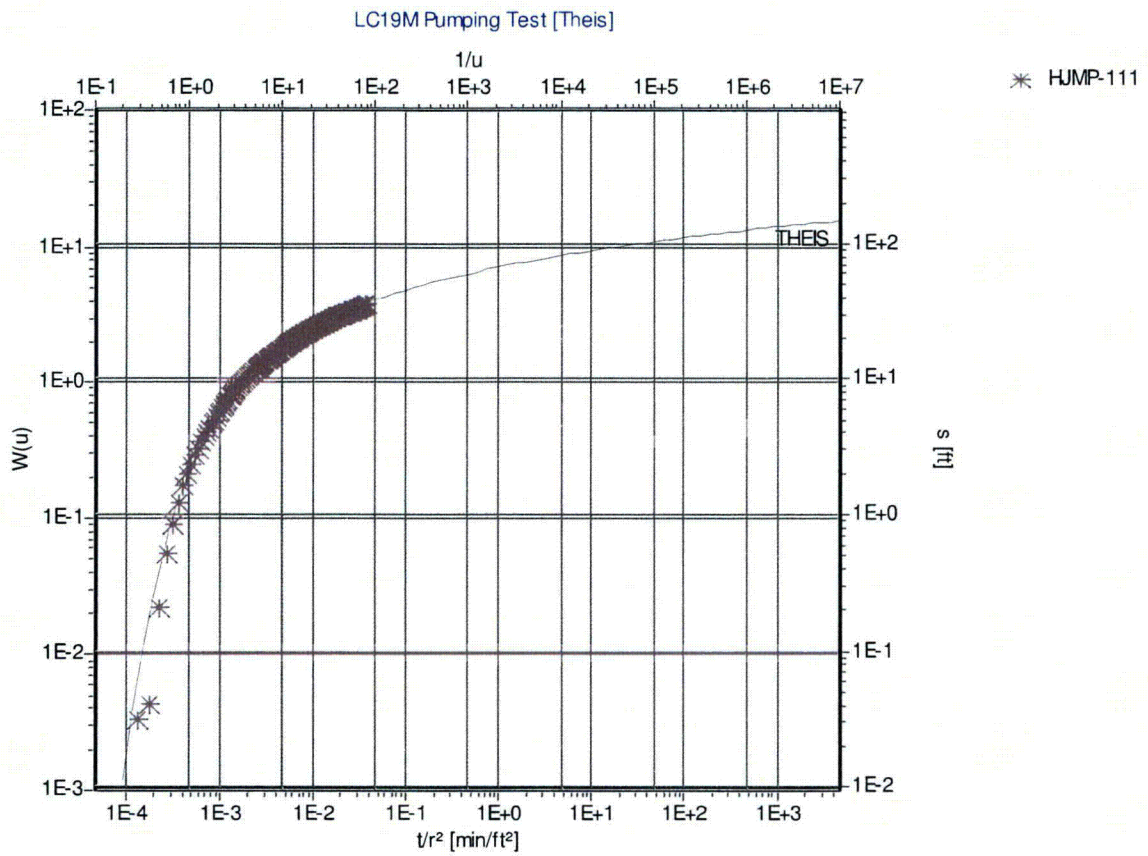
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis**

Analysis Results:	Transmissivity:	6.98E+1 [ft²/d]	Conductivity:	5.81E-1 [ft/d]
	Storativity:	9.13E-5		
Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		

Comments: HJ observation well located on north side of Lost Creek Fault.

Evaluated by: EPL

Evaluation Date: 7/5/2007

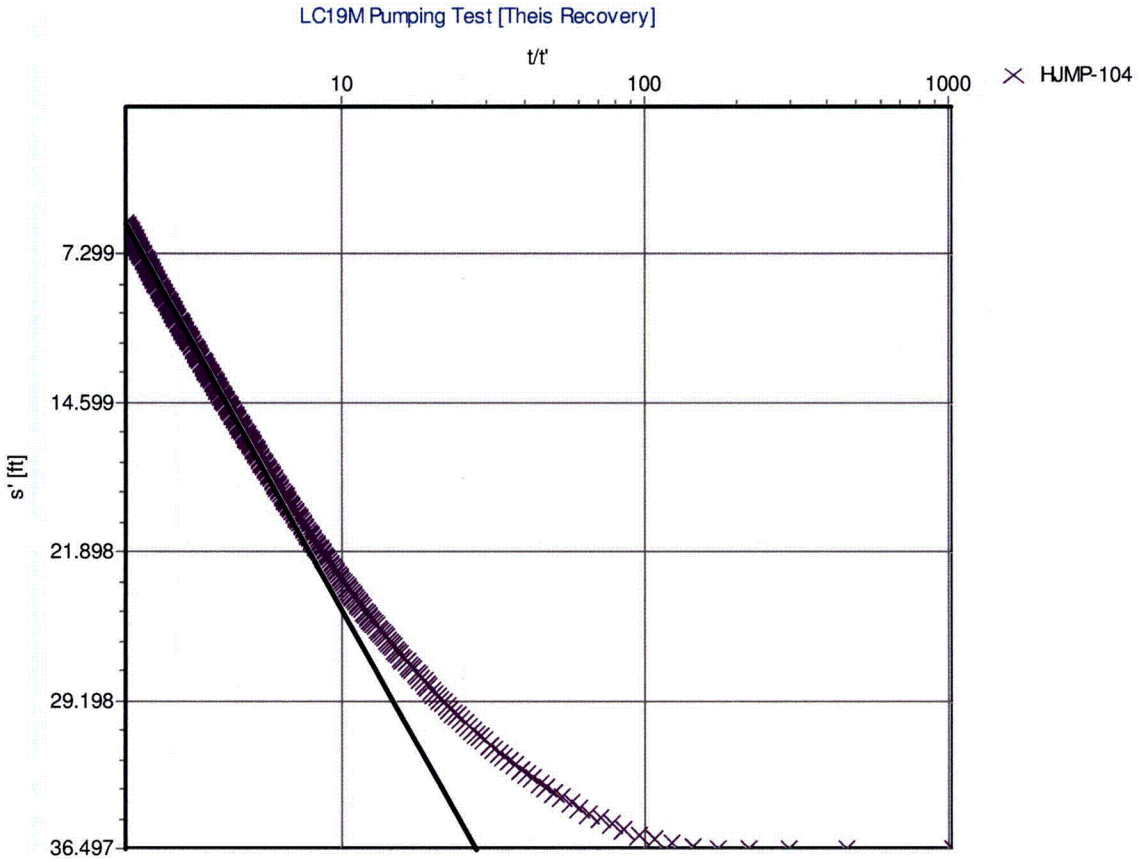
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis Recovery**

Analysis Results:	Transmissivity:	5.68E+1 [ft²/d]	Conductivity:	4.74E-1 [ft/d]

Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		
	Pumping Time	8252 [min]		

Comments: HJ observation well located on north side of Lost Creek Fault.

Evaluated by: KRS

Evaluation Date: 9/28/2007

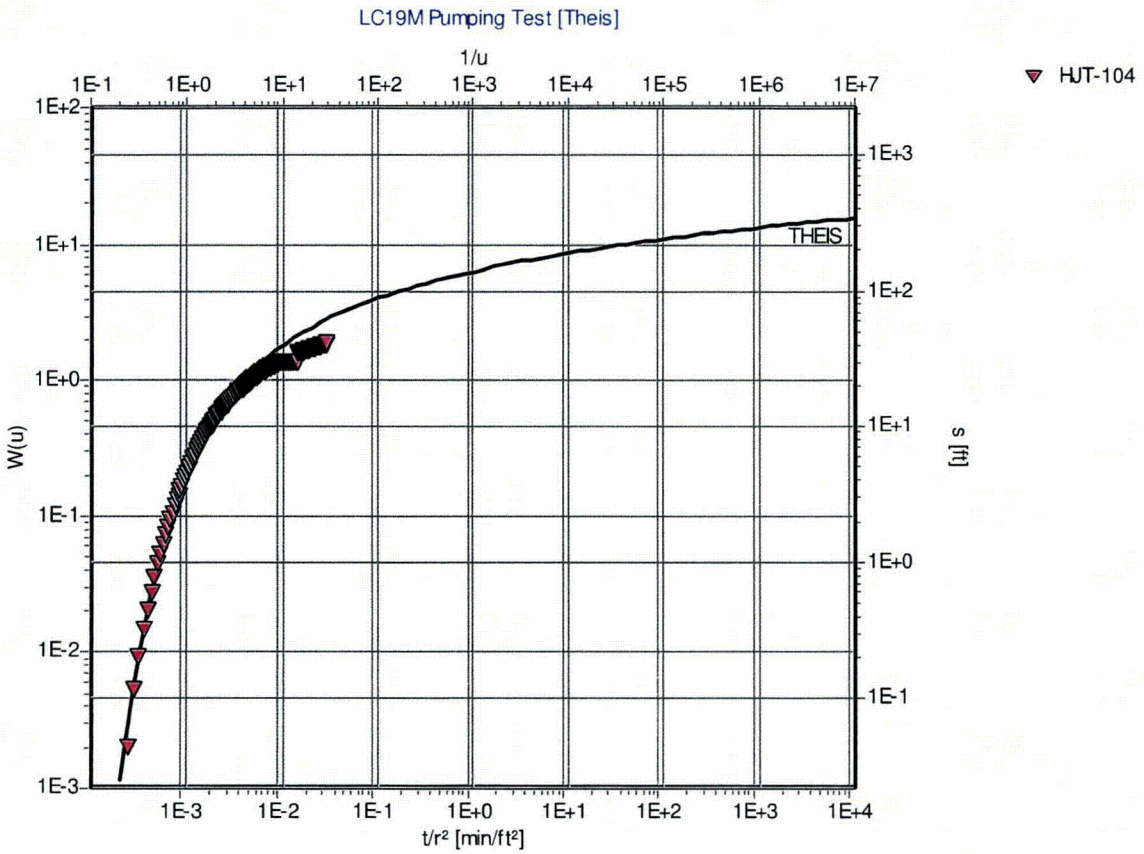
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis**

Analysis Results:	Transmissivity:	3.00E+1 [ft²/d]	Conductivity:	2.50E-1 [ft/d]
	Storativity:	9.58E-5		
Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		

Comments: HJ observation well located on north side of Lost Creek Fault. Early to middle time data was used for match due to effects of Fault on later time data.

Evaluated by: KRS

Evaluation Date: 10/3/2007

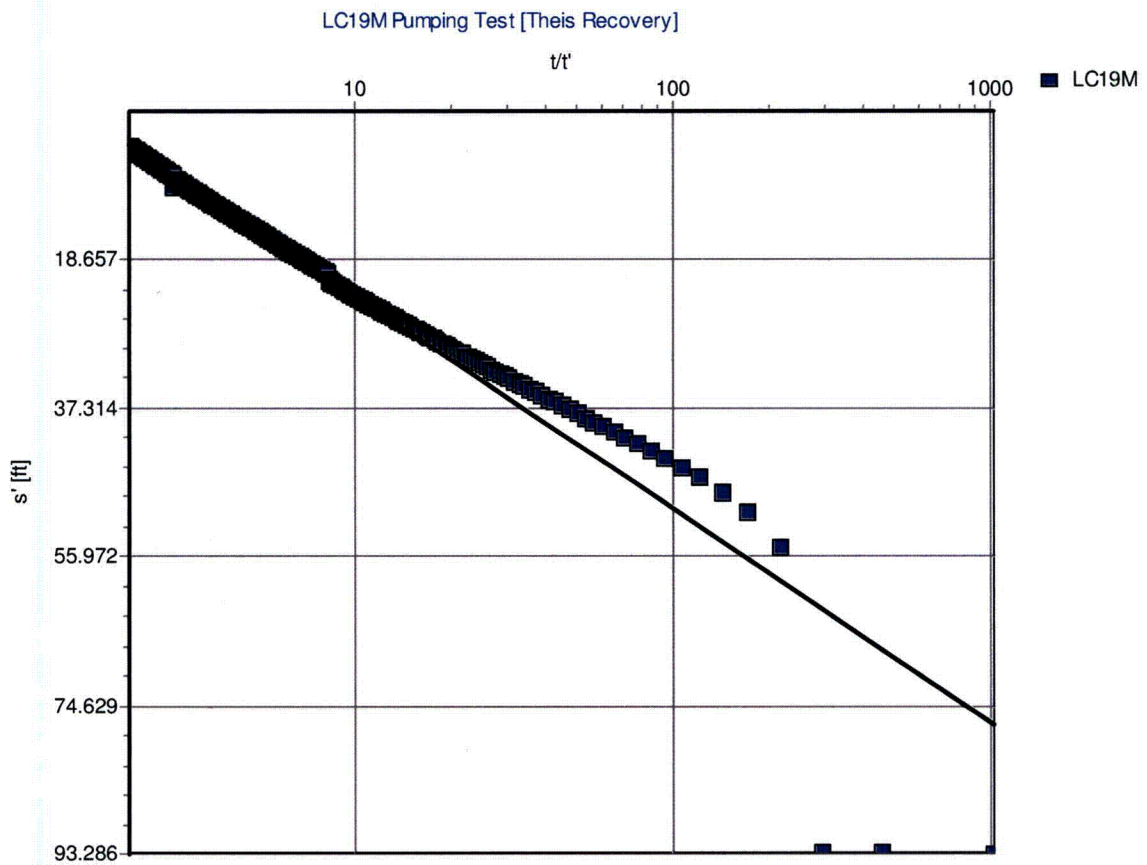
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis Recovery**

Analysis Results:	Transmissivity:	5.67E+1 [ft²/d]	Conductivity:	4.73E-1 [ft/d]

Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		
	Pumping Time	8252 [min]		

Comments: HJ pumping well located on north side of Lost Creek Fault.

Evaluated by: KRS

Evaluation Date: 9/20/2007

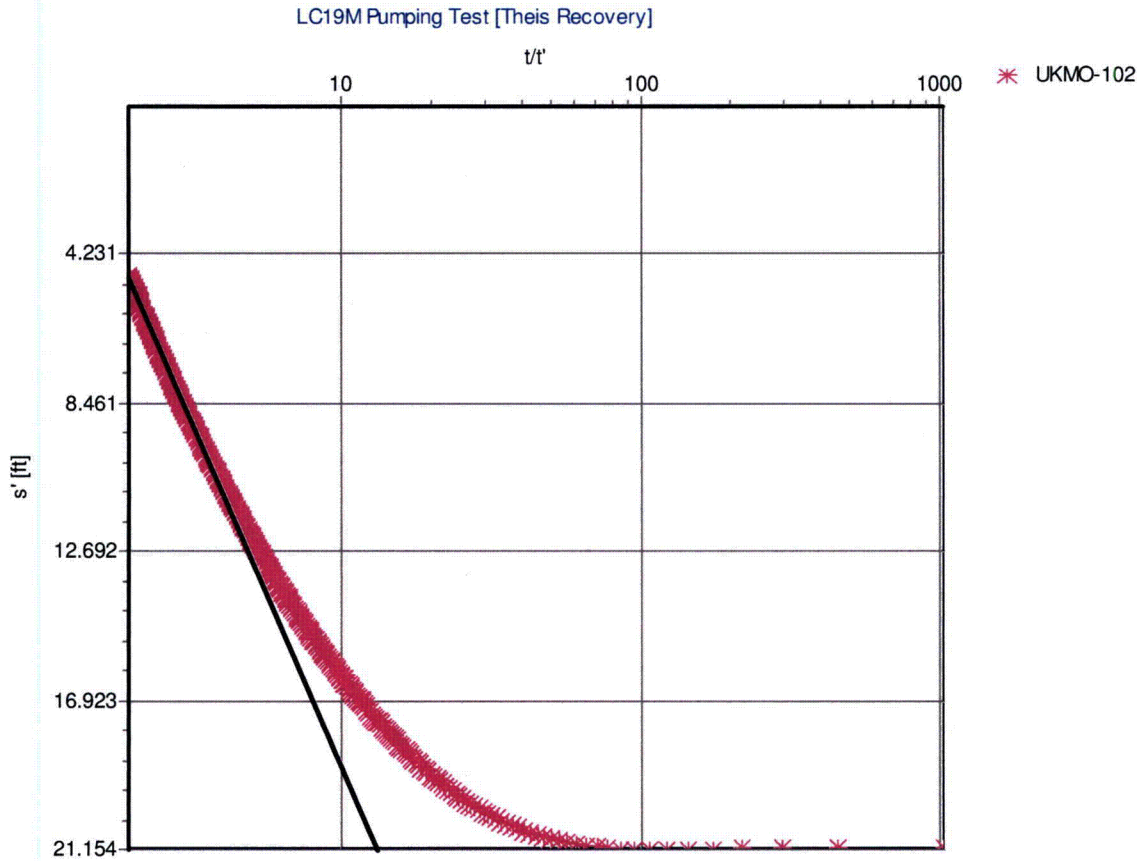
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis Recovery**

Analysis Results:	Transmissivity:	7.69E+1 [ft²/d]	Conductivity:	6.41E-1 [ft/d]

Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		
	Pumping Time	8252 [min]		

Comments: HJ observation well located on north side of Lost Creek Fault.

Evaluated by: KRS

Evaluation Date: 9/28/2007

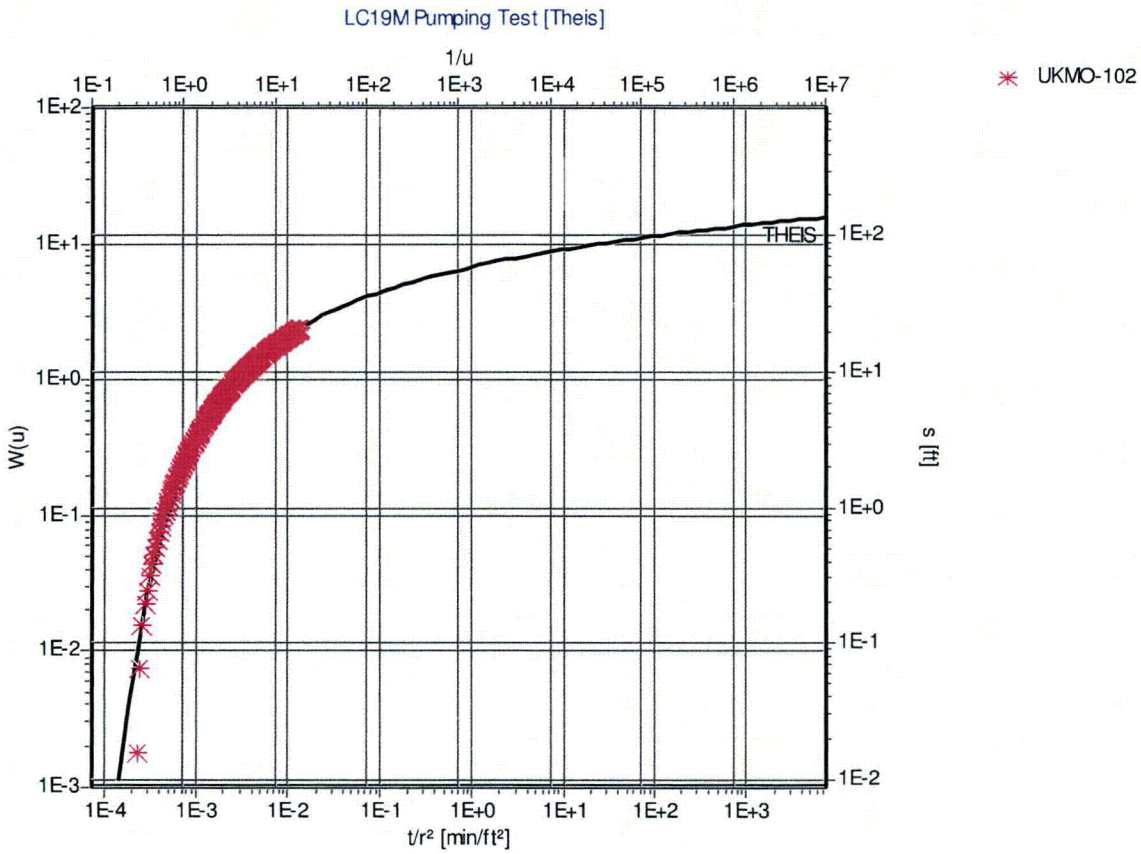
Petrotek
10288 West Chatfield Avenue • Suite 201 • Littleton, Colorado 80127-4239 USA
303-290-9414 • 303-290-9580 (fax) • www.petrotek.com

Pumping Test Analysis Report

Project: Lost Creek LC19M Pumping Test 2007

Number: 315-4

Client: LC ISR, LLC



Pumping Test: **LC19M Pumping Test**

Analysis Method: **Theis**

Analysis Results:	Transmissivity:	7.55E+1 [ft²/d]	Conductivity:	6.29E-1 [ft/d]
	Storativity:	1.52E-4		
Test parameters:	Pumping Well:	LC19M	Aquifer Thickness:	120 [ft]
	Casing radius:	0.1875 [ft]	Confined Aquifer	
	Screen length:	51 [ft]		
	Boring radius:	0.4 [ft]		
	Discharge Rate:	42.9 [U.S. gal/min]		

Comments: HJ observation well located on north side of Lost Creek Fault.

Evaluated by: KRS

Evaluation Date: 9/20/2007

APPENDIX A
COMPLETION REPORTS

Appendix A
LC ISR, LLC
Lost Creek Regional Aquifer Test
Well Completion Information

Well Name	Sand	Northing	Easting	Driller	Driller TD	Logger TD	Deviation	Deviation Direction	Grouted Interval	Casing ID (inches)	Cased to	Underreamed Interval	Screen Length	Total Length scrn, Jc, Kp	J-Collar Used?	# K-packers	Setting Depth
HJT-104	HJ	534,900	743,660	KE Taylor Drilling Inc.	460.0	462.8	1.5	135.2 SSE	N/A	4.5	410	410-460	50	57	Yes	2	403
HJT-105	HJ	535,030	744,450	KE Taylor Drilling Inc.	850.0	849.4	26.7	215.0 SW	438-850	4.5	407	407-438	30	35	Yes	2	403
HJMP-104	HJ	534,900	742,900	KE Taylor Drilling Inc.	430.0	430.1	2.5	095.8 ESE	N/A	4.5	402	402-430	30	34	Yes	2	396
HJMP-107	HJ	534,800	743,700	KE Taylor Drilling Inc.	464.0	461.9	9.7	272.6 W	N/A	4.5	423	423-460	40	45	Yes	2	416
HJMP-110	HJ	535,200	743,700	KE Taylor Drilling Inc.	476.0	475.1	3.3	340.9 NNW	N/A	4.5	431	431-476	45	47	Yes	2	430
HJMP-111	HJ	535,370	743,850	KE Taylor Drilling Inc.	440.0	440.7	1.2	205.7 SW	N/A	4.5	393	393-440	47	50	Yes	2	388
UKMO-101	HJ	534,940	744,100	KE Taylor Drilling Inc.	487.4	487.4	2.2	359.4 N	N/A	4.5	465	465-487	25	27	Yes	2	460
UKMO-102	HJ	535,160	744,150	KE Taylor Drilling Inc.	420.0	419.9	4.9	324.3 NNW	N/A	4.5	379	379-420	40	45	Yes	2	379
LC19M	HJ	743,383	535,317	KE Taylor Drilling Inc.	463.0	455.3	1.7	282.3 W	N/A	4.5	412	412-463	Open Hole	N/A	N/A	N/A	N/A
LC16M	HJ	744,553	534,811	KE Taylor Drilling Inc.	472.0	470.9	10.7	289.2 WNW	N/A	4.5	410	410-467	Open Hole	N/A	N/A	N/A	N/A
LC18M	LFG	743,368	535,316	KE Taylor Drilling Inc.	350.0	347.5	3.7	303.2 WNW	N/A	4.5	290	290-332	Open Hole	N/A	N/A	N/A	N/A
LC25M	LFG	743,397	534,601	KE Taylor Drilling Inc.	380.0	380.0	N/A	N/A	N/A	4.5	316	316-349	Open Hole	N/A	N/A	N/A	N/A
UKMP-101	UKM	534,930	744,100	KE Taylor Drilling Inc.	575.0	570.0	5.0	005.5 N	N/A	4.5	547	547-575	30	33	Yes	2	545
UKMP-102	UKM	535,150	744,150	KE Taylor Drilling Inc.	498.0	499.9	2.3	350.0 NNW	N/A	4.5	475	475-498	20	24	Yes	2	472
LC20M	UKM	743,383	535,331	KE Taylor Drilling Inc.	543.0	541.3	7.2	219.1 SW	N/A	4.5	511	511-543	Open Hole	N/A	N/A	N/A	N/A

APPENDIX D
WATER LEVEL DATA
(ELECTRONIC DATASET)

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3.6 Ecology

The Permit Area is located in the Wyoming Basin ecoregion (Chapman, 2004) at an elevation of approximately 7,000 ft amsl. With approximately 260 feet of relief, sub-zero winter temperatures, and less than ten inches of annual precipitation, vegetation development and species diversity are limited.

The information in this section is based on field surveys conducted in 2006 and 2007 as well as on existing reports and databases of state and federal agencies. The abundance, habitat requirements, seasonal fluctuations, and distribution of species were evaluated. Species of particular interest included:

- threatened or endangered species, and Migratory Birds of High Federal Interest (MBHFI);
- commercially or recreationally valuable species;
- species affecting the well-being of species of special concern;
- species critical to the structure and function of the ecological system; and
- biological indicator species of radionuclides or chemical pollutants in the environment.

Appropriate state and federal agencies, including WDEQ, WGFD, BLM, US Fish and Wildlife Service (FWS), were consulted on the scope of work for the proposed ecological surveys and presence or absence of species of special concern.

3.6.1 Vegetation

Within the Permit Area, two vegetation types, dominated by big sagebrush, were identified and mapped (**Figure 3.6-1**). The Upland Big Sagebrush Shrubland type dominates the flat upland areas and the gentle slopes (**Figure 3.6-2**). The Lowland Big Sagebrush Shrubland type occurs in deeper soils along the gently sloped, south-facing ephemeral dry washes (**Figure 3.6-3**).

During the 2006 growing season, a vegetation survey was conducted within the area originally planned for the Permit Area. Prior to commencing field work in 2006, WDEQ reviewed and accepted the study design (Moxley, M. Lander Field Office Supervisor, WDEQ-LQD Lander Field Office. Personal communication. June 2006).

Once the vegetation types were identified and delineated, each of the types was sampled with 20 transects (a total of 40 transects) using a point-intercept approach to obtain vegetation cover and species diversity data. Vegetation cover observations were made on a species basis. Observations were also made for cover by litter and bare soil.

Observations on species diversity were obtained by recording all the species that occurred along and within 3.3 feet (one meter) of each 82-foot (25-meter)-long transect. The two vegetation types are fairly homogeneous, but the overall species diversity is relatively low (58 species were observed and are presented in **Table 3.6-1**). The absence of perennial streams, minimal topographic variation, and limited annual precipitation tend to restrict the overall species diversity. In general, the vegetation of the Permit Area is typical and representative of most of the region.

The planned Permit Area was expanded in early 2007, and the vegetation survey was extended to include the Permit Area expansion during the 2007 growing season. Field work for 2007 consisted of preparing and field checking a vegetation map of the Permit Area expansion. Since the vegetation types that occurred in the Permit Area expansion were the same as those in the original Permit Area, no additional sampling was conducted. This approach was deemed to be acceptable to WDEQ (Moxley, M. Lander Field Office Supervisor, WDEQ-LQD Lander Field Office. Personal communication. April 2007).

In the section that follows, each of the vegetation types is described based on data collected in June 2006 and on general observations made during various site visits in 2006 and 2007.

3.6.1.1 Upland Big Sagebrush Shrubland

The Upland Big Sagebrush Shrubland type covers most of the Permit Area (approximately 85 percent of the total Permit Area). It covers flat areas and the gently sloping south-facing slopes, and its development is not affected by the gentle topography that characterizes the Permit Area. The percent slope of this type ranges from zero to six percent. Soils throughout the upland areas are mostly shallow and coarse textured. The only environmental settings in the Permit Area that do not support the Upland Big Sagebrush Shrubland type are the areas along the drainages where the Lowland Big Sagebrush Shrubland type grows in the deeper soils that characterize the bottomland areas.

The major species in this type is big sagebrush, which occurs at a mean absolute cover of 14 percent, and accounts for 54 percent of the cover by all species. Sandberg bluegrass *(Poa secunda)*, needle-and-thread grass *(Stipa comata)*, Indian ricegrass *(Oryzopsis hymenoides)*, and thickspike wheatgrass *(Agropyron dasystachyum)* occur as the most prevalent perennial grass species. Together, these four species had a mean cover of eight percent and accounted for 31 percent of the cover by all species. Cushion plants are common in this vegetation type, but collectively accounted for only six percent of the cover by all species. Even though the mean cover values for these species are low, they

were commonly encountered along all the sample transects. The mean total vegetation cover in this type was 26 percent, the cover by litter and rock combined was 22 percent, the bare soil cover was 52 percent, and the total ground cover (vegetation plus litter and rock) was 48 percent. The percent cover by bare soil is a reflection of the sparseness of the vegetation in the Upland Big Sagebrush Shrubland type. Even though there is a considerable amount of bare soil, the vegetation development is very homogeneous across the upland parts of the Permit Area. In general, vegetation development in the region is restricted because of the limited amount of annual precipitation.

Shrubs are abundant in this vegetation type. Big sagebrush occurred at a density of 12,332 individuals per acre (about three per square meter) and rabbitbrush *(Chrysothamnus viscidiflorus)* occurred at a density of 1,490 individuals per acre (0.4 per square meter). While these shrub species occur at high densities, none of the plants are tall. In general, most of the plants are less than 20 inches (0.5 meters) in height and many are less than ten inches (25 centimeters) in height. Semi-shrubs are also common in these upland areas. The total density for semi-shrub species was 2,583 individuals per acre (0.64 per square meter) with winterfat *(Ceratoides lanata)* and prickly gilia *(Leptodactylon pungens)* occurring as the most prevalent of the semi-shrub species.

In all, 36 species were observed in this type (**Table 3.6-1**), with a mean density of about 2.8 species per 100 square feet (about 15 species per 50 square meters).

3.6.1.2 Lowland Big Sagebrush Shrubland

The Lowland Big Sagebrush Shrubland type of the Permit Area occurs along and immediately adjacent to the ephemeral drainages that cross the Permit Area from north to south. Overall, this type covers approximately 15 percent of the total Permit Area. The soils along the drainages tend to be deeper than those on the adjacent uplands and, thereby, have the potential for holding more moisture than the upland areas. The increased potential soil moisture allows for more growth by big sagebrush, so that the individual shrubs growing along the drainages tend to be much larger than the shrubs growing on the upland areas. Along some of the drainages, there are individual big sagebrush plants that are more than 6.6 feet (two meters) tall and have stem diameters greater than 8 inches (20 centimeters). The slope measurements along the sampled transects in this type ranged between zero and three percent; all the transects were either flat or had a southerly aspect component.

The major species in this type is big sagebrush, which occurred at a mean cover of 31 percent and accounted for 72 percent of the cover by all species. Rabbitbrush had a mean cover of three percent and accounted for eight percent of the total vegetation cover. These two dominant shrub species tend to overwhelm the vegetation to the degree that

herbaceous species account for only limited amounts of cover in this type. All native perennial grasses combined had a mean cover of seven percent (16 percent of the total vegetation cover) with Sandberg bluegrass *(Poa secunda)*, thickspike wheatgrass *(Agropyron dasystachyum)*, and squirreltail grass *(Sitanion longifolium)* occurring as the most prevalent perennial grass species. Forb species occur throughout this type, but all occurred at mean cover values that were less than one percent. As a group, all forbs and cushion plants accounted for approximately three percent of the total vegetation cover. The mean total vegetation cover in this type was 43 percent, the cover by litter and rock combined was 34 percent, the bare soil cover was 23 percent, and the total ground cover (vegetation plus litter and rock) was 77 percent. Overall, the vegetation cover in the Lowland Big Sagebrush Shrubland type was 17 percent greater than the cover in the Upland Big Sagebrush Shrubland type.

Shrubs are abundant in this vegetation type. Big sagebrush occurred at a density of 14,417 individuals per acre (3.6 per square meter), and rabbitbrush *(Chrysothamnus viscidiflorus)* occurred at a density of 2,591 individuals per acre (0.6 per square meter). Semi-shrubs occur in this type, but the overall densities are lower than the densities for semi-shrubs in the upland areas. The total density for semi-shrub species was 235 individuals per acre (0.1 per square meter), with prickly gilia *(Leptodactylon pungens)* occurring as the most common of the semi-shrub species.

In all, 43 species were observed in this type (**Table 3.6-1**) with a mean density of about 2.4 species per 100 square feet (12.8 species per 50 square meters).

3.6.1.3 Threatened, Endangered and Special Concern Plant Species

As defined by WDEQ-Land Quality Division (LQD) Guideline No. 2, a literature review was conducted to identify species of special concern, prohibited and restricted noxious weeds, and selenium indicators that could be present within the Permit Area. The review identified several species that occur within the general region.

Threatened and endangered species of the region include the blowout penstemon (*Penstemon haydenii*) and the desert yellowhead (*Yermo xanthocephalus*). Descriptions of these species are provided below.

- Blowout penstemon: This is the only endangered plant species in Wyoming and is known from an area south of the Ferris Mountains, in northwestern Carbon County (Fertig, 2000). While the species is known to occur on a site approximately 32 miles east-northeast of the Permit Area, it is unlikely to occur in the Permit Area. Blowout penstemon grows exclusively in sand blowout

areas, a habitat type absent in the Permit Area. The site south of the Ferris Mountains is the only known location for the species in Wyoming. The only other known populations of blowout penstemon occur in similar sand blowout habitats in northwestern Nebraska.

- Desert yellowhead: This is a threatened species in Wyoming, occurring in southern Fremont County in the Beaver Rim Area, approximately 45 miles northwest of the Permit Area. This species was first discovered in 1990. Its only known population occurs in the Beaver Rim Area. The species appears to be restricted to surface outcrops of Miocene ash deposits. The known populations occur in an area of approximately 42 acres; however, plants occur on only approximately eight acres within the overall distribution area. Studies conducted subsequent to the 1990 discovery have not identified any other localities of the species (Heidel, 2002).

An additional 12 rare plant species are known to occur in Sweetwater County (**Table 3.6-2**). During the vegetation surveys, special consideration was given to these species of special concern and micro-environments capable of supporting these species. However, no species of special concern were observed within the Permit Area.

3.6.1.4 Weeds and Selenium Indicator Species

Overall, the Permit Area has very few weeds due to the remoteness of the site and the limited amount of past disturbance, other than two-track roads and drill sites (**Section 3.3.3**) that has occurred in the area. A list of the prohibited and restricted weeds is provided in **Table 3.6-3**. Only one listed restricted noxious weed species, tansy mustard, was observed within the Permit Area. Scattered individuals of tansy mustard *(Descurainia pinnata)* were observed in the Lowland Big Sagebrush Shrubland. No areas dominated by weedy species were observed within the Permit Area. Selenium indicator species were not observed on-site, and none of the soils of the Permit Area are considered seleniferous.

3.6.2 Aquatic Life and Wetlands

After conducting field investigations and research, aquatic life and wetlands were determined to not exist within the boundaries of the Permit Area. Surface water may be present seasonally, but does not sustain aquatic life or wetland species.

3.6.3 Wildlife

Wildlife inventories of the Permit Area were conducted in 2006 and 2007. Wildlife inventories were designed to provide baseline data for permitting the ISR Project and to ensure that wildlife species and habitats are afforded adequate protection during construction, operations, and restoration. Data collection included file searches of state and federal agency documents, and field surveys for raptors, sage grouse, and breeding birds. Wildlife studies focused on threatened and endangered (T&E) species, MBHFI, raptors, sage grouse leks and nesting habitat, breeding bird surveys, and Pygmy rabbits, as well as a general wildlife inventory of the Permit Area.

For most surveys, the study area was the same as the Permit Area. In order to identify the off-site habitat and individuals that could be affected by Project activities, the study area for sage grouse included an additional two-mile perimeter, and the study area for raptors included an additional one-mile perimeter. Land ownership of the study area is under the jurisdiction of BLM and the State of Wyoming.

The dominant vegetation type within the Permit Area is big sagebrush. The elevation ranges from 6,790 feet to 7,050 feet. The topography is characterized by rolling plains with small, ephemeral drainages dissecting the area. There are no perennial water sources within the study area. Crook Well Reservoir, a stock pond located in Section 16 of Township 25 North, Range 92 West, was dry during the 2006 field survey and contained a small amount of water during the spring of 2007. The entire Permit Area covers approximately 4,220 acres.

The field surveys and reports specific to the Project were completed by Eric Berg, Cecily Mui, Ray Fetherman, Troy Gerhardt, Dennis Buechler, and Eric Fetherman, who are all qualified wildlife biologists or ecologists. Personnel contacted from WGFD include Greg Hiatt (2006, 2007) and Reg Rothwell (2006). Mary Jennings with FWS was also contacted. The interviewed BLM personnel were Rhen Etzelmiller (2006, 2007) and Frank Blomquist (2006). Regular Project briefings were held during the baseline surveys, and BLM and WDEQ-LQD staffs were updated with the progress of the wildlife surveys.

3.6.3.1 Wildlife Habitat Description

The wildlife habitat in the Permit Area is predominantly big sagebrush shrublands (**Figure 3.6-1**). Other wildlife habitats include cushion plant communities, small isolated patches of grassland, and disturbed lands. The big sagebrush shrublands were divided into two different types: Upland Big Sagebrush Shrubland and Lowland Big Sagebrush Shrubland.

The Upland Big Sagebrush Shrubland wildlife habitat (**Figure 3.6-2**) is generally found on flat and rolling hills. This habitat is important for pronghorn antelope, mule deer, sage grouse, white-tailed prairie dogs, and reptiles. Raptors often hunt in big sagebrush shrubland habitat, and sage grouse leks are typically located on ridge tops that are dominated by cushion plant communities.

The Lowland Big Sagebrush Shrubland wildlife habitat (**Figure 3.6-3**) is found along drainages in areas with relatively steep slopes. This habitat type has significantly more vegetation cover than the Upland Big Sagebrush Shrubland. The Lowland Big Sagebrush Shrubland wildlife habitat also provides important cover for resident and migratory birds, reptiles, and small mammals. The taller big sagebrush provides nesting sites for raptors and critical forage for ungulates and sage grouse during winters with extreme snowfall.

Species Lists

A list of wildlife species that potentially occur in the Permit Area is provided in **Table 3.6-4**. A total of 224 wildlife species potentially occur in the Permit Area. Of these, 164 species are birds, 51 species are mammals, four species are amphibians, and five species are reptiles. Species that are known to exist in the study area, from observation or the presence of identifying signs, are denoted with an asterisk in **Table 3.6-4**.

3.6.3.2 Methods

File and Data Searches

Locations of raptor nest sites, sage grouse leks, prairie dog towns, big game ranges, and T&E species were obtained from GIS data from the BLM and WGFD. WGFD publications and the computerized WGFD Wildlife Observation System (WOS) of the Permit Area were reviewed (**Attachment 3.6-1**) along with FWS publications.

A copy of the Sweetwater Uranium Facility Environmental Report (Shepherd Miller, Inc., 1994) that covered a study area southwest of the Permit Area was also reviewed. The Shepherd Miller study was used as an initial survey reference for the area for T&E plant and animal species, big game ranges, sage grouse leks, and raptor nest sites.

Field Surveys

Field surveys for sage grouse leks, raptor nest sites, and breeding birds were completed in the Permit Area between early April and October 2006; additional sage-grouse-lek and nesting raptor surveys were completed during the spring of 2007. Pygmy rabbit surveys were completed during June and July of 2007. The presence of other wildlife species or

their identifying signs were also recorded, and all observed species are included in **Table 3.6-4**. Breeding bird surveys were conducted within the Permit Area; surveys for raptor nests and sage grouse also included one- and two-mile buffer areas, respectively. Pygmy rabbit surveys were conducted in random transects within the Permit Area.

General field surveys were completed by traversing the Permit Area and the surrounding area in a high-wing aircraft, four-wheel drive vehicles, and on foot. Binoculars and spotting scopes were used for observations. Specific survey methods for individual species or groups of species are presented in **Attachment 3.6-2**. Wildlife surveys were completed according to a work plan developed in consultation with the WGFD, WDEQ, and BLM. The scope of field work was finalized in consultation with BLM in Rawlins, Wyoming, in February and March of 2006 (BLM, 2006). The field survey protocols were consistent with recommendations from both BLM and WGFD (**Attachment 3.6-3**).

3.6.3.3 Results

The following sections provide the results from the file searches and field studies, along with relevant figures, tables, and maps. **Table 3.6-4** provides a list of wildlife species that have the potential of occurring in the study area. **Attachment 3.6-1** includes the WGFD WOS record of wildlife species previously observed in the Permit Area.

Big Game

Specific big game surveys were not required for the Project (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006); however, the relative abundance of big game observations during the course of field work was recorded and is presented in **Table 3.6-5**.

Pronghorn, mule deer, and elk were the only big game animals recorded in the Permit Area during field observations in 2006 and 2007. WGFD observations in **Attachment 3.6-1** indicate that pronghorn are the most abundant big game species in the study area. Pronghorn use of the study area, as determined by WGFD and BLM, is shown on **Figure 3.6-4**. The Permit Area is classified as Winter/Yearlong Range. Winter/Yearlong Range is the area where a population of animals makes general use of the habitat on a year-round basis, and there is a significant influx of animals between December and April. The study area comprises a portion of the Red Desert Antelope Herd Unit (WGFD Hunt Area 61). Based on the most current Annual Big Game Herd Unit Job Completion Reports (JCRs) (WGFD 2006a), the Red Desert Antelope Herd had a five-year (2000 through 2005) average population of 14,454 pronghorns.

A map of mule deer use of the study area is presented in **Figure 3.6-5**. The Permit Area is out of mule deer range. Areas described as "out of range" contain few animals or the available habitat is of limited importance to the species.

Elk use of the study area is mapped in **Figure 3.6-6**. Elk likely use the Permit Area as transitional range while moving to other areas. The 2005 WGFD data defines the seasonal range of the elk to be outside of the Permit Area. The 2007 WGFD Herd Unit Data describes two herds, the Shamrock Elk Herd Unit (#643) and the Steamboat Elk Herd Unit (#426), as being situated on or near the Permit Area.

The Permit Area is classified as out of moose range (as determined by WGFD and BLM; **Figure 3.6-7**); no moose or sign of moose were observed in the study area.

Upland Game Birds

Field surveys of upland game birds focused on sage grouse strutting grounds, also known as leks. All known strutting grounds were inventoried, and the entire study area within two miles of the Permit Area was searched for additional leks. Three aerial surveys were completed for new leks during April of 2006 and 2007. In addition, ground surveys of new leks were completed by driving on roads within the study area and listening for booming sage grouse. Aerial surveys were completed by flying north-south transects in a fixed-wing aircraft at an altitude of 330 to 490 feet (100 to 150 meters) above ground level, with a transect spacing of about 0.6 miles (one kilometer). Lek attendance surveys, which document the number of male sage grouse observed at each lek, were completed on the ground three times for each known lek during April of 2006 and 2007. Sage grouse brood surveys were not required by BLM and WGFD (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006).

Sage grouse and mourning doves were the only upland game birds noted in the study area. Sage grouse may inhabit the area year-long, but mourning doves are migrants and only inhabit the area from spring into early fall. No active sage grouse leks were located in the Permit Area. The Crooked Well Lek, which is a known strutting ground along the northeast boundary of the Permit Area (Township 25 North, Range 92 West, Section 16), was inactive during three site visits in April 2006 (**Figure 3.6-8**). Four males were observed on the lek on April 4, 2007, but no sage grouse were present in the other two lek surveys; therefore, it is considered inactive. No other birds were observed on the lek during 2007. Six active leks were located within the two-mile buffer zone. The locations and lek attendance of these leks are presented in **Figure 3.6-8** and **Table 3.6-6.**

Five of the six active leks had been previously mapped by WGFD. The Discover 2 Lek, located in Township 25 North, Range 93 West, Section 23, approximately 0.7 miles west

of the Permit Area, is a newly mapped active lek. It appears to be a satellite of the previously mapped Discover Lek, 0.5 miles to the west. The Prospect South Lek (Township 25 North, Range 92 West, Section 3, Southwest Quarter) is located approximately 0.75 miles south of the Prospect Lek. These are new leks not previously mapped by WGFD or located during the 2006 surveys. The Green Ridge Satellite Lek is located approximately 0.2 miles west of the Green Ridge Lek. At undisturbed leks, attendance ranged from 17 to 126 males during the April 2006 survey. The most highly frequented leks in 2006 and 2007 were Sand Gully (58 to 126 males), Discover (19 to 69 males), and Prospect (41 to 64 males). All sage grouse leks occurred in association with Upland Big Sagebrush Shrubland communities in areas with cushion plants, blowouts and bare ground. The Sooner and Sooner Oil leks were also counted in 2007 because they are located near off-site transportation routes that may be used by the Project.

Raptors

A raptor nest survey of the entire Permit Area and a one-mile buffer zone was conducted in April and June of 2006, and April, May and June of 2007. The survey provided status updates on nests previously identified by BLM and WGFD and a survey for new nests. Surveys were conducted on foot or using four-wheel-drive vehicles; additional surveys were completed by air while looking for sage grouse leks. Raptor observations were made using binoculars and a high-powered spotting scope. Nest site activity and production surveys were conducted according to protocols vetted by the BLM, Rawlins District (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006). Special attention was made to avoid disturbance of any active nests while completing the wildlife surveys.

Agency files were reviewed for data on raptor nests in the area. File searches identified 12 previously documented raptor nests within a one-mile buffer zone of the Permit Area. The status of these nests is presented in **Table 3.6-7** and the locations are presented in **Figure 3.6-9**.

No active raptor nests occur within the Permit Area. Nest FH25921601 was an active ferruginous hawk's nest on an artificial nest structure, which was in excellent condition in previous visits. However, in 2007, Nest FH25921601 was in poor condition, and inactive on multiple visits in 2006 and 2007. One raptor nest was found within the one-mile buffer zone. Nest AFH25921004 was occupied by a pair of ferruginous hawks and was in excellent condition and located on top of artificial nest platforms. Nest AFH25921004 had two or three chicks in the nest when it was last observed on June 15, 2006. Seven other nests that had been previously documented by BLM in the one-mile buffer zone surrounding the Permit Area (**Table 3.6-7** and **Figure 3.6-9**) were not located during the 2006 and 2007 surveys. Global Positioning System (GPS) units were used to visit the

sites of these nests, but none were located. No new raptor nests were identified during the 2006 or 2007 field surveys.

Several other raptor species were recorded within the study area, but nests were not documented. These species include the Swainson's hawk, red-tailed hawk, northern harrier, golden eagle, kestrel, prairie falcon, and turkey vulture. While the conditions are present for the northern harrier and American kestrel nests within the Permit Area, specific nest sites were not located. Northern goshawk, merlin, and peregrine falcons were not observed in the study area.

Waterfowl and Shorebirds

Specific waterfowl and shorebird surveys were not required by the BLM, Rawlins District (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006). One shorebird species was observed during bird and wildlife surveys, which is noted in the species list of **Table 3.6-4**. Most recorded waterfowl and shorebird species are designated "uncommon" to "fairly common" in the region.

In the study area, habitat for waterfowl and shorebirds is sparse. The man-made Crooked Well Reservoir was dry during the 2006 field survey and contained a small amount of water during the spring of 2007. Waterfowl and shorebird species would be expected in the Permit Area during migrations in the spring and fall, with additional use in the summer months. Late fall and winter use of the Permit Area by waterfowl and shorebirds is believed to be very limited.

Passerine and Breeding Birds

A breeding bird survey of all representative habitats of the Permit Area was conducted during the peak of the nesting season in June 2006, using methods recommended in WDEQ-LQD Wildlife Guideline No. 5 Wildlife (1994). Surveys took place in the morning between 0500 to 0930 hours. One 3,280-foot (1,000-meter) transect was established in each habitat within the Permit Area. In Upland Big Sagebrush Shrubland, 328-foot- (100-meter-) wide belt transects were walked, and all birds that were heard or observed were recorded. In riparian zones, where limited habitat size precluded 3,280-foot- (1,000-meter-) wide transects, point transects with 328-foot- (100-meter-) wide spacing were surveyed for five minutes; all birds heard or observed within 164 feet (50 meters) were recorded.

All avian species observed are documented in the species list in **Table 3.6-4**. A total of 31 passerine species were recorded during surveys. The most common species in the Permit Area were the horned lark, Brewer's sparrow, and sage sparrow.

Species observed in the Upland Big Sagebrush Shrubland habitat were similar to species observed in the Lowland Big Sagebrush Shrubland habitats. There were 12 breeding species seen in each of the big sagebrush habitats during breeding bird surveys.

Migratory Birds of High Federal Interest

MBHFI and other wildlife species were inventoried during all site visits. This was accomplished by searching all suitable or potentially suitable habitats and recording all species encountered.

Several MBHFI species are known to occur in the region (**Attachment 3.6-4**). Level I MBHFI species are described by FWS as in need of conservation, while Level II MBHFI species are described as in need of monitoring. Level I MBFHI species in the region include the bald eagle, ferruginous hawk, Swainson's hawk, peregrine falcon, burrowing owl, sage grouse, mountain plover, Brewer's sparrow, and sage sparrow. Of these, the ferruginous hawk, sage grouse, Brewer's sparrow, and sage sparrow were documented in the Permit Area; the mountain plover and burrowing owl have been noted in adjacent areas (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006).

Level II species documented in the Permit Area include the sage thrasher, loggerhead shrike, vesper sparrow, and lark sparrow. Level II MBHFI species known to exist in the region, but not documented in the study area, include the merlin, Cassin's kingbird, sage thrasher, black-billed cuckoo, loggerhead shrike, and lark bunting.

The ferruginous hawk nests in the study area were previously discussed in this section. Sage grouse mating and nesting in the study area and their strutting grounds were previously discussed in this section as well. The breeding Brewer's sparrow and sage sparrow were found throughout the big sagebrush habitats of the Permit Area. The breeding sage thrasher, loggerhead shrike, vesper sparrow, and lark sparrow were also located within the Permit Area.

No mountain plover were observed on or near the Permit Area during spring and early summer of the 2006 and 2007 field studies. The Permit Area was evaluated for mountain plover habitat. The extensive tall shrub cover and absence of grassland or open shrub habitats make the Permit Area poorly suited to the mountain plover. Small open areas (grassland and disturbed blowouts) do occur in the Permit Area, but are isolated. Mountain plover prefer open grasslands, bare ground, disturbed areas, prairie dog colonies and sparse shrubland habitats for nesting. Good potential mountain plover habitat occurs a few miles to the south and west of the Permit Area. However, since no good potential mountain plover habitat exists in the study area and no mountain plover

were observed during other field studies, it is unlikely that mountain plovers inhabit the Permit Area.

Other Mammals

All mammal species and identifying signs observed during the field studies were recorded and are documented on the species list in **Table 3.6-4**. A total of 19 mammal species were recorded in the study area. The most common species seen were the white-tailed jackrabbit, desert cottontail, Wyoming ground squirrel, thirteen-lined ground squirrel, deer mouse, and meadow vole. The coyote was the most abundant predator. The majority of mammalian species were observed in big sagebrush habitats.

Two wild horse HMAs overlap with the Permit Area. The Permit Area is within the Stewart Creek HMA and the Lost Creek HMA. Horses were seen in all habitats of the study area.

Aerial and ground surveys of the entire Permit Area were used to locate prairie dog towns. There were no active colonies in the Permit Area.

T&E and State-Listed Species of Concern

Threatened, endangered, and candidate wildlife species surveys were completed during all site visits by searching suitable habitats for the target species. The specific survey techniques used to identify each species and their potential of occurrence in the Permit Area are included in **Table 3.6-8**.

The bald eagle (threatened) and black-footed ferret (endangered) are the only federally listed or candidate species that may occur in the vicinity of the Permit Area (FWS, 2006). Bald eagle nesting habitat does not exist within the study area, but they might be found in the Permit Area during migration. The bald eagle has not been recorded in the study area (**Attachment 3.6-1**).

A black-footed ferret survey was not required, since black-footed ferrets live exclusively in prairie dog colonies, which are not present within the Permit Area.

The state-listed wildlife species (WGFD, 2005a, 2005b) not included under other wildlife categories, and their probability of occurrence in the Permit Area, are listed in **Table 3.6-9**. State-listed species that may occur in the Permit Area are classified as Native Species Status (NSS) 2, 3, or 4 (WGFD, 2005a). Status 2 species have declining populations that are threatened with extirpation, and have restricted or vulnerable habitat. These species may also be sensitive to human disturbance or have significant habitat loss. Status 3 species have: 1) populations that are restricted or declining with the threat of extirpation,

2) habitat that is restricted or vulnerable, or 3) a wide distribution and unknown population, with significant habitat loss. Status 4 species have: 1) populations that are restricted or declining with stable habitat, 2) widely distributed stable populations with restricted habitat that are sensitive to human disturbance, or 3) stable or increasing populations with significant loss of habitat.

Listed waterfowl and shorebird species such as the American white pelican, upland sandpiper, and long-billed curlew, and passerines, such as McCown's longspur, chestnut-collared longspur, and bobolink, are unlikely to be in the Permit Area, because there is no suitable habitat for these species; they may pass through the Permit Area during migration. The sage thrasher, Brewer's sparrow, and sage sparrow (all NNS4 species) were observed in the Permit Area. Suitable habitat exists for the willow lark bunting, though this species was not observed.

State-listed mammal species that may occur in the Permit Area have been classified as Native Species Status 2, 3, or 4 (WGFD, 2005b). Several listed shrew and bat species, such as the dwarf shrew, vagrant shrew, hoary bat, and silver-haired bat, have ranges that include the Permit Area. There is no suitable habitat in the study area, so they are unlikely to be present. Suitable roosting habitats for the western small-footed myotis, little brown myotis, long-legged myotis, big brown bat, Townsend's big-eared bat, and pallid bat might be found in rock crevices, rock outcrops, or trees near the Stratton Rim to the north of the Permit Area. These species could also potentially roost in the vertical walls of eroded streambeds in the Permit Area. None of these species was observed in the Permit Area. The state-listed olive-backed pocket mouse and prairie vole were not observed in the Permit Area. Suitable habitat exists in the Permit Area, and these species are known to be in the region (WGFD, 2004a).

Surveys were conducted for Pygmy rabbits (NNS3 species). Pygmy rabbits were observed in the Permit Area during the summer of 2007. Based on these surveys Pygmy rabbits occur in all Lowland Big Sagebrush Shrubland habitats (**Figure 3.6-1**). Scat, burrows, and individual Pygmy rabbits were observed along every transect within the Lowland Big Sagebrush Shrubland habitats of the study area.

Reptiles and Amphibians

Specific reptile and amphibian surveys were not required for the Project (Etzelmiller, R. Wildlife Biologist, BLM. Personal communication. February 2006; Blomquist, F. Wildlife Biologist, BLM. Personal communication. February 2006). Several species were observed during general surveys, as noted in **Table 3.6-4**. These included the greater short-horned lizard, prairie rattlesnake, and western terrestrial garter snake.

Fish

The Permit Area is predominately dry shrubland, and there is no aquatic habitat for most of the year. The Crooked Well Reservoir is an ephemeral stock pond that is dry except for a short period of time after spring snowmelt. No fish or other aquatic life occur.

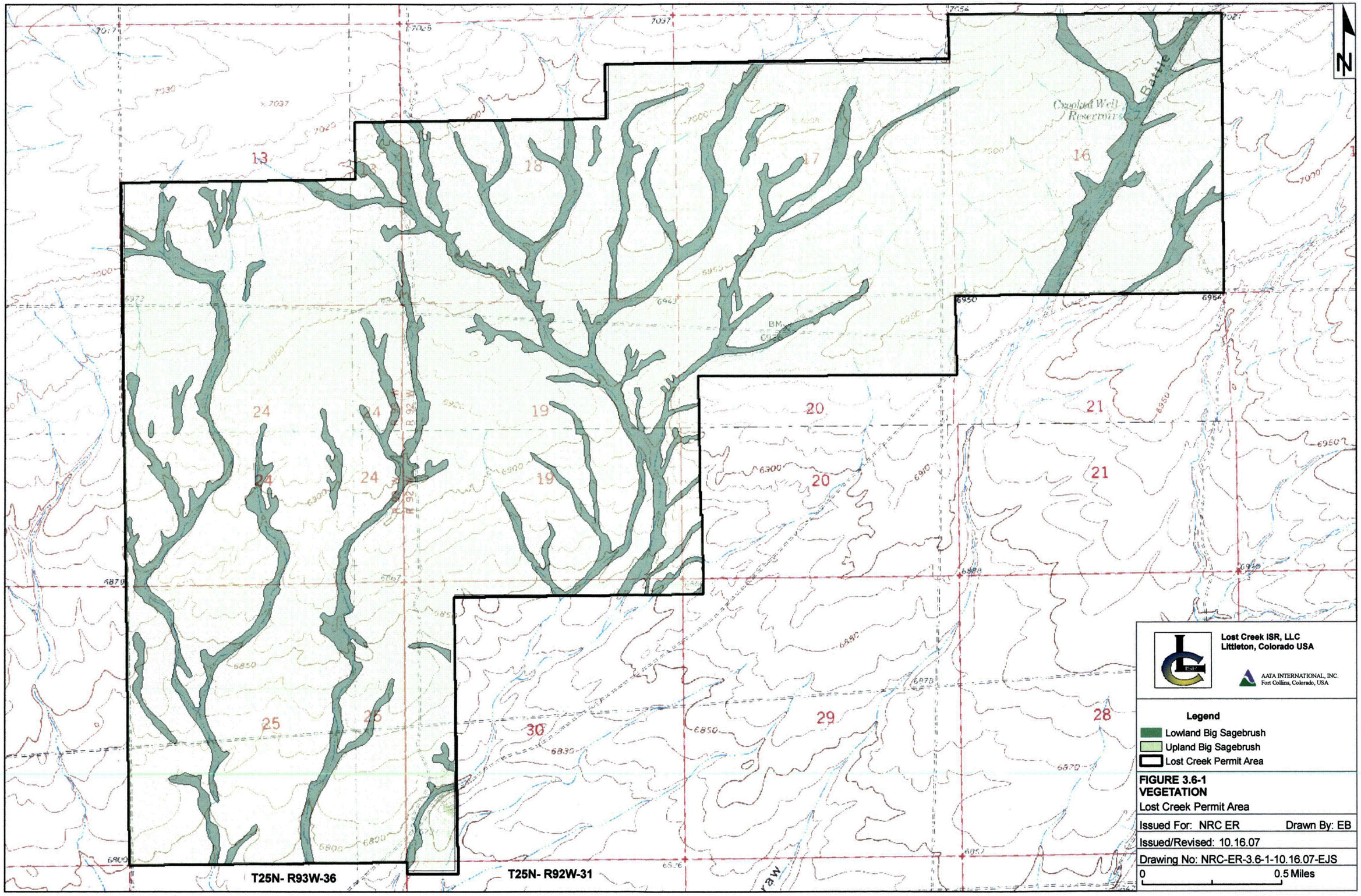


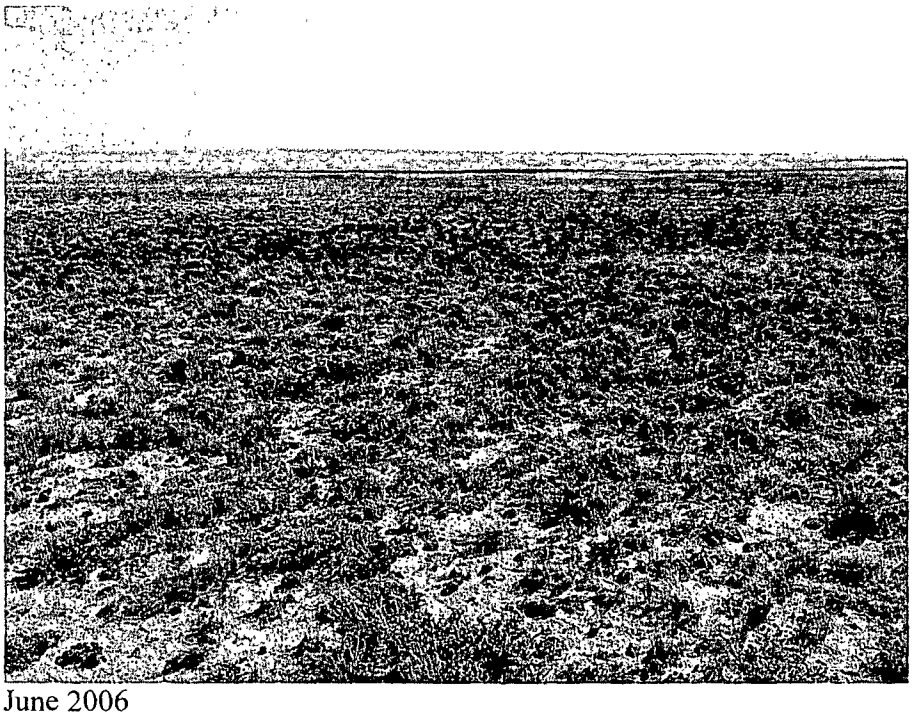
FIGURE 3.6-1
VEGETATION
Lost Creek Permit Area

Issued For: NRC ER Drawn By: EB

Issued/Revised: 10.16.07

Drawing No: NRC-ER-3.6-1-10.16.07-EJS

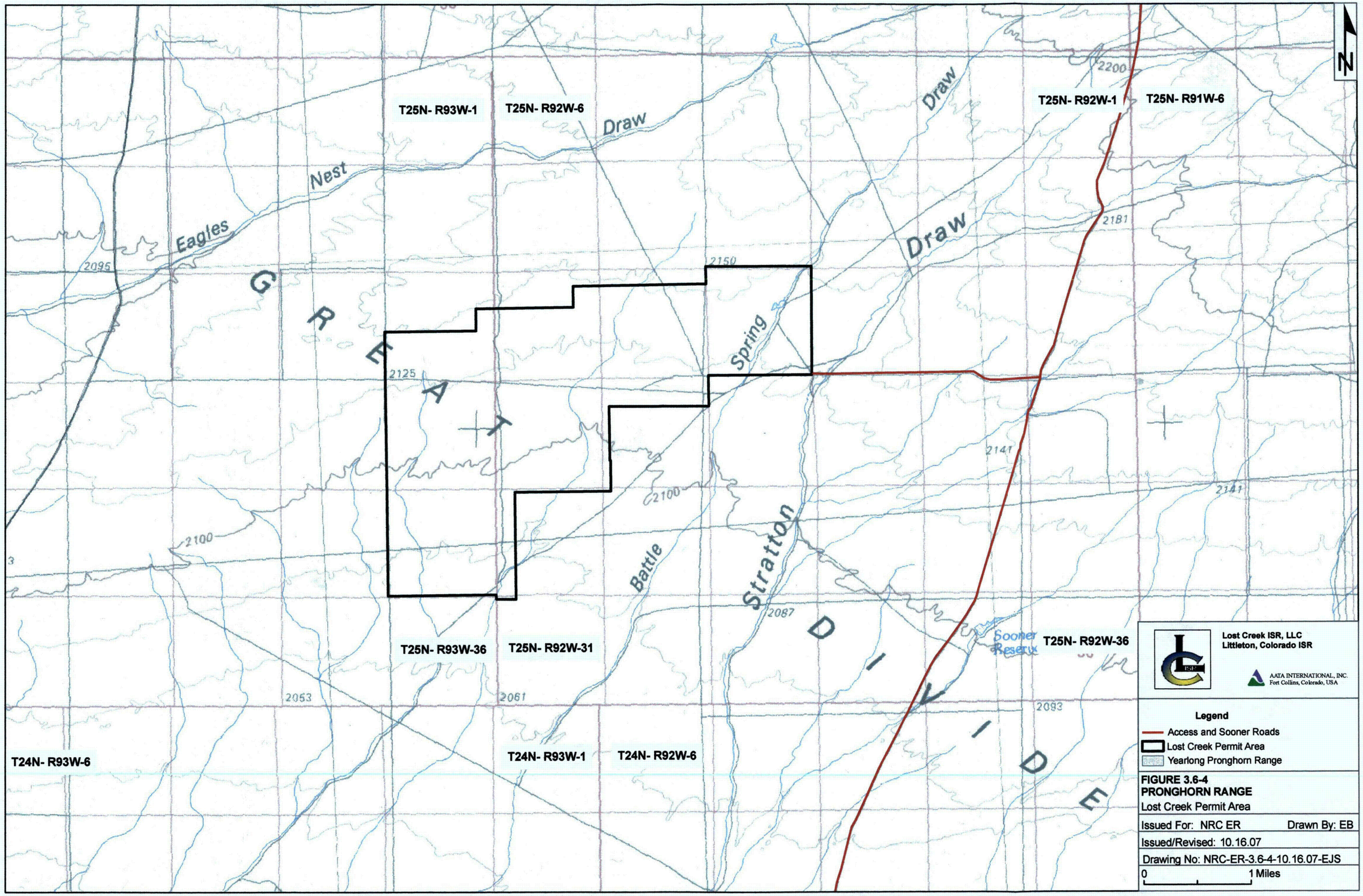
Figure 3.6-2 Upland Big Sagebrush Shrubland



June 2006

Figure 3.6-3 Lowland Big Sagebrush Shrubland

June 2006


N
T25N- R93W-1
T25N- R92W-6
T25N- R92W-1
T25N- R91W-6
T25N- R93W-36
T25N- R92W-31
T25N- R92W-36
T24N- R93W-6
T24N- R93W-1
T24N- R92W-6
Eagles Nest Draw
Draw
Draw
Spring
Battle
Stratton
GREAT DIVIDE
Sooner Reservoir
2200
2181
2150
2125
2141
2141
2100
2100
2095
2087
2053
2061
2093
Lost Creek ISR, LLC
Littleton, Colorado ISR
AATA INTERNATIONAL, INC.
Fort Collins, Colorado, USA
Legend
Access and Sooner Roads
Lost Creek Permit Area
Yearlong Pronghorn Range
FIGURE 3.6-4
PRONGHORN RANGE
Lost Creek Permit Area
Issued For: NRC ER
Drawn By: EB
Issued/Revised: 10.16.07
Drawing No: NRC-ER-3.6-4-10.16.07-EJS
0
1 Miles

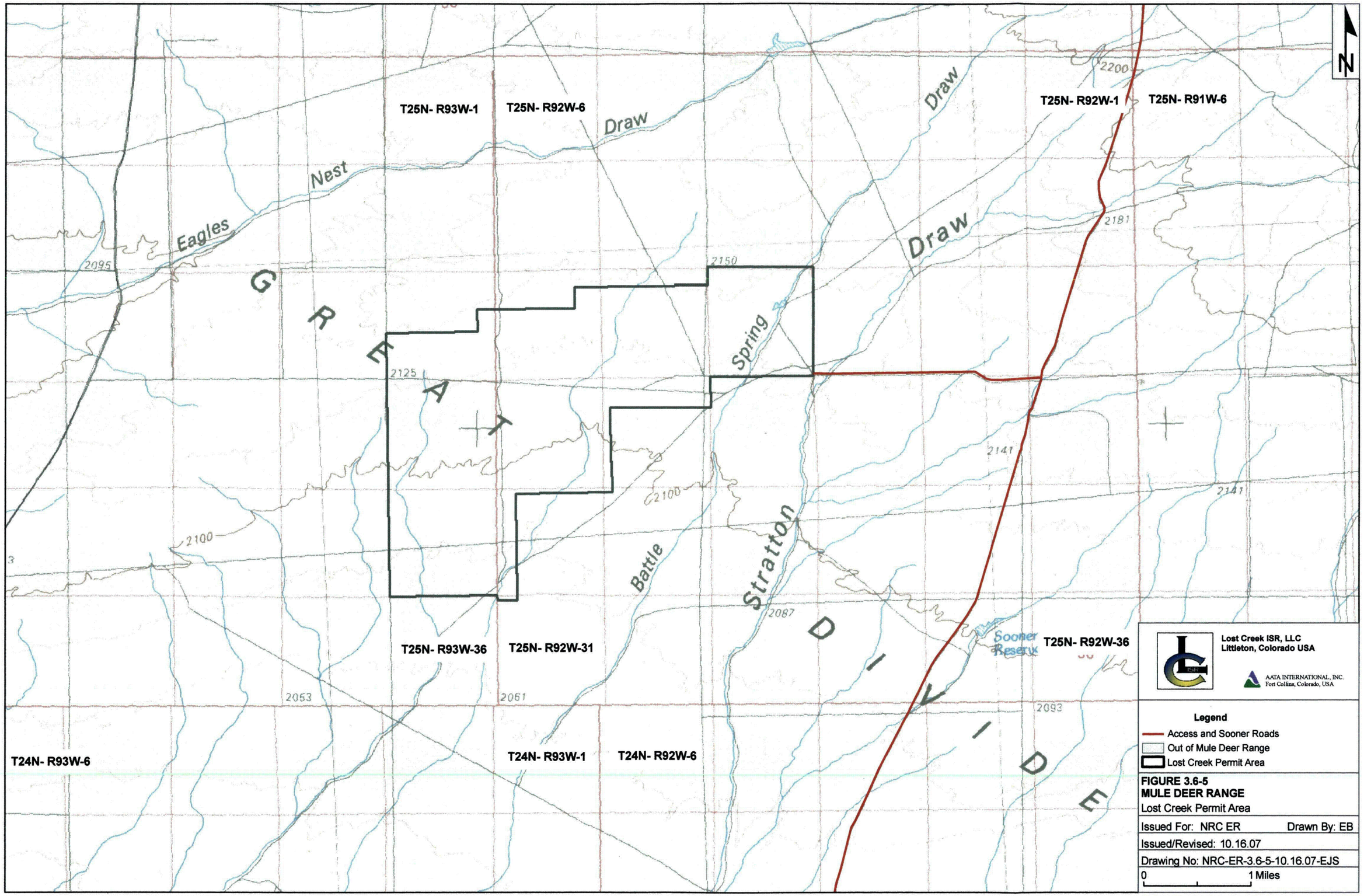


FIGURE 3.6-5
MULE DEER RANGE
Lost Creek Permit Area

Issued For: NRC ER Drawn By: EB

Issued/Revised: 10.16.07

Drawing No: NRC-ER-3.6-5-10.16.07-EJS

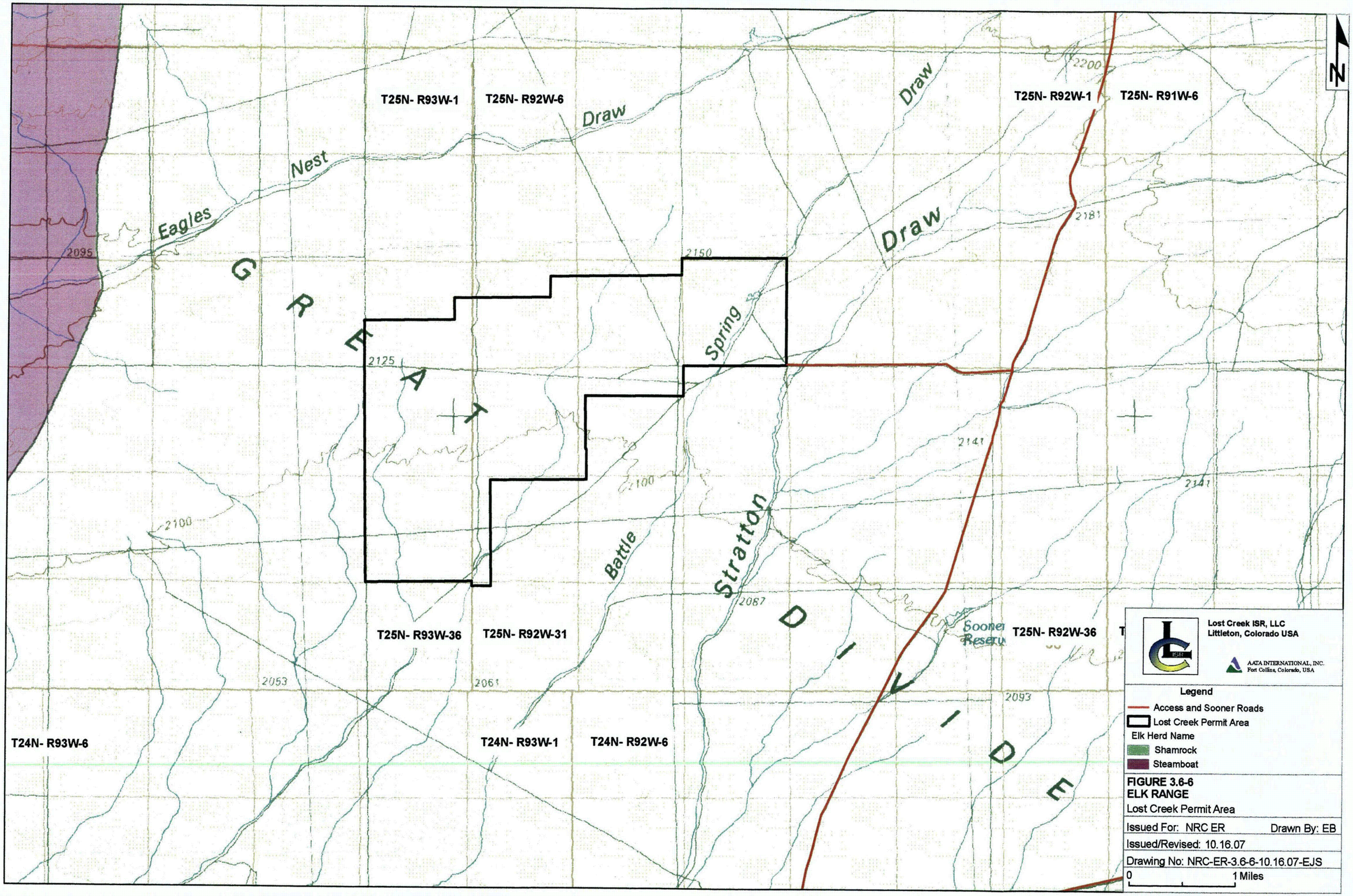
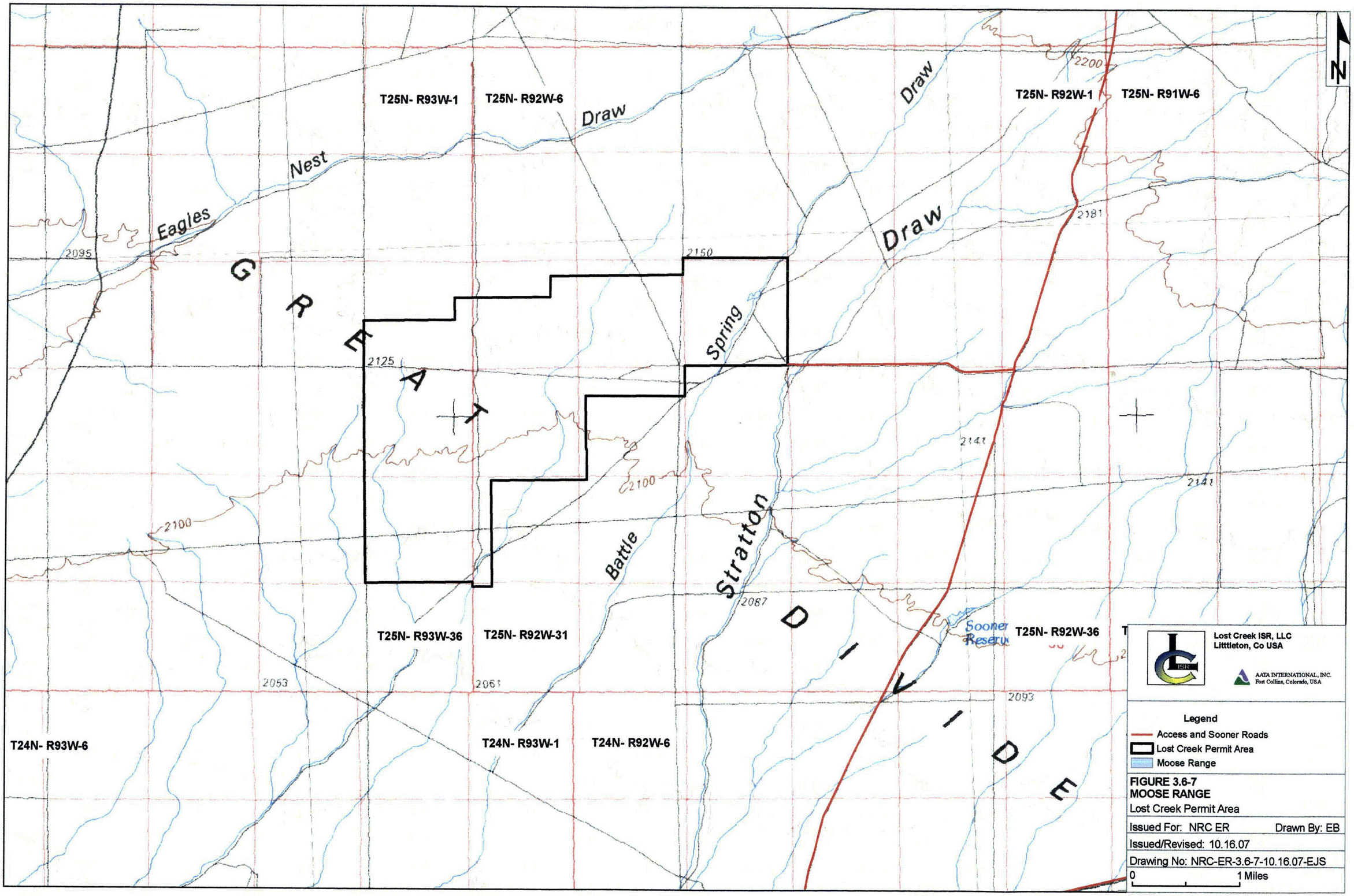


FIGURE 3.6-6
ELK RANGE
Lost Creek Permit Area

Issued For: NRC ER Drawn By: EB
Issued/Revised: 10.16.07
Drawing No: NRC-ER-3.6-6-10.16.07-EJS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T25N- R92W-6
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T25N- R91W-6
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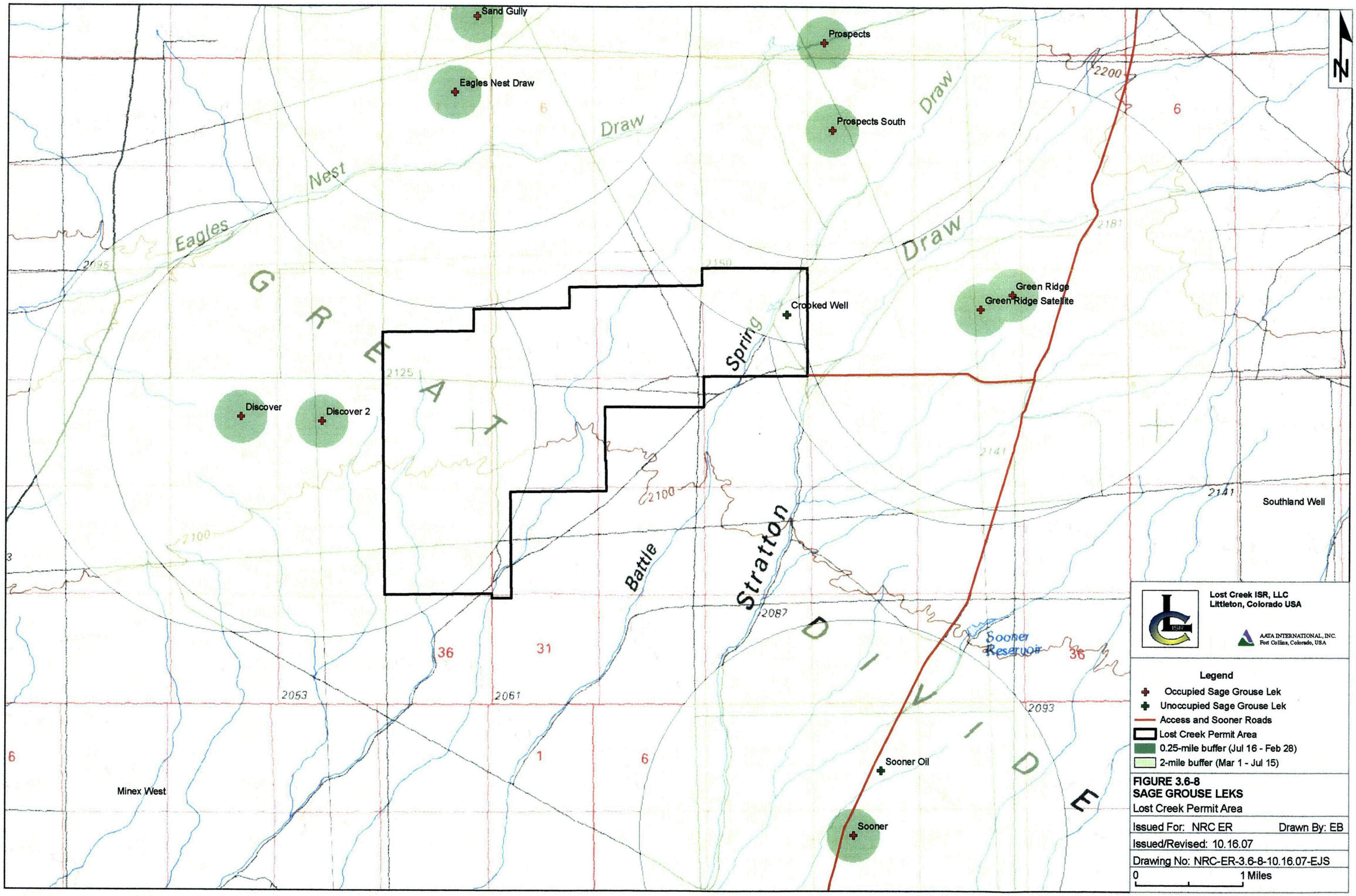
T25N- R92W-31
T25N- R92W-36
T24N- R93W-6
T24N- R93W-1
T24N- R92W-6
Eagles Nest Draw
Draw
Draw
Spring
Battle
Stratton
GRAY DIVIDE
Sooner Reserve
2200
2181
2150
2125
2100
2100
2095
2087
2141
2141
2053
2061
2093
Lost Creek ISR, LLC
Littleton, Co USA
AATA INTERNATIONAL, INC.
Fort Collins, Colorado, USA
Legend
Access and Sooner Roads
Lost Creek Permit Area
Moose Range
FIGURE 3.6-7
MOOSE RANGE
Lost Creek Permit Area
Issued For: NRC ER
Drawn By: EB
Issued/Revised: 10.16.07
Drawing No: NRC-ER-3.6-7-10.16.07-EJS
0
1 Miles


Sand Gully
Prospects
Eagles Nest Draw
Prospects South
Draw
Nest
Eagles
Draw
Draw
Green Ridge
Green Ridge Satellite
Crooked Well
Spring
G R E A T
Discover
Discover 2
Battle
Stratton
D I V I D E
Southland Well
Sooner Reservoir
Sooner Oil
Sooner
Minex West
2200
2181
2150
2125
2141
2100
2087
2053
2061
2093
36
31
6
1
N
Lost Creek ISR, LLC
Littleton, Colorado USA
AATA INTERNATIONAL, INC.
Fort Collins, Colorado, USA
Legend
Occupied Sage Grouse Lek
Unoccupied Sage Grouse Lek
Access and Sooner Roads
Lost Creek Permit Area
0.25-mile buffer (Jul 16 - Feb 28)
2-mile buffer (Mar 1 - Jul 15)
FIGURE 3.6-8
SAGE GROUSE LEKS
Lost Creek Permit Area
Issued For: NRC ER
Drawn By: EB
Issued/Revised: 10.16.07
Drawing No: NRC-ER-3.6-8-10.16.07-EJS
0
1 Miles

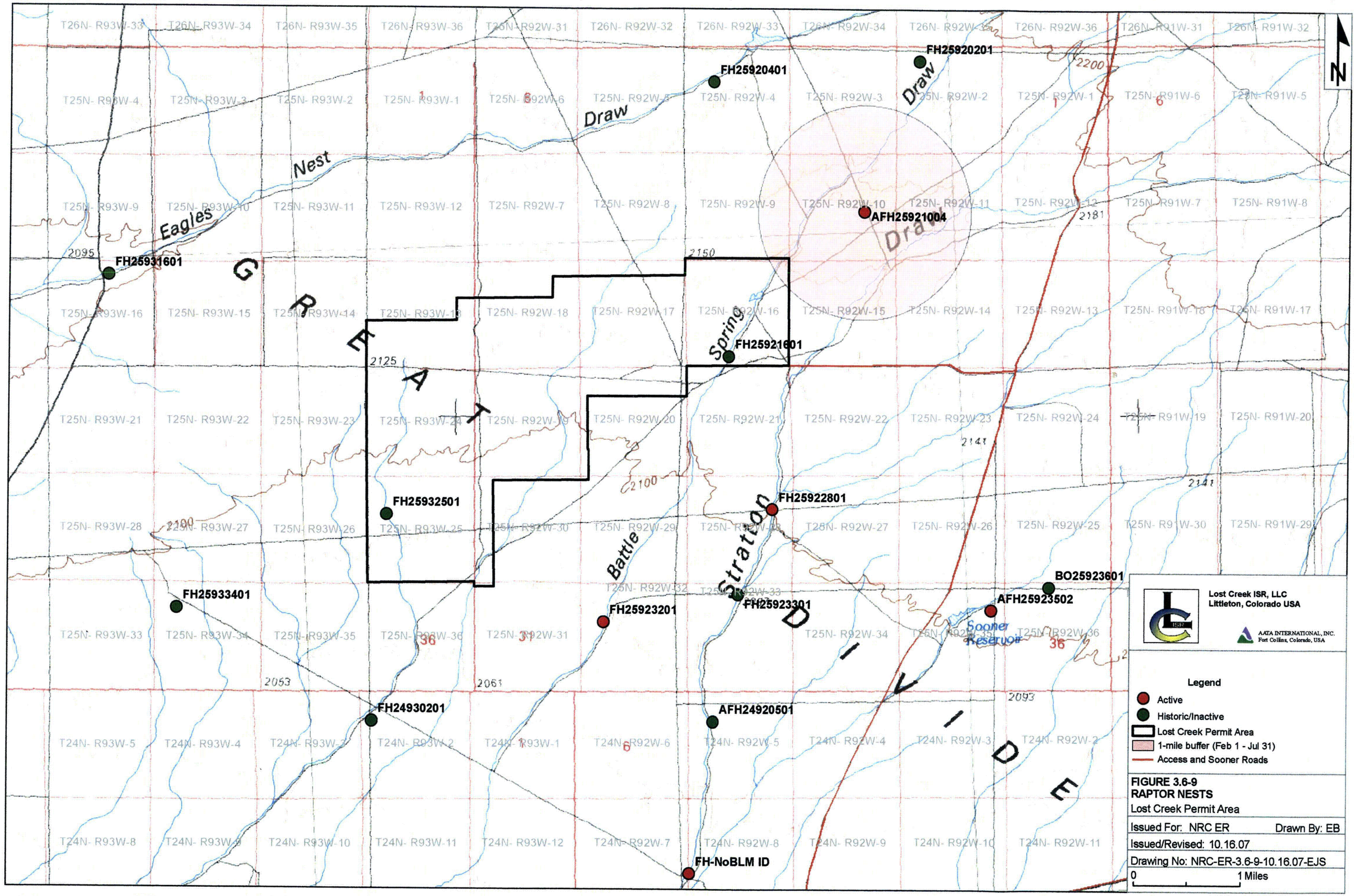


FIGURE 3.6-9
RAPTOR NESTS
Lost Creek Permit Area

Issued For: NRC ER Drawn By: EB
Issued/Revised: 10.16.07
Drawing No: NRC-ER-3.6-9-10.16.07-EJS

Table 3.6-1 Summary of Vegetation Data (Page 1 of 2)

Scientific Name	Common Name	Lost Creek Permit Area	
		Upland Big Sagebrush Shrubland	Lowland Big Sagebrush Shrubland
ANNUAL FORBS			
Alyssum desertorum	Desert Alyssum		x
Chenopodium album	Goosefoot		x
Chenopodium leptophyllum	Narrowleaf Goosefoot		x
Cordylanthus ramosus	Cordylanthus		x
Cryptantha minima	Small Cryptantha		x
Descurainia pinnata	Tansy Mustard		x
Gayophytum ramossissimum	Gaywings		x
Lupinus kingii	Annual Lupine	x	
Microsteris micrantha	Microsteris		x
Navarettia breweri	Navarettia		x
Polygonum aviculare	Devil's Shoestrings		x
Polygonum sawatchense	Sawatch Knotweed		x
Sisymbrium altissimum	Tumbling Hedge Mustard		x
PERENNIAL FORBS			
Allium textile	Prairie Onion	x	x
Antennaria rosea	Pussytoes		x
Arabis sp.	Rockcress	x	x
Astragalus mollissimus	Woolly Milkvetch	x	
Astragalus sericoleucus	Silky Milkvetch	x	
Crepis occidentalis	Hawksbeard		x
Cryptantha thrysiflora	Cryptantha	x	
Erigeron pumilus	Fleabane	x	
Hymenoxis acaulis	Stemless Actinea	x	
Lomatium orientale	Bisquitroot	x	
Machaeranthera canescens	Machaeranthera	x	
Sedum lanceolatum	Stonecrop	x	
Senecio integerrimus	Groundsel		x
Trifolium gymnocarpon	Hollyleaf Clover	x	x

Table 3.6-1 Summary of Vegetation Data (Page 2 of 2)

Scientific Name	Common Name	Lost Creek Permit Area	
		Upland Big Sagebrush Shrubland	Lowland Big Sagebrush Shrubland
COOL SEASON PERENNIAL GRASSES AND GRASSLIKE PLANTS			
Agropyron dasystachyum	Thickspike Wheatgrass	x	x
Agropyron smithii	Western Wheatgrass		x
Agropyron spicatum	Bluebunch Wheatgrass	x	x
Carex douglasii	Douglas Sedge		x
Carex eleocharis	Spikerush Sedge		x
Elymus cinereus	Great Basin Wildrye		x
Hordeum jubatum	Foxtail Barley		x
Koeleria macrantha	Prairie Junegrass	x	x
Muhlenbergia richardsonis	Mat Muhly		x
Oryzopsis hymenoides	Indian Ricegrass	x	x
Poa secunda	Sandberg Bluegrass	x	x
Sitanion longifolium	Squirreltail Grass	x	x
Stipa comata	Needle-and-thread Grass	x	x
Stipa lettermannii	Lettermann Needlegrass		x
CUSHION PLANTS			
Arenaria hookeri	Hooker's Sandwort	x	x
Astragalus spatulatus	Spatulate Leaf Milkvetch	x	
Eriogonum acaule	Stemless Buckwheat	x	x
Eriogonum ovalifolium	Oval Leaved Buckwheat	x	x
Haplopappus acaulis	Stemless Goldenweed	x	
Paronychia sessiliflora	Nailwort	x	
Phlox hoodii	Hood's Phlox	x	x
SEMI-SHRUBS			
Artemisia frigida	Fringed Sagewort	x	
Artemisia spinescens	Bud Sage	x	
Ceratoides lanata	Winterfat	x	x
Gutierrezia sarothrae	Broom Snakeweed	x	
Leptodactylon pungens	Leptodactylon	x	x
SHRUBS			
Artemisia tridentata	Big Sagebrush	x	x
Chrysothamnus nauseosus	Rubber Rabbitbrush	x	x
Chrysothamnus viscidiflorus	Rabbitbrush	x	x
CACTUS			
Opuntia polyacantha	Plains Prickly Pear Cactus	x	x
LICHEN			
Parmelia chlorochroa (lichen)	Parmelia	x	x

Table 3.6-2 Rare Plant Species (Page 1 of 2) *

Scientific Name	Common Name	Local Distribution	Heritage [1]/ State Rank [2]	Federal Status [3]
Artemisia biennis var *diffusa*	Mystery Wormwood	Central Sweetwater Co.	G5T1Q/S1	C2
Asclepias uncialis	Dwarf Milkweed	Northwestern Sweetwater Co.	G3/SH	C2, S-R2
Astragalus jejunus var. *jejunus*	Starveling Milkvetch	Eastern and Western edges of Sweetwater Co.	G3T1/S1	C2
Astragalus proimanthus	Precocious Milkvetch	Extreme southwestern Sweetwater Co.	G1/S1	C2
Cirsium ownbeyi	Ownbey's Thistle	South-central Sweetwater Co.	G3/S1	C2
Descurainia torulosa	Wyoming Tansy Mustard	South-central Sweetwater Co.	G1/S1	C2, S-R2, S-R4
Lesquerella macrocarpa	Large-fruited Bladderpod	North-central Sweetwater Co.	G2/S2	C2
Oryzopsis contracta	Contracted Indian Ricegrass	Northeast, northwest and southwest Sweetwater Co.	G3/S3	C2
Penstemon acaulis var *acaulis*	Stemless Beardtongue	Extreme southwestern Sweetwater Co.	G3/S1	C2, S-R4
Penstemon gibbensii	Gibben's Beardtongue	Extreme southeastern Sweetwater Co.	G1/S1	C2
Phlox opalensis	Opal Phlox	Central part of western Sweetwater Co.	G1/S1	C2
Thelesperma caespitosum	Green River Greenthread	Southwestern Sweetwater Co.	G1/S1	C2, S-R4

* (USGS, 2006b)

[1] **Heritage Rank Codes:**

G1: Critically imperiled globally because of extreme rarity (5 or fewer occurrences, or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction (Critically endangered throughout its range).

G2: Imperiled globally because of rarity (6 to 20 occurrences) or because of other factors demonstrably making it very vulnerable to extinction throughout its range. (Endangered throughout its range).

G3: Very rare or local throughout its range or found locally in a restricted range (21 to 100 occurrences. (Threatened throughout its range).

Table 3.6-2 Rare Plant Species (Page 2 of 2)

G4: Apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery.
G5: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
T1: The variety is critically imperiled globally because of extreme rarity (5 or fewer occurrences, or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction (Critically endangered throughout its range).
Q: Indicates uncertainty about taxonomic status.

[2] **State Rank Codes:**

S1: Critically imperiled in state because of extreme rarity (5 or fewer occurrences, or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extirpation from the state. (Critically endangered in state).
S2: Imperiled in state because of rarity (6 to 20 occurrences) or because of other factors demonstrably making it very vulnerable to extirpation from the state (Endangered or threatened in state).
S3: Rare in state (21 to 100 occurrences)
SH: Of historical occurrence, not documented in Wyoming since 1920.

[3] **Federal Status Codes:**

C2: Notice of Review, Category 2: taxa for which current information indicates that proposing to list as endangered or threatened is possible, but appropriate or substantial biological information is not on file to support an immediate rulemaking.
S: Sensitive: those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by:
a. Significant current or predicted downward tends in population numbers or density.
b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.
R: Forest Region

Table 3.6-3 Prohibited and Restricted Noxious Weeds *

Scientific Name	Common Name	Lost Creek Permit Area	
		Upland Big Sagebrush Shrubland	Lowland Big Sagebrush Shrubland
PROHIBITED NOXIOUS (DESIGNATED WEEDS)			
Agropyron repens	Quackgrass		
Arctium minus	Common Burdock		
Cardaria draba	Hoarycress		
Cardaria pubescens	Hoarycress		
Carduus acanthoides	Plumeless Thistle		
Carduus nutans	Musk Thistle		
Centaurea maculosa	Spotted Knapweed		
Centaurea repens	Russian Knapweed		
Chrysanthemum leucanthemum	Ox-eye Daisy		
Cirsium arvense	Canada Thistle		
Convolvulus arvensis	Field Bindweed		
Cynoglossum officinale	Hound's Tongue		
Euphorbia esula	Leafy Spurge		
Franseria discolor	Skeletonleaf Bursage		
Isatis tinctoria	Dyer's Woad		
Lepidium latifolium	Perennial Pepperweed		
Linaria dalmatica	Dalmatian Toadflax		
Linaria vulgaris	Butter and Eggs		
Onopordum acanthium	Scotch Thistle		
Sonchus arvensis	Perennial Sowthistle		
RESTRICTED NOXIOUS (DESIGNATED WEEDS)			
Ambrosia psilostachya	Western Ragweed		
Avena fatua	Wild Oats		
Centaurea diffusa	Diffuse Knapweed		
Centaurea solstitialis	Yellow Starthistle		
Chorispora tenella	Blue Mustard		
Cucusta spp.	Dodder		
Descurainia pinnata	Tansy Mustard		x
Glycyrrhiza lepidota	Wild Licorice		
Iva axillaris	Poverty Sumpweed		
Lactuca pulchella	Blue Lettuce		
Plantago lanceolata	English Plantain		
Sphaerophysa salsula	Austrian Peaweed		
Tanacetum vulgare	Tansy		
Tribulus terrestris	Puncture Vine		

* (WDEQ-LQD, 1997)

Table 3.6-4 Wildlife Species Observed or Potentially Occurring in the Permit Area (Page 1 of 6) *

Common Name	Scientific Name	Abundance Code [1]	Status [2]	Confirmed on Site
BIRDS				
Pied-billed Grebe	*Podilymbus podiceps*	Fairly Common		
Eared Grebe	*Podiceps nigricollis*	Uncommon		
American White Pelican	*Pelecanus erythrorhynchos*	Fairly Common	NSS3	
Great Blue Heron	*Ardea herodias*	Uncommon	NSS4	
Snowy Egret	*Egretta thula*	Rare	NSS3	
Black-crowned Night-Heron	*Nycticorax nycticorax*	Uncommon		
Canada Goose	*Branta canadensis*	Uncommon		x
Green-winged Teal	*Anas crecca*	Uncommon		
Mallard	*Anas platyrhynchos*	Fairly Common		x
Northern Pintail	*Anas acuta*	Uncommon	NSS3	
Gadwall	*Ana strepera*	Uncommon		
Blue-winged Teal	*Anas discors*	Fairly Common		
Cinnamon Teal	*Anas cyanoptera*	Fairly Common		
Northern Shoveler	*Anas clypeata*	Uncommon		
American Wigeon	*Anas americana*	Uncommon		
Canvasback	*Aythya valisineria*	Rare	NSS3	
Redhead	*Aythya americana*	Rare	NSS3	
Common Goldeneye	*Bucephala clangula*	Uncommon		
Bufflehead	*Bucephala albeola*	Uncommon		
Hooded Merganser	*Lophodytes cucullatus*	Uncommon		
Common Merganser	*Mergus merganser*	Fairly Common		
Ruddy Duck	*Oxyura jamaicensis*	Uncommon		
Turkey Vulture	*Cathartes aura*	Common		x
Osprey	*Pandion haliaetus*	Rare		
Bald Eagle	*Haliaeetus leucocephalus*	Unknown	MBHFI, FT, NSS2	
Northern Harrier	*Circus cyaneus*	Common		x
Sharp-shinned Hawk	*Accipiter striatus*	Uncommon		x
Cooper's Hawk	*Accipiter cooperii*	Uncommon		
Northern Goshawk	*Accipiter gentilis*	Uncommon	SSS, NSS4	
Swainson's Hawk	*Buteo swainsoni*	Common	BCC, MBHFI, NSS4	x
Red-tailed Hawk	*Buteo jamaicensis*	Common		x
Ferruginous Hawk	*Buteo regalis*	Common	BCC, MBHFI, SSS, NSS3	x
Rough-legged Hawk	*Buteo lagopus*	Common		x
Golden Eagle	*Aquila chrysaetos*	Common	BCC	x
American Kestrel	*Falco sparverius*	Common		x
Merlin	*Falco columbarius*	Unknown	MBHFI, NSS3	
Prairie Falcon	*Falco mexicanus*	Uncommon	BCC	x
Peregrine Falcon	*Falco peregrinus*	Unknown	BCC, MBHFI, SSS, NSS3	
Sage Grouse	*Centrocercus urophasianus*	Common	MBHFI, SSS, NSS2	x
Sora	*Porzana carolina*	Uncommon		
American Coot	*Fulica americana*	Uncommon		
Sandhill Crane	*Grus canadensis*	Rare	NSS3	
Killdeer	*Charadrius vociferus*	Common		x
Mountain Plover	*Charadrius montanus*	Unknown	BCC, MBHFI, SSS, NSS4	
American Avocet	*Recurvirostra americana*	Uncommon		
Greater Yellowlegs	*Tringa melanoleuca*	Uncommon		
Lesser Yellowlegs	*Tringa flavipes*	Uncommon		
Spotted Sandpiper	*Actitis macularia*	Fairly Common		

Table 3.6-4 Wildlife Species Observed or Potentially Occurring in the Permit Area (Page 2 of 6)

Common Name	Scientific Name	Abundance Code[1]	Status[2]	Confirmed on Site
Upland Sandpiper	*Bartramia longicauda*	Rare	BCC, MBHFI, NSS4	
Long-billed Curlew	*Numenius americanus*	Uncommon	BCC, MBHFI, SSS, NSS3	
Marbled Godwit	*Limosa fedoa*	Rare	BCC	
Wilson's Snipe	*Gallinago delicata*	Fairly Common		
Wilson's Phalarope	*Phalaropus tricolor*	Uncommon	BCC	
Franklin's Gull	*Larus pipixcan*	Uncommon		
Ring-billed Gull	*Larus delawarensis*	Uncommon		
California Gull	*Larus californicus*	Uncommon		
Rock Dove	*Columba livia*	Common		
Band-tailed Pigeon	*Columba fasciata*	Unknown		
Mourning Dove	*Zenaida macroura*	Abundant		x
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Rare	MBHFI	
Great Horned Owl	*Bubo virginianus*	Fairly Common		
Snowy Owl	*Nyctea scandiaca*	Unknown		
Western Burrowing Owl	*Athene cunicularia*	Uncommon	MBHFI, SSS, NSS4	
Long-eared Owl	*Asio otus*	Uncommon		
Short-eared Owl	*Asio flammeus*	Uncommon	MBHFI, NSS4	
Common Nighthawk	*Chordeiles minor*	Common		
Common Poorwill	*Phalaenoptilus nuttallii*	Uncommon		
White-throated Swift	*Aeronautes saxatalis*	Uncommon		
Broad-tailed Hummingbird	*Selasphorus platycercus*	Rare		
Rufous Hummingbird	*Selasphorus rufus*	Rare		
Downy Woodpecker	*Picoides pubescens*	Uncommon		
Hairy Woodpecker	*Picoides villosus*	Rare		
Northern Flicker	*Colaptes auratus*	Uncommon		
Western Wood-Pewee	*Contopus sordidulus*	Fairly Common		
Empidonax Species	*Empidonax spp.*	Common		
Willow Flycatcher	*Empidonax traillii*	Fairly Common	NSS3	
Hammond's Flycatcher	*Empidonax hammondii*	Uncommon		
Gray Flycatcher	*Empidonax wrightii*	Common		
Dusky Flycatcher	*Empidonax oberholseri*	Common		
Say's Phoebe	*Sayornis saya*	Common		
Cassin's Kingbird	*Tyrannus vociferans*	Uncommon	MBHFI	
Western Kingbird	*Tyrannus verticalis*	Common		
Eastern Kingbird	*Tyrannus tyrannus*	Fairly Common		
Horned Lark	*Eremophila alpestris*	Abundant		x
Tree Swallow	*Tachycineta bicolor*	Fairly Common		
Violet-green Swallow	*Tachycineta thalassina*	Fairly Common		
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	Fairly Common		
Bank Swallow	*Riparia riparia*	Common		
Cliff Swallow	*Petrochelidon pyrrhonota*	Common		
Barn Swallow	*Hirundo rustica*	Fairly Common		
Steller's Jay	*Cyanocitta stelleri*	Uncommon		
Pinyon Jay	*Gymnorhinus cyanocephalus*	Rare		
Clark's Nutcracker	*Nucifraga columbiana*	Fairly Common		
Black-billed Magpie	*Pica pica*	Abundant		
American Crow	*Corvus brachyrhynchos*	Fairly Common		x
Common Raven	*Corvus corax*	Abundant		x
Black-capped Chickadee	*Poecile atricapillus*	Uncommon		
Mountain Chickadee	*Poecile gambeli*	Uncommon		
Red-breasted Nuthatch	*Sitta canadensis*	Fairly Common		

Table 3.6-4 Wildlife Species Observed or Potentially Occurring in the Permit Area (Page 3 of 6)

Common Name	Scientific Name	Abundance Code [1]	Status [2]	Confirmed on Site
White-breasted Nuthatch	*Sitta carolinensis*	Rare		
Brown Creeper	*Certhia americana*	Uncommon		
Rock Wren	*Salpinctes obsoletus*	Common		
House Wren	*Troglodytes aedon*	Uncommon		
Western Bluebird	*Sialia mexicana*	Rare		
Mountain Bluebird	*Sialia currucoides*	Common		
Townsend's Solitaire	*Myadestes townsendi*	Uncommon		
Veery	*Catharus fuscescens*	Uncommon		
Swainson's Thrush	*Catharus ustulatus*	Uncommon		
Hermit Thrush	*Catharus guttatus*	Uncommon		
American Robin	*Turdus migratorius*	Common		x
Gray Catbird	*Dumetella carolinensis*	Uncommon		
Northern Mockingbird	*Mimus polyglottos*	Uncommon		
Sage Thrasher	*Oreoscoptes montanus*	Common	MBHFI, SSS, NSS4	x
European Starling	*Sturnus vulgaris*	Fairly Common		
Bohemian Waxwing	*Bombycilla garrulus*	Uncommon		
Cedar Waxwing	*Bombycilla cedrorum*	Uncommon		
Northern Shrike	*Lanius excubitor*	Uncommon		
Loggerhead Shrike	*Lanius ludovicianus*	Common	BCC, MBHFI, SSS	x
Warbling Vireo	*Vireo gilvus*	Uncommon		
Yellow Warbler	*Dendroica petechia*	Fairly Common		
Yellow-rumped Warbler	*Dendroica coronata*	Fairly Common		
American Redstart	*Setophaga ruticilla*	Uncommon		
Northern Waterthrush	*Seiurus noveboracensis*	Rare		
MacGillivray's Warbler	*Oporornis tolmiei*	Uncommon		
Common Yellowthroat	*Geothlypis trichas*	Uncommon		
Yellow-breasted Chat	*Icteria virens*	Uncommon		
Western Tanager	*Piranga ludoviciana*	Uncommon		
Black-headed Grosbeak	*Pheucticus melanocephalus*	Rare		
Blue Grosbeak	*Guiraca caerulea*	Rare		
Lazuli Bunting	*Passerina amoena*	Uncommon		
Indigo Bunting	*Passerina cyanea*	Unknown		
Green-tailed Towhee	*Pipilo chlorurus*	Common		
Spotted Towhee	*Pipilo maculatus*	Fairly Common		
American Tree Sparrow	*Spizella arborea*	Uncommon		x
Chipping Sparrow	*Spizella passerina*	Uncommon		x
Clay-colored Sparrow	*Spizella pallida*	Rare		x
Brewer's Sparrow	*Spizella breweri*	Common	BCC, MBHFI, SSS, NSS4	x
Vesper Sparrow	*Pooecetes gramineus*	Common	MBHFI	x
Lark Sparrow	*Chondestes grammacus*	Common	MBHFI	x
Sage Sparrow	*Amphispiza belli*	Fairly Common	MBHFI, SSS, NSS4	x
Lark Bunting	*Calamospiza melanocorys*	Common	MBHFI, NSS4	
Savannah Sparrow	*Passerculus sandwichensis*	Uncommon		
Grasshopper Sparrow	*Ammodramus savannarum*	Uncommon	MBHFI, NSS4	
Song Sparrow	*Melospiza melodia*	Uncommon		
White-crowned Sparrow	*Zonotrichia leucophrys*	Uncommon		
Dark-eyed Junco	*Junco hyemalis*	Common		
McCown's Longspur	*Calcarius mccownii*	Uncommon	BCC, MBHFI, NSS4	
Chestnut-collared Longspur	*Calcarius ornatus*	Unknown	MBHFI, NSS4	
Snow Bunting	*Plectrophenax nivalis*	Unknown		

Table 3.6-4 Wildlife Species Observed or Potentially Occurring in the Permit Area (Page 4 of 6)

Common Name	Scientific Name	Abundance Code[1]	Status[2]	Confirmed on Site
Bobolink	*Dolichonyx oryzivorus*	Rare	MBHFI, NSS4	
Red-winged Blackbird	*Agelaius phoeniceus*	Abundant		
Western Meadowlark	*Sturnella neglecta*	Abundant		x
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	Rare		
Brewer's Blackbird	*Euphagus cyanocephalus*	Abundant		
Common Grackle	*Quiscalus quiscula*	Fairly Common		
Brown-headed Cowbird	*Molothrus ater*	Fairly Common		
Bullock's Oriole	*Icterus bullockii*	Rare		
Gray-crowned Rosy Finch	*Leucosticte tephrocotis*	Fairly Common		
Cassin's Finch	*Carpodacus cassinii*	Uncommon		
House Finch	*Carpodacus mexicanus*	Uncommon		
Red Crossbill	*Loxia curvirostra*	Uncommon		
Pine Siskin	*Carduelis pinus*	Uncommon		
American Goldfinch	*Carduelis tristis*	Fairly Common		
House Sparrow	*Passer domesticus*	Uncommon		

Table 3.6-4 Wildlife Species Observed or Potentially Occurring in the Permit Area (Page 5 of 6)

Common Name	Scientific Name	Abundance Code [1]	Status [2]	Confirmed on Site
MAMMALS				
Masked Shrew	*Sorex cinereus*	Fairly Common		
Pygmy Shrew	*Sorex hoyi*	Rare		
Dusky Shrew	*Sorex monticolus*	Fairly Common		
Dwarf Shrew	*Sorex nanus*	Rare	NSS3	
Vagrant Shrew	*Sorex vagrans*	Rare	NSS3	
Western Small-footed Myotis	*Myotis ciliolabrum*	Uncommon	NSS3	
Long-eared Myotis	*Myotis evotis*	Uncommon	SSS	
Little Brown Myotis	*Myotis lucifugus*	Fairly Common	NSS3	
Long-legged Myotis	*Myotis volans*	Unknown	NSS2	
Hoary Bat	*Lasiurus cinereus*	Rare	NSS4	
Silver-haired Bat	*Lasionycteris noctivagans*	Uncommon	NSS4	
Big Brown Bat	*Eptesicus fuscus*	Fairly Common	NSS3	
Townsend's Big-eared Bat	*Plecotus townsendii*	Rare	SSS, NSS2	
Pallid Bat	*Antrozous pallidus*	Rare	NSS2	
Pygmy Rabbit	*Brachylagus idahoensis*	Common	SSS, NSS3	x
Desert Cottontail	*Sylvilagus audubonii*	Common		x
Mountain Cottontail	*Sylvilagus nuttallii*	Fairly Common		
White-tailed Jackrabbit	*Lepus townsendii*	Common		x
Least Chipmunk	*Tamias minimus*	Common		x
Wyoming Ground Squirrel	*Spermophilus elegans*	Common		x
Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	Common		x
White-tailed Prairie Dog	*Cynomys leucurus*	Uncommon	SSS, NSS4	
Northern Pocket Gopher	*Thomomys talpoides*	Common		
American Beaver	*Castor canadensis*	Common		
Olive-backed Pocket Mouse	*Perognathus fasciatus*	Common	NSS3	
Ord's Kangaroo Rat	*Dipodomys ordii*	Common		x
Western Harvest Mouse	*Reithrodontomys megalotis*	Uncommon		
Deer Mouse	*Peromyscus maniculatus*	Abundant		x
Northern Grasshopper Mouse	*Onychomys leucogaster*	Fairly Common		
Bushy-tailed Woodrat	*Neotoma cinerea*	Fairly Common		
House Mouse	*Mus musculus*	Uncommon		
Long-tailed Vole	*Microtus longicaudus*	Fairly Common		
Montane Vole	*Microtus montanus*	Common		
Prairie Vole	*Microtus ochrogaster*	Fairly Common	NSS3	
Sagebrush Vole	*Lemmiscus curtatus*	Fairly Common		
Western Jumping Mouse	*Zapus princeps*	Uncommon		
Common Porcupine	*Erethizon dorsatum*	Uncommon		
Coyote	*Canis latrans*	Abundant		x
Red Fox	*Vulpes vulpes*	Common		x
Raccoon	*Procyon lotor*	Rare		x
Long-tailed Weasel	*Mustela frenata*	Fairly Common		x
Black-footed Ferret	*Mustela nigripes*	Unknown	FE/NSS1	
American Badger	*Taxidea taxus*	Common		x
Western Spotted Skunk	*Spilogale gracilis*	Unknown		
Striped Skunk	*Mephitis mephitis*	Common		x
Mountain Lion	*Felis concolor*	Uncommon		
Bobcat	*Lynx rufus*	Fairly Common		x
American Elk	*Cervus elaphus*	Common		x
Mule Deer	*Odocoileus hemionus*	Abundant		x
Pronghorn	*Antilocapra americana*	Common		x
Feral Horse	*Equus caballus*	Common		x

Table 3.6-4 Wildlife Species Observed or Potentially Occurring in the Permit Area (Page 6 of 6)

Common Name	Scientific Name	Abundance Code [1]	Status [2]	Confirmed on Site
AMPHIBIANS				
Tiger Salamander	*Ambystoma tigrinum*	Fairly Common		
Great Basin Spadefoot Toad	*Spea intermontana*	Unknown	SSS	
Western Chorus Frog	*Pseudacris triseriata*	Unknown		
Northern Leopard Frog	*Rana pipiens*	Rare	SSS	
REPTILES				
Northern Sagebrush Lizard	*Sceloporus graciosus*	Common		
Greater Short-horned Lizard	*Phrynosoma hernandesi*	Common		x
Great Basin Gopher Snake	*Pituophis catenifer*	Rare		
Western Terrestrial Garter Snake	*Thamnophis elegans*	Fairly Common		x
Prairie Rattlesnake	*Crotalus viridis*	Uncommon		x

* (Wyoming Game and Fish Department, 2005)

[1] **Abundance Codes**

Abundant - A species that inhabits much of the preferred habitat within its range. The species or its sign is typically encountered while using survey techniques that could be expected to indicate its presence.

Common - A species that inhabits much of the preferred habitat within its range. The species or its sign is usually encountered while using survey techniques that could be expected to indicate its presence.

Uncommon - A species that is common only in limited areas within its range or is found throughout its range in relatively low densities. Intensive surveying is usually required to locate the species or its sign.

Rare - A species that occupies only a small percentage of the preferred habitat within its range or is found throughout its range in extremely low densities. The species or its sign is seldom encountered while using survey techniques that could be expected to indicate its presence.

Unknown - Insufficient information is available to determine abundance. Species is difficult to observe without specialized survey techniques.

[2] **Status**

Federal – Endangered Species Act

FT - Federally listed threatened species

Federal – Migratory Bird Treaty Act

BCC - Birds of Conservation Concern species identified by the USFWS as those migratory non-game birds that without additional conservation actions are likely to become candidates for listing under the Endangered Species Act.

Federal – Migratory Birds of High Federal Interest in Wyoming

MBHFI - Listed utilized by the USFWS, Wyoming Field Office for reviews concerning existing or proposed coal mine leased land.

BLM – Special Status Species

SSS - BLM Special Status Species are species protected under the Endangered Species Act and those designated by the State Director as Sensitive. Sensitive species are those under status review by the FWS/National Marine and Fisheries Service (NMFS), or whose numbers are declining so rapidly that Federal listing may become necessary, or with typically small or widely dispersed populations, or those inhabiting ecological refugia or other specialized or unique habitats. The minimum level of policy protection for these designated sensitive species will be the same as policy for candidate

State – Native Species Status

NSS1 - Native Species Status 1 - Populations are greatly restricted or declining, extirpation appears possible and on-going significant loss of habitat.

NSS2 - Native Species Status 2 - Populations are declining, extirpation appears possible; habitat is restricted or vulnerable but no recent or on-going significant loss; species may be sensitive to human disturbance.

NSS3 - Native Species Status 3 - Populations are greatly restricted or declining, extirpation appears possible; habitat is not restricted, vulnerable but no loss; species is not sensitive to human disturbance.

NSS4 - Native Species Status 4 - Populations are greatly restricted or declining, extirpation appears possible; habitat is stable and not restricted.

Table 3.6-5 Relative Abundance of Big Game Observations

Month	Species	Habitat Type	
		Upland Sagebrush	Lowland Sagebrush
March	Pronghorn	High	High
March	Elk	Low	Low
April	Pronghorn	High	High
June	Pronghorn	Medium	Medium
July	Mule Deer	Low	--
July	Elk	Low	--
July	Pronghorn	Medium	Medium

Table 3.6-6 Sage Grouse Lek Counts

Lek	Location	Lek Attendance 2006															
		April 8				April 13 & 14				April 20 & 21				April 29			
		Male	Female	Unknown	Total	Male	Female	Unknown	Total	Male	Female	Unknown	Total	Male	Female	Unknown	Total
Crooked Well	T25N R92W Section 16	0	2	0	2	0	0	0	0	0	0	0	0	--	--	--	--
Discover	T25N R93W Section 22	59	30	3	92	19	23	4	46	69	10	0	79	--	--	--	--
Discover 2	T25N R93W Section 23	--[1]	--	--	--	17	14	0	31	22	10	0	32	29	6	0	35
Eagles Nest Draw	T25N R93W Section 01	57	37	7	101	8	6	4	18	6	2	0	8	--	--	--	--
Green Ridge	T25N R92W Section 14	40	45	0	85	61	38	0	99	39	11	0	50	--	--	--	--
Prospects	T26N R92W Section 34	41	29	0	70	41	12	0	53	64	14	0	78	--	--	--	--
Sand Gully	T26N R93W Section 36	99	8	9	116	126	62	30	218	97	23	0	120	--	--	--	--

Lek	Location	Lek Attendance 2007											
		April 3 and 4				April 10 and 11				April 17 and 18			
		Male	Female	Unknown	Total	Male	Female	Unknown	Total	Male	Female	Unknown	Total
Crooked Well	T25N R92W Section 16	4	0	0	4	0	0	0	0	0	0	0	0
Discover	T25N R93W Section 22	15	19	0	34	23	0	0	23	19	7	0	26
Discover 2	T25N R93W Section 23	2	0	0	2	3	0	0	3	12	0	0	12
Eagles Nest Draw	T25N R93W Section 01	13	6	0	19	22	3	0	25	6	4	0	10
Green Ridge Satellite	T25N R92W Section 14	--	--	--	--	8	0	0	8	5	0	0	1
Green Ridge	T25N R92W Section 14	62	17	0	79	73	4	0	77	82	13	0	95
Prospects	T26N R92W Section 34	66	15	0	81	59	6	0	66	64	15	0	79
Prospects South	T25N R92W Section 03	0	0	0	0	7	0	0	7	10	0	0	10
Sand Gully	T26N R93W Section 36	108	18	0	136	58	30	0	88	88	13	0	102
Sooner	T24N R92W Section 9	28	6	0	34	36	0	36	0	32	0	0	32
Sooner Oil	T24N R92W Section 4	0	0	0	0	0	0	0	0	0	0	0	0

[1] -- Not Surveyed on the date shown.

Table 3.6-7 Raptor Nest Locations

Nest ID Number	Species	Claim Area	PLSS Location	UTM Location	Nest Status	Nest Substrate	Nest Condition	Notes
FH25921001	Ferruginous Hawk	Lost Creek	T25N R92W SENW Section 10	0268009E 4670752N	Gone	--	Gone	Historic nest first observed 1976
FH25921002	Ferruginous Hawk	Lost Creek	T25N R92W NWSW Section 10	0267800E 4670534N	Gone	--	Gone	Historic nest first observed 1976
FH25921003	Ferruginous Hawk	Lost Creek	T25N R92W CSE Section 10	0268722E 4670325N	Gone	--	Gone	First observed in 1989
AFH25921004	Ferruginous Hawk	Lost Creek	T25N R92W NWSE Section 10	0268595E 4670503N	Active	Artifical Nest Structure	Good	Within 1-mile buffer
FH25921501	Ferruginous Hawk	Lost Creek	T25N R92W NWSW Section 15	0268071E 4668399N	Gone	--	Gone	Historic nest first observed 1976
FH25921502	Ferruginous Hawk	Lost Creek	T25N R92W NENE Section 15	0269053E 4669519N	Gone	--	Gone	Historic nest first observed 1976
FH25921601	Ferruginous Hawk	Lost Creek	T25N R92W SESW Section 16	0266480E 4668397N	Inactive Dilapidated	Sagebrush	Poor	Stick nest, in claim area
FH25922101	Ferruginous Hawk	Lost Creek	T25N R92W SENE Section 21	0267316E 4667392N	Gone	--	Gone	Historic nest first observed 1976
FH25922801	Ferruginous Hawk	Lost Creek	T25N R92W SENE Section 28	0267066E 4665882N	Active	Artifical Nest Structure	Good	Outside 1-mile buffer
FH25923201/AFH25923203	Ferruginous Hawk	Lost Creek	T25N R92W SWNW Section 32	0264483E 4664481N/ 0264660E 4664493N	Active	Artifical Nest Structure	Good	Outside 1-mile buffer
FH25923202	Ferruginous Hawk	Lost Creek	T25N R92W NENW Section 32	0264575E 4664572N	Gone	--	Gone	
No BLM ID Assigned	Ferruginous Hawk	Lost Creek	T24N R92W NWSW Section 8	0265632E 4660464N	Active	Artifical Nest Structure	Good	Outside 1-mile buffer

Table 3.6-8 T & E Wildlife Species Potentially Occurring in the Permit Area

Species	Status	Survey Techniques	Potential Occurrence
Birds			
Bald Eagle	Threatened	Raptor nest surveys and other spring surveys completed 2006 and 2007.	Unlikely except as migrant through the area. Preferred habitat characteristics are lacking in permit area.
Mammals			
Black-footed Ferret	Endangered	Aerial and ground surveys found no habitat (active prairie dog colonies).	No active prairie dog colonies in or near claim area.

Table 3.6-9 Wildlife Species of Special Concern (Page 1 of 2)

Species	Status [1]	Preferred Habitat	Potential Occurrence	Identified on the Permit Site
Birds				
American White Pelican	NSS3	Big rivers, lakes, reservoirs, estuaries, islands, peninsulas	Unlikely	
Great Blue Heron	NSS4	Wetlands, water banks, rivers, lakes, fields, meadows	Present	
Snowy Egret	NSS3	Marshes, water banks, and shallow rivers, lakes, ponds	Possible	
Northern Pintail	NSS3	Riparian/wetlands, rivers, lakes,ponds in grasslands, fields, boreal forest	Likely	
Canvasback	NSS3	Riparian/wetlands, big rivers, lakes,	Present	
Redhead	NSS3	Wetlands, lakes, rivers	Likely	
Sandhill Crane	NSS3	Wetlands, grasslands, banks of rivers, lakes, ponds	Possible	
Upland Sandpiper	NSS4	Fen, cropland, grassland, fields	Unlikely	
Long-billed Curlew	NSS3	Wetland/riparian, grassland, meadows	Unlikely	
Western Burrowing Owl	NSS4	Grasslands, deserts, and savannas in burrows	Likely	
Short-eared Owl	NSS4	Wetland, fen, grassland, cropland,	Possible	
Willow Flycatcher	NSS3	Riparian, shrubland, woodland	Possible	
Sage Thrasher	NSS4	Desert, shrubland, sagebrush plains	Present	
Brewer's Sparrow	NSS4	Desert, shrubland, sagebrush plains	Present	
Sage Sparrow	NSS4	Desert, shrubland, sagebrush	Present	
Lark Bunting	NSS4	Cropland, desert, grassland,	Likely	
Grasshopper Sparrow	NSS4	Grasslands, fields, savanna	Present	X
McCown's Longspur	NSS4	Cropland, grassland	Unlikely	
Chestnut-collared Longspur	NSS4	Cropland, desert, grassland	Unlikely	
Bobolink	NSS4	Wetland, cropland, grassland	Unlikely	

Table 3.6-9 Wildlife Species of Special Concern (Page 2 of 2)

Species	Status [1]	Preferred Habitat	Potential Occurrence	Identified on the Permit Site
Mammals				
Dwarf Shrew	NSS3	Wetlands in alpine, scree, conifer forest, grassland, shrubland, woodland	Possible	
Vagrant Shrew	NSS3	Wetland/riparian, fen, conifer forest, woodland, grassland, field, shrubland	Possible	
Western Small-footed Myotis	NSS3	Roost in rock crevices, caves, tunnels, under boulder, loose bark, buildings, mines in desert, badland, semiarid habitat	Possible	
Little Brown Myotis	NSS3	Roost in buildings, caves, hollow trees in fens, wetland/riparian, forests, shrublands, woodlands	Possible	
Long-legged Myotis	NSS2	Roosts in caves, mines, buildings, rock crevices, under bark, hollow trees in riparian, desert, forest, woodland	Possible	
Hoary Bat	NSS4	Roasts in tree foliage, rock crevices, tree trunks and cavities in riparian, conifer forest, woodland	Unlikely	
Silver-haired Bat	NSS4	Tree cavities of conifer forest adjacent to lakes, ponds, streams	Unlikely	
Big Brown Bat	NSS3	Roost in buildings, trees, rock crevices, tunnels, caves in woodlands and conifer forests	Possible	
Townsend's Big-eared Bat	NSS2	Roost in caves, mines, buildings, tree cavities in conifer forest, woodland sagebrush, riparian	Possible	
Pallid Bat	NSS2	Roost in rock crevices in desert and grasslands	Possible	
Pygmy Rabbit	NSS3	Burrows in dense big sagebrush and	Present	X
Olive-backed Pocket Mouse	NSS3	Burrows in cropland, grassland, shrubland	Likely	
Prairie Vole	NSS3	Burrows in grasslands, fields,	Likely	

[1] State – Native Species Status

NSS1 - Native Species Status 1 - Populations are greatly restricted or declining; extirpation appears possible and on-going significant loss of habitat.

NSS2 - Native Species Status 2 - Populations are declining, extirpation appears possible; habitat is restricted or vulnerable but no recent or on-going significant loss; species may be sensitive to human disturbance.

NSS3 - Native Species Status 3 - Populations are greatly restricted or declining, extirpation appears possible; habitat is not restricted, vulnerable but no loss; species is not sensitive to human disturbance.

NSS4 - Native Species Status 4 - Populations are greatly restricted or declining, extirpation appears possible; habitat is stable and not restricted.

Attachment 3.6-1 WGFD Wildlife Observations System Data

obs_number	district	form_number	obs_date	species_common	species_scientific	male_adult_qty	male_yrlg_qty	male_juv_qty	male_uncl_qty	male_est_count_flag	male_age	male_age_tag	female_adult_qty	female_yrlg_qty	female_juv_qty	female_uncl_qty	female_est_count_flag	female_age	female_age_tag	unk_adult_qty	unk_yrlg_qty	unk_juv_qty	unk_uncl_qty	unk_est_count_flag	unk_age	unk_age_tag	animal_activity	habitat	mortality	observer_activity	hunt_area	degree_block	utm_zone	utm_easing	utm_northing	datum	observer_name	user_id	append_date	other_info
3607900000406	LRO[1]	36079	4/2/1992	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	261604	4669009	NAD-83	ADMIN	ADMIN	4/2/1992	
2618900000106	LRO	26189	3/26/1988	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				0	0	0	1				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	262288	4669653	NAD-83	ADMIN	ADMIN	3/26/1988	
2618900000406	LRO	26189	3/26/1988	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				0	0	0	1				Courtship	OIL AND GAS SITES	NONE	Ground Trend Counts	9	0	13	262404	4668204	NAD-83	ADMIN	ADMIN	3/26/1988	
2473900000506	LRO	24739	3/30/1987	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				0	0	0	1				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	267199	4668044	NAD-83	ADMIN	ADMIN	3/30/1987	
2473900000406	LRO	24739	3/30/1987	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				0	0	0	1				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	266800	4668502	NAD-83	ADMIN	ADMIN	3/30/1987	
3417000000806	LRO	34170	4/19/1986	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				0	0	0	1				Loafing, Roosting; Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261578	4668232	NAD-83	ADMIN	ADMIN	4/19/1986	
3109800000606	LRO	31098	12/1/1982	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				0	0	0	2				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261976	4667774	NAD-83	ADMIN	ADMIN	12/1/1982	
3109600000606	LRO	31096	11/30/1982	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				0	0	0	2				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261232	4670244	NAD-83	ADMIN	ADMIN	11/30/1982	
3109600000806	LRO	31096	11/30/1982	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				0	1	0	0				Disturbed	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261067	4665358	NAD-83	ADMIN	ADMIN	11/30/1982	
3077700000306	LRO	30777	9/3/1982	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				1	0	0	0				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261976	4667774	NAD-83	ADMIN	ADMIN	9/3/1982	
3397500000806	LRO	33975	10/30/1975	EAGLE, GOLDEN	*AQUILA CHRYSAETOS*	0	0	0	0				0	0	0	0				0	0	0	2				Feeding	UNKNOWN	NONE	Casual observation	0	18	13	261405	4668015	NAD-83	ADMIN	ADMIN	10/30/1975	1
3397500000706	LRO	33975	10/30/1975	FALCON, PRAIRIE	*FALCO MEXICANUS*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	UNKNOWN	NONE	Casual observation	0	18	13	266679	4664837	NAD-83	ADMIN	ADMIN	10/30/1975	
4858600000306	LRO	48586	7/30/2003	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				1	0	5	0				0	0	0	0				Unknown	UNKNOWN	NONE	Unknow/ Undetermined	0	0	13	264803	4665716	NAD-83	BROWN	ffaulk	7/30/2003	

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obs_number	district	form_number	obs_date	species_common	species_scientific	male_adult_qty	male_yrlg_qty	male_juv_qty	male_uncl_qty	male_est_count_flag	male_age	male_age_tag	female_adult_qty	female_yrlg_qty	female_juv_qty	female_uncl_qty	female_est_count_flag	female_age	female_age_tag	unk_adult_qty	unk_yrlg_qty	unk_juv_qty	unk_uncl_qty	unk_est_count_flag	unk_age	unk_age_tag	animal_activity	habitat	mortality	observer_activity	hunt_area	degree_block	utm_zone	utm_easting	utm_northing	datum	observer_name	user_id	append_date	other_info
4846700000506	LRO	48467	3/22/2003	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				0	0	0	0				0	0	0	0				Territorial Behavior	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	267114	4669153	NAD-83	HIATT, GREG	emeyer	3/22/2003	
4766800000606	LRO	47668	4/6/2002	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	1	0	0	0				0	0	0	0				0	0	0	0				Courtship	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	267689	4668303	NAD-83	HIATT, GREG	emeyer	4/6/2002	
4766800000706	LRO	47668	4/6/2002	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				0	0	0	0				0	0	0	0				Territorial Behavior	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	267114	4669153	NAD-83	HIATT, GREG	emeyer	4/6/2002	
4625100000406	LRO	46251	3/23/2000	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				0	0	0	0				0	0	0	0				Territorial Behavior	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	9	0	13	266412	4669293	NAD-83	HIATT, GREG	emeyer	3/23/2000	
4625100000806	LRO	46251	3/23/2000	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				0	0	0	0				0	0	0	0				Sign: tracks, scat, etc.	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	HIATT, GREG	emeyer	3/23/2000	
4372400001606	LRO	43724	4/6/1998	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				0	0	0	0				0	0	0	0				Territorial Behavior	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	ADMIN	ADMIN	4/6/1998	
3736600000206	LRO	37366	4/5/1993	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	5	0	0	0				0	0	0	0				0	0	0	0				Courtship	SAGEBRUSH-GRASSLAND	Cause Undetermined	Unknow/ Undetermined	9	0	13	265999	4669307	NAD-83	ADMIN	ADMIN	4/5/1993	
3608000000406	LRO	36080	4/2/1992	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	6	0	0	0				0	0	0	0				0	0	0	0				Courtship	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	ADMIN	ADMIN	4/2/1992	
3604400000706	LRO	36044	3/21/1992	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	1	0	0	0				0	0	0	0				0	0	0	0				Disturbed	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	ADMIN	ADMIN	3/21/1992	
2978500000506	LRO	29785	3/9/1991	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	6	0	0	0				0	0	0	0				0	0	0	0				Courtship	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	ADMIN	ADMIN	3/9/1991	
2854600000506	LRO	28546	3/20/1990	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	13	0	0	0				0	0	0	0				0	0	0	0				Unknown	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	ADMIN	ADMIN	3/20/1990	
2746300000506	LRO	27463	4/13/1989	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	25	0	0	0				0	0	0	0				0	0	0	0				Courtship	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	ADMIN	ADMIN	4/13/1989	
2618700000706	LRO	26187	3/26/1988	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	10	0	0	0				2	0	0	0				0	0	0	0				Courtship	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	ADMIN	ADMIN	3/26/1988	
2618900000206	LRO	26189	3/26/1988	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	SAGEBRUSH-GRASSLAND	Predation	Unknown/ Undetermined	9	0	13	262032	4669439	NAD-83	ADMIN	ADMIN	3/26/1988	

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obs_number	district	form_number	obs_date	species_common	species_scientific	male_adult_qty	male_yrlg_qty	male_juv_qty	male_uncl_qty	male_est_count_flag	male_age	male_age_tag	female_adult_qty	female_yrlg_qty	female_juv_qty	female_uncl_qty	female_est_count_flag	female_age	female_age_tag	unk_adult_qty	unk_yrlg_qty	unk_juv_qty	unk_uncl_qty	unk_est_count_flag	unk_age	unk_age_tag	animal_activity	habitat	mortality	observer_activity	hunt_area	degree_block	utm_zone	utm_easting	utm_northing	datum	observer_name	user_id	append_date	other_info
2618900000304	LRO	26189	3/26/1988	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	SAGEBRUSH-GRASSLAND	Predation	Unknown/ Undetermined	9	0	13	260049	4669506	NAD-83	ADMIN	ADMIN	3/26/1988	
2473900000306	LRO	24739	3/30/1987	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	17	0	0	0				4	0	0	0				0	0	0	0				Courtship	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	ADMIN	ADMIN	3/30/1987	
3417100000206	LRO	34171	4/19/1986	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	30	0	0	0				0	0	0	0				0	0	0	0				Courtship	SAGEBRUSH-GRASSLAND	NONE	Ground Trend Counts	9	0	13	266412	4669293	NAD-83	ADMIN	ADMIN	4/19/1986	1
3417100000106	LRO	34171	4/19/1986	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				1	0	0	0				0	0	0	0				Escape: direct flight	SAGEBRUSH-GRASSLAND	NONE	Casual observation	9	0	13	263975	4668151	NAD-83	ADMIN	ADMIN	4/19/1986	1
3397600000206	LRO	33976	10/30/1975	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				0	0	0	0				0	0	0	30				Unknown	UNKNOWN	NONE	Casual observation	9	0	13	261965	4667440	NAD-83	ADMIN	ADMIN	10/30/1975	
3397600000106	LRO	33976	10/30/1975	GROUSE, GREATER SAGE	*CENTROCERCUS UROPHASIANUS*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	UNKNOWN	Golden Eagle	Casual observation	9	0	13	261405	4668015	NAD-83	ADMIN	ADMIN	10/30/1975	
3417100000406	LRO	34171	4/19/1986	HARRIER, NORTHERN	*CIRCUS CYANEUS*	1	0	0	0				0	0	0	0				0	0	0	0				Courtship	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	265108	4664889	NAD-83	ADMIN	ADMIN	4/19/1986	
3416600000706	LRO	34166	4/18/1986	HARRIER, NORTHERN	*CIRCUS CYANEUS*	1	0	0	0				0	0	0	0				0	0	0	0				Flying	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261923	4666219	NAD-83	ADMIN	ADMIN	4/18/1986	
4846700000406	LRO	48467	3/22/2003	HAWK, FERRUGINOUS	*BUTEO REGALIS*	0	0	0	0				0	0	0	0				1	0	0	0				Reproduction	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	266459	4668383	NAD-83	HIATT, GREG	cmeyer	3/22/2003	
4625400000806	LRO	46254	3/25/2000	HAWK, FERRUGINOUS	*BUTEO REGALIS*	0	0	0	0				0	0	0	0				2	0	0	0				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	262032	4669439	NAD-83	HIATT, GREG	cmeyer	3/25/2000	
3736500000406	LRO	37365	4/5/1993	HAWK, FERRUGINOUS	*BUTEO REGALIS*	0	0	0	0				0	0	0	0				1	0	0	0				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	262472	4670203	NAD-83	ADMIN	ADMIN	4/5/1993	
3417000000106	LRO	34170	4/19/1986	HAWK, FERRUGINOUS	*BUTEO REGALIS*	0	0	0	0				0	0	0	0				1	0	0	0				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	262296	4664983	NAD-83	ADMIN	ADMIN	4/19/1986	
3417000000206	LRO	34170	4/19/1986	HAWK, FERRUGINOUS	*BUTEO REGALIS*	0	0	0	0				0	0	0	0				1	0	0	0				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Live Trapping Operation - Animal	0	18	13	261923	4666219	NAD-83	ADMIN	ADMIN	4/19/1986	

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obs_number	district	form_number	obs_date	species_common	species_scientific	male_adult_qty	male_yrlg_qty	male_juv_qty	male_uncl_qty	male_est_count_flag	male_age	male_age_tag	female_adult_qty	female_yrlg_qty	female_juv_qty	female_uncl_qty	female_est_count_flag	female_age	female_age_tag	unk_adult_qty	unk_yrlg_qty	unk_juv_qty	unk_uncl_qty	unk_est_count_flag	unk_age	unk_age_tag	animal_activity	habitat	mortality	observer_activity	hunt_area	degree_block	utm_zone	utm_easting	utm_northing	datum	observer_name	user_id	append_date	other_info
3417000000406	LRO	34170	4/19/1986	HAWK, FERRUGINOUS	*BUTEO REGALIS*	0	0	0	0				0	0	0	0				1	0	0	0				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261232	4670244	NAD-83	ADMIN	ADMIN	4/19/1986	
3416600000806	LRO	34166	4/18/1986	HAWK, FERRUGINOUS	*BUTEO REGALIS*	0	0	0	0				0	0	0	0				1	0	0	0				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261067	4665358	NAD-83	ADMIN	ADMIN	4/18/1986	
3416700000106	LRO	34167	4/18/1986	HAWK, FERRUGINOUS	*BUTEO REGALIS*	0	0	0	0				0	0	0	0				1	0	0	0				Loafing, Roosting, Resting, etc.	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261867	4664553	NAD-83	ADMIN	ADMIN	4/18/1986	
2854700000206	LRO	28547	3/20/1990	HAWK, ROUGH-LEGGED	*BUTEO LAGOPUS*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	261179	4668690	NAD-83	ADMIN	ADMIN	3/20/1990	
4766700001206	LRO	47667	5/19/1993	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				4	0	0	0				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	0	18	13	267801	4666246	NAD-83	ADMIN	ADMIN	5/19/1993	
3766700000206	LRO	37667	5/19/1993	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				4	0	0	0				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	0	18	13	267801	4666246	NAD-83	ADMIN	ADMIN	5/19/1993	
3774000000506	LRO	37740	5/11/1993	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				7	0	0	0				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	0	18	13	262923	4666408	NAD-83	ADMIN	ADMIN	5/11/1993	
3736600000106	LRO	37366	4/5/1993	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				0	0	0	6				Feeding	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	266427	4669737	NAD-83	ADMIN	ADMIN	4/5/1993	
3604400000806	LRO	36044	3/21/1992	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	SAGEBRUSH-GRASSLAND	Cause Undetermined	Unknown/ Undetermined	0	18	13	266255	4669520	NAD-83	ADMIN	ADMIN	3/21/1992	
2618700000806	LRO	26187	3/26/1988	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				10	0	0	0				Escape: direct flight	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	0	18	13	267024	4670273	NAD-83	ADMIN	ADMIN	3/26/1988	
3416600000606	LRO	34166	4/18/1986	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				4	0	1	0				Feeding	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261923	4666219	NAD-83	ADMIN	ADMIN	4/18/1986	
3416600000406	LRO	34166	4/18/1986	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				2	0	0	0				Feeding	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	260206	4669279	NAD-83	ADMIN	ADMIN	4/18/1986	
3415600000806	LRO	34156	4/11/1986	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				3	0	0	0				Feeding	SAGEBRUSH-GRASSLAND	NONE	Casual observation	0	18	13	261405	4668015	NAD-83	ADMIN	ADMIN	4/11/1986	
3255400000506	LRO	32554	6/11/1984	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				0	0	0	2				Unknown	UNKNOWN	NONE	Aerial Trend Counts	0	0	13	263694	4664714	NAD-83	ADMIN	ADMIN	6/11/1984	
3255400000306	LRO	32554	6/11/1984	HORSE, WILD	*EQUUS CABALLUS*	0	0	0	0				0	0	0	0				0	0	0	2				Unknown	UNKNOWN	NONE	General Census	0	0	13	265373	4667882	NAD-83	ADMIN	ADMIN	6/11/1984	
4920400000306	LRO	49204	8/8/2004	PRONGHORN	*ANTILOCAPRA AMERICANA*	2	0	0	0				0	0	0	0				0	0	0	0				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	265842	4669659	NAD-83	BROWN	cmeyer	8/8/2004	
884395200000406	LRO	9E+06	8/10/1998	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	0	0	0				0	0	0	0				0	0	0	0				Unknown	UNKNOWN	NONE	Classification counts	61	0	13	261751	4666002	NAD-83	ADMIN	ADMIN	8/10/1998	

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obs_number	district	form_number	obs_date	species_common	species_scientific	male_adult_qty	male_yrlg_qty	male_juv_qty	male_uncl_qty	male_est_count_flag	male_age	male_age_tag	female_adult_qty	female_yrlg_qty	female_juv_qty	female_uncl_qty	female_est_count_flag	female_age	female_age_tag	unk_adult_qty	unk_yrlg_qty	unk_juv_qty	unk_uncl_qty	unk_est_count_flag	unk_age	unk_age_tag	animal_activity	habitat	mortality	observer_activity	hunt_area	degree_block	utm_zone	utm_easting	utm_northing	datum	observer_name	user_id	append_date	other_info
884395200000306	LRO	9E+06	8/10/1998	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	0	0	0				0	0	0	0				0	0	0	0				Unknown	UNKNOWN	NONE	Classification counts	61	0	13	261803	4667557	NAD-83	ADMIN	ADMIN	8/10/1998	
4205700001706	LRO	42057	8/16/1996	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	0	0	0				0	0	0	0				0	0	0	0				Unknown	UNKNOWN	NONE	Classification counts	61	0	13	265000	4669117	NAD-83	ADMIN	ADMIN	8/16/1996	
4197000000306	LRO	41970	5/20/1996	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				43	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	0	0	13	266653	4669063	NAD-83		ADMIN	4/28/2005	
4196200000406	LRO	41962	5/14/1996	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				9	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	0	0	13	266653	4669063	NAD-83		ADMIN	4/28/2005	
4765700001106	LRO	47657	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	261859	4669223	NAD-83	ADMIN	ADMIN	5/19/1993	
4765700001206	LRO	47657	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	260206	4669279	NAD-83	ADMIN	ADMIN	5/19/1993	
3765700000106	LRO	37657	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	261859	4669223	NAD-83	ADMIN	ADMIN	5/19/1993	
3765700000206	LRO	37657	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	260206	4669279	NAD-83	ADMIN	ADMIN	5/19/1993	
4765600001106	LRO	47656	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	2				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	268118	4665790	NAD-83	ADMIN	ADMIN	5/19/1993	
3765600000106	LRO	37656	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	2				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	268118	4665790	NAD-83	ADMIN	ADMIN	5/19/1993	
3765600000206	LRO	37656	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	6				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	266547	4665842	NAD-83	ADMIN	ADMIN	5/19/1993	
4765600001206	LRO	47656	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	6				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	266547	4665842	NAD-83	ADMIN	ADMIN	5/19/1993	
3765500000306	LRO	37655	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	266653	4669063	NAD-83	ADMIN	ADMIN	5/19/1993	
4765500001306	LRO	47655	5/19/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	0	13	266653	4669063	NAD-83	ADMIN	ADMIN	5/19/1993	
3774000000406	LRO	37740	5/11/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	2				Unknown	UNKNOWN	NONE	Unknown/ Undetermined	61	18	13	260040	4664393	NAD-83	ADMIN	ADMIN	5/11/1993	
3773900000406	LRO	37739	5/11/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	2				Unknown	UNKNOWN	NONE	General Census	61	0	13	263322	4665950	NAD-83	ADMIN	ADMIN	5/11/1993	
3773900000306	LRO	37739	5/11/1993	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	3				Unknown	UNKNOWN	NONE	General Census	61	0	13	263374	4667504	NAD-83	ADMIN	ADMIN	5/11/1993	
3513900000506	LRO	35139	8/14/1991	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	1	0	0				0	0	0	0				0	0	0	0				Unknown	UNKNOWN	NONE	Classification counts	61	0	13	265000	4669117	NAD-83	ADMIN	ADMIN	8/14/1991	
2566200000406	LRO	25662	9/5/1987	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	0	0	0				0	0	0	0				0	0	0	0				Unknown	UNKNOWN	Legal Harvest	Field Check Station	61	0	13	266969	4668607	NAD-83	ADMIN	ADMIN	9/5/1987	
2566200000506	LRO	25662	9/5/1987	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	0	0	0				0	0	0	0				0	0	0	0				Unknown	UNKNOWN	Legal Harvest	Field Check Station	61	0	13	266229	4668743	NAD-83	ADMIN	ADMIN	9/5/1987	

Attachment 3.6-1 WGFD Wildlife Observations System Data

obs_number	district	form_number	obs_date	species_common	species_scientific	male_adult_qty	male_yrlg_qty	male_juv_qty	male_uncl_qty	male_est_count_flag	male_age	male_age_tag	female_adult_qty	female_yrlg_qty	female_juv_qty	female_uncl_qty	female_est_count_flag	female_age	female_age_tag	unk_adult_qty	unk_yrlg_qty	unk_juv_qty	unk_uncl_qty	unk_est_count_flag	unk_age	unk_age_tag	animal_activity	habitat	mortality	observer_activity	hunt_area	degree_block	utm_zone	utm_easting	utm_northing	datum	observer_name	user_id	append_date	other_info
2489500000206	LRO	24895	5/31/1987	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				4	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	268118	4665790	NAD-83	ADMIN	ADMIN	5/31/1987	
2489400000506	LRO	24894	5/31/1987	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	266602	4667508	NAD-83	ADMIN	ADMIN	5/31/1987	
2489400000406	LRO	24894	5/31/1987	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				3	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	265031	4667560	NAD-83	ADMIN	ADMIN	5/31/1987	
2489400000606	LRO	24894	5/31/1987	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	268172	4667456	NAD-83	ADMIN	ADMIN	5/31/1987	
2489400000106	LRO	24894	5/31/1987	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				5	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	268223	4669011	NAD-83	ADMIN	ADMIN	5/31/1987	
2489400000206	LRO	24894	5/31/1987	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				2	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	266653	4669063	NAD-83	ADMIN	ADMIN	5/31/1987	
2489400000306	LRO	24894	5/31/1987	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				2	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	265000	4669117	NAD-83	ADMIN	ADMIN	5/31/1987	
3254700000306	LRO	32547	6/11/1984	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	266093	4664634	NAD-83	ADMIN	ADMIN	6/11/1984	
3254500000706	LRO	32545	6/11/1984	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				3	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	266280	4670298	NAD-83	ADMIN	ADMIN	6/11/1984	
3254700000206	LRO	32547	6/11/1984	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				8	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	268118	4665790	NAD-83	ADMIN	ADMIN	6/11/1984	
3254900000806	LRO	32549	6/11/1984	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	262096	4666435	NAD-83	ADMIN	ADMIN	6/11/1984	
3254600000206	LRO	32546	6/11/1984	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	267799	4668691	NAD-83	ADMIN	ADMIN	6/11/1984	
3254600000506	LRO	32546	6/11/1984	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				5	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	266602	4667508	NAD-83	ADMIN	ADMIN	6/11/1984	
3254600000306	LRO	32546	6/11/1984	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	266229	4668743	NAD-83	ADMIN	ADMIN	6/11/1984	
3254600000406	LRO	32546	6/11/1984	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				1	0	0	0				Unknown	UNKNOWN	NONE	Aerial Trend Counts	61	0	13	265402	4668771	NAD-83	ADMIN	ADMIN	6/11/1984	
3165600000206	LRO	31656	9/3/1983	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	0	0	0				0	0	0	0				0	0	0	0				Unknown	UNKNOWN	Legal Harvest	Field Check Station	61	0	13	266653	4669063	NAD-83	ADMIN	ADMIN	9/3/1983	1
3109800000806	LRO	31098	12/1/1982	PRONGHORN	*ANTILOCAPRA AMERICANA*	28	0	0	0				27	0	0	0				0	0	15	0				Feeding	SAGEBRUSH-GRASSLAND	NONE	Marked Animal	61	0	13	260777	4669037	NAD-83	ADMIN	ADMIN	12/1/1982	1
3109800000706	LRO	31098	12/1/1982	PRONGHORN	*ANTILOCAPRA AMERICANA*	28	0	0	0				27	0	0	0				0	0	15	0				Feeding	SAGEBRUSH-GRASSLAND	NONE	Classification counts	61	0	13	260777	4669037	NAD-83	ADMIN	ADMIN	12/1/1982	1
3077700000206	LRO	30777	9/3/1982	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				1	0	0	0				0	0	0	0				Disturbed	SAGEBRUSH-GRASSLAND	NONE	Classification counts	61	0	13	261123	4667024	NAD-83	ADMIN	ADMIN	9/3/1982	
3077700000106	LRO	30777	9/3/1982	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	0	0	0				3	0	0	0				0	0	2	0				Feeding	SAGEBRUSH-GRASSLAND	NONE	Classification counts	61	0	13	260736	4665370	NAD-83	ADMIN	ADMIN	9/3/1982	

Attachment 3.6-1 WGFD Wildlife Observations System Data

obs_number	district	form_number	obs_date	species_common	species_scientific	male_adult_qty	male_yrlg_qty	male_juv_qty	male_uncl_qty	male_est_count_flag	male_age	male_age_tag	female_adult_qty	female_yrlg_qty	female_juv_qty	female_uncl_qty	female_est_count_flag	female_age	female_age_tag	unk_adult_qty	unk_yrlg_qty	unk_juv_qty	unk_uncl_qty	unk_est_count_flag	unk_age	unk_age_tag	animal_activity	habitat	mortality	observer_activity	hunt_area	degree_block	utm_zone	utm_easting	utm_northing	datum	observer_name	user_id	append_date	other_info
1944800000606	LRO	19448	5/15/1981	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	BASIN-PRAIRIE SHRUB-SHRUB STEPPE	NONE	Aerial Trend Counts	61	0	13	261457	4669570	NAD-83	ADMIN	ADMIN	5/15/1981	
1944800000206	LRO	19448	5/15/1981	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	2				Unknown	BASIN-PRAIRIE SHRUB-SHRUB STEPPE	NONE	Aerial Trend Counts	61	0	13	267103	4670159	NAD-83	ADMIN	ADMIN	5/15/1981	
1944700000706	LRO	19447	5/15/1981	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	4				Unknown	BASIN-PRAIRIE SHRUB-SHRUB STEPPE	NONE	Aerial Trend Counts	61	0	13	264681	4669462	NAD-83	ADMIN	ADMIN	5/15/1981	
1944700000306	LRO	19447	5/15/1981	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	BASIN-PRAIRIE SHRUB-SHRUB STEPPE	NONE	Aerial Trend Counts	61	0	13	263002	4666294	NAD-83	ADMIN	ADMIN	5/15/1981	
1944700000206	LRO	19447	5/15/1981	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	BASIN-PRAIRIE SHRUB-SHRUB STEPPE	NONE	Aerial Trend Counts	61	0	13	265348	4664659	NAD-83	ADMIN	ADMIN	5/15/1981	
1944700000106	LRO	19447	5/15/1981	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	BASIN-PRAIRIE SHRUB-SHRUB STEPPE	NONE	Aerial Trend Counts	61	0	13	266920	4664607	NAD-83	ADMIN	ADMIN	5/15/1981	
1944700000606	LRO	19447	5/15/1981	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	1				Unknown	BASIN-PRAIRIE SHRUB-SHRUB STEPPE	NONE	Aerial Trend Counts	61	0	13	263828	4668712	NAD-83	ADMIN	ADMIN	5/15/1981	
1944700000506	LRO	19447	5/15/1981	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	4				Unknown	BASIN-PRAIRIE SHRUB-SHRUB STEPPE	NONE	Aerial Trend Counts	61	0	13	263772	4667046	NAD-83	ADMIN	ADMIN	5/15/1981	

Attachment 3.6-1 WGFD Wildlife Observations System Data

obs_number	district	form_number	obs_date	species_common	species_scientific	male_adult_qty	male_yrlg_qty	male_juv_qty	male_uncl_qty	male_est_count_flag	male_age	male_age_tag	female_adult_qty	female_yrlg_qty	female_juv_qty	female_uncl_qty	female_est_count_flag	female_age	female_age_tag	unk_adult_qty	unk_yrlg_qty	unk_juv_qty	unk_uncl_qty	unk_est_count_flag	unk_age	unk_age_tag	animal_activity	habitat	mortality	observer_activity	hunt_area	degree_block	utm_zone	utm_easting	utm_northing	datum	observer_name	user_id	append_date	other_info
1944800000506	LRO	19448	5/15/1981	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	0	0	0				0	0	0	0				0	0	0	3				Unknown	BASIN-PRAIRIE SHRUB-SHRUB STEPPE	NONE	Aerial Trend Counts	61	0	13	262201	4667099	NAD-83	ADMIN	ADMIN	5/15/1981	
61700001804	GRRO[2]	617	10/4/1977	PRONGHORN	*ANTILOCAPRA AMERICANA*	0	1	0	0				3	0	0	0				0	0	2	0				Unknown	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	60	0	13	260232	4667610	NAD-83	ADMIN	ADMIN	10/4/1977	
61900001804	GRRO	619	10/4/1977	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	0	0	0				5	0	0	0				0	0	4	0				Unknown	SAGEBRUSH-GRASSLAND	NONE	Unknown/ Undetermined	60	0	13	260232	4667610	NAD-83	ADMIN	ADMIN	10/4/1977	
61800001804	GRRO	618	10/4/1977	PRONGHORN	*ANTILOCAPRA AMERICANA*	1	0	0	0				3	0	0	0				0	0	4	0				Unknown	GRASSLANDS	NONE	Unknown/ Undetermined	60	0	13	260232	4667610	NAD-83	ADMIN	ADMIN	10/4/1977	

[1] LRO = Lander Regional Office
[2] GRRO = Green River Regional Office

This report was written on behalf of Ur Energy, USA. NFU and LC ISR, LLC are both 100% owned by UR-Energy, USA.

Wildlife surveys were conducted on the Lost Creek Permit Area and in a buffer area of up to two miles beyond the permit boundary.

Attachment 3.6-2

Biological Studies Work Plan
Lost Creek ISR Uranium Project
Ur-Energy USA Inc.

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February 2006

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Biological Studies Work Plan
Lost Creek ISR Uranium Project
Ur-Energy USA Inc.

1.0 Introduction

AATA International, Inc. (AATA) is pleased to submit this work plan for Biological Field studies to support permitting efforts for the proposed Ur-Energy USA Inc, Lost Creek property in Fremont and Sweetwater Counties, Wyoming. The project is located on lands administered by the Bureau of Land Management (BLM) Rawlins Field Office. Because the site is located on lands administered by the BLM and will require other federal permits the project will have to be considered under the National Environmental Policy Act (NEPA). The Wyoming Department of Environmental Quality (WDEQ) is responsible for state permitting and review of the project.

The following scope of work summarizes field surveys and data gathering that will be required to support WYDEQ and BLM permitting for the project. Informal agency scoping meetings with the BLM, WYDEQ and Wyoming Game and Fish Department (WGFD) were completed to help define the work scope outlined in this plan (Blomquist 2006, Etzelmiller 2006, Hyatt 2006).

2.0 Biological Studies Work Plan

2.1 Data Collection and Mapping

To expedite field work formal data request will be made to the BLM, WYGF, and Wyoming Natural Heritage Program for the project. Data requests will include GIS mapping of habitat areas for big game, sage grouse, raptors, prairie dog colonies and other habitat features. These data requests will supplement existing data already gathered for the project. The data that is received (sage grouse lek locations, raptor nest locations, and other data) will help focus the spring/summer field work. AATA will develop project GIS maps that show appropriate data. These maps will be used to focus the biological studies for the project.

2.2 Sage Grouse Surveys

2.2.1 Lek Surveys (from BLM 2005)

Lek Survey: A monitoring technique to identify new sage grouse leks and to determine whether known leks are active.

<u>Lek Survey</u> Methodology:

1. Searches should be conducted from early April to early May (April 1 – May 7). (Survey season corresponds to peak male attendance as established by the WGFD for documenting population trends.)

2. Surveys for new leks should be conducted three (3) times (with subsequent surveys 7-10 days apart).

3. Surveys for new leks should be conducted throughout suitable habitat. New leks can be located by the discovery of concentrated tracks/droppings/feathers at all times of the day when conducting other field activities. Return visits to such sites during the morning strutting hours must be made to confirm the location as a lek.

4. Surveys to confirm the activity of a lek may require only one visit if grouse are identified on the lek.

   - **NOTE** To designate a known lek as inactive requires either an absence of birds on the lek during multiple ground visits under ideal conditions throughout the strutting season or a ground check of the exact lek site late in the strutting season that fails to find any sign (droppings/feathers) of strutting activity.

5. Surveys can be conducted from the ground or from an aircraft.

   - Lek surveys can be conducted from the **ground** by driving along roads in suspected or known breeding habitat and stopping every ½ mile to listen for sounds of breeding grouse. Ground searches can be conducted from an hour before to an hour after sunrise. In less accessible areas, searches can be made from a mountain bike, trail motorcycle, 4-wheel all terrain vehicle, horseback, or on foot. On a calm morning, breeding sage grouse may be heard at a distance of 1.5 km (about 1 mi). All openings or areas of less dense sagebrush should be searched for breeding birds with binoculars or a spotting scope.

   - Helicopters or fixed-wing airplanes can be used for **aerial** surveys. Suspected breeding habitat should be flown on north - south transects with lines about one km (.6 mi) apart. Aerial searches are biased toward finding larger leks; small leks (<15 birds) are more difficult to detect. Calm, clear mornings are a prerequisite to aerial searches. Winds over 15 mph and more than scattered cloud cover should be sufficient to cancel search flights. Cocks can be observed from the air at distances greater than one km (0.6 mi) in early morning sun, but cloud cover greatly reduces observability. Under conditions of marginal light, transect width should be narrowed. High winds not only make traveling a straight transect difficult, but also affect strutting behavior. Fewer cocks will strut continuously, and flushing distance appears to be greater under windy conditions.

     Transects should be flown at about 100-150 meters (300-450 ft) above ground level. Whenever possible, two observers should be used in addition to the pilot so that one observer is always looking away from the sun regardless of the direction the aircraft is flying. Surveys should begin at the east edge of the survey area and work west to minimize the possibility of the plane flying over leks prior to them being observed. Special attention should be paid to old lakebeds, stock-watering areas, and other relatively open sites largely surrounded by sagebrush with 15 to

25% canopy cover. Lek searches from an aircraft should be conducted from ½ hour before to one hour after sunrise.

6. If a new lek is identified, the location should be accurately determined and recorded in UTMs using NAD83 datum. It is advisable to record/map the perimeters of new leks. Surveyor(s) should **not** disturb grouse to GPS lek locations. If a lek is active, the surveyor(s) should make the best estimate of the lek location and return later to confirm.

2.2.2 Lek Trend Surveys (from BLM 2005)

Lek Count: A census technique that documents the actual number of male sage grouse observed on a particular lek.

- Lek count data are primarily used to develop indices to relative population levels and provide short and long term trend information for both populations and changes in occupied range.

<u>Lek Count</u> Methodology:

1. Counts should be conducted during the month following the peak of mating activity, which is usually in early April in Wyoming (April 1 – May 7). Research has shown that the highest numbers of male sage grouse are observed during this period. The increased number of males is due to young males showing up later in the strutting season even though most of the breeding has already occurred.

2. Counts should be conducted from the ground. Counts from fixed-winged aircraft are not accurate enough to be used for monitoring population trends.

3. Counts should be made as close to sunrise as possible and may extend for one-half hour after sunrise. The phase of the moon may affect use patterns of leks. During a full moon, grouse may display at night and consequently terminate activities earlier in the morning.

4. Counts should be conducted a minimum of three (3) times each year between April 1 – May 7 for each lek (at least one count every 7-10 days.)

5. Optimum weather conditions for counts are clear, calm days. Wind speeds should be less than 20 mph due to the fact that high winds reduce lek activity. Temperature seems to have little effect on lek activity. Weather conditions should be recorded each time lek observations are made.

6. The location of each lek should be accurately determined and recorded in UTMs using NAD83 datum. Observer(s) should not disturb grouse to obtain lek locations. If a lek is active, the observer(s) should make the best estimate of the lek location and return later to confirm.

7. Data should be recorded on the standardized statewide reporting form with the following information:

LOCATION _____ GPS_____ UTM_____

Date Time Observer Males Females Unk QQ Sec Twn Rng northing easting Grouse Sign Comments

Annual status - Each year a lek will be determined to be in one of the following status categories:

Active. Any lek that has been attended by male sage grouse during the strutting season. Presence can be documented by observation of birds using the site or by signs of strutting activity.

Inactive. Leks where it is known that there was no strutting activity through the course of a strutting season. A single visit, or even several visits, without strutting grouse being seen is not adequate documentation to designate a lek as inactive. This designation requires either an absence of birds on the lek during multiple ground visits under ideal conditions throughout the strutting season or a ground check of the exact lek site late in the strutting season that fails to find any sign (droppings/feathers) of strutting activity.

Unknown. Leks that have not been documented either active or inactive during the course of a strutting season.

2.3 Nesting Raptor Surveys (from BLM 2005)

Recommended protocol based on peer reviewed publications.

1. Surveys (combination of aerial and ground) should be conducted within 0.5 miles of proposed surface disturbance or activity to document nest activity during April 15 to June 15. Surveys outside this period may not accurately depict nesting activity. It is recommended for early nesting species such as eagles and great-horned owls that this survey be conducted early as possible, while late nesting species could be conducted later in the survey window. Surveys for nest sites between Feb. 1 and April 15 shall be avoided to protect this sensitive breeding and nesting period. Surveys conducted at other times of the year, are allowed however a nest occupancy check and/or additional surveys may be required.

2. Surveys should be done in important raptor habitat including: rock outcrops, cliffs, ridges, knolls, stream banks, conifer, and cottonwood trees. Nests should be recorded in UTM cooridinates using NAD83 datum.

3. Optimum weather conditions for surveys are clear, calm days. Nests should be approached cautiously to avoid flushing the female, and their status (ie, number of nestling) will be determined from a distance with binoculars or a spotting scope.

4. Nests will not be visited during adverse weather conditions (e.g. extreme cold, precipitation events, windy periods or during the hottest part of the day). Visits will be as brief as possible.

5. Photograph the nest to help illustrate nest shape, condition, and substrate. See attached nest photographs in appendix 2 for assistance in determining nest condition.

6. Data should be recorded on the standardized form, and summarized for project reports in a table format; data should be provided to the land management agency in a digital format. Field names and codes to use are as follows:

Raptor Nest ID

Previously documented nests should be identified in all documentation (reports, tables, etc.) with the identification number supplied by the land management agency, in order to avoid confusion and duplication.

New nests should be identified in a unique 12 digit, alpha/numeric format. The number in its entirety indicates species and location. The first two characters are alpha and refer to the raptor species (first letter). Next is a three digit alpha/numeric character which indicates the township number and whether the township is north or south of the base line (N or S). This is followed by another three more alpha/numeric characters which indicate the range number and whether the range is east or west of the base line (E or W). The next two characters refer to the section and the final two numeric characters represent a sequential number for all known and inventoried nests for that particular species within that section. Therefore, nest number FH11N54E2102 is a Ferruginous Hawk nest in T.11N., R.54E., Section 21, and this is the 2nd ferruginous hawk nest identified within section 21.

Species

BUOW	= Burrowing Owl	**OSPR**	= Osprey
COHA	= Cooper's Hawk	**PEFA**	= Peregrine Falcon
FEHA	= Ferruginous Hawk	**PRFA**	= Prairie Falcon
GOEA	= Golden Eagle	**RETA**	= Red-tailed Hawk
GRHO	= Great Horned Owl	**SWHA**	= Swainson's Hawk
NOGO	= Northern Goshawk	**SHHA**	= Sharp-shinned hawk
BAEA	= Bald Eagle	**UNAC**	= Unknown Accipiter
AMKE	= American Kestrel	**UNBU**	= Unknown Buteo
LOOW	= Long-eared Owl	**UNOW**	= Unknown Owl
MERL	= Merlin	**UNRA**	= Unknown Raptor
NOHA	= Northern Harrier		

LOCATION

Enter Township Number; for example, **12**; Select/Circle either **N** for North or **S** for South;
Enter Range Number; for example, **57**; Select/Circle either **E** for East or **W** for West;
Enter the **Quarter**, and **Quarter/Quarter** Section.

UTM ZONE

Enter the UTM Zone for the nest location:

GEO. DATUM: Circle NAD 27 or NAD 83 or whatever datum is used. NAD83 preferred.

NORTHING: Enter the northing UTM coordinate (7 characters);

EASTING: Enter the easting UTM coordinate (6 characters);

NEST SITE ELEVATION
Enter the elevation at the nest in feet. (**NOT** nest height, but the elevation of the terrain)

USGS QUAD NAME
Enter the name of the appropriate USGS 7½" Quad.

BLM MAP NAME
Enter the name of the appropriate BLM 1:100,000 Map.

COUNTY
Enter the name of the appropriate County (if desired).

NEST STATUS
Status of the nest when observed (4 Characters)

ACTI: ACTIve nest; A nest in which a breeding attempt was made as indicated by:
1) Eggs in nest, or
2) Young in nest, or
3) Fledged young near nest, or
4) Incubating/brooding adult.

ACTF: ACTive Failed; An active nest that did not fledge young, indicated by:
1) Egg shells in or around nest with no young when, young should be in the nest, or
2) Young present but known not to have fledged, or
3) Eggs in nest but obviously abandoned (past the time when eggs should have normally hatched).

DNLO: Did Not L0cate; Surveyor searched but was unable to locate the nest (does not mean nest is gone or destroyed, merely that the observer was unable to find the nest).

OCCU: OCCUpied; A nest with one or more of the following:
1) Fresh lining material
2) Adult presence at or near the nest
3) Recent and well-used perch site near the nest

OCAL: OCcupied ALternate; A tended nest within the boundaries of a territory housing an ACTIve nest.

INAC: INACtive; A nest with no apparent recent use or adult presence at the time of observation, but in good condition.

INAL: INactive ALternate; An inactive nest within a territory that contains an active nest.

INDI: INactive DIlapidated; An inactive nest in a state of ruin due to weather, natural aging and/or neglect.

INDE: INactive DEstroyed; A nest showing no sign of raptor activity that is destroyed to the point that it is no longer usable without major reconstruction. These nests, for all practical purposes, have disappeared, but there is often still lingering evidence of an historic presence.

GONE: nest was GONE; A nest that was located during a previous survey but has subsequently been found to have been destroyed and no longer exists. No evidence remains.

PRED: PREDated; The nest was active, but there is evidence that it was predated (remains of adults or young, feathers or egg shells scattered, or other physical evidence is present).

NEST CONDITION

GONE: There may or may not be evidence of where the nest was, but it is no longer there.
REMNANTS: Scant material remaining and not usable unless fully rebuilt.
POOR: Nest is dilapidated, in need of major repair to be used.
FAIR: Nest is not dilapidated, but needs significant repair in order to be used.
GOOD: Nest is in need of only minor attention in order for it to be used.
EXCELLENT: Nest is able to be used with little or no attention or maintenance.
UNKNOWN: The nest is obviously present (i.e. a tree cavity, rock cavity), but because of its location, a determination can't be made.

NUMBER OF YOUNG

Record the number of young in the nest.

DATE OBSERVED

Date of observation in Month/Day/Year format (MM/DD/YYYY). This format applies to the date of the first observation and the dates of all future observations.

OBSERVED BY

Record the name of the person making the first observation of this nest.

OWNERSHIP

P: Private Land
S: State Land
FS: Forest Service

BLM: BLM (Public) Land
LU: Bankhead-Jones LU Lands
OTHER: Other - Specify

NEST SUBSTRATE

Substrate upon which nest is built (3 Characters)

ABB = Abandoned Burrow
ACB = Active Burrow
ANS = Artificial Nesting Structure
ASP = Aspen Tree
BLS = Blue Spruce Tree
BLT = Broadleaf Tree
BOX = Boxelder Tree
BTT = Butte
CLF = Cliff
CKB = Creek Bank
CTL = Cottonwood Tree (Live)
CTD = Cottonwood Tree (Dead)
DOF = Douglas Fir
ERC = Erosion Cone
ERR = Erosion Remnant (Badland)
GRE = Green Ash
GHS = Ground/Hillside
JUN = Juniper Tree
LIM = Limber Pine Tree
LOW = Low Ridge/Knoll
LPP = Lodgepole Pine Tree
MMS = Manmade Structures
OSS = Other Shrub Species
PON = Ponderosa Pine Tree
RIM = Rimrock
RIP = Riparian Area
ROC = Rock Cavity
ROK = Rock Outcrop
ROL = Rocky Ledge
ROP = Rock Pillar/Pinnacle
RUS = Russian Olive
SAG = Sagebrush
SER = Serviceberry
UNK = Unknown
WIL = Willow (Live)

HEIGHT OF SUBSTRATE

Record (in feet) the height of the substrate upon/in which the nest is located. Height of the cliff/butte/tree/etc. above the surrounding terrain.

HEIGHT OF NEST ON SUBSTRATE

Record (in feet) the height of the nest on/in the substrate (i.e. height of tree nest above the ground; height of cliff nest on cliff eight of pillar nest above the surrounding terrain).

NEST EXPOSURE

Record the general direction of nest exposure (i.e. N, NE, S, SW, WNW, etc.)

VEGETATION TYPE

Indicates the type of habitat/vegetation found around the nest site; select habitat type from pull down menu of options.

Badland
Bitterbrush Shrubland
Cottonwood/Riparian
Cultivated Cropland
Cultivated/Reseeded
Grassland
Juniper Woodland

Mixed Mountain Shrub
Ponderosa Pine Woodland
Ponderosa Pine/Grassland
Ponderosa/Juniper Woodland
Ponderosa Pine/Skunkbrush
Riparian
Sagebrush/Grassland
Short Grass Prairie

REMARKS

Any unique features, physical relationships to other nests, proximity to human disturbances, or other pertinent observations are to be placed in the remarks section.

RAPTOR NEST LOCATION
Raptor Inventory Data Sheet

Raptor Nest ID*:_____

Species:_____

Location: Township _____ N S, Range _____ E W

Section _____, _____ ¼ _____ ¼

UTM Zone:_____

Geo. Datum (circle one): NAD 27 NAD 83

Northing: _____, Easting:_____

Nest Site Elevation: _____

USGS Quad Name: _____

BLM Map Name: _____

County: _____

Nest Status*: _____

Nest Condition*: _____

Number of Eggs: _____ Young: _____

* Use existing data codes ¹ Historic Nest

Date First Observed*:_____

Observed By:_____

Ownership: P S FS BLM LU Other____

Nest Substrate*: _____

Height of Substrate (ft.):_____

Nest Height On/In Substrate (ft.):_____

Nest Exposure: _____

Vegetation Type*:_____

Remarks/Comments: Physical Relationship to Other Nests, Proximity to Potential Disturbances, Etc.:

_____

_____

_____

_____

_____

Record Monitoring of Nest Activity on Reverse Side

Map/Photo

NEST HISTORY
Nest Number _____

* Date MM/DD/YY	* Nest Status	* Nest Condition	Number Of Young	Observer Name	Remarks

* Use existing data codes.

2.4 Nesting Bird Surveys

Nesting non game bird surveys will be conducted in representative habitat types within the claim areas. Surveys will be completed in areas where mining activities area proposed to occur and in adjacent areas where active mining is non currently proposed.

Surveys will be completed by following techniques recommended by the WYDEQ (WYDEQ 1987). At least 2 transects will be established in each vegetation type of the Lost Creek site. Transects will be 1,000 meters in length (2,000 meters per habitat type) on each site. Transects will be concentrated on areas that are proposed for mining disturbance.

In upland vegetation types belt transects (100 meters) wide will be walked. All birds observed or heard will be recorded. In riparian zones point transects will be used. The observer will walk from point to point (100 meters apart). At each point the observer will stop (for 5 minutes) and listen and observe birds within 50 meters. If possible 1,000 meter transects will be used in riparian habitat.

Surveys will be completed during the peak of the nesting season from June 1 to July 1. Surveys will be completed from 0.5 hours before sunrise to 9:30 am.

2.5 Mountain Plover Surveys

Mountain plover presence and absence surveys will follow USFWS recommended protocol (USFWS 1999, 2002).

MOUNTAIN PLOVER SURVEY GUIDELINES

(From U.S. Fish and Wildlife Service2002)
March 2002

The mountain plover (*Charadrius montanus*) is a small bird (17.5 cm, 7 in.) about the size of a killdeer (*C. vociferus*). It is light brown above with a lighter colored breast, but lacks the contrasting dark breast-belt common to many other plovers. During the breeding season it has a white forehead and a dark line between the beak and eye, which contrasts with the dark crown.

Mountain plover breeding habitat includes short-grass prairie and shrub-steppe landscapes; dryland, cultivated farms; and prairie dog towns. Plovers usually nest on sites where vegetation is sparse or absent, conditions that can be created by herbivores, including domestic livestock and prairie dogs. Vegetation in shortgrass prairie sites is typically less than 4 inches tall. Nest sites within the shrub-steppe landscape are also confined to areas of little to no vegetation, although surrounded by areas visually dominated by shrubs. Commonly, nest sites within shrub-steppe areas are on active prairie dog towns. Nests are commonly located near a manure pile or rock. In addition to disturbance by prairie dogs or livestock, nests have also been found on bare

ground created by oil and gas development activities, and on dryland, cultivated agriculture in the southern part of their breeding range. Mountain plovers are rarely found near water. Positive indicators for mountain plovers therefore include level terrain, prairie dogs, bare ground, *Opuntia* pads, cattle, widely spaced plants, and horned larks. It would be unusual to find mountain plovers on sites characterized by irregular or rolling terrain; dense, matted vegetation; grass taller than 4 inches, wet soils, or the presence of killdeer.

These guidelines were developed by Service biologists and Dr. Fritz Knopf, USGS-BRD. Keep in mind these are guidelines - please call the local Fish and Wildlife Service, Ecological Services office, if you have any suggestions.

GENERAL GUIDELINES FOR SURVEYS

On February 16, 1999, the Service proposed the mountain plover for federal listing as threatened. Because listing of this species is proposed, the Service may recommend surveys for mountain plovers to better define nesting areas, and minimize potential negative impacts. The Service may recommend surveys for mountain plovers to better define nesting areas, and minimize potential negative impacts. The Service may recommend surveys for mountain plovers in all suitable habitat, as well as avoidance of nesting areas, to minimize impact to plovers in a site planned for development. While the Service believes that plover surveys, avoidance of nesting and brood rearing areas, and timing restrictions (avoidance of important areas during nesting) will lessen the chance of direct impacts to and mortality of individual mountain plovers in the area, these restrictions do nothing to mitigate indirect effects, including changes in habitat suitability and habitat loss. Surveys are, however, a necessary starting point. The Service has developed the following 3 survey guidelines, depending on whether the intent is to determine the presence or absence of plovers at a site during the nesting season for permanent and short term projects, or to determine the density of nesting plovers at known nesting sites.

Survey Protocol

Surveys for mountain plovers are conducted during the period where the highest numbers of plovers are likely to be tending nests and territories, and therefore are most likely to be detected. Throughout their range, these dates are generally from May 01 through June 15. However, seasonal restrictions for ground disturbing activities in suitable mountain plover nesting habitats are usually longer than the survey dates. The longer seasonal restrictions allow for protection of early nesting birds, and very young chicks which tend to sit still to avoid detection during the first week post-hatch. Since specific nesting dates across the breeding range of the plover vary according to latitude and local weather, the project proponent or the land management agency should contact the local U.S. Fish and Wildlife Service Office to determine what seasonal restrictions apply for specific projects.

Two types of surveys may be conducted: 1) surveys to determine the presence/absence of breeding plovers (i.e., displaying males and foraging adults), or 2) surveys to determine nest density. The survey type chosen for a project and the extent of the survey area (i.e., beyond the edge of the construction or operational ROW) will depend on the type of project activity being

analyzed (e.g., construction, operation) and the users intent. One methodology outlines a breeding survey that was used in northeastern Colorado to establish the density of occupied territories, based on displaying male plovers or foraging adults. The other was developed to only determine whether plovers occupy an area.

Techniques Common to Each Survey Method

- Conduct surveys during early courtship and territorial establishment. Throughout the breeding range, this period extends from approximately mid-April through early July. However, the specific breeding period, and therefore peak survey days, depends on latitude, elevation, and weather.

- Conduct surveys between local sunrise and 1000 and from 1730 to sunset (periods of horizontal light to facilitate spotting the white breast of the adult plovers).

- Drive transects within the project area to minimize early flushing. Flushing distances for mountain plovers may be within 3 meters for vehicles, but plovers often flush at 50 to 100 meters when approached by humans on foot.

- Use of a 4-wheel drive vehicle is preferable where allowed. Use of ATVs has proven highly successful in observing and recording displaying males. Always seek guidance from land management agencies regarding use of vehicles on public lands, and always obtain permission of private landowners before entering their lands.

- Stay in or close to the vehicle when scanning. Use binoculars to scan and spotting scopes to confirm sightings. Do not use scopes to scan.

- Do not conduct surveys in poor weather (i.e., high wind, precipitation, etc.).

- Surveys conducted during the courtship period should focus on identifying displaying or calling males, which would signify breeding territories.

- For all breeding birds observed, conduct additional surveys immediately prior to construction activities to search for active nest sites.

- If an active nest is located, an appropriate buffer area should be established to prevent direct loss of the nest or indirect impacts from human-related disturbance. The appropriate buffer distance will vary, depending on topography, type of activity proposed, and duration of disturbance. For disturbances including pedestrian foot traffic and continual equipment operations, a 1/4 mile buffer is recommended.

SURVEY TO DETERMINE PRESENCE/ABSENCE

Large scale/long term projects

Conduct the survey between May 1 and June 15, throughout the breeding range.

1. Visual observation of the area should be made within 1/4 mile of the proposed action to detect the
    i. presence of plovers. All plovers located should be observed long enough to determine if a nest is present. These observations should be made from within a stationary vehicle, as plovers do not appear to be wary of vehicles. Because this survey is to determine presence/absence only, and not calculate statistical confidence, there is no recommended distance interval for stopping the vehicle to scan for birds. Obviously numerous stops will be required to conduct a thorough survey, but number of stops should be determined on a project and site-specific basis.

2. If no visual observations are made from vehicles, the area should be surveyed on ATV's. Extreme care should be exercised in locating plovers due to their highly secretive and quiet nature. Surveys by foot are not recommended because plovers tend to flush at greater distances when approached using this method. Finding nests during foot surveys is more difficult because of the greater flushing distance.

3. A site must be surveyed 3 times during the survey window, with each survey separated by at least 14 days. The need for 3 surveys is to capture the entire nesting period, with the intent of reducing the risk of concluding the site is not nesting habitat by an absence of nesting birds during a single survey.

4. Initiation of the project should occur as near to completion of the survey as possible. For example, seismic exploration should begin within 2 days of survey completion. A 14 day period may be appropriate for other projects.

5. If an active nest is found in the survey area, the planned activity should be delayed 37 days, or seven days post-hatching. If a brood of flightless chicks is observed, activities should be delayed at least seven days.

MOUNTAIN PLOVER GENERAL HABITAT INDICATORS

Positive habitat images

Stock tank (non-leaking, leaking tanks often attract killdeer)
Flat (level or "tilted") terrain
Burned field/prairie/pasture
Bare ground (minimum of 30 percent)
"Spaced" grass plants
Prairie dog colonies
Horned larks
Cattle
Heavily grazed pastures

Opuntia pads visible

Negative habitat images

Killdeer present (indicating less than optimal habitat)
Hillsides or steep slope
Prominent, obvious low ridge
Leaky stock tanks
Vegetation greater than 4 inches in height in short-grass prairie habitat
Increasing presence of tall shrubs
Matted grass (i.e., minimal bare ground)
Lark buntings

2.6 Prairie Dog Colony Mapping (from BLM 2005)

Recommended Protocol

1. Delineate colonies using a GPS receiver in UTM coordinates and NAD83 datum. First, Identify the prairie dog colony with one GPS fix at the approximate center of the town. Then map the colony perimeter by taking points approximately every 10 meters at the outermost burrows around the colony edge. Document segments of the colony by activity level (high, low, or inactive).

2. Use this table to submit data on prairie dog colony locations. If you have GPS files, guidelines and a data dictionary are available at http://nris.state.mt.us/mtnhp (navigate to "animals" and "submit data").

Location: provide as specific location information as possible in UTM coordinates, NAD83 datum. **Township-Range/UTM:** Include township, range, section and ¼ section and UTM's for the approximate center of the colony. **Activity:** defines if the colony is occupied: YES = animals or fresh sign seen, NO = mounds present but neither fresh sign nor animals seen and mounds show various stages of abandonment. UNKNOWN = mounds present but neither fresh sign or animals seen, mounds may or may not show various stages of abandonment OR the survey was not at the time of day and/or season when animals or fresh sign would be expected to be seen. **Size:** If a colony is active, record the acreage of active mounds. Include the acreage of any inactive mounds, if possible. If a colony is inactive or activity is unknown, indicate the acreage of all mounds. If acreage cannot be accurately estimated, place size in one of the following acreage categories; A: 0-5, B: 6-40, C: 41 – 160, D: 161 – 640, E: > 640, or U: unfamiliar with or unable to give acreage estimation. **How size determined:** Indicate how the size was determined, e.g., visual, 7.5-minute map, GPS. **Density:** estimate the number of burrows per acre: Low = less than 5 burrows per acre, Medium = 5 – 10 burrows per acre, High = more than 10 burrows per acre. (An acre is a circle with a diameter of 235 feet, or a square 209 feet to the side.) **Land Ownership:** Indicate ownership, if known. **Comments:** provide any notable information such as shape of colony, landscape features, or adjacent land use. Indicate if any of these associated species are present: Burrowing Owl, Mountain Plover, Ferruginous Hawk, Swift Fox, or Black-footed Ferret.

Prairie Dog Colony Observation Form

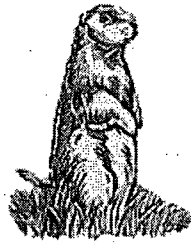
Observer _____

Address _____

_____

Tel. _____

Email _____



Location or Identifier	Township, Range, Section, ¼ and UTM zone, east, north	Date (mo/day/yr)	Activity Y, N, U	Size (acres) all mounds	Size (acres) active mounds	How size determined	Density L, M, H	Land Ownership
Example: 2.5 mi SSE of Miles City	T7N,R47E,12,NW	7/1/00	Y	20	15	Mapped	M	Private
Comments: Example: Colony is semi-circular in shape. Colony is bordered by grain fields on the north. Five acres of inactive burrows adjacent to the west.								
Example: town ref # muss99012	13T 271988E, 5171617N	7/12/00	Y	D		Visual	M	BLM
Comments : Example: Colony is elongate, approximately ¾ mile long and ½ mile wide. Two burrowing owls near center of colony and one Ferruginous Hawk.								
1.								
Comments:								
2.								
Comments:								
3.								
Comments:								
4.								
Comments:								
5.								
Comments:								

2.7 Black-Footed Ferret Surveys

If active prairie dog colonies are present within the study area that meet criteria as potential black-footed ferret habitat (white-tailed prairie dog towns or complexes greater than 200 acres) the BLM and U.S. Fish and Wildlife Service (USFWS) will be consulted regarding requirements for black-footed ferret surveys. A portion of the study area has been block-cleared for black-footed ferrets.

If ferret surveys are required survey protocol will follow standard USFWS guidelines (USFWS 1989). Nocturnal (spotlight) surveys would be completed during the survey window of July 1 and October 31. Each section (320 acres or smaller) of the colony would be surveyed for 3 consecutive nights. All results would be recorded on standard data forms. Survey reports would follow USFWS guidelines. A biologist who has completed USFWS training in conducting ferret surveys would lead the field effort.

2.8 Other Wildlife Resources

Specific field studies are not proposed for small mammals, reptiles and amphibians, big game animals, predators, wintering sage grouse, waterbirds, wintering and migrating passerine birds, wild horses, or other biological resources. Existing data will be used to describe other wildlife resources in the project area. Past environmental studies, GIS data bases, research reports, and field reconnaissance level surveys will be used to describe these resources.

All sightings or sign of BLM Sensitive Species (that are not included in other studies) that are observed on the site will be recorded on standard field data sheets. BLM Sensitive Species are listed in the following table.

Table 2.8-1 BLM Sensitive Species than may occur in the Great Divide Basin Project Area

Common Name (scientific name)	Habitat
Amphibians	
Northern leopard frog (*Rana pipiens*)	Beaver ponds, permanent water in plains and foothills
Great Basin spadefoot toad (*Scaphiopus intermontanus*)	Sagebrush, semi-desert shrublands, ephemeral pools, streams
Birds	
Baird's sparrow (*Ammodramus bairdii*)	Grasslands, weedy fields
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops
Greater sage-grouse	Basin-prairie shrub, mountain-foothill shrub

(*Centrocercus urophasianus*)	
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows
Mountain plover (*Charadrius montanus*)	Sparse shrub and grasslands, prairie dog colonies with vegetation < 4 inches and slopes < 5%
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests
Peregrine falcon (*Falco peregrinus*)	Cliffs, especially over rivers

Sage sparrow (*Amphispiza billi*)	Basin-prairie shrub, mountain-foothill shrub
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows
Yellow-billed cuckoo (*Coccyzus americanus*)	Riparian cottonwood forest with a dense shrub understory.
Fish	
None in the general area	
Mammals	
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines
Spotted bat (*Euderma maculatum*)	Cliffs over perennial water, basin-prairie shrub
White-tailed prairie dog (*cynomys leucurus*)	Colonies on grasslands and shrublands
Pygmy rabbit (*Sylvilagus idahoensis*)	Tall sage brush stands, draws.
Swift fox (*Vulpes velox*)	Grasslands
Townsend's big-eared bat (*Corynorhinus townsendii*)	Forests, basin-prairie shrub, caves and mines

Plants	
Starveling milkvetch (*Astragalus jejumus*)	Dry barren ridges and bluffs
Contracted Indian ricegrass (*Oryzopsis contracta*)	Basin and foothill areas, dry sandy soils
Gibben's beardtongue (*Penstemon gibbensii*)	Sparsely vegetated shale, sandy, clay slopes
Devil's Gate twinpod (*Physaria eburniflora*)	Cushion plant communities
Persistent sepal yellowcress (*Rorippa calycina*)	Riverbanks, shorelines, sandy soils
Laramie false sagebrush (*Sphaeromeria simplex*)	Cushion plant communities.

2.9 Aquatic Life Surveys

There is no perennial stream in the Lost Creek Permit Area and there is no aquatic life. Therefore, no survey on aquatic life is needed.

3.0 Summary Report

The results of all field surveys completed during the 2006 field season will be summarized in a Biological Field Survey Report.

The report will describe survey methods and survey results. Resource locations will be shown on 1:24,000 Scale Quadrangle maps. Mapping will include sage grouse leks, raptor nests, mountain plover locations and nests, prairie dog colonies, and locations of all study transects and points. Site photographs, photographs of raptor nests and other features will be included as attachments to the report.

4.0 References

Blomquist, F. 2006. Bureau of Land Management, Wildlife Ecologist, Rawlins Field Office, Rawlins Wyoming. Personal Communication With AATA International, Inc. February 2006

Bureau of Land Management. 2005. Wildlife Survey Protocal for Coal Bed Natural Gas Development Powder River Basin Wildlife Taskforce. Buffalo Field Office, Buffalo Wyoming.

Clark, T.W., T.M. Campbell III, M.H. Schroeder, and L. Richardson. 1994. Handbook and Methods for Locating Black-Footed Ferrets. BLM Technical Wildlife Technical Bulletin No. 1. Cheyenne, Wyoming 55pp.

Etzelmiller, R. 2006. Bureau of Land Management, Wildlife Biologist, Rawlins Field Office, Rawlins Wyoming. Personal Communication With AATA International, Inc. February 2006

Hyatt, G. 2006. Wyoming Game and Fish Department, District Wildlife Biologist, Sinclair, Wyoming. Personal Communication. With AATA International, Inc. February 2006

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Wyoming Department of Environmental Quality. 1987. Guideline No. 5, Wildlife. Land Quality Division.

Wyoming Game and Fish Department. 1982. Handbook of Biological Techniques.

Attachment 3.6-3 BLM and WDEQ Correspondence

Correspondence Wildlife Report
Ur Energy Lost Creek Project
NRC Technical Report
August 2007

List of Letters and Memos:

Memo1 – Meeting Notes BLM and AATA International on Project Overview and Wildlife Study Requirements

Memo2 – Meeting Notes WDEQ and AATA International on Project Team Introductions

Letter 3 – Correspondence between Cecily Mui (AATA Wildlife Specialist) and Rhen Etzelmiller (BLM Wildlife Biologist)

Letter4 – Correspondence between Cecily Mui (AATA Wildlife Specialist) and Rhen Etzelmiller (BLM Wildlife Biologist)

Letter5 – Correspondence between Cecily Mui (AATA Wildlife Specialist) and Melissa Bautz (WDEQ Senior Environmental Analyst)

AATA International, Inc. - Internal Memorandum
Ur-Energy USA Great Divide Basin ISL Project
Meeting Notes – BLM and AATA International
Meeting Date: February 2, 2006

Subject: Project overview and wildlife study requirements

Attendance:
AATA International, Inc.: Ping Wang (Project Manager/Geologist, Scott Kinderwater (Assistant Project Manager/Soil Scientist), Cecily Mui (Wildlife Ecologist), Eric Berg (AATA Associate/Wildlife Consultant)
BLM: Mark Newman (Project Manager/Geologist), Rhen Etzelmiller (Primary Wildlife Biologist for the Project), Frank Blomquist (Wildlife Biologist), Bob Lange (Hydrologist), Debbie Johnson (Assistant Field Manager), Mr. Carmella Miller (Supervisor)

Materials Provided: Regional topo map, aerial photos for Lost Soldier and Lost Creek project sites.

Ping Wang, Scott Kinderwater, Cecily Mui, and Eric Berg met with BLM staff at the Rawlins BLM Field Office to present a quick overview of the project and to discuss wildlife study needs for the Ur-Energy Great Divide Basin ISL Uranium Project - baseline study. Mark Newman of BLM Rawlins was assigned as the project manager for this project. Rhen Etzelmiller was introduced as the primary wildlife biologist who will be working with us. Frank Blomquist will be a secondary wildlife biologist contact for the BLM.

Scott Kinderwater presented an overview of the Ur-Energy ISL mining process. Mark Newman clarified that we will need to submit a Plan of Operation, which is the classification for mining activities with an area greater than five acres. The Plan is described in 43-CFR-3809 Surface Mining Claim Regulations. (The next day, Mr. Mark Moxely, WDEQ – Lander, clarified that the Wyoming Permit to Mine is comparable to BLM's Plan of Operation and that WDEQ will be the lead agency for the permit application process). Mr. Newman mentioned that we can submit a Plan of Operations to include both the Lost Soldier and Lost Creek project sites. The plan will be reviewed by BLM and WDEQ simultaneously. BLM will have 30 days to review the Plan of Operations (permit application) and to make decisions and comments. If they see problems with the plan, i.e. threatened and endangered species concerns, they can request an additional 60-day extension for the review process. Should there be findings of no significant impacts, the Plan of Operation will be accepted as an EA. Otherwise, the plan will move into NEPA review and an EIS process will be required. Debbie Johnson was concerned about the project timetable should NEPA and EIS be involved. Mark Newman mentioned that he does not foresee that need.

The meteorology station will disturb an area less than 5 acres, hence, a Notification of Intent will need to be filed prior to its installation. BLM will have 15 days to review the

Notice. Mark Newman mentioned that Ur-Energy has filed a Notice of Intent for the Lost Soldier and Lost Creek sites for exploratory drilling operations. Ur-Energy will need to amend the Lost Soldier Area Claim Notification of Intent with a letter describing actions for the meteorology station. The reclamation process should follow protocols described in 43-CFR-3809. AATA International will forward an electronic copy of the letter describing the met station amendment to Nancy FitzSimmons at Ur-Energy. Ur-Energy, USA will then send the amendment to Mark Newman on their letterhead.

Projected related questions posed by BLM concerned:

- Processing plant and building construction on the claim site – Ping and Scott clarified that project design and engineering are still under development. Currrent Plan of Operations does not include constuctrion of a mill on-site and uranium extraction from the "resin" will be processed off-site. Possible building structure on the claim sites would be a small-scale construction (less than 5 acres) for the primary pre-processing of extracted solution and preparation of lixivant injection.

- Aquifer depletion, contamination, and post-mining status – Bob Lange of BLM wanted to know what will be the source for water used for re-injection. Ping explained that the water will come from the same aquifer from which dissolved uranium is recovered. He explained that during wellfield reclamation, water will be returned to the aquifer in a background state. There will be numerous monitoring wells surrounding the active ISL wellfield to ensure a successful reclamation. The aquifer to be mined will have a categorical exemption under EPA's underground injection control (UIC) program.. WDEQ has a parallel program for underground injection. The aquifer exemption (for human consumption and other uses) will remain in that status after mining – even after water quality action levels are met as a result of reclamation.

  Bob was also interested in the depth of the wells. Ping responded that potential depths will mostly be 100 – 900 feet below ground surface (shallower in the Lost Soldier Claim Area and deeper in the Lost Creek Claim area). BLM will be interested in knowing about ISL in areas of shallow groundwater, since they recharge water in the Lost Soldier Creek area for agricultural, wetlands, and wildlife beneficial uses. Ping pointed out that the recharging are is up-gradient from the claim areas and thus will not be impacted by proposed ISL operations.

  Bob referenced us to a USGS groundwater study that was recently conducted for Sweetwater County and is currently being conducted for Carbon County. Ping recorded the reference for the publication. (AATA has obtained a digital copy of the report.)

The discussion at the point was re-directed to wildlife. Scott presented the background that Gas Hill recently presented an EA for a similar project. It is unknown if the Great Divide Basin ISL Uranium permit application would likely achieve a similar outcome,

although the intent is to conduct baseline studies that would meet all data requirements for any potential NEPA requirements.

Rhen wanted us to better clarify the extent of surface disturbance. Ping and Scott described the following probable disturbance: monitoring well, exploration well, injection wells, and production well drilling; adjacent temporary well pad areas and mud pits; one small primary pre-processing building and header works on each claim; some buried pipelines. Well monitoring activities may disturb the surface, but will be minimized by not monitoring when the surface is wet. No new roads are anticipated except for a road at each claim to the header works building. In summary, 40 plus wells will be active before and after operations commence. Minimal noise levels are anticipated - similar to compression stations.

BLM wants the restoration to be to the state of Wyoming engineering standards. Rhen mentioned that the mining activities will need to be sensitive to wildlife activities such as migratory bird nesting seasons especially for species on the BLM species of concern list which is slightly different from the Wyoming state list.

Rhen mentioned the need for a nesting bird survey in representative habitats on the Project sites. Eric will modify his scope of work to include it.

Eric presented the studies that he has planned that the BLM will most likely require. He will be doing a sage grouse lek survey. He wanted input from BLM on their preferred method, either aerial or ground. BLM suggested talking to grouse expert Greg Hyatt of WGFD. They will contact him for additional information on lek surveying and the need for winter surveys. Winter survey requirements are determined on a project-to-project basis and will need Greg's input. These surveys will be conducted with a two mile radius around the Project sites. Cecily asked if we could acquire presently know data for leks and other wildlife. BLM said yes and we could get it from their GIS department.

Eric presented his plan for a mountain plover survey. Frank agreed because he believes that they are nesting in the Lost Creek area.

Eric mentioned that he planned to conduct a raptor nest survey. That will include a one mile radius around the Project sites.

Eric inquired if additional big game data would be need or if existing data would suffice. Rhen and Frank agreed that additional data is not necessary.

Eric asked if this area is black-footed ferret block-cleared, which meant that the area is exempted from further needs to search for black-footed ferrets. Rhen and Frank do not think that it is. Hence if prairie dogs are found on the site, the towns will not only need to be mapped, they will need to be searched for black-footed ferrets. (However, later review of GIS data showed that the Project sites are block-cleared except for two section of Lost Soldier Claim Area.)

Eric mentioned that he is doing pygmy rabbits studies on another site and wanted to know if the Rawlins BLM wanted it for this area. Frank and Rhen mentioned that they recently learned from upper division BLM that they have pygmy rabbits in their management area. They do not know about proper protocols yet. Eric proposed that he could submit surveying protocols for the study if it is needed. Cecily suggested that we should wait for the BLM to determine their regulatory policies and they could then contact us on the monitoring needs. Rhen and Frank agreed.

Cecily asked if BLM were aware of any plant of concern on these sites. BLM said no.

Mark Newman want to know the actual extent of the disturbance area and if it was throughout the whole site. Ping said no. Mark mentioned that a biological study of the whole site might not be necessary. Scott stated that Ur-Energy wanted a baseline for the whole area and not just the active mining areas.

Action Plan:

Eric Berg (wildlife specialist) will present an updated scope of work to AATA International based on the information gathered at the BLM meeting.

Eric Berg will communicate survey plans and methods to BLM. All problem areas will be clarified with further consultation with BLM and WGFD.

Cecily and Eric will get GIS and previous wildlife data from Rhen and Frank.

Eric will touch base with Greg Hyatt from WGFD to review our meeting with BLM.

Rhen and Frank will contact Greg for sage grouse lek surveying methods and winter surveying needs.

If there is a need to conduct sage grouse winter surveys, Eric will see to those needs immediately.

Rhen will follow-up with us on BLM pygmy rabbit policy.

Rhen requested that we provide the BLM with our wildlife findings and maps.

AATA International, Inc. - Internal Memorandum
Ur-Energy USA Great Divide Basin ISL Project
Meeting Notes – WDEQ and AATA International
Meeting Date: February 3, 2006

Subject: AATA International project team introductions

Attendance:
AATA: John Aronson (President), Ping Wang (Project Manager/Geologist, Scott Kinderwater (Assistant Project Manager/Soil Scientist), Cecily Mui (Wildlife Ecologist), Eric Berg (AATA Associate/Wildlife Consultant)
WDEQ-Land Quality Division: Mark Moxley (Project Manager?/District Supervisor) and Amy D. Boyle (Senior Environmental Analyst)

Materials Provided: Regional topo map, aerial photos for Lost Soldier and Lost Creek project sites.

John Aronson, Ping Wang, Scott Kinderwater, Cecily Mui, and Eric Berg met with Mark Moxley and Amy Boyle at the Wyoming DEQ Landers office on February 3, 2006.

John introduced the members of the AATA team to WDEQ and mentioned other members not present, including Warren Keammerer (Botanist) and Kathol (Sociologist). Mark asked about the hydrologist for the project and John mentioned a specialized hydrology firm based in Wyoming will be contracted by Ur-Energy for the work.

Ping was asked by John to summarize the key points of the BLM Rawlins Field Office meeting from the previous day.

Ping mentioned the meteorology station and John presented background information and data that will be collected by the meteorology station. Ping and Scott mentioned their plans to add an amendment to the Notice of Intent for exploratory drilling present by Ur-Energy. This amendment was advised by BLM based on the discussions during the previous day at the Rawlins BLM Field Office. The meteorology station would most likely be installed immediately after the Notice is reviewed by the BLM.

Ping reviewed the ISL mining procedures. John suggested that a visit should be made by the participating government agencies to the Smith Ranch Highlands ISL site so that they can see and understand how the operation works and the level of environmental impact.

Ping reviewed the aquifer discussion at BLM and that ore depth ranged from 100-900 feet (shallower in the Lost Soldier Claim Area and deeper in the Lost Creek Claim area). Mark wanted to know about past drilling exploration activities and the possibility of existing open bore holes. John mentioned that their may be holes that were not covered properly in the past but that it was a very small percentage.

Eric Berg reviewed the BLM wildlife discussion and his scope of work. Mark reaffirmed that he wanted us to follow the WDEQ wildlife guidelines. Ping mentioned that he will be posting protocols to the environmental management website.

Everyone concurred that the baseline studies will have to be done this summer for permitting review to begin in the fall.

Tom Nicholson, his association?, will be the on-site geologist and will be conducting the geohydrology work. Mark wants a meeting with the groundwater team as soon as possible. He would like to review well drilling that was conducted last fall and ground water sampling at each site, especially if the sampling will begin again soon this year. John stated that the sampling protocol will need to be reviewed by WDEQ and that similarly, architects will want to come up to meet with WDEQ. John further assured that Ur-Energy plans to hire a groundwater specialized company with an engineering focus. However, AATA will help review the environmental aspects their groundwater plans.

Mark discussed BLM and the NEPA process. NRC will take the lead on NEPA. Steve Cowen from NRC will be reviewing the environmental aspects. Mark mentioned that there has been poor coordination between NRC and BLM in the past. BLM does not appear to understand the NRC environmental assessment process. John assured that he will have meetings with NRC in Washington, D.C. to review the NEPA and that he will bring the agencies together.

Ping mentioned that the riparian area along Lost Soldier Creek will not be disturbed and that mining activities will be concentrated up-gradient of the stream. Mark reaffirmed a need for riparian delineation.

Ping discussed present road conditions on the site and WDEQ were able to see the numerous existing roads on the aerial photos. Ping reaffirmed that no new roads will be built except for a road to the primary pre-processing building which will be on parcels less than 5 acres on each site. Dirt roads on the site will not be used if the ground surface is wet and off-road driving will not occur.

Mark asked if a monitoring station will be installed for surface hydrology studies. John responded that it will be and there will be sampling during the wet and dry seasons. Eric mentioned that the BLM had said that they supplement flows in Lost Soldier for agricultural and wildlife enhancements. Ping reassured that activities should not impact the riparian area.

Action Plan:
Ur-Energy will need to contact WDEQ with the name of the firm administering to groundwater and to set-up a meeting between the firm and WDEQ.

AATA will contact Ur-Energy to amend the Notice of Intent for Lost Soldier for the meteorology station installation.

Eric Berg will conduct the wildlife studies in a manner that will meet WDEQ wildlife guidelines.

The architectural team will need to meet with WDEQ to review architectural plans.

John Aronson will meet with NRC in Washington, D.C. and will orchestrate a smooth communication between pertinent government agencies.

AATA will confirm proper riparian delineation and surface water monitoring according to WDEQ guidelines.

March 17, 2006

Rhen Etzelmiller
Wildlife Biologist
Bureau of Land Management
Rawlins Field Office
1300 North Third Street
P.O. Box 2407
Rawlins, WY 82301

Dear Rhen,

I would like to give you an update on the progress we are making in the Wildlife section of the baseline study for Ur-Energy at the Lost Soldier and Lost Creek Claim Areas.

First of all, many thanks to you, Frank Blomquist, and Lynn McCarthy for the time, data support, and insights that you have all given to us on the project. Our wildlife team is well-situated for a timely start to the field season. The fieldwork will begin with Sage Grouse Lek Surveys and Counts on the first week of April. Other wildlife surveys planned for the season are:

- Raptor nest survey
- Nesting mountain plover survey
- Breeding bird survey
- Prairie dog colony mapping
- Black-footed ferret survey
- Aquatic survey

I have enclosed a rough timetable of our field schedule.

We have also compiled a set of written field protocols for each of the above surveys to ensure uniform data collection. These protocols are based on your inputs and techniques commonly used by BLM and WGFD. We desire to use techniques that are accepted by the BLM that would result in a data set which may be useful for your database. Any suggestions or comments that you have on our field protocols would be acknowledged and greatly appreciated.

I look forward to hearing from you.

Sincerely,

Cecily H.Y. Mui
Environmental Specialist II

cc: Mark Newman, BLM, Rawlins Field Office

From: Rhen_Etzelmiller@blm.gov
Sent: Thursday, March 23, 2006 10:35 AM
To: Cecily Mui
Subject: Re: Ur-Energy Wildlife Work Plan

Cecily,

First off, I apologize for not getting back to you sooner. I've been out of the office for a few days. I haven't yet had a chance to review the Wildlife Studies Workplan that you sent to me. There are a couple of issues that must be resolved before I can allocate much work time to the review or coordination of the project. I completely understand the desire to get out there and get ahead of the project to gather some important and relevant wildlife baseline info. The primary problem from my end is that there is no Plan of Operations submitted yet for the project, and the Plan of Ops. is the document that is necessary for us (BLM) to officially start work on the project.

Now, with that being said, I can also say that I am trying to figure out what I am allowed to do in regards to this project, and I am fully willing to do whatever I can in order to facilitate the implementation of survey protocols and ensure that the information gathered will be up to standard. In that regard, I will say that whatever wildlife work that is done before a Plan of Operations is submitted is dependent upon what you (AATA) determine to be necessary and are willing to pay for. I can not/will not require/request any surveys until I have reviewed the Plan of Operations and determined exactly what is relevant.

Thanks,

Rhen M. Etzelmiller, Wildlife Biologist
BLM, Rawlins Field Office
1300 N. 3rd, P.O. Box 2407
Rawlins, WY 82301-2407
1 (307) 328-4200
"Rhen_Etzelmiller@blm.gov"

"Cecily Mui" <cecily.mui@aata.com>

03/17/2006 12:18 PM

To <rhen_etzelmiller@blm.gov>
cc <mark_newman@blm.gov>, <frank_blomquist@blm.gov>, "John Aronson" <john.aronson@aata.com>, "Ping Wang" <ping.wang@aata.com>, "Scott Kinderwater" <scott.kinderwater@aata.com>, "Ayman Salloum" <ayman.salloum@aata.com>
Subject Ur-Energy Wildlife Work Plan

Dear Rhen,

I would like to give you an update on the progress we are making in the Wildlife section of the baseline study for Ur-Energy at the Lost Soldier and Lost Creek Claim Areas.

First of all, many thanks to you, Frank Blomquist, and Lynn McCarthy for the time, data support, and insights that you have all given to us on the project. Our wildlife team is well-situated for a timely start to the field season. The fieldwork will begin with Sage Grouse Lek Survey and Counts on the first week of April. Other wildlife surveys planned for the season are:

- Raptor nest survey
- Nesting mountain plover survey
- Breeding bird survey
- Prairie dog colony mapping
- Black-footed ferret survey
- Aquatic survey

I have enclosed a rough timetable of our field schedule.

We have also compiled a set of written field protocols for each of the above surveys to ensure uniform data collection. These protocols are based on your inputs and techniques commonly used by BLM and WGFD. We desire to use techniques that are accepted by the BLM that would result in a data set which may be useful for your database. A hardcopy of the attachments to this email will follow via post. Any suggestions or comments that you have on our field protocols would be acknowledged and greatly appreciated.

I look forward to hearing from you.

Sincerely,
Cecily

CECILY H.Y. MUI
Environmental Specialist II
AATA International, Inc.
300 East Boardwalk Dr, Ste 4A
Fort Collins, CO 80525
Office: 970-223-1333
Fax: 970-223-9115
cecily.mui@aata.com

March 24, 2006

Melissa L. Bautz
Senior Environmental Analyst
State of Wyoming
Department of Environmental Quality
Land Quality Division
Lander, WY 82520

Dear Melissa,

You may have heard from either Mark Moxley or Scott Kinderwater that I am the wildlife task manager at AATA International, Inc. I would like to give you an update on the progress we are making in the Wildlife section of the baseline study for Ur-Energy at the Lost Soldier and Lost Creek Claim Areas.

Our wildlife team is well-situated for a timely start to the field season. The fieldwork will begin with Sage Grouse Lek Surveys and Counts on the first week of April. Other wildlife surveys planned for the season are:

- Raptor nest survey
- Nesting mountain plover survey
- Breeding bird survey
- Prairie dog colony mapping
- Black-footed ferret survey
- Aquatic survey

I have enclosed a tentative schedule for our field work in 2006.

We have also compiled a set of written field protocols for each of the above surveys to ensure uniform data collection. These protocols are based on techniques commonly used by BLM and WGFD. Please let us know if you have comments on our wildlife studies work plan.

Sincerely,

Cecily H.Y. Mui
Environmental Specialist II

cc: Greg Hyatt, Biologist, WGFD

Attachment 3.6-4 MBHFT in Wyoming

Because attachment is comprehensive, it may be used for both coal and non-coal projects (WDEQ Guideline 5).

Migratory Bird of High Federal Interest in Wyoming
COAL MINE LIST

Based on Wyoming Bird Conservation Plan, 1 May 2000 (Cerovski et al. 2000)

May 2, 2002

U.S. Fish and Wildlife Service, Wyoming Field Office,
4000 Airport Parkway, Cheyenne, Wyoming 82001

The Wyoming Field Office of the U.S. Fish and Wildlife Service (Service) has compiled the following list from the ongoing work among State and Federal agencies, non-governmental organizations, and the interested public that produced the Wyoming Bird Conservation Plan. This list will now serve as the Service's list of Migratory Birds of High Federal Interest (also known as the Migratory Bird Species of Management Concern in Wyoming) to be used exclusively for reviews concerning existing or proposed coal mine leased land. The Wyoming Bird Conservation Plan identified "priority species" based on a number of criteria (see below) using the best information available for these generally un-studied species. In many cases, this list reflects identified threats to habitat because no information is available on the species population trends. In some cases it reflects identified population declines though no causal factors have been identified.

Partners in Flight (PIF) is the name given to the coalition of groups that produced the Wyoming Bird Conservation Plan. PIF developed a scoring system to rank species in order of conservation priority. A species' PIF score is the sum of seven sub scores rating the following biological criteria: relative abundance (RA), breeding distribution (BD), non-breeding distribution (ND), threats on breeding grounds (TB), threats on non-breeding grounds (TN), population trends (PT), and area of importance (AI). These criteria are more fully described the end of this document. AI, PT and total PIF scores are listed for each species in Tables 1 and 2. Species with a PIF score of 18 or above, an AI score of 3 or above, and/or PT score of 3 or above were identified as the highest priority species. For more information on the listing process, refer to the Wyoming Bird Conservation Plan, available from the U.S. Fish and Wildlife Service, 4000 Airport Parkway, Cheyenne, Wyoming 82001; or Wyoming Game and Fish Department, Nongame Branch, 260 Buena Vista, Lander, Wyoming 82520.

Table 1. **Level I Species (Conservation Action)**. Species clearly needs conservation action. Includes species of which Wyoming has a high percentage of and responsibility for the breeding population, and the need for additional knowledge through monitoring and research into basic natural history, distribution, etc.

Species	PIF Score[a]	AI[b]	PT[c]	Primary Habitat Type(s)
Mountain Plover[d]	28	4	3	Shortgrass Prairie, Shrub-steppe
Sage Grouse	26	5	3	Shrub-steppe
McCown's Longspur	26	3	2	Shortgrass Prairie, Shrub-steppe
Baird's Sparrow	26	2	3	Shortgrass Prairie
Ferruginous Hawk	23	4	3	Shrub-steppe, Shortgrass Prairie
Brewer's Sparrow	23	5	5	Shrub-steppe, Mountain-foothills Shrub
Sage Sparrow	22	5	2	Shrub-steppe, Mountain-foothills Shrub
Swainson's Hawk	21	3	3	Plains/Basin Riparian
Long-billed Curlew	21	2	3	Shortgrass Prairie
Short-eared Owl	20	3	3	Shortgrass Prairie
Peregrine Falcon	19	3	3	Specialized (cliffs)
Burrowing Owl	19	3	4	Shortgrass Prairie
Bald Eagle	18	3	3	Montane Riparian, Plains/Basin Riparian
Upland Sandpiper	18	2	2	Shortgrass Prairie

[a] From the PIF Priority Database (Carter et al. 1997).
[b] AI = Area Importance (from the PIF Priority Database, Carter et al. 1997).
[c] PT = Population Trend (from the PIF Priority Database, Carter et al. 1997).
[d] Species previously appeared on the Service's 1995 list.

Table 2. **Level II Species (Monitoring)**. The action and focus for the species is monitoring. Includes species of which Wyoming has a high percentage of and responsibility for the breeding population, species whose population trend is unknown, species that are peripheral for breeding in the habitat or state, or species for which additional knowledge is needed.

Species	PIF Score[a]	AI[b]	PT[c]	Primary Habitat Type(s)
Cassin's Kingbird	22	3	3	Juniper Woodland, Plains/Basin Riparian
Lark Bunting	22	4	4	Shortgrass Prairie, Shrub-steppe
Dickcissel	21	3	3	Shortgrass Prairie
Chestnut-collared Longspur	21	2	3	Shortgrass Prairie
Black-chinned Hummingbird	20	2	3	Plains/Basin Riparian, Shrub-steppe
Pygmy Nuthatch	20	3	3	Low Elevation Conifer
Marsh Wren	20	3	4	Wetlands
Western Bluebird	19	3	3	Juniper Woodland, Low Elevation Conifer
Sage Thrasher	19	5	2	Shrub-steppe
Grasshopper Sparrow	19	3	5	Shortgrass Prairie, Shrub-steppe
Bobolink	19	2	3	Shortgrass Prairie, Shrub-steppe
Common Loon	18	3	3	Wetlands
Black-billed Cuckoo	18	2	3	Plains/Basin Riparian
Red-headed Woodpecker	18	2	3	Plains/Basin Riparian, Low Elevation Conifer
Yellow-billed Cuckoo	18	3	3	Plains/Basin Riparian
Eastern Screech-Owl	18	3	3	Plains/Basin Riparian
Western Screech-Owl	18	3	3	Plains/Basin Riparian
Western Scrub-Jay [d]	18	3	3	Juniper Woodland
Loggerhead Shrike	18	3	3	Shrub-steppe
Vesper Sparrow	18	5	4	Shrub-steppe
Lark Sparrow	18	3	4	Shrub-steppe
Ash-throated Flycatcher [d]	16	2	3	Juniper Woodland
Bushtit [d]	16	3	3	Juniper Woodland
Merlin	15	3	3	Low Elevation Conifer
Sprague's Pipit	n/a	n/a	n/a	Grassland, Plains/Basin Riparian, Shortgrass Prairie
Barn Owl	n/a	n/a	n/a	Shortgrass Prairie, Urban

[a] From the PIF Priority Database (Carter et al. 1997).
[b] AI = Area Importance (from the PIF Priority Database).
[c] PT = Population Trend (from the PIF Priority Database).
[d] Nicholoff, S. 2002. Wyoming Bird Conservation Plan, Version 1.1. Wyoming Partners In Flight and Wyoming Game and Fish Department, Lander. In press.

Wyoming Partners In Flight Process for Prioritizing Species

Wyoming Partners In Flight participants developed the current list of priority species based on a combination of the seven criteria in the national Partners In Flight Priority Database (Carter et al. 1997). This database serves as a defensible method of prioritizing both species and habitats in need of conservation. The criteria include Wyoming-dependent and Wyoming-independent factors. The Wyoming-independent criteria are constant over a species' range and do not vary for each species. The Wyoming-dependent criteria were the key components used to prioritize species and their conservation action needs. In the absence of any more rigorous statewide surveys, Breeding Bird Survey data dating back to 1968 were used to determine population trends in Wyoming.

Criteria

Within each criterion below, a species was given a rank score ranging from 1 to 5, with 1 being the least critical rank and 5 the most critical. Each ranked species could potentially receive a low score of 7 and a high score of 35. However, setting conservation goals based only on total score could be misleading; therefore, each total score was reviewed in conjunction with its component parts. In Wyoming, species were initially ranked using total score, area importance, and population trend.

1. Relative Abundance (RA) - The abundance of a bird, in appropriate habitat within its entire range, relative to other bird species. This criterion gives an indication of a species' vulnerability to withstand cataclysmic environmental changes. A low score would indicate a higher relative abundance, therefore reducing the risk of complete extirpation from losses in one or more regions. Higher scores indicate a lower relative abundance, thus more vulnerability to drastic losses or population changes.

2. Breeding Distribution (BD) - A relative measure of breeding range size as a proportion of North America [defined as the main body of the continent, excluding Greenland, through Panama and the islands of the Caribbean, comprising an area of 22,059,680 km^2 (National Geographic Society 1993)], and as such it provides an index of a species' vulnerability to random environmental events. High scores indicate localized breeding, thus a higher likelihood of serious decline from drastic environmental changes. Low scores indicate wide breeding distribution, therefore less likelihood of extirpation. Used for breeding birds only.

3. Non-breeding Distribution (ND) - A relative measure of non-breeding, or winter, range size as a proportion of North America, and as such it provides an index of a species' vulnerability to random environmental events. High scores indicate localized distribution on the non-breeding grounds. Low scores indicate wide distribution on the non-breeding grounds, therefore less likelihood of extirpation. Used for wintering birds only.

4. Threats on Breeding Grounds (TB) - The ability of a habitat in an area to support populations of a species in that area. Two factors are considered here: 1) each species' demographic and ecological vulnerability (the potential inability of a species to recover from population loss by normal reproductive effort due to low reproductive rate, high juvenile mortality, or both; and the level of ecological specialization of a species and, hence, its potential inability to withstand environmental change), and 2) habitat loss or disruption (a combination of the amount of habitat or conditions necessary for survival and reproductive success that has been lost since 1945, and the amount that is anticipated to be lost in the future). High scores indicate either a large loss of habitat or a species that is an extreme ecological specialist. Low scores indicate a stable or increasing habitat or a species that is an ecological generalist. Used for both breeding and wintering birds.

5. Threats on Non-breeding Grounds (TN) – Range-wide threats on non-breeding, or winter, grounds. This is scored using the same criteria as threats on breeding grounds but reflects non-breeding issues, including migratory habitat. Used for wintering birds only.

6. Population Trend (PT) - The overall population trend of each species assigned independently for each state, province, or physiographic area. This criterion must meet two thresholds, reliability and magnitude, to warrant either a very high or very low score. When possible, a score was assigned using BBS data, which incorporated a population trend uncertainty score based on the statistical validity of the BBS data (i.e. a species must be detected on a minimum of 14 BBS routes per state for population trends to have statistical significance). This criterion was chosen to alert managers to species with modest, but certain, population declines.

7. Area Importance (AI) - The abundance of a species within a state, province, or physiographic area relative to its abundance throughout its range. This criterion helps direct conservation efforts toward areas that are most important to a species' survival. Area Importance is scored locally; therefore, high scores indicate that a large proportion of the species' breeding or winter range occurs in Wyoming, or a species is using a habitat that is only available in Wyoming. Low scores indicate that a small proportion of the species' range occurs in Wyoming, or the preferred habitat is widespread across its range. Used for both breeding and wintering birds.

Priority Species

Priority bird species in Wyoming were identified from the PIF Priority Database (Carter et al. 1997) and by qualitative, informed decisions. Those species with a total score of 18 or above, Area Importance (AI) of 3 or above, and/or Population Trend (PT) of 3 or above from the database, or with a total score less than 18 but of significant local interest were identified as the highest priority species. However, as more information becomes available, the highest priority species for Wyoming may change, as this is a dynamic database that allows for updated information to be periodically inserted and reviewed. The primary habitat type or types required for breeding were identified for each species to determine the highest priority habitat types for the state.

Literature Cited

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