



Western Water & Land, Inc.

October 25, 2016

Mr. Kent Walter, Manager  
U.S. Bureau of Land Management  
220 East Market St.  
Meeker, CO 81641

**Monitoring Well/Test Hole Plugging and Abandonment Reports  
American Shale Oil, LLC**

Dear Mr. Walter,

Western Water & Land, Inc. (WWL) is submitting the attached well plugging and abandonment reports on behalf of American Shale Oil, LLC (AMSO). As you know, AMSO is currently conducting reclamation operations at its oil shale RD&D lease tract in Rio Blanco County, Colorado. Reclamation is being performed in accordance with AMSO's approved Plan of Development. As specified in Section (10) of the Plan of Development, all abandoned wells will be plugged to surface with cement to protect the unmined recoverable resources and other resources. The attached reports document that AMSO has completed plugging and abandonment of all test holes and monitoring wells at the RD&D lease tract. These reports were submitted to the Colorado Division of Reclamation, Mining, and Safety under separate cover; the reports were included as part of AMSO's annual report to DRMS which was submitted on October 18, 2016.

If you have any questions, please contact me at [bmerrill@westernwaterandland.com](mailto:bmerrill@westernwaterandland.com) or (970) 242-0170.

Sincerely,

**Western Water & Land, Inc.**

William G. Merrill  
Principal Hydrogeologist

Attachment

cc: Travis Marshall, DRMS  
Claude Pupkin, AMSO  
Dianne Boe, AMSO

*Applications in Earth Science*

743 Horizon Court Suite 330, Grand Junction, CO 81506  
Phone: (970) 242-0170 Fax: (970) 242-0270

**American Shale Oil, LLC**

**Well Plugging and Abandonment Reports**

**AMSO Oil Shale RD&D Project**

**Lease No. COC 69169**

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** BH-1

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE ¼ Section 21, T2S, R89W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.858671° E -108.397194°

**Date Well Plugging & Abandonment Completed:** 8/23/2016

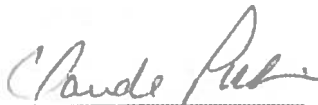
**Type of Material:** Type I Cement

**Method of Placement:** Tremmie

**Interval of Placement:**

Casing/Hole Diameter (in)	Interval (ft bgs)	
	From	To
6 ½	2382	2017
4 ½	2017	0

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16  
Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** HB-L3

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** SW ¼ SE ¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.857144° E -108.395015°

**Date Well Plugging & Abandonment Completed:** 9/15/2016

**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (In)	Interval (ft bgs)	
	From	To
5 ½	1676	0
4 ½	1824	1676

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16  
Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** MWP1-L3

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** SE¼ SW¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.856207°

E -108.401242°

**Date Well Plugging & Abandonment Completed:** 9/20/2016

**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (in)	Interval (ft bgs)	
	From	To
4.33	1744	0
6 ½	1874	1744

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16

Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** MWP2-BG

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NE¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.861683° E -108.395857°

**Date Well Plugging & Abandonment Completed:** 8/25/2016

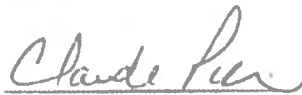
**Type of Material:** Type 1 Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (In)	Interval (ft bgs)	
	From	To
5 ½	1036	0
4 ½	1076	1036

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16

Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** MWP2-L3

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.861796°

E -108.395765°

**Date Well Plugging & Abandonment Completed:** 8/29/2016

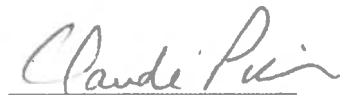
**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (in)	Interval (ft bgs)	
	From	To
5 ½	1685	0
4 ½	1824	1685

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16  
Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** MWP2-WS

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.861914°

E -108.395678°

**Date Well Plugging & Abandonment Completed:** 9/2/2016

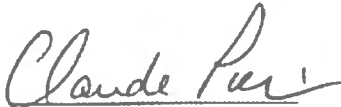
**Type of Material:** Type 1 Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (in)	Interval (ft bgs)	
	From	To
5 ½	2314	0
4 ½	2420	2314

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16  
Date



## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** T-1H

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NE¼ SW¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.859384°

E -108.399289°

**Date Well Plugging & Abandonment Completed:** 8/1/2016

**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (in)	Interval (ft bgs)	
	From	To
13 3/8	2130	0

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16

Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** T-1P

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.858787° E -108.396790°

**Date Well Plugging & Abandonment Completed:** 9/23/2016

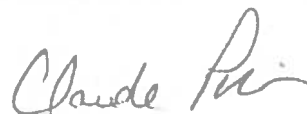
**Type of Material:** Type I Cement

**Method of Placement:** Tremie


**Interval of Placement:**

Casing/Hole Diameter (in)	Interval (ft bgs)	
	From	To
9 5/8	1993	0

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC



Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** TM-1

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.858940° E -108.397097925°

**Date Well Plugging & Abandonment Completed:** 8/18/2016

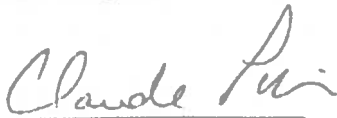
**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (in)	Interval (ft bgs)	
	From	To
10 ¾	1833	0
4 ½	2186	1833

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC



Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** TM-2

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.858917° E -108.397210°

**Date Well Plugging & Abandonment Completed:** 8/9/2016

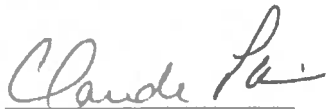
**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (in)	Interval (ft bgs)	
	From	To
4 ½	2245	0

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16

Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** TM-3

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.858898° E -108.397297°

**Date Well Plugging & Abandonment Completed:** 8/12/2016

**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (in)	Interval (ft bgs)	
	From	To
4 ½	2164	0

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16

Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** TM-4

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.858823°

E -108.397176°

**Date Well Plugging & Abandonment Completed:** 8/12/2016

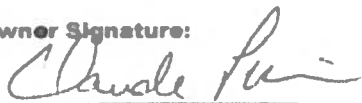
**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:** Initial cement bond evaluations indicated intervals of limited to no cement as shown in attached Figure 1. Abandonment completed in accordance with NOI as shown in Figure 2.

Casing/Hole Diameter (in)	Interval (ft bgs)		Comments
	From	To	
7 5/8	45	0	
13.375	103	45	Perforated 7 5/8" casing at 76'; squeezed cement outside of 7 5/8" casing through perforations; cemented inside 7 5/8" casing
12 1/4	508	103	Perforated 7 5/8" casing at 107' and 420'; squeezed cement outside of 7 5/8" casing through perforations; cemented inside 7 5/8" casing
7 5/8	1807	508	Initial cement evaluations estimated top of cement inside 7 5/8" casing is 1807 ft bgs
1.5 - 1.9	2237	1715	Tubing cut and removed @ free point (1715 ft bgs); filled below 1715 as much as possible by gravity

**Well Owner Signature:**

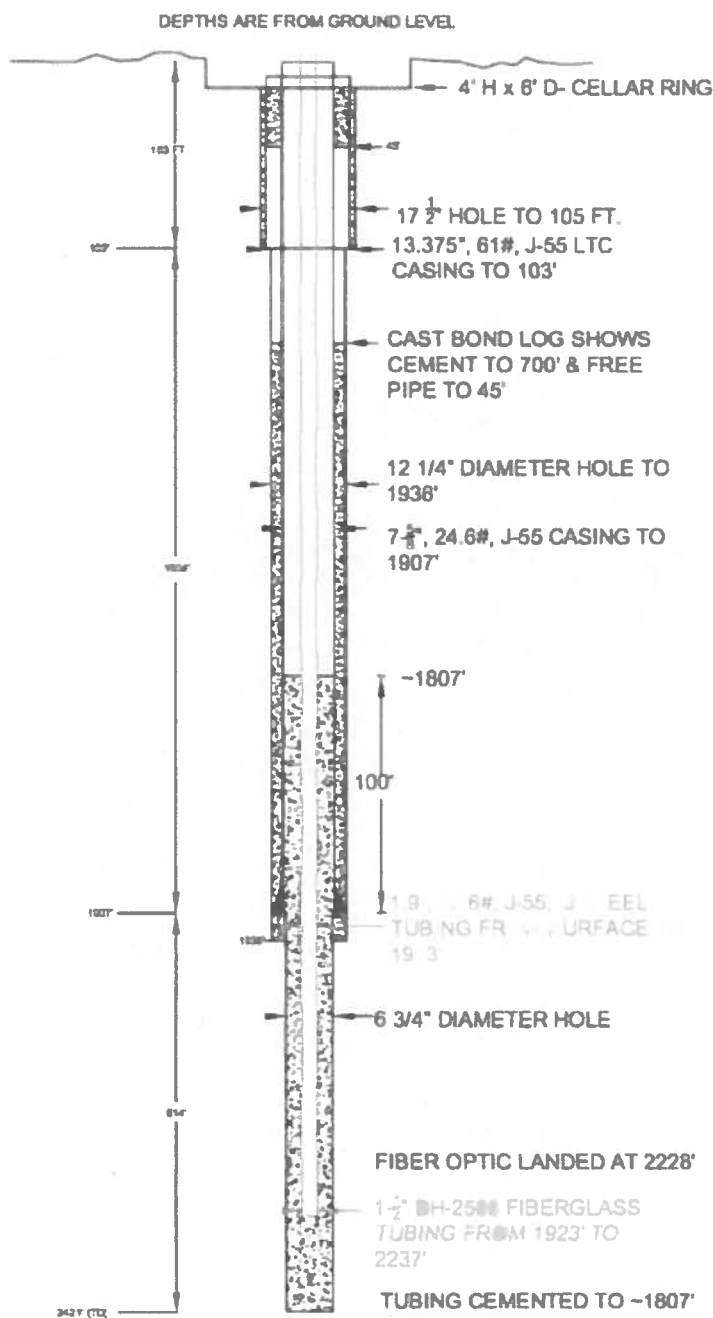


Claude Pupkin  
President  
American Shale Oil, LLC

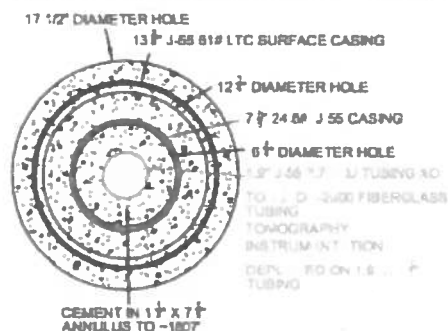
10/17/16  
Date

FIGURE 1

# AMERICAN SHALE OIL, LLC TOMOGRAPHY WELL TM-4



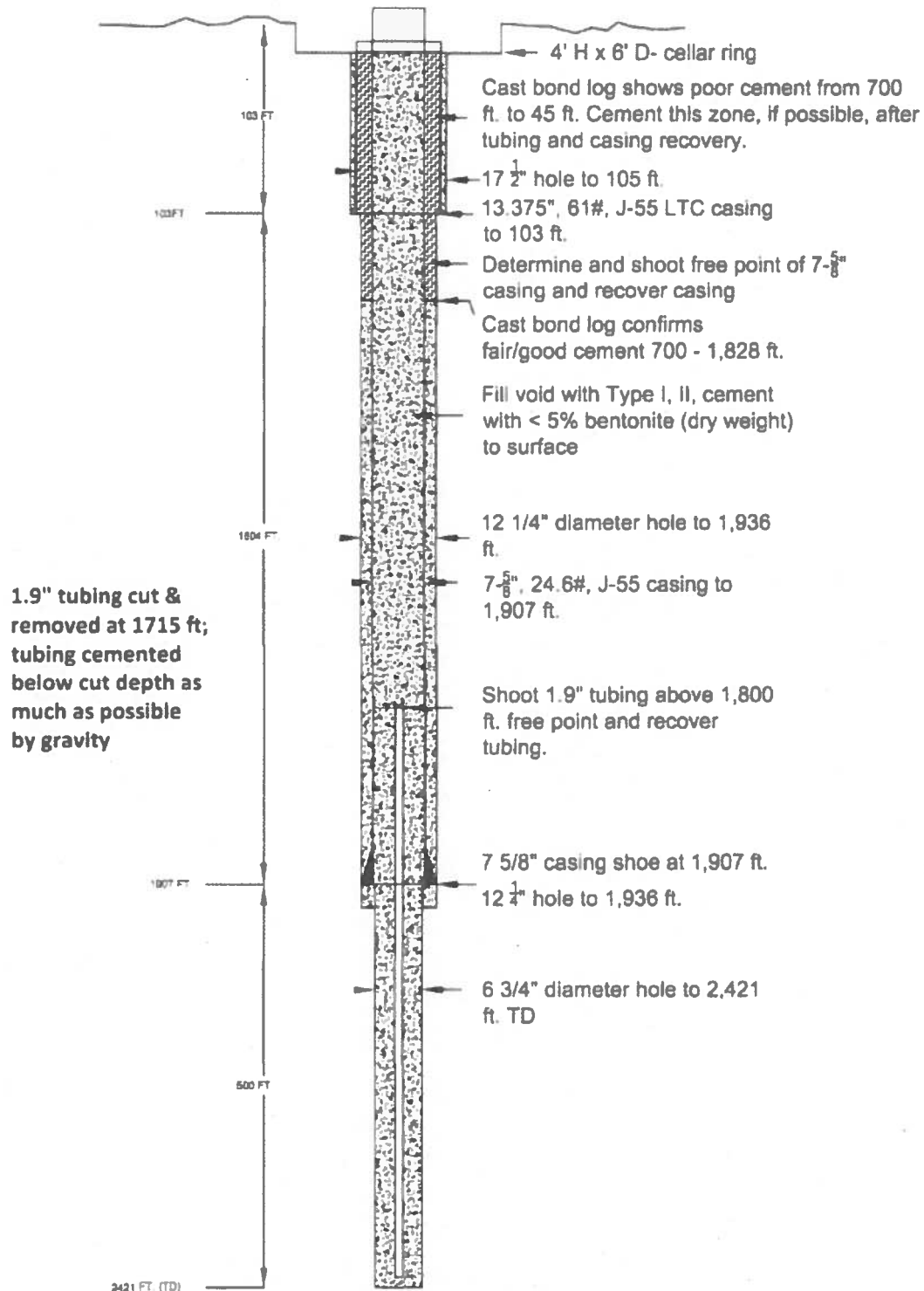
DRAWING NOT TO SCALE



## Well TM-4, Depth reference GL 6906.8'

Depth	Description
1929.3	3C geophone
1933	CASSM amplifier for accelerometer at 2080
1936	CASSM amplifier for accelerometer at 2058
1938	CASSM amplifier for accelerometer at 2028
1964.3	3C geophone
1991.2	ERT #32
1997.0	ERT #31
1999.3	3C geophone
2002.8	ERT #30
2008.6	ERT #29
2014.4	ERT #28
2016	CASSM piezo source
2020.2	ERT #27
2026.0	ERT #26
2028	CASSM accelerometer sensor
2031.8	ERT #25
2034.3	3C geophone
2037.6	ERT #24
2043.5	ERT #23
2049.3	ERT #22
2055.1	ERT #21
2058	CASSM accelerometer sensor
2060.9	ERT #20
2066.7	ERT #19
2069.3	3C geophone
2072.5	ERT #18
2075	CASSM piezo source
2078.3	ERT #17
2080	CASSM accelerometer sensor
2084.1	ERT #16
2089.9	ERT #15
2095.7	ERT #14
2097	CASSM piezo source
2101.6	ERT #13
2104.3	3C geophone
2107.4	ERT #12
2113.2	ERT #11
2119.0	ERT #10
2124.8	ERT #9
2130.6	ERT #8
2136.4	ERT #7
2139.3	3C geophone
2142.2	ERT #6
2148.0	ERT #5
2153.8	ERT #4
2159.7	ERT #3
2165.5	ERT #2
2171.3	ERT #1
2174.3	3C geophone
2179	eye bolt

**FIGURE 2**  
**AMERICAN SHALE OIL, LLC**  
**TOMOGRAPHY WELL TM-4 ABANDONMENT**



DRAWING NOT TO SCALE



## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** TM-5

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.858826° E -108.397074°

**Date Well Plugging & Abandonment Completed:** 8/15/2016

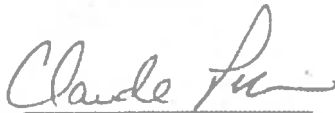
**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (In)	Interval (ft bgs)	
	From	To
4 ½	2250	0

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16

Date

## Plugging and Abandonment Report

### American Shale Oil, LLC

**NOI No.:** P-2008-046

**Company:** American Shale Oil, LLC

**Project:** AMSO Oil Shale RD&D Project

**Well/Hole No.:** TM-6

**Company Responsible for Plugging and Abandoning the Well:** Snow Consulting & Services, Inc.

**Well/Hole Location:** NW¼ SE¼ Section 21, T2S, R98W, 6<sup>th</sup> PM

**GPS Coordinates:** N 39.858833°

E -108.396935°

**Date Well Plugging & Abandonment Completed:** 8/19/2016

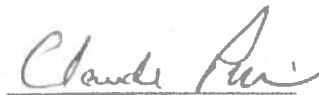
**Type of Material:** Type I Cement

**Method of Placement:** Tremie

**Interval of Placement:**

Casing/Hole Diameter (In)	Interval (ft bgs)	
	From	To
4 ½	2245	0

**Well Owner Signature:**



Claude Pupkin  
President  
American Shale Oil, LLC

10/17/16

Date