EPWM - 5

APPROVED PERMIT APPLICATION AND CONDITON APPROVALS

Jones, Brad A., EMNRD

From: Jones, Brad A., EMNRD
Sent: Monday, March 21, 2011 10:36 AM
To: 'Tgcoakley@aol.com'; tmichaud4@gmail.com
Cc: VonGonten, Glenn, EMNRD
Subject: RE: Liner Test Results

Dear Tim,

The Oil Conservation Division (OCD) received your email, dated March 18, 2011, which included the test results of the Liner Installation Report. OCD has reviewed the test results from the liner installation and has determined that the information provided is adequate. The emails sent on March 17th and the March 18, 2011 email included an as-built drawing and the test results of the installation of the liner material which demonstrated compliance to the proposed manufacturer's recommended installation parameters, as indentified in Attachment M of your permit application and Condition #5 of the September 9, 2010 annual temporary approval EPWM-005. Based upon acceptance of this material and the demonstration of compliance with Condition #1 by OCD on March 14, 2011, OCD hereby grants CAS approval of use of CAS's containment impoundment and approval to receive, store, process, and treat produced water at CAS's produced water treatment facility located at 157 Lake Road, Artesia New Mexico.

If you have any question regarding this matter, please do not hesitate to contact me.

Sincerely,

Brad

Brad A. Jones
Environmental Engineer
Environmental Bureau
NM Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505
E-mail: brad.a.jones@state.nm.us
Office: (505) 476-3487
Fax: (505) 476-3462

From: Tgcoakley@aol.com [mailto:Tgcoakley@aol.com]
Sent: Friday, March 18, 2011 3:33 PM
To: Jones, Brad A., EMNRD; tmichaud4@gmail.com
Subject: Fwd: Liner Test Results

The printed form. It is better

From: agservices@dfn.com
To: Tgcoakley@aol.com
Sent: 3/18/2011 3:31:34 P.M. Mountain Daylight Time
Subj: RE: Liner Test Results

Ok let's try these...

Ben Boal

Ag Services Construction, Inc.

1905 Old Dexter Highway

Roswell, NM 88203

575-623-9264

Fax 575-622-7232

From: Tgcoakley@aol.com [mailto:Tgcoakley@aol.com]
Sent: Friday, March 18, 2011 12:22 PM
To: agservices@dfn.com
Subject: Liner Test Results

Ben,

OCD is complaining they can't make out the writing on the liner test results. Please scn the original, or have it typed as soon as possible.

Sincerely,

Tim Coakley

In a message dated 3/17/2011 2:29:47 P.M. Mountain Daylight Time, agservices@dfn.com writes:

> That was weird, here is a scanned original...
>
> Ben Boal
>
> Ag Services Construction, Inc.
>
> 1905 Old Dexter Highway

Roswell, NM 88203

575-623-9264

Fax 575-622-7232

From: Tgcoakley@aol.com [mailto:Tgcoakley@aol.com]
Sent: Thursday, March 17, 2011 2:06 PM
To: agservices@dfn.com
Subject: Re: Plan view

the view is mirror view, can you fix it

In a message dated 3/17/2011 1:47:14 P.M. Mountain Daylight Time, agservices@dfn.com writes:

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Sent: Friday, March 18, 2011 3:33 PM
To: Jones, Brad A., EMNRD; tmichaud4@gmail.com
Subject: Fwd: Liner Test Results
Attachments: LinerairtestCAS.xlsx; LinerfieldseamtestCAS.xlsx; LinervacuumtestCAS.xlsx

The printed form. It is better

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Roswell, NM 88203

575-623-9264

Fax 575-622-7232

Ag Services Construction, Inc.
1905 Old Dexter Hwy
Roswell, NM 88203

Air Testing Log

Project: C.A.S.
Material: 60mil HDPE

Minimum Starting Pressure (PSIG): 30psi
Maximum Pressure Drop (PSIG): 2psi
Test Time (minutes): 5min

Date	Seam Number	Starting Time	Starting Pressure	Ending Time	Ending Pressure	Pass/ Fail	Tester
11/11/10	P1, P3	9:41am	40	9:46am	40	P	J.P.
11/11/10	P1, P4	9:49am	34	9:54am	34	P	J.P.
11/11/10	P3, P4	9:4am	36	9:49am	36	P	J.P.
11/11/10	P1, P2	9:55am	36	10:00am	34	P	J.P.
11/11/10	P2, P4	10:05am	32	10:10am	32	P	J.P.
11/11/10	P3, P4	10:10am	32	10:15am	32	P	J.P.
11/11/10	P3, P5	10:15am	36	10:20am	36	P	J.P.
11/11/10	P5, P6	10:20am	33	10:25am	32	P	J.P.
11/11/10	P6, P7	10:45am	32	10:30am	30	P	J.P.
11/11/10	P7, P8	10:55am	40	11:00am	40	P	J.P.
11/11/10	P8, P9	11:05am	36	11:10am	36	P	J.P.
11/11/10	P7, P9	11:10am	32	11:15am	32	P	J.P.

Ag Services Construction, Inc.
1905 Old Dexter Hwy
Roswell, NM 88203

Project: C.A.S.
Material: 60mil HDPE

Trial Field Seam Test

Date	Time	Welder Initial	Machine Number	Temp Setting	Speed Setting	Test #1 Peel	Test #1 Shear	Test #2 Peel	Test #2 Shear	Test #3 Peel	Test #3 Shear
11/10/2010	8:00am	D.S.	671	370C	10.5	123	148	130	160	127	165
11/11/2010	8:30am	D.S.	671	370C	10.5	121	151	129	152	121	167

Ag Services Construction, Inc.
1905 Old Dexter Hwy
Roswell, NM 88203

Project: C.A.S.

Material: 60mil HDPE

Vacuum Test Record

Repair Number	Seam Number	Seam Location	Date Repaired	Repaired By	Type of Repair	Number of Leaks	Retest	Date Accepted	Tester
1	P3, P4	On west toe	11/12/2010	D.S.	patch	0	0	11/12/2010	D.S.
2	P4, P5, P3	On P3, P4 butt weld	11/12/2010	D.S.	T	0	0	11/12/2010	D.S.
3	P4, P1, P3	On P3, P4 butt weld	11/12/2010	D.S.	T	0	0	11/12/2010	D.S.
4	P2, P4, P1	On P2, 3, 4 butt weld	11/12/2010	D.S.	T	0	0	11/12/2010	D.S.
5	P7, P8, P9	On P9, P8 butt weld	11/12/2010	D.S.	T	0	0	11/12/2010	D.S.

3801 W Country Club Rd.
Roswell, NM 88201
575-623-3201
575-623-3201
CASwater.com

Controlled Aqua Systems

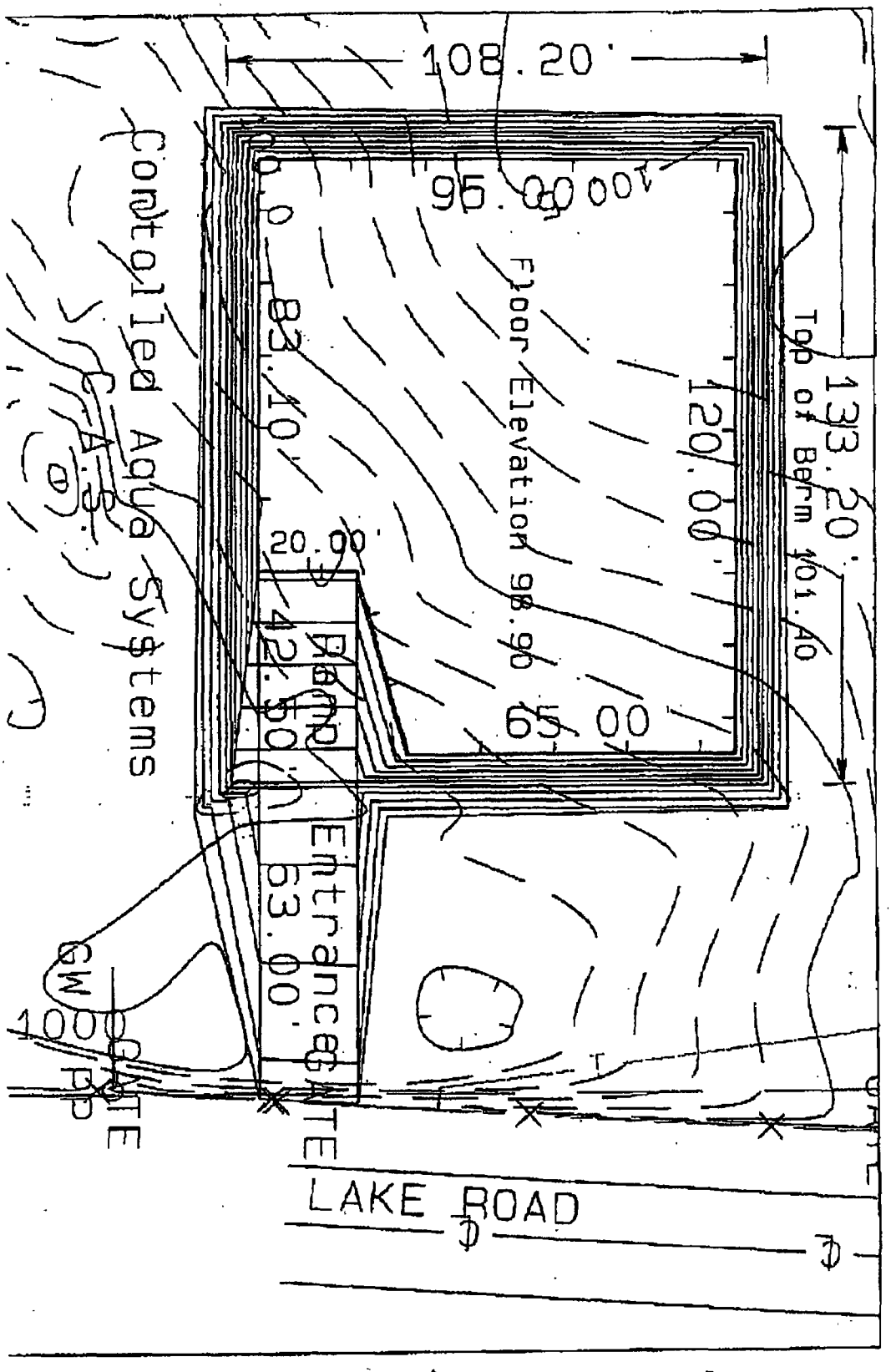
Fax

To:	BRAD JONES	**From:**	TOM MICHAUD
Fax:	505-476-3462	**Pages:**	7
Phone:		**Date:**	3/17/11
Re:		**cc:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments**

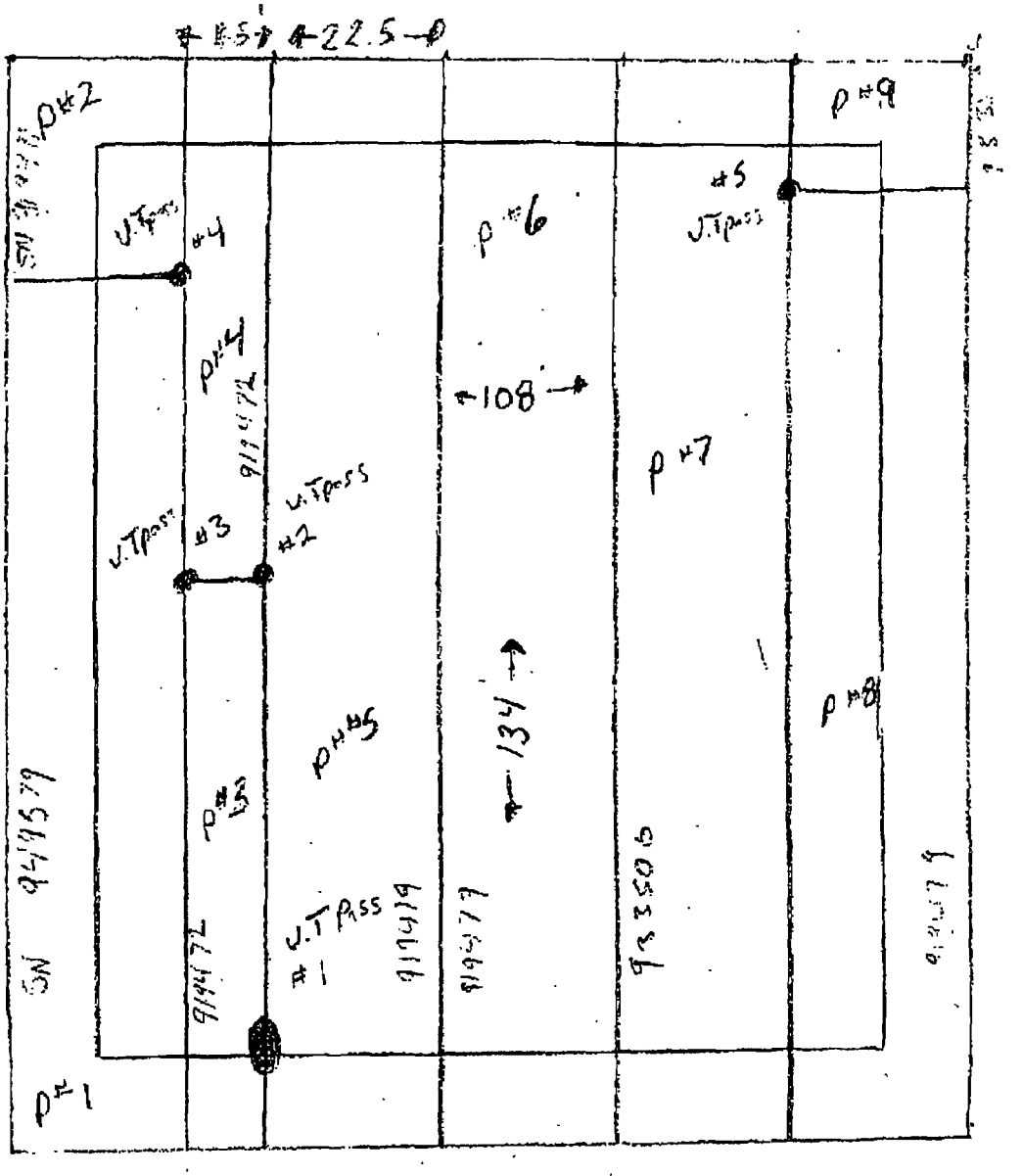
INFORMATION FROM AG SERVICES RE: LINER AND AS-BUILT DRAWINGS



Nov. 2010 As Built C.A.S.

54

5½



NA P=Panel

Please Fax to
Tim Cooksley

1905 Old Dexter Highway
Roswell, NM 88203

AIR TESTING LOG

PROJECT C.A.S

MATERIAL 60 mil hdpe

MINIMUM STARTING PRESSURE (PSIG) 30 psi TEST TIME (MINUTES) 5 min

MAXIMUM PRESSURE DROP (PSIG) 2 psi

DATE	SEAM NUMBER	STARTING TIME	STARTING PRESSURE	ENDING TIME	ENDING PRESSURE	PASS/ FAIL	TESTER
11-11-10	P1 + P3	9:41	40	9:46	40	P	JP
11-11-10	P1 + P4	9:49	34	9:54	34	P	JP
11-11-10	P4 + P3	9:44	36	9:49	36	P	JP
11-11-10	P1 + P2	9:55	36	10:00	34	P	JP
11-11-10	P2 + P4	10:05	32	10:10	32	P	JP
11-11-10	P5 + P4	10:10	32	10:15	32	P	JP
11-11-10	P3 + P5	10:15	36	10:20	36	P	JP
11-11-10	P5 + P6	10:20	33	10:25	32	P	JP
11-11-10	P6 - P7	10:45	32	10:50	30	P	JP
11-11-10	P7 - P8	10:55	40	11:00	40	P	JP
11-11-10	P8 - P9	11:05	36	11:10	36	P	JP
11-11-10	P9 - P7	11:10	32	11:15	32	P	JP

Ag Services Construction, Inc.
1905 Old Dexter Highway
Roswell, NM 88203

Trial Field Seam Test

Project: C.A.S
Material: 60 ml hdpe

Date	Time	Welder Initial	Machine Number	Temp Setting	Speed Setting	Test #1 Peel	Test #1 Shear	Test #2 Peel	Test #2 Shear	Test #3 Peel	Test #3 Shear
11/10/10	8:00	DS	671	370°c	10.5	125	149	130	160	127	165
11/11/10	8:30	DS	671	370°c	10.5	121	151	129	152	121	167

SMOOTH HDPE GEOMEMBRANE
ENGLISH UNITS

Property	Test Method	Minimum Average Values 30 Mil	40 Mil	60 Mil	80 Mil	100 Mil
Thickness, mils	ASTM D 5199					
minimum average		30	40	60	80	100
lowest individual reading		27	36	54	72	90
Sheet Density, g/cc	ASTM D 1505/D 792	0.940	0.940	0.940	0.940	0.940
Tensile Properties [1]	ASTM D 6693					
1. Yield Strength, lb/ in		63	84	126	168	210
2. Break Strength, lb/ in		114	152	228	304	380
3. Yield Elongation, %		12	12	12	12	12
4. Break Elongation, %		700	700	700	700	700
Tear Resistance, lb	ASTM D 1004	21	28	42	56	70
Puncture Resistance, lb	ASTM D 4833	54	72	108	144	180
Stress Crack Resistance [2], hrs	ASTM D 5397 (App.)	300	300	300	300	300
Carbon Black Content [3], %	ASTM D 1603	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion [4]	ASTM D 5596			--Note 4--		
Oxidate Induction Time (OIT) Standard OIT, minutes	ASTM D 3895	100	100	100	100	100
Oven Aging at 85°C	ASTM D 5721					
High Pressure OIT (% retained after 90 days)	ASTM D 5885	80	80	80	80	80
UV Resistance [5]	GRI GM11					
High Pressure OIT [6] (% retained after 1600 hrs)	ASTM D 5885	50	50	50	50	50
Seam Properties	ASTM D 6392 (@ 2 in/min)					
1. Shear Strength, lb/ in		57	80	120	160	200
2. Peel Strength, lb/ in - Hot Wedge		45	60	91	121	151
- Extrusion Fillet		39	52	78	104	130
Roll Dimensions						
1. Width (feet):		23	23	23	23	23
2. Length (feet)		1000	750	500	375	300
3. Area (square feet):		23,000	17,250	11,500	8,625	6,900
4. Gross Weight (pounds, approx.)		3,470	3,470	3,470	3,470	3,470

1. Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction Yield elongation is calculated using a gauge length of 1.3 inches; Break elongation is calculated using a gauge length of 2.0 inches.
2. The yield stress used to calculate the applied load for the SP-NCTL test should be the mean value via MQC testing
3 Other methods such as ASTM D 4218 or microwave methods are acceptable if an appropriate correlation can be established.
4. Carbon black dispersion for 10 different views: 9 in Categories 1 and 2 with one allowed in category 3.
5. The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation 60°C.
6. UV resistance is based on percent retained value regardless of the original HP-OIT value.

This data is provided for informational purposes only and is not intended as a warranty or guarantee Poly-Flex, Inc. assumes no responsibility in connection with the use of this data These values are subject to change without notice. REV. 11/06

[<< PREVIOUS PAGE] [PRINTABLE PAGE] [METRIC UNITS]

MANUAL 

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Poly-Flex, Inc. • 2000 W. Marshall Dr. • Grand Prairie, TX 75051 U.S.A. • 888-765-9359
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High Density Polyethylene Smooth Liner™

Product Data

Property	Test Method	Values				
Thickness (min. ave.), mil (mm)	ASTM D5199*	30 (.75)	40 (1.0)	60 (1.5)	80 (2.0)	100 (2.5)
Thickness (lowest indiv.), mil (mm)	ASTM D5199*	27 (.68)	36 (.90)	54 (1.35)	72 (1.80)	90 (2.25)
*The thickness values may be changed due to project specifications (i.e., absolute minimum thickness)						
Density, g/cc, minimum	ASTM D792, Method B	0.94	0.94	0.94	0.94	0.94
Tensile Properties (ave. both directions)	ASTM D6693, Type IV					
Strength @ Yield (min. ave.), lb/in width (N/mm)	2 in/minute	66 (11.6)	88 (15 4)	132 (23.1)	176 (30 8)	220 (38.5)
Elongation @ Yield (min. ave.), % (GL=1.3in)	5 specimens in each direction	13	13	13	13	13
Strength @ Break (min. ave.), lb/in width (N/mm)		120 (21)	160 (28)	240 (42)	320 (56)	400 (70)
Elongation @ Break (min. ave.), % (GL=2.0in)		700	700	700	700	700
Tear Resistance (min. ave.), lbs. (N)	ASTM D1004	23 (102)	30 (133)	45 (200)	60 (267)	72 (320)
Puncture Resistance (min. ave.), lbs. (N)	ASTM D4833	60 (267)	80 (356)	120 (534)	160 (712)	190 (845)
Carbon Black Content (range in %)	ASTM D4218	2 - 3	2 - 3	2 - 3	2 - 3	2 - 3
Carbon Black Dispersion (Category)	ASTM D5596	Only near sphencal agglomerates for 10 views· 9 views in Cat. 1 or 2, and 1 view in Cat. 3				
Stress Crack Resistance (Single Point NCTL), hours	ASTM D5397, Appendix	300	300	300	.300	300
Oxidative Induction Time, minutes	ASTM D3895, 200°C, 1 atm O_2	≥100	≥100	≥100	≥100	≥100
Melt Flow Index, g/10 minutes	ASTM D1238, 190°C, 2.16kg	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0
Oven Aging	ASTM D5721	80	80	80	80	80
with HP OIT, (% retained after 90 days)	ASTM D5885, 150°C, 500psi O_2					
UV Resistance	GRI GM11	20hr. Cycle @ 75°C/4 hr. dark condensation @ 60°C				
with HP OIT, (% retained after 1600 hours)	ASTM D5885, 150°C, 500psi O_2	50	50	50	50	50

These product specifications meet or exceed GRI's GM13

Supply Information (Standard Roll Dimensions)

Thickness		Width		Length		Area (approx.)		Weight (average)*	
mil	mm	ft	m	ft	m	ft^2	m^2	lbs	kg
30	.75	23	7	1,040	316.99	23,920	2,222	3,900	1,770
40	1.0	23	7	835	254.51	19,205	1,784	3,900	1,770
60	1.5	23	7	540	164.59	12,420	1,154	3,900	1,770
80	2.0	23	7	415	126.49	9,545	887	3,900	1,770
100	2.5	23	7	335	102.109	7,705	716	3,900	1,770

Notes:

All rolls are supplied with two slings. All rolls are wound on a 6 inch core. Special lengths are available on request. All roll lengths and widths have a tolerance of ±1%

**The weight values may change due to project specifications (i.e. absolute minimum thickness or special roll lengths) or shipping requirements (i.e. international containerized shipments).*

All information, recommendations and suggestions appearing in this literature concerning the use of our products are based upon tests and data believed to be reliable; however, it is the users responsibility to determine the suitability for their own use of the products described herein. Since the actual use by others is beyond our control, no guarantee or warranty of any kind, expressed or implied, is made by Agru/America as to the effects of such use or the results to be obtained, nor does Agru/America assume any liability in connection herewith. Any statement made herein may not be absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations. Nothing herein is to be construed as permission or as a recommendation to infringe any patent.

500 Garrison Road, Georgetown, South Carolina 29440 843-546-0600 800-373-2478 Fax: 843-527-2738

email: salesmkg@agruamerica.com www.agruamerica.com

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Stress Crack Resistance (Single Point NCTL), hours	ASTM D5397, Appendix	300	300	300	300	300
Oxidative Induction Time, minutes	ASTM D3895, 200°C, 1 atm O_2	≥100	≥100	≥100	≥100	≥100
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with HP OIT, (% retained after 90 days)	ASTM D5885, 150°C, 500psi O_2					
UV Resistance	GRI GM11	20hr. Cycle @ 75°C/4 hr. dark condensation @ 60°C				
with HP OIT, (% retained after 1600 hours)	ASTM D5885, 150°C, 500psi O_2	50	50	50	50	50

These product specifications meet or exceed GRI's GM13

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Thickness		Width		Length		Area (approx.)		Weight (average)	
mil	mm	ft	m	ft	m	ft^2	m^2	lbs	kg
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500 Garrison Road, Georgetown, South Carolina 29440 843-546-0600 800-373-2478 Fax: 843-527-2738
email: salespkg@agruamerica.com www.agruamerica.com

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Ag Services Construction, Inc.
1905 Old Dexter Highway
Roswell, NM 88203

Project: C.A.S
Material: Liner

Vacuum Test Record

Repair Number	Seam Number	Seam Location	Date Repaired	Repaired By	Type of Repair	Number of Leaks	Retest	Date Accepted	Tester
1	p3 p4	on west toe	11-12-10	[illegible]	patch	0	0	11-12-10	[illegible]
2	p4 p5 p3	on p3+4 butt weld	11-12-10	[illegible]	[illegible]	0	0	11-12-10	[illegible]
3	p4 p1 p3	on p3+4 butt weld	11-12-10	[illegible]	[illegible]	0	0	11-12-10	[illegible]
4	p2 p4 p1	on p2 p1 p4 butt	11-12-10	[illegible]	[illegible]	0	0	11-12-10	[illegible]
5	p7 p8 p9	on p9 p8 butt	11-12-10	[illegible]	[illegible]	0	0	11-12-10	[illegible]

Jones, Brad A., EMNRD

From: Jones, Brad A., EMNRD
Sent: Monday, March 14, 2011 6:15 PM
To: 'Thomas Michaud'; 'Tgcoakley@aol.com'
Cc: VonGonten, Glenn, EMNRD
Subject: Compliance with Condition 1 of EPWM-005

Dear Tim and Tom,

The Oil Conservation Division (OCD) received your packet today, dated March 10, 2011, which included the replacement material for Appendix K regarding compliance with 19.15.11 NMAC. OCD has reviewed the replacement material and has determined that the information provided is adequate. OCD has replaced the information in Appendix K with the March 10th material. The review of the March 10th packet also revealed the submittal of some additional documents and drawings. An attempt from OCD to contact Tim resulted in a return phone call from Tom. Based upon the phone conversation with Tom the two drawings (an unidentified road map and PPM circle map) and a copy of the 19.15.11 NMAC which were provided in the March 10, 2011 packet were not added to the previously approved submittal, per confirmation from Tom. OCD still awaits the submittal of the Liner Installation Report as required under Condition 5 of the September 9, 2010 annual temporary approval EPWM-005. Condition 5 states the following:

5. *CAS shall submit to and obtain approval from the OCD's Environmental Bureau for a Liner Installation Report prior to use of the impoundment after the issuance of this annual temporary approval.*

The Liner Installation Report should include as-built drawings and the test results of the installation of the liner material which should demonstrate compliance to the proposed manufacturer's recommended installation parameters, as indentified in Attachment M of your permit application.

OCD recommends that CAS review all of the conditions to ensure compliance with the September 9, 2010 annual temporary approval EPWM-005. Also, an updated renewal date will not be issued since the information provided in the March 10th packet was required to satisfy compliance to Condition 1 of the September 9, 2010 annual temporary approval EPWM-005. Compliance with conditions of an approval does not constitute or result in a new permit renewal date.

If you have any question regarding this matter, please do not hesitate to contact me.

Sincerely,

Brad

Brad A. Jones
Environmental Engineer
Environmental Bureau
NM Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505
E-mail: brad.a.jones@state.nm.us
Office: (505) 476-3487
Fax: (505) 476-3462

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Jim Noel
Cabinet Secretary

Karen W. Garcia
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

September 9, 2010

Mr. Tim Coakley
Industry Standard Technology Corporation, d/b/a Controlled Aqua Systems
3801 West Country Club Road
Roswell, New Mexico 88201

RE: Request for Annual Temporary Approval for a Produced Water Treatment Facility
Industry Standard Technology Corporation, d/b/a Controlled Aqua Systems (CAS)
EPWM - 005
Facility Address: 157 Lake Road, Artesia, New Mexico 88210
Facility Location: Units G and H of Section 16, Township 18 South, Range 26 East, NMPM, Eddy County, New Mexico

Dear Mr. Coakley:

The Oil Conservation Division (OCD) has reviewed Controlled Aqua Systems' (CAS) application dated July 12, 2010, and revisions and additions dated August 10, 2010 and August 20, 2010 for a produced water treatment facility located in Units G and H of Section 16, Township 18 South, Range 26 East NMPM, Eddy County, New Mexico. OCD understands that the treated produced water will be made available to the Center of Excellence for Hazardous Materials Management (CEHMM), located at 67 E. Four Dinkus Road, Artesia, New Mexico 88210, as a water source for use in their experimental algae propagation ponds – bio-fuel project, contingent upon a permit issued by OCD's Environmental Bureau pursuant to 20.6.2 NMAC.

This request is hereby approved with the following understandings and conditions:

1. CAS may initiate and complete the construction of the facility, but shall not receive any material at the facility for storage, processing, and treatment until an H2S contingency plan is approved by OCD's Environmental Bureau for the permitted produced water treatment facility.

2. CAS shall comply with all applicable requirements of the Produced Water Rule (19.15.34 NMAC), the Oil and Gas Act (Chapter 70, Article 2 NMSA 1978), and all conditions specified in this annual temporary approval, and shall construct, operate and

close the facility in accordance with the approved application of July 12, 2010, and revisions and additions dated August 10, 2010 and August 20, 2010.

3. CAS shall post an upright sign not less than 12 inches by 24 inches with lettering not less than two inches in height in a conspicuous place. The sign shall provide the following information: the operator's name; the location of the site by quarter-quarter or unit letter, section, township and range; and emergency telephone numbers.

4. At least five (5) business days prior to the start of the impoundment construction, CAS shall furnish OCD's Environmental Bureau with a major milestone schedule for the impoundment construction.

5. CAS shall submit to and obtain approval from the OCD's Environmental Bureau for a Liner Installation Report prior to use of the impoundment after the issuance of this annual temporary approval.

6. CAS shall obtain OCD's Environmental Bureau approval prior to any design changes to the produced water receiving, storage, and treatment areas.

7. CAS shall obtain OCD's Environmental Bureau approval prior to the installation of additional tanks or other structures within the boundaries of the facility.

8. The source of the produced water approved for treatment by CAS is Oxy USA, Inc.'s MOC-SWD #1 well (API# 30-015-21669) located within Unit K of Section 7, Township 20 South, Range 25 East, NMPM, Eddy County, New Mexico. CAS shall submit a modification request and obtain OCD's Environmental Bureau approval prior to switching to a new source of the produced water for treatment.

9. CAS shall ensure all oilfield waste is transported by a hauler that has a form C-133, Authorization to Move Produced Water, approved by OCD.

10. CAS shall not discharge any treated or untreated produced water on the ground, to ground water, or into any surface water body without prior written authorization from the OCD's Environmental Bureau.

11. CAS shall store all produced water (treated and untreated) in above ground tanks. CAS shall not manage any oilfield wastes at the produced water treatment facility site on the ground in pits, ponds, below-grade tanks or land application units without an OCD approved permit.

12. CAS shall test the produced water influent prior to treatment and the effluent after treatment, for the constituents identified in Subsections A, B, and C of 20.6.2.3103 NMAC, twice a year (a semi-annual basis) to demonstrate the efficacy of the treatment

process. CAS shall provide the OCD's Environmental Bureau a copy of the laboratory analytical results of each sampling event within 30 days of receipt of the analytical results from the lab. The laboratory reportable limits shall not exceed the standards specified in Subsections A, B, and C of 20.6.2.3103 NMAC.

13. CAS shall only provide treated produced water to the Center of Excellence for Hazardous Materials Management (CEHMM), located at 67 E. Four Dinkus Road, Artesia, New Mexico 88210, as a water source for use in its experimental algae propagation ponds – bio-fuel project, contingent upon a permit issued by OCD's Environmental Bureau pursuant to 20.6.2 NMAC.

14. CAS shall properly dispose of concentrated produced water from the treatment process (filtration and reverse osmosis systems) by injection into Mesquite SWD, Inc.'s Ann SWD #1 well (API# 30-015-23580) located within Unit G of Section 18, Township 19 South, Range 26 East, NMPM, Eddy County, New Mexico. CAS shall submit a modification request and obtain OCD's Environmental Bureau approval prior to switching to another injection well for the disposal of the concentrated produced water.

15. CAS shall properly dispose of the produced water treatment filters and membranes at Lea Land LLC Landfill (OCD Permit NM-1-035) for the disposal of produced water treatment filters and membranes, if applicable. CAS shall submit a modification request and obtain OCD's Environmental Bureau approval prior to switching to an alternative surface waste management facility for disposal of the produced water treatment filters and membranes.

16. CAS shall properly dispose of the precipitate, solid residual of the suspended particles, and BS&W (basic sediment and water) from the Dewatering System Unit at GMI – Gandy Marley Incorporated Surface Waste Management Facility (OCD Permit NM-1-019) for dewatering, evaporation of liquids, solidification, and disposal of the precipitate, solid residual of the suspended particles, and BS&W if applicable. CAS shall submit a modification request and obtain OCD's Environmental Bureau approval prior to switching to an alternative surface waste management facility for dewatering, evaporation of liquids, solidification, and disposal of the precipitate, solid residual of the suspended particles, and BS&W.

17. In addition to the closure plan provided in Attachment D of the approved application, CAS shall not accept any produced water for the collection, disposal, evaporation, remediation, reclamation, treatment, or storage, upon closure of the entire facility.

18. CAS shall report all unauthorized discharges, spills, leaks, and releases of produced water and conduct corrective action pursuant to 19.15.29 NMAC and 19.15.30 NMAC, as appropriate.

19. CAS shall report quarterly discharge volumes (produced water diverted) in gallons to the OCD's Environmental Bureau via email no later than and within **five (5) business days** of the end of each of the following quarters:

- January 1st through March 31st
- April 1st through June 30th
- July 1st through September 30th
- October 1st through December 31st

This authorization is approved for a period of one (1) year. **This temporary approval will expire September 10, 2011.** Renewal requests for temporary approvals shall be submitted 45 days prior to the expiration date. Temporary approval may be revoked or suspended for violation of any applicable provisions and/or conditions. The OCD may administratively modify this temporary approval at any time, by incorporating additional conditions, if it determines that such conditions are necessary and proper for the protection of fresh water, public health, and the environment.

Please be advised that approval of this request does not relieve CAS of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve CAS of its responsibility to comply with any other applicable governmental authority's rules and regulations.

If there are any questions regarding this matter, please do not hesitate to contact Brad Jones at (505) 476-3487 or brad.a.jones@state.nm.us.

Sincerely,

Glenn von Gonten
Acting Environmental Bureau Chief

GVG/BAJ

cc: OCD District II Office, Artesia

CEHMM Center of Excellence for Hazardous Materials Management

505 North Main Street • Carlsbad, New Mexico 88220 • 575.885.3700 • FAX 575.885.6422 • www.cehmm.org

November 30, 2010

Mr. Mark E. Fesmire, P.E. Director
NM Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: CEHMM Produced Water for Beneficial Use Permit Application

Dear Mr. Fesmire:

The Center of Excellence for Hazardous Materials Management (CEHMM) requests permission to use treated produced water as a source of makeup water in one of our algae ponds at our facility on the grounds of the Agricultural Science Center of New Mexico State University near Artesia pursuant to 19.15.34.12.B NMAC. The legal description of the CEHMM algal facility is Section 16, T18S, R26E in Eddy County.

The intent of this proposal would be to compare algal culture growth and lipid production between the pond with treated produced water and other ponds that use ground water for makeup pursuant to NMED Ground Water discharge permit DP-1634, as modified. A total of five ponds are currently constructed and in use.

The Supplemental Environmental Project (SEP) grant issued to CEHMM by the New Mexico Air Quality Bureau specifically speaks of "water purification" as one of the objectives.

Produced water is a waste product generated as part of oil and gas well development. This water is typically injected back into the ground. The idea that produced water can be cleaned to a quality equal to or better than ground water (see Attachment 1 for minimum water quality requirements) currently used by CEHMM. This makeup water has the potential to mitigate evaporation loss thus alleviating the need for appropriation of beneficial groundwater. This scenario poses an intriguing alternative for disposition.

The scope of this project will be restricted to research and development at one pond at the CEHMM facility. Should this project be successful, CEHMM would hope to work with the State to expand the use of treated produced water perhaps at the pilot or commercial scale.

The equipment used to purify produced water is provided by CAS, a firm which has applied to the New Mexico Oil Conservation (NMOCD) for a permit for their "Produced Water Treatment Facility" to be located at the CEHMM algae facility. Once NMOCD issues a permit to CAS, CEHMM would hope to have this firm begin to treat produced water acquired from their facility in the near proximity. Start-up of this activity is anticipated to be early 2011.

The CAS application includes a section on Hydrogen Sulfide detection. A vendor familiar with OCD detection requirements will be hired to provide detection equipment and installation. CEHMM will adhere to the CAS H2S Exposure Control Standard approved by OCD, and CEHMM employees will be trained in safety procedures associated with potential exposure to H2S. The detection equipment installed will include a call-out system to alert CEHMM and CAS personnel of H2S levels in excess of State mandates during non-working hours.

Sincerely,

Douglas C. Lynn
Executive Director

DCL:ss
Attachment

cc: Tom Bowles, Office of the Govenor
James Noel, NMEMNRD
Marcy Leavitt, NMED
Rebecca Cook, NMED

Chemistry Report

Source:	NMSU Well Water
Test Description	Full Chemistry Report

Nutrient	Quantity Measured
Potassium	175 mg/L
Sulfate	600 mg/L
Nitrate	.5 mg/L
Iron	.31 mg/L
Orthophosphate	.07 mg/L
Magnesium	340 mg/L
Calcium	640 mg/L
Total Hardness	980 mg/L
Carbonate	0 mg/L
Bicarbonate	177 mg/L
Hydroxide	0 mg/L
Silica	
Total Dissolved Solids	
Salinity	
Dissolved Oxygen	
pH	
Oxidative Reduction Potential	

CAS

3801 West Country Club Road Roswell, NM 88201

505-623-3201 fax 505-622-3717

To: NMOCD

Attn: Mr. Brad Jones

Date: July 12, 2010

Dear Mr. Jones,

Please find attached a copy of our revised plan. Thank you in advance for your consideration and efforts in reviewing our work.

If you have questions, please contact Tim Coakley at 575-513-0201

Sincerely,

T.G. Coakley, President

CAS **Permit Application for - Produced Water Treatment Facility**
LOCATION - 157 Lake Road Artesia, NM 88210 location

Date: July 12, 2010

Application: New

Type: Produced Water Treatment Facility

Operator: Industry Standard Technology Corporation dba Controlled Aqua Systems (CAS).

Site Address: 157 Lake Road Artesia, NM 88210

Business Address: 3801 W. Country Club Road Roswell, NM 88201

Contact Person: Tim Coakley, President

Contact Phone: 575.623.3201 -O 575.513.0201 - C

Location Coordinates: Section 16, T18S, R26E.

Purpose

CAS, the applicant, is a dba **of Industry Standard Technology Corporation** located at 3801 W. Country Club Road Roswell, NM 88201.

- **CAS** proposes to the **New Mexico Oil Conservation Division (NMOCD)**, that **CAS** establish a Water Treatment Facility to be located at **157 Lake Road Artesia, NM 99210** for the purpose of extracting **treated produced water** from oilfield produced waters.

- Exempt produced water will be supplied from the **Oxy MOC SWD#1 API 30-015-21669 located section 7, Township 20 S, Range 25 E.** This SWD will be the sole source of raw water for the **CAS** remediation process.

- Waters treated by the **CAS** system will meet NMOCD 3103 specifications and will be tested twice yearly by an outside independent laboratory with 3103 water quality reports made available to the NMOCD as well as all interested parties.

- Treated produced Waters will be made available to the **Center of Excellence for Hazardous Materials Management (CEHMM)**. They will certify water quality each time they take it from our produced water remediation facility.

- **CAS** will continuously sample the water for total organic carbon (TOC)(, Calcium and Salinity levels to insure the water quality meets basic specifications. The water will then be passed through a Reverse Osmosis system for final polishing to insure it meets the 3103 standard.

Streams Disposition

- **Concentrated produced water** will be disposed of by **Nabors Trucking,** a licensed waste hauler in accordance with 19.15.34.11.

Waste hauler #: 214
Nabors Well Service
3006 E. Greene
Carlsbad, NM 88220

SWD Nix-Ann
Mesquite SWD, Inc 1031 EDDY STREET Carlsbad, NM 88220
Rockin' R Red Road
API #30-015-24305

- **Chemicals** used in water testing are confined to Deminerialized Water. They will be disposed of along with Waste Materials. Electronic Probe Cleaning will use small amounts of dilute Muratic Acid. These wastes will be neutralized by dilution to a pH of 7.0 and placed in the Hand Washing waste. Comprehensive testing by outside labs.

- **Waste material** from hand washing and toilet facilities will be hauled away by **J.T. Septic Tank Service. Artesia, NM**

- **Liquid Waste concentrate** will disposed of at:
  GMI - Gandy Marley Incorporated
  OCD # NM 0010019
  Route 45 W. Crossroads, Roswell, NM 88203

- **Industrial Filters and R/O elements will be transported and disposed of at:**
  Lea Land LLC Landfill
  Hwy 180/62 30 miles N.E. of Carlsbad , NM @ Mile Marker 64
  Lea County, NM
  OCD permit # NM-1-035

Attachment Index

Attachment Index

Attachment "A" - Names and addresses of the applicant and principal officers and owners of 25% or more of the applicant. Include the individual principally responsible for overseeing the facility.

- Facility Location Maps.
- CEHMM Permission Letter

Attachment "B" - Process Description.
- Process Photographs

Attachment "C" - Berm Construction.
- Berm Layout with Berm vs Tank capacity reserve calculations.

Attachment "D" - Closure and post closure plan
- Cost Estimate

Attachment "E" - **Best Management Practice for health safety and the environment.**

Attachment "F" - Water Transfer form for receipt and release of produced water.

Attachment "G" - Water transfer above ground trap drawing

Attachment "H" - Ozone Emission Potential from the CAS Produced Water Remediation System.

Attachment "I" - Process and facility sampling log

Attachment "J" – State of New Mexico Energy and Natural Resources form to accept Solid Waste. **(DELETED as hazardous solid wastes will not be generated)** non-hazardous industrial waste will be received by Lea Land LLC.

Attachment "K" - CAS Hydrogen Sulfide Exposure Control Standard
- Miniature H2S poster
- Evacuation meeting locations

Attachment "L" - Commitment from Oxy Petroleum to provide produced water.

Attachment "M" - LLPDE Specification and Installation details.

Attachment "N" - OCD Release Notification Guidelines

Attachment "O" - OCD Remediation Guidelines

Attachment A

Names and Addresses of Applicant and Principle Officers and Owners

Facility Location Maps at CEHMM Site

CEHMM Permission Letter

Names and Addresses of Applicant and Principle Officers and Owners of CAS

Industry Standard Technology Corp. dba **Controlled Aqua Systems** (CAS) 3801 W. Country Club Road Roswell, NM 88201

Phone: 575-623-3201

Sole Owner/Officer - Timothy Coakley, President
2903 W 25th St
Roswell, NM 88201
Cell: 575-513-0201

Additional persons responsible for operations at 157 Lake Road Artesia, NM 88201 site facility:

- Robert Archuleta - 1515 N. Missouri Ave., Roswell, NM 88201
- John Capehart - 601 Moore, Roswell, NM 88201

Mr. Timothy G. Coakley, President

CAS

3801 W. Country Club Rd.

Roswell, NM 88201

Dear Tim,

This letter authorizes CAS to stage equipment and conduct operations in support of the CEHMM algae to biofuels project. This consent is authorized under the 10 year research collaboration agreement with the current farm administration at the New Mexico State University Agricultural Experimental Station, Artesia.

The subject lands are owned and managed under an agreement with the Southeast New Mexico Agricultural Research Association (SENMARA). SENMARA is a 501c3 coop that consists of farmers who reside and operate in Southeast New Mexico.

Both entities have legal, cooperative authority over the subject property are aware and supportive of the CAS/CEHMM project and endorse the associated activities. For confirmation of this information, please contact Dr. Robert Flynn at the (Artesia) NMSU Agricultural Experimental, or SENMARA (Board Chairman) Mr. Todd Roberson at (575-748-1228).

Thanks,

D.C. Lynn

Douglas Lynn by direction

Executive Director

CEHMM

505 North Main

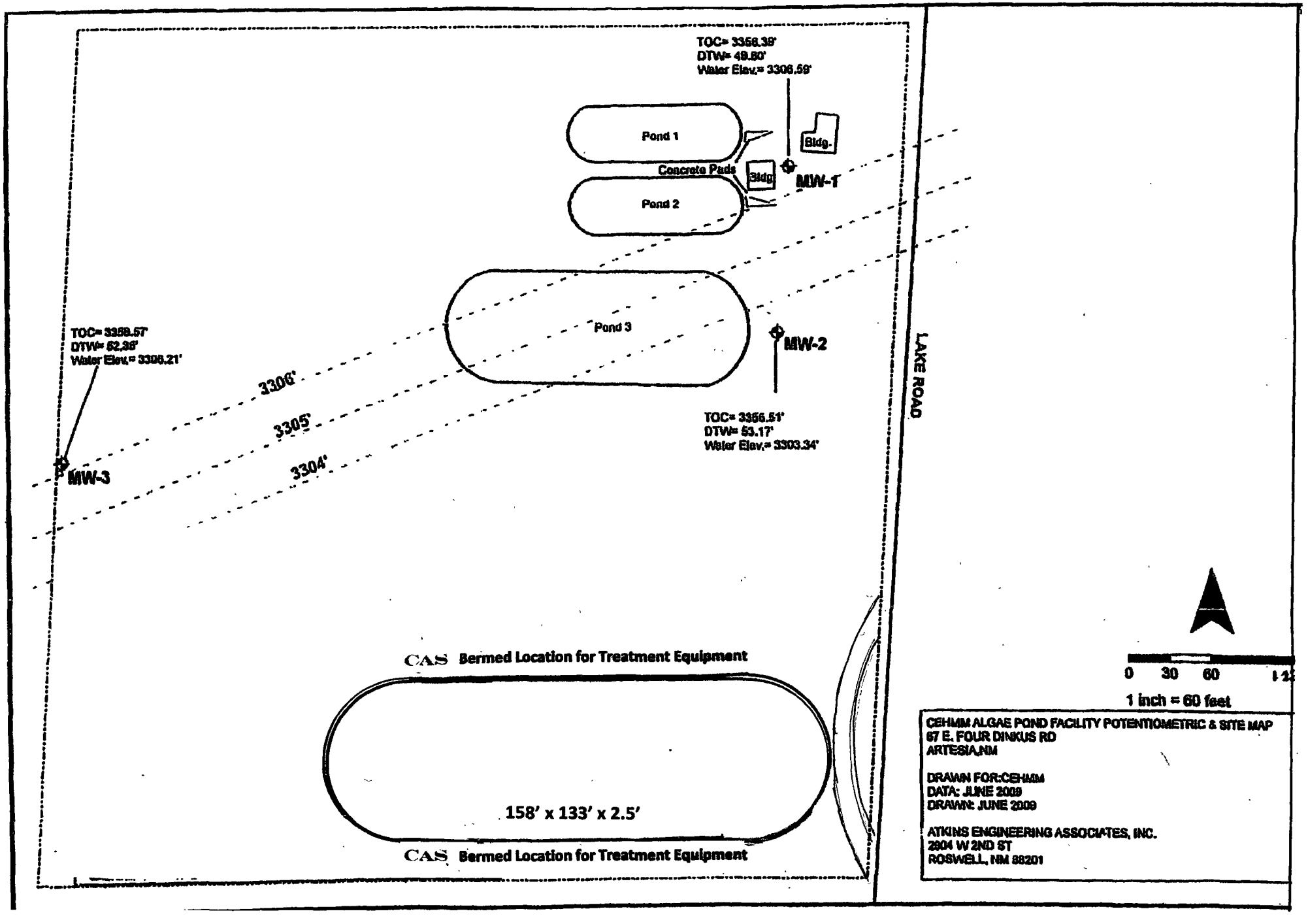
Carlsbad New Mexico 88220

575-885-3700 office

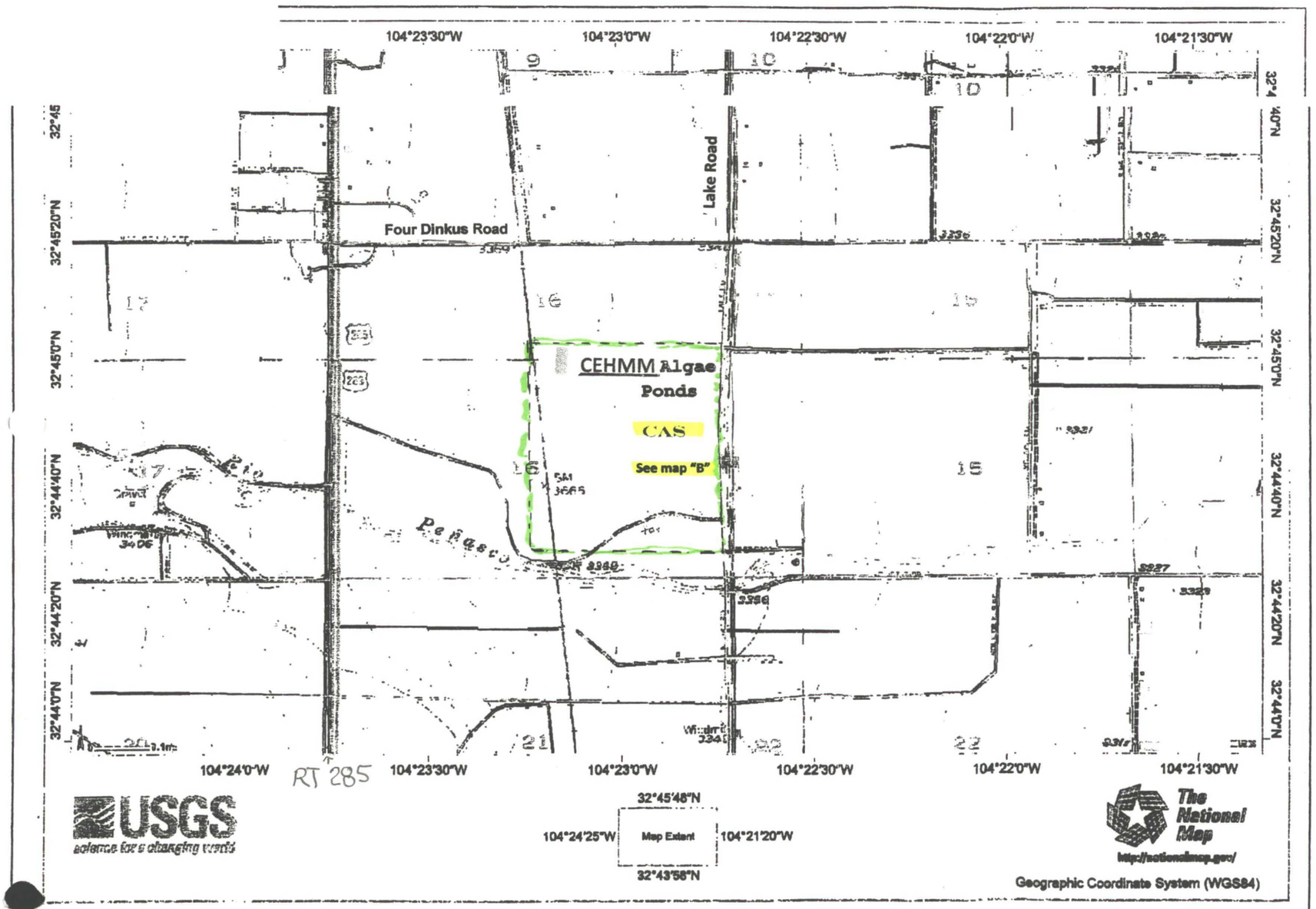
575-706-2486 cell

MAP **Site placement of CAS Equipme[illegible] relation to Algae Ponds on Location**

Attachment C-4 **CAS 157 State Road Artesia, New Mexico 88210**



Attachment C-3
USGS Topographic Map



RT 285

Legend

CEHMM ALGAE PONDS

TOPOGRAPHIC MAPS
100,000 Index
Quad Index - 100K
USGS Raster Graphics (Topo Maps)
No legend available

BOUNDARIES
US States
National Atlas States
National Atlas States
National Atlas States

TRANSPORTATION
County Road Labels (USGS)
No legend available
National Road Dataset (CENSUS)
No legend available
National Road Dataset Labels (CENSUS)
No legend available
New Mexico Roads (BTS)
BTS Roads-New Mexico Ferry Crossings
BTS Roads-New Mexico Interstate
BTS Roads-New Mexico Local Roads
BTS Roads-New Mexico Local Roads(Small Scale)
BTS Roads-New Mexico Secondary Roads
BTS Roads-New Mexico Trails
BTS Roads-New Mexico US/Major St Highway
State Highway Labels (USGS)
No legend available
US Highway Labels (USGS)
No legend available
US Road Labels (BTS)
No legend available
US Roads (BTS)
Light Duty Road
Primary Highway
Secondary Highway
Trail
Other Road

OTHER
Section Labels (BLM)
No legend available
Township Boundaries (BLM)
detail_twp
Township Labels (BLM)

No legend available

ELEVATION
1 3 ArcSecond NE CONUS

RECEIVED OCD
2010 AUG 10 P 1:31

Attachment B

- **Water Sample - Showing Representative list of Characteristics to be Sampled X2 Annually**
- **Process description**
- **Process photographs**

Water Sample Categories	146								
SAR (Na Absorption Ratio)									
TDS (mg/L)									
Turbidity (NTU)									
Boron (mg/L)									
Iron (mg/L)									
Alkalinity (as CaCO3) (mg/L)									
Cyanide (mg/L)									
Copper (mg/L)									
Oil & Grease (HEM) (mg/L)									
Calcium (mg/L)									
Magnesium (mg/L)									
Phosphorus (mg/L)									
Potassium (mg/L)									
Sodium (mg/L)									
Strontium (mg/L)									
Silicon, Recoverable (mg/L)									
Aluminum (mg/L)									
Arsenic (mg/L)									
Barium (mg/L)									
Cadmium (mg/L)									
Chromium (mg/L)									
Cobalt (mg/L)									
Lead (mg/L)									
Manganese (mg/L)									
Molybdenum (mg/L)									
Nickel (mg/L)									
Selenium (mg/L)									
Silver (mg/L)									
Uranium (mg/L)									
Zinc (mg/L)									
Calcium (SAR Extracted) (mg/L)									
Magnesium (SAR Extracted) (mg/L)									
Mercury (mg/L)									
Sodium (SAR Extracted)									
Chloride (mg/L)									
Nitrate-Nitrogen, Total (mg/L)									
Sulfate (mg/L)									
Inorganic Carbon, TIC (mg/L)									
Phenols (mg/L)									
PCB-1016 (mg/L)									
PCB-1221 (mg/L)									
PCB-1232 (mg/L)									
PCB-1242 (mg/L)									
PCB-1248 (mg/L)									
PCB-1254 (mg/L)									
PCB-1260 (mg/L)									
Benzene (mg/L)									
Carbon Tetrachloride (mg/L)									
Chloroform (mg/L)									
1,2-Dibromoethane (mg/L)									

1,1-Dichloroethane (mg/L)
1,2-Dichloroethane (mg/L)
1,1-Dichloroethylene (mg/L)
Ethylbenzene (mg/L)
Methylene Chloride (mg/L)
1,2,2,2-Tetrachloroethane (mg/L)
Tetrachloroethylene (mg/L)
Toluene (mg/L)
1,1,1-Trichloroethane (mg/L)
1,1,2-Trichloroethane (mg/L)
Trichloroethylene (mg/L)
Vinyl Chloride (mg/L)
m-and p-Xylene (mg/L)
o-Xylene (mg/L)
Acenaphthene (mg/L)
Acenaphthylene (mg/L)
Anthracene (mg/L)
Benzo(a)anthracene (mg/L)
Benzo(a)pyrene (mg/L)
Benzo(b)fluoranthene (mg/L)
Benzo(ghi)perylene (mg/L)
Benzo(k)fluoranthene (mg/L)
Indeno(1,2,3-cd)pyrene (mg/L)
Chrysene (mg/L)
Dibenz(a,h)anthracene (mg/L)
Fluoranthene (mg/L)
Fluorene (mg/L)
2-Methylnapthalene (mg/L)
Naphthalene (mg/L)
Phenanthrene (mg/L)
Pyrene (mg/L)
Bicarbonate (mg/L)
Carbon Dioxide (mg/L)
Carbonate (mg/L)
Free Carbon Dioxide (mg/L)
Hydroxide (mg/L)
Laboratory pH
Organic Carbon, TOC (mg/L)
Sulfide as H2S
Antimony (mg/L)
Laboratory pH
TOC (mg/L) (On-site TOC Instrument)

Attachment B

Process description

Process photographs

Process Description

For CAS Equipment Located at 157 Lake Road Artesia, NM 88210

The descriptions below are referenced to the attached photographs of the produced water remediation system's equipment. Those photographs have been component named to correspond with the descriptions below.
The CAS system's primary function is to remediate oil and gas field produced waters by a process termed as progressive, selective, oxidation, isolation and functional removal of all contaminants present both in solution and in suspension of oil and gas produced waters to discharge levels in compliance with 3103 specifications.
The exact process knowhow is omitted from this disclosure and the focus of the document is on the input and outputs process and waste streams to and from all components.

An overview of the process design:

1. Produced waters are introduced to the CAS Remediation System via the **Pump Module** from **Produced Water Tank #1**. The primary function of the **Pump Module** it is to keep Process Vessel #1 at its operating level. The **Pump Module** functions as a metering device for the system. The Pump Module forwards every gallon of incoming produced water it receives to **Process Vessel #1**. Its waste liquids from the collection tank are routed to the **DWU** described in #13 below.

2. **Process vessel #1**- Is supplied by compressed air, produced onboard the remediation system trailer. This compressed air is introduced to all of the liquid contained in **Process Vessel #1** by a proprietary mixing system. Suspended particles are agglomerated and routed to the **Dewatering System Unit** **(described in # 13 below)**, for separation. The collection of these liquids and suspended particles, as well as minor amounts of BS+W (Basin Sediment and Waste), are routed to the **Dewatering System Unit.** The remaining balance of the liquid continually flows in its entirety to **Process Vessel #2**. Level control is achieved by two separate means. *A high level in any Process Vessel will shut down the System Process Flow.

3. **Process Vessel #2** – is supplied ozone gas generated onboard **Process Trailer #2** . This gas is completely introduced to the fluid being treated, by a proprietary system located inside of the vessel at the bottom of **Process Vessel #2**. Agglomerated and separated liquids, particles and BS+W are routed to the **Dewatering System Unit** .

The remaining balance of the liquid continually flows in its entirety to **Process Vessel #3**.

Page 1, Item 3

Ozone Emission Potential from the CAS Produced Water Remediation System
May 30, 2010

Disclosure
The emission of ozone is not a function of the design process of the CAS system. In the CAS process, all ozone gas generated is completely injected directly into the produced water fluids being treated.

Method
The ozone is mixed into the interstitial spaces of the water molecules by means of a rotating injector system. The transfer is 99% effective. The contaminants in the produced water totally consume the ozone in the oxidation process. The gas head spaces of the tanks are connected together by piping and the combination of Offgas is introduced to the first tank as a supply gas, by the means of a conventional injector and recirculation pump thereby reusing the oxygen that is not consumed in the individual process tanks.

- The ozone generators are controlled by variable output process from the oxidation reduction process variable*
    - The byproduct of ozone use is O2, oxygen.
    - Stray Ozone gas emissions from the CAS system are not a part or consequence of the system operation.

***USPatent # 5,236,673 Aug 16, 1993**

4. **Process Vessel #3** – is supplied ozone gas generated onboard **Process Trailer #2**. This gas is completely introduced to the fluid being treated, by a proprietary system located inside of the vessel at the bottom of **Process Vessel #3**. Agglomerated and separated particles and BS+W are routed to the **Dewatering System Unit**. The remaining balance of the treated liquid continually flows in its entirety to **Process Vessel #4**.

5. **Process Vessel #4**– is supplied ozone gas generated onboard **Process Trailer #2**. This gas is completely introduced to the fluid being treated, by a proprietary system

located inside of the vessel at the bottom of **Process Vessel #4**. Agglomerated and separated particles and BS+W are routed to the **Dewatering System Unit** . The remaining balance of the treated liquid continually flows in its entirety to **Process Vessel #4**.

6. **Process Vessel #5**– is supplied ozone gas generated onboard **Process Trailer #2**. This gas is completely introduced to the fluid being treated, by a proprietary system located inside of the vessel at the bottom of **Process Vessel #5**. Agglomerated and separated particles and BS+W are routed to the **Dewatering System Unit** . The remaining balance of the treated liquid continually flows in its entirety to **Process Vessel #6**.

7. **Process Vessel #6**– is supplied ozone gas generated onboard **Process Trailer #2**. This gas is completely introduced to the fluid being treated, by a proprietary system located inside of the vessel at the bottom of **Process Vessel #6**. Agglomerated and separated contaminant particles and BS+W are routed to the **Dewatering System Unit** . The remaining balance of the treated liquid continually flows in its entirety to **Process Trailer#2**.

8. **Process Trailer#2**- Contains the **Ozone Generating System**, (4) **Particle Filtration Systems**, a Total Organic Monitoring System (**TOC Analyzer**), a reverse osmosis system (**The R/O**), a reverse osmosis cleaning station and laboratory monitoring equipment for pH, TDS, Salinity and water flow. The trailer is powered by 480 3 phase electricity from **Process Trailer #1**.

9. **Ozone Generating** System – A self contained ozone generation system is contained within **Process Trailer#2**. It is routed to (5) Process Vessels as described above.

10. **TOC Analyzer** - A laboratory grade automatic TOC analyzer is provided to monitor and sample the total organic carbon levels in the effluent of **Process Vessel #6**. This level is ideally maintained at 5 ppm or less with an alarm function provided at 10 ppm that will cause the system on **Process Trailer #1** to go into recirculation mode, until the levels are reduced to the setpoint of the monitoring system.

11. **R/O** - A reverse osmosis system is provided to polish the treated water to standards required by the application being fed by the CAS Remediation System. The system has one liquid input supplied from the Activated Carbon Filter, and it has two discharge points. One is termed product water and it is routed from the R/O to the

Cleaned Produced Water Storage Tank #1. Reject water from the **R/O** is routed to the **Produced Water Return Tank** where it is transported to a licensed produced water disposal company. Backwash fluids from the R/O, when required, are routed to the Produced Water Return Tank. They are supplied from **Cleaned Produced Water Storage Tank #1.**

12. Filtration Systems located in **Process Trailer #2** (4): Four back-washable permanent media filtration systems are contained within Process Trailer #2. All fluid discharged from Process Vessel #6 is passed in series through these four filters. One Activated Carbon Filter, also back-washable and permanent, is placed as a final polish before the input of the R/O. All backwash fluids passed from these filters are supplied from the **Cleaned Produced Water Storage Tank #1,** and are routed to the **Dewatering System Unit (DWU)** for recovery and retreatment.

13. **Dewatering System Unit (DWU)**- The system is capable of containing all particles routed to the DWU by mechanical separation. Fluids routed to the DWU are recycled to Process Vessel #1. Separated liquids are retained in the **DWU** and hauled to:

GMI - Gandy Marley Incorporated
OCD # NM 0010019
Route 45 W. Crossroads, Roswell, NM 88203
By:
Crain Hot Oil
2339 S Main Ave
Lovington, NM 88260
505-396-6543

14. **Produced Water Tank #1** - A 500 bbl fiberglass vessel .

15. **Cleaned Produced Water Storage Tank #1** - **a 500 bbl fiberglass tank.**

16. **Produced Water Return – 500 bbl fiberglass tank.**

Monitoring

- Cleaned produced waters will be monitored twice yearly by an EPA approved lab. **The results of these analyses will be made available to the OCD and other interested parties.**

Cleaned produced waters will be monitored twice yearly by an EPA approved lab. The results of these analyses will be made available to the OCD and other interested parties. Challenge Produced waters will be sampled at the same time and compared for process efficacy.

RECEIVED OCD
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- Cleaned waters routed to the **CEHMM Water Storage Tank #1** are monitored locally by means of in place TDS and salinity monitoring systems installed permanently on the R/O. CEHMM will thoroughly analyze all waters to insure they meet 3103 specifications prior to accepting these waters for their purpose.
- In process remediated produced waters discharged from Process Vessel #6 are continuously monitored 10 times per hour by the **TOC Analyzer**. Salinity and TDS readings are sampled by the operators periodically as the system is in operation.

All vessel Water levels are continuously monitored by both electronic and mechanical means to insure that normal operating levels exist at all times during system operation. High fluid levels in any Process Vessel will cause the shutdown of the system preventing any input. Operators walk around the system hourly and are positioned so that any variations from normal operation can be seen immediately.

The **DWU** **'s water level** is also electrically monitored and a high level will shutdown the system and cause an alarm to sound along with a flashing light.

The CAS battery of three (3) 500 bbl tanks, which are located inside the berm, are continuously monitored both mechanically and visually for high levels.

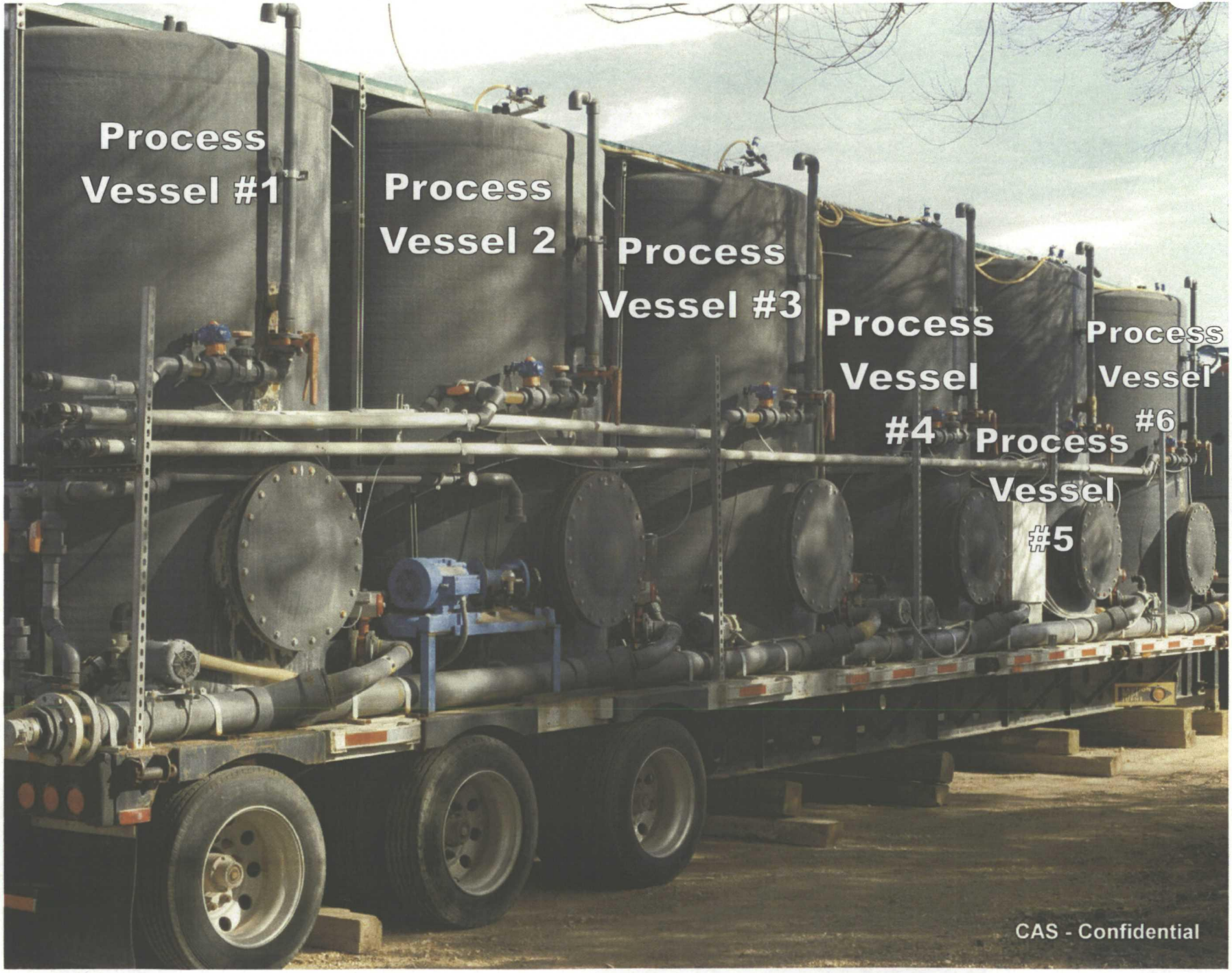
Battery access extends beyond the berm and each access point is fitted with **ABOVE GROUND** drip pans to catch and collect connection loss. An off-road turnout is provided to isolate produced water trucks from the berm and CEHMM production areas. This turnout is protected by locked gates to minimize interference by uninvited people or animals during the unoccupied periods for the site.

BERM

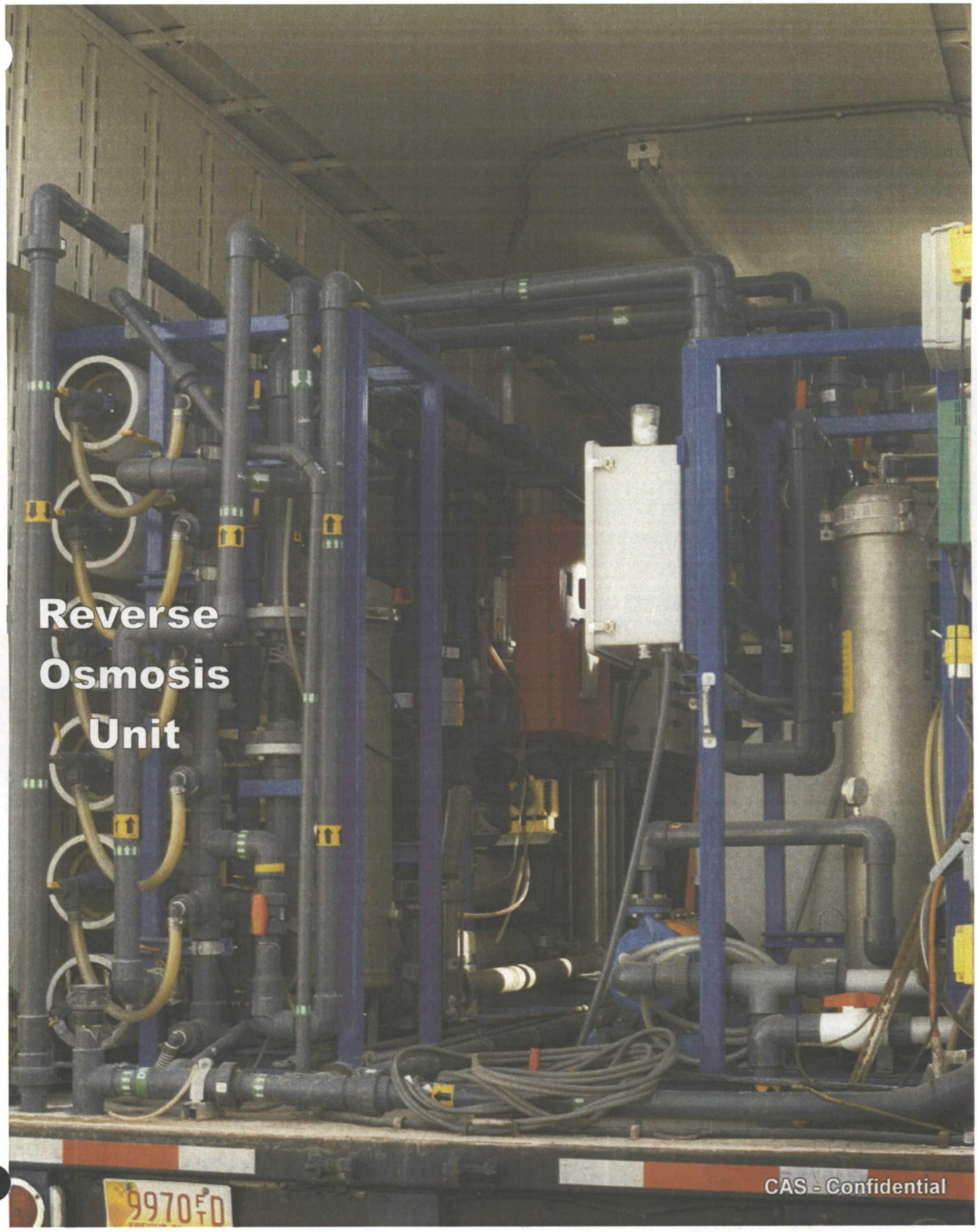
A 125' x 150' (id) berm, fitted with a 60 mil LLPDE liner, detailed elsewhere in this submittal, has the capacity to hold 320% of the fluids contained in every system that is located inside the berm.

- **Solid non-toxic Industrial waste** ie: R/O Membranes, Final filter cartridges **will be transported by CAS truck to:**

  Lea Land LLC Landfill
  Hwy 180/62 30 miles N.E. of Carlsbad , NM @ Mile Marker 64
  Lea County, NM
  OCD permit # NM-1-035


Process Vessel #1
Process Vessel 2
Process Vessel #3
Process Vessel #4
Process Vessel #5
Process Vessel #6
CAS - Confidential

De-watering Unit


Reverse
Osmosis
Unit
CAS - Confidential


Process Trailer #2
Pump Module
12ET

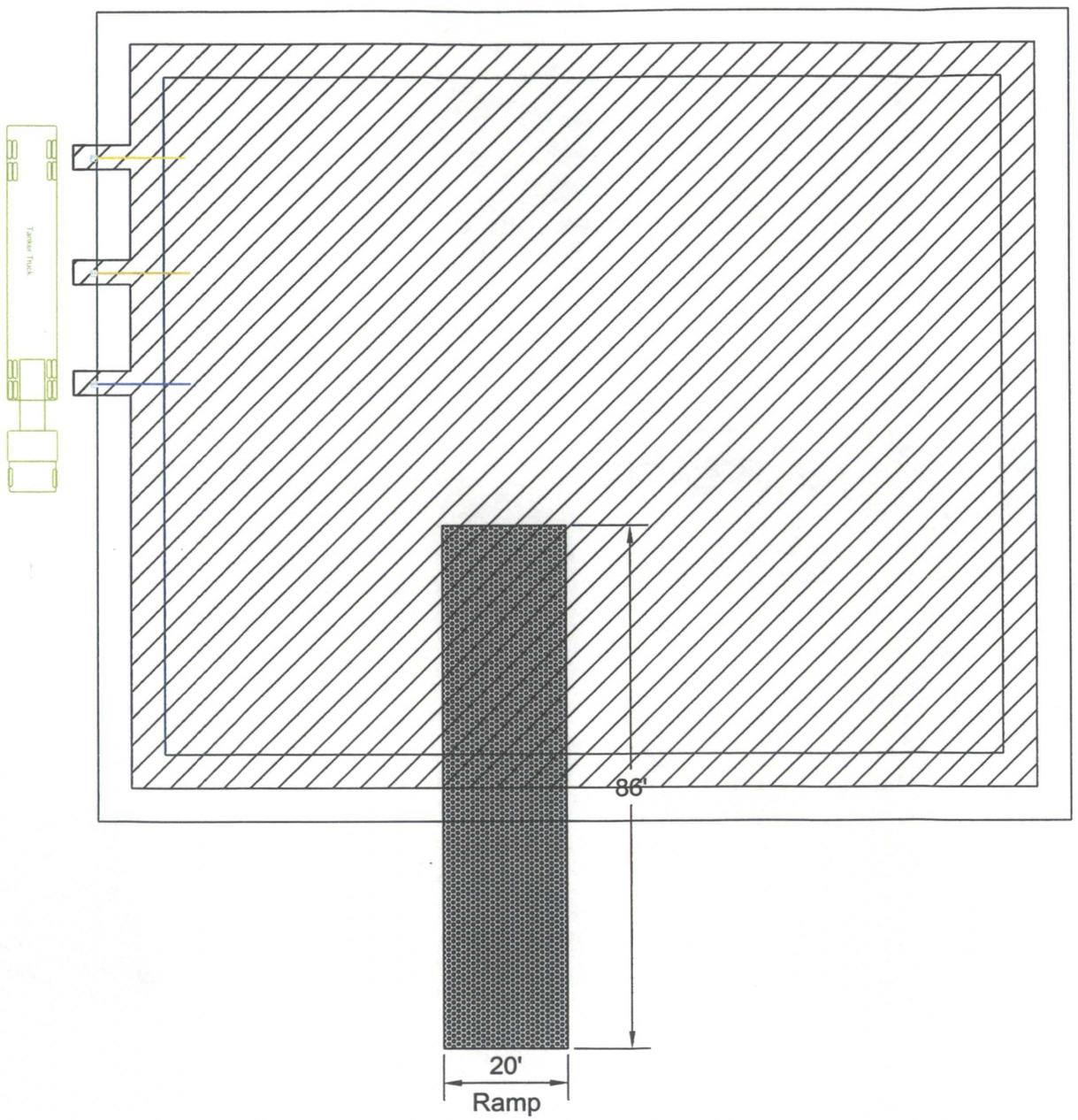
Attachment C

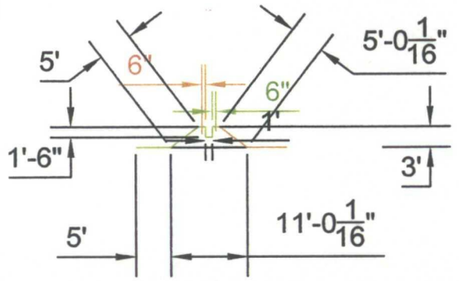
Diagrams of berm construction design and plan layout

- **60 Mil LLPDE Liner Layout** **DWG – 1**
- **60 Mil LLPDE Liner Layout w/ ramp** **DWG – 2**
- **Berm Equipment Placement** **DWG – 3**
- **Berm / Ramp Construction #1** **DWG – 4**
- **Anchor Trench and Ramp Intersection** **DWG – 5**
- **Berm Ramp Construction #2** **DWG – 6**
- **Anchor Trench Detail w / Liner end** **DWG – 7**
- **Finish Grade and Anchor Trench Detail** **DWG – 8**
- **Berm Layout with Containment Calculations**

Area to be covered in 60 mil plastic liner, inside berm, sides of berm, top and anchor trench.

Area to also be covered with 60 mil plastic liner is were unloading and loading take place.

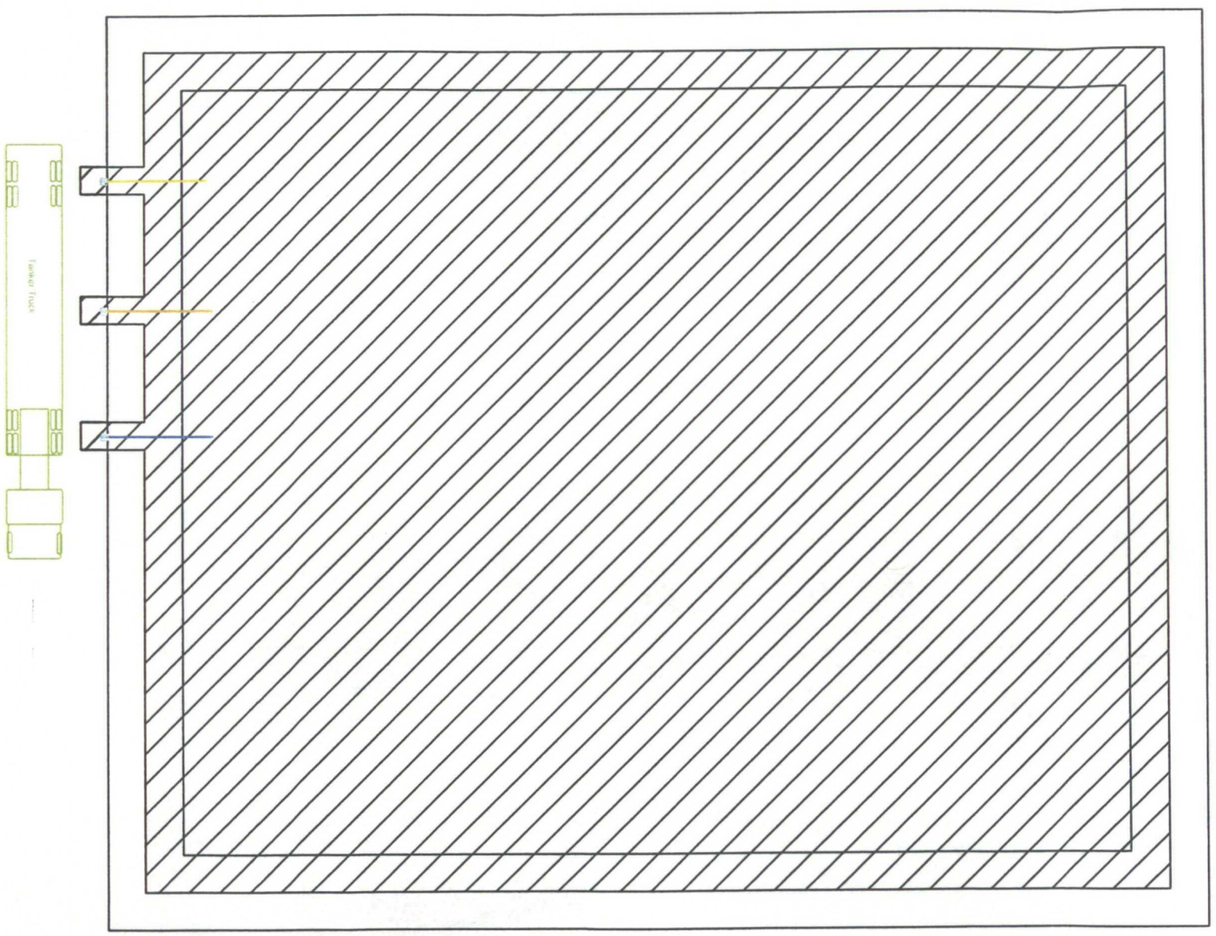


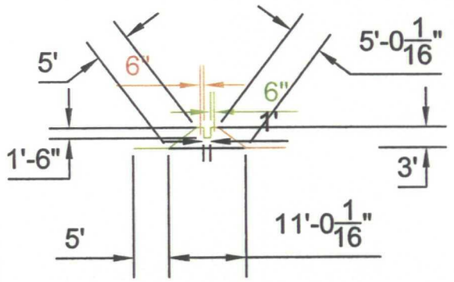


Red is Inside berm dimension and into and out of anchor trench,
Green is loading and unloading protection liner dimension from outside and into and out anchor trench

DWG-2

Controlled Aqua Systems
CEHMM 60 mil Plastic Liner Layout
8 /16 /10 J. Capehart Scale 192 Size B





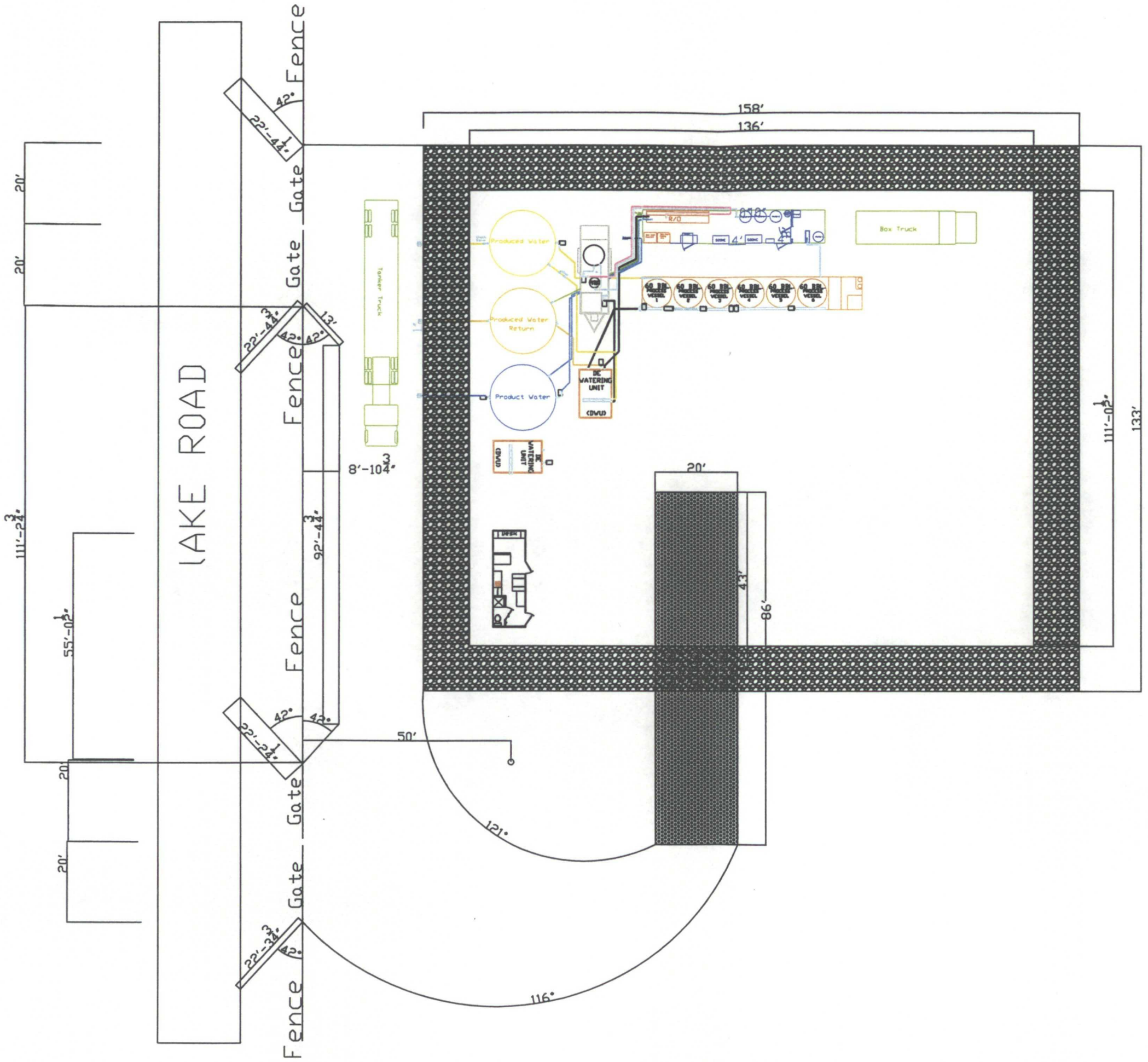
Red is Inside berm dimension and into and out of anchor trench,
Green is loading and unloading protection liner dimension from outside and into and out anchor trench

Area to be covered in 60 mil plastic liner, inside berm, sides of berm, top and anchor trench.

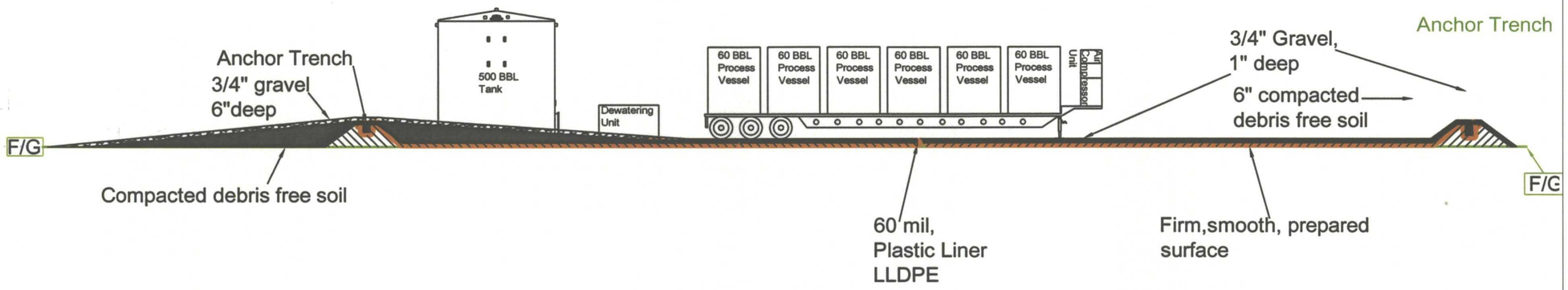
Area to also be covered with 60 mil plastic liner is were unloading and loading take place.

DWG-1

Controlled Aqua Systems
CEHMM 60 mil Plastic Liner Layout
8 /16 /10 J. Capehart Scale 192 Size B

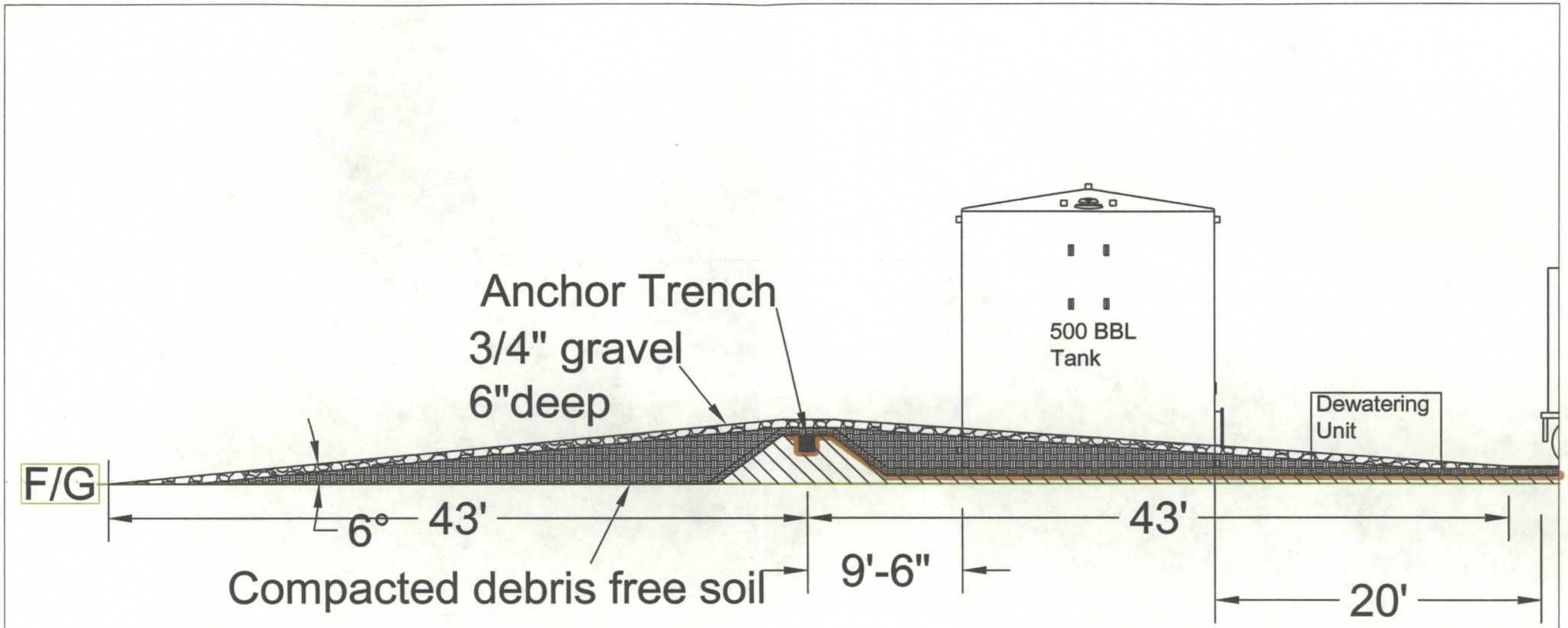

111'-2 3/4"
20'
20'
20'
20'
55'-0 1/2"
lAKE ROAD
22'-2 3/4"
22'-2"
22'-4 3/4"
22'-4"
42°
42°
42°
42°
42°
42°
Fence
Gate
Gate
Fence
Fence
Gate
Gate
Fence
92'-4 3/4"
13'
8'-10 3/4"
Tanker Truck
50'
121'
116'
DE WATERING UNIT (DWU)
DE WATERING UNIT (DWU)
Product Water
Produced Water Return
Produced Water
R/O
4'
Box Truck
20'
43'
86'
136'
158'
111'-0 1/2"
133'

DWG-3



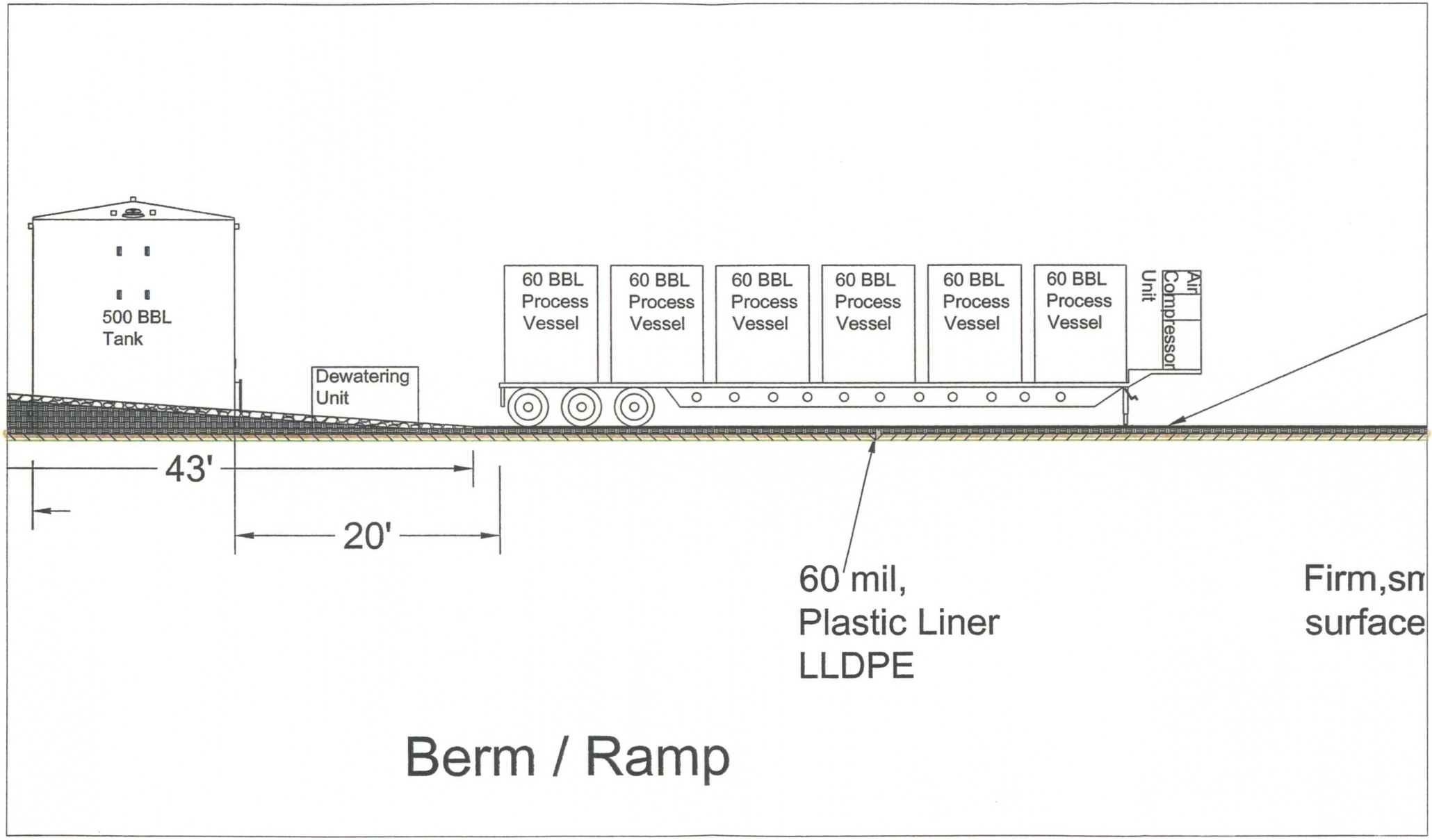
Berm / Ramp

DWG-4

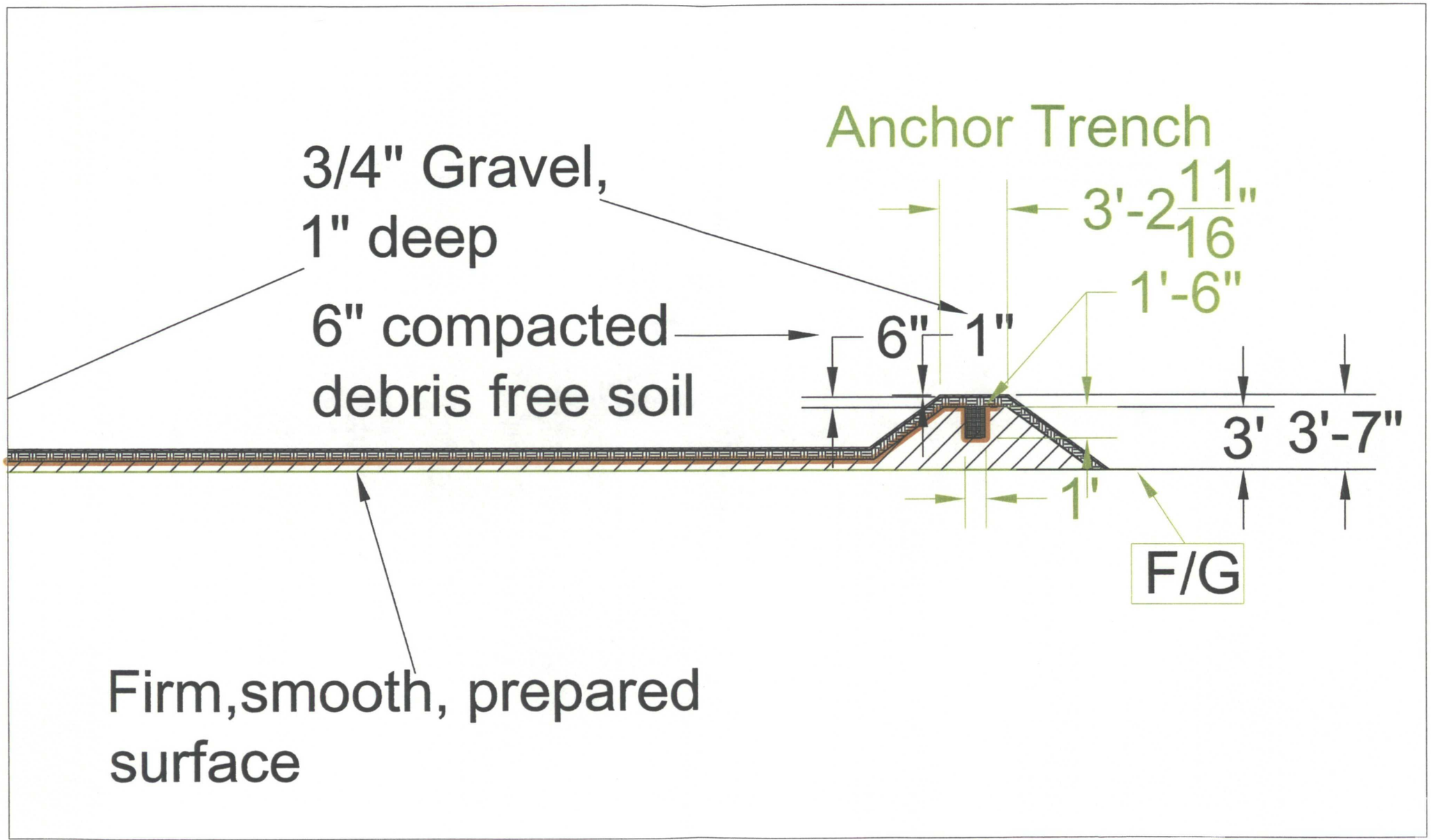

Anchor Trench
3/4" gravel
6"deep
500 BBL
Tank
Dewatering
Unit
F/G
6°
43'
43'
Compacted debris free soil
9'-6"
20'

Bern

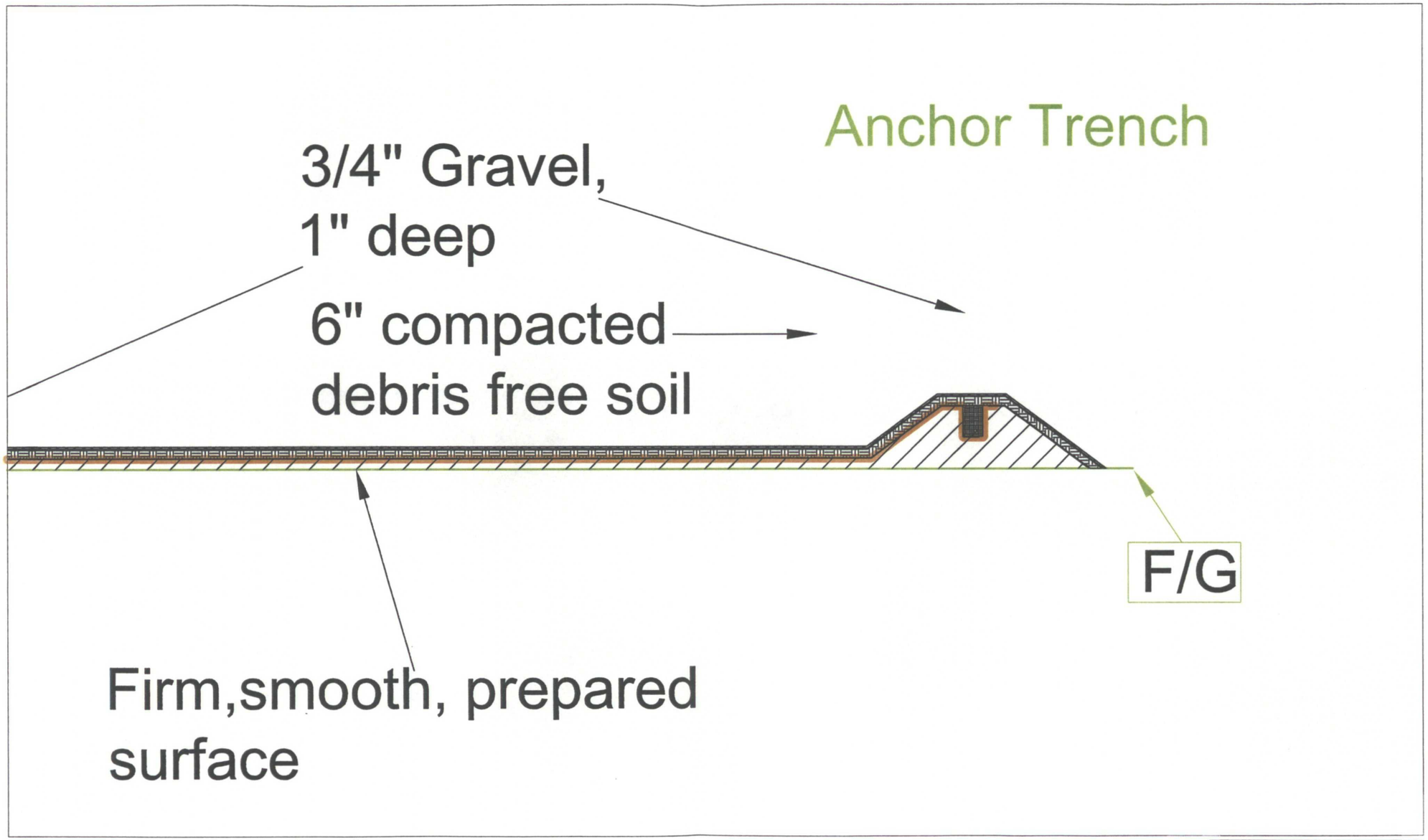
DWG-5


500 BBL
Tank
Dewatering
Unit
60 BBL
Process
Vessel
60 BBL
Process
Vessel
60 BBL
Process
Vessel
60 BBL
Process
Vessel
60 BBL
Process
Vessel
60 BBL
Process
Vessel
Air
Compressor
Unit
43'
20'
60 mil,
Plastic Liner
LLDPE
Firm,sm
surface
Berm / Ramp

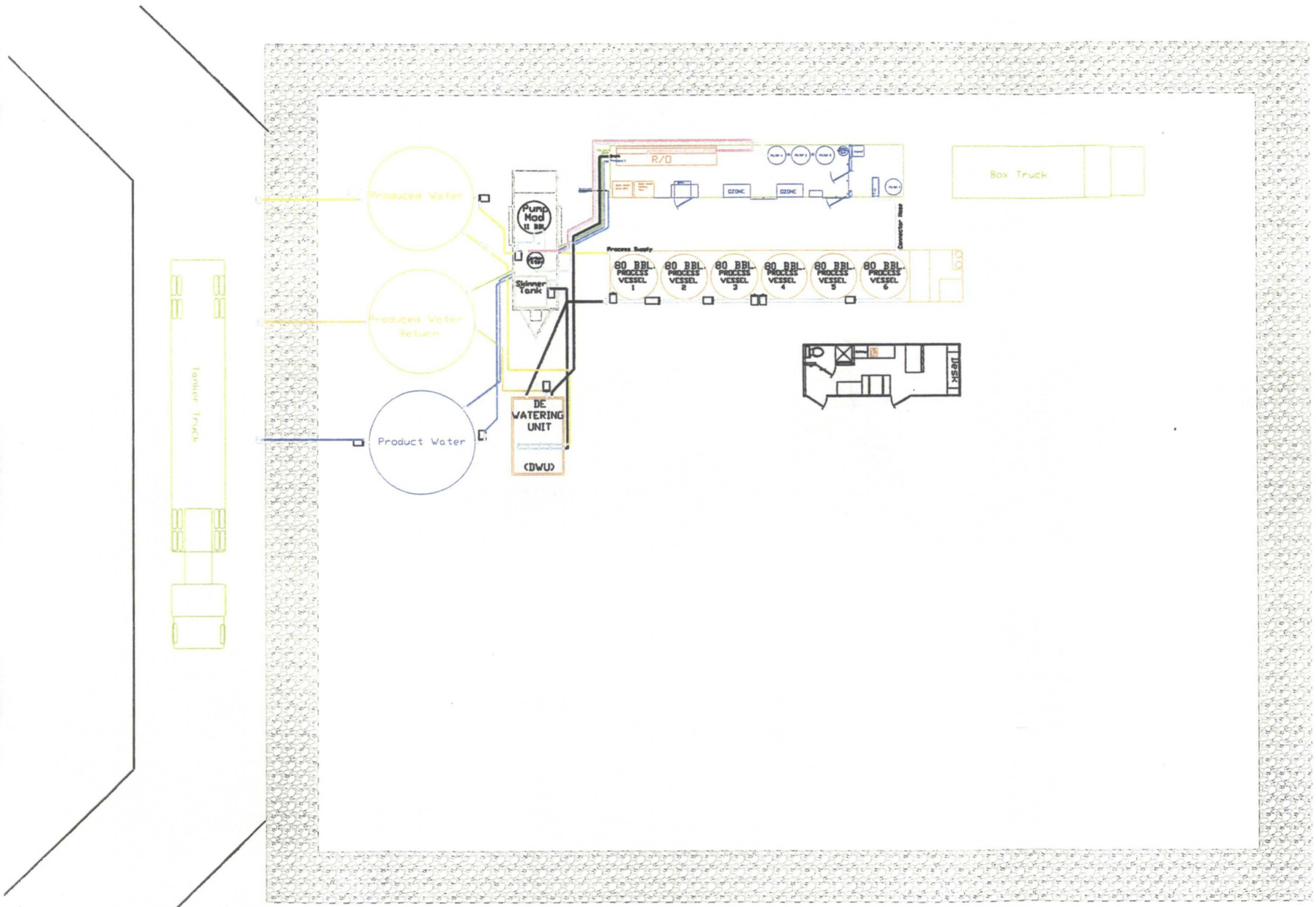
DWG-6


Anchor Trench
3/4" Gravel,
1" deep
6" compacted
debris free soil
3'-2 11/16"
1'-6"
6"
1"
3'
3'-7"
1'
F/G
Firm,smooth, prepared
surface

DWG-7


Anchor Trench
3/4" Gravel,
1" deep
6" compacted
debris free soil
F/G
Firm,smooth, prepared
surface

DWG-8



CAS Produced Water Remediation Site
157 Lake Road
Artesia, NM. 88210

Tank Capacities

3 - 500 BBL Storage	=	1500 BBL
6 - BBL Process	=	480 BBL
1 - 320 BBL DWU	=	320 BBL
1 - 11 BBL Pump Mod	=	11 BBL
Piping = 141 BBL	=	141 BBL
Total Fluid Potential	=	2,441 BBL

Berm
158' x 133' x 2' 6"
Maximun Capacity
Berm capacity of 320%
of available fluid at maximums

Attachment D

Site closure plan

Site Closure Plan

The site will be closed in accordance with 19.15.17.13 NMAC, revised for a lined, bermed, non-pit installation.

Closure: (19.15.17.13 C)

All liquids and BS&W shall be removed from the lined area prior to implementing a closure method and shall dispose of the liquids and BS&W in a division-approved facility. The liner system shall be removed and disposed of in a division-approved facility.
The operator shall test the soils beneath the lined area to determine whether a release has occurred. The operator shall collect, at a minimum, a five point, composite sample; collect individual grab samples from any area that is wet, discolored or showing other evidence of a release; and analyze for BTEX, TPH and chlorides to demonstrate that the benzene concentration, as determined by EPA SW-846 methods 8021B or 8260B or other EPA method that the division approves, does not exceed 0.2 mg/kg; total BTEX concentration, as determined by EPA SW-846 methods 8021B or 8260B or other EPA method that the division approves, does not exceed 50 mg/kg; the TPH concentration, as determined by EPA method 418.1 or other EPA method that the division approves, does not exceed 100 mg/kg; and the chloride concentration, as determined by EPA method 300.1 or other EPA method that the division approves, does not exceed 250 mg/kg, or the background concentration, whichever is greater. The operator shall notify the division of its results on form C-141. The division may require additional delineation upon review of the results.
If the operator or the division determines that a release has occurred, then the operator shall comply with 19.15.29 NMAC and 19.15.30 NMAC, as appropriate.
If the sampling program demonstrates that a release has not occurred or that any release does not exceed the concentrations specified in Paragraph (3) of Subsection C of 19.15.17.13 NMAC, then the operator shall remove the berm material to the location it was originally acquired from, or other location at the discretion of the land owner.

Reclamation of location. (19.15.17.13 G)

1. Once the operator has closed the facility, the operator shall reclaim the location and all areas associated with the facility including associated access roads to a safe and stable condition that blends with the surrounding undisturbed area. The operator shall substantially restore the impacted surface area to the

condition that existed prior operations by placement of the soil cover as provided in Subsection H of 19.15.17.13 NMAC, recontour the location and associated areas to a contour that approximates the original contour and blends with the surrounding topography and re-vegetate according to Subsection I of 19.15.17.13 NMAC.

2. The operator may propose an alternative to the re-vegetation requirement if the operator demonstrates that the proposed alternative effectively prevents erosion, and protects fresh water, human health and the environment. The proposed alternative shall be agreed upon by the surface owner. The operator shall submit the proposed alternative, with written documentation that the surface owner agrees to the alternative, to the division for approval.

Soil cover designs. (19.15.17.13 H)

1. The soil cover for closures where the operator has removed the facility contents or remediated the contaminated soil to the division's satisfaction shall consist of the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater.
2. The operator shall construct the soil cover to the site's existing grade and prevent ponding of water and erosion of the cover material.

Re-vegetation. (19.15.17.13 I)

The location of the site is in an area that has been cleared of native vegetation by the owner. This area is inside a research facility..

Closure notice. (19.15.17.13 J)

1. The operator shall notify the surface owner by certified mail, return receipt requested, that the operator plans to close facility. Evidence of mailing of the notice to the address of the surface owner shown in the county tax records is sufficient to demonstrate compliance with this requirement.
2. The operator shall notify the appropriate division district office verbally or by other means at least 72 hours, but not more than one week, prior to any closure operation. The notice shall include the operator's name and the location to be closed by unit letter, section, township and range.
3. The operator shall notify the environmental bureau in the division's Santa Fe office at least 60 days prior to cessation of operations and provide a proposed schedule for closure. If there is no closure plan on file with the environmental bureau in the division's Santa Fe office applicable to the permanent pit, the operator shall provide a closure plan with this notice. Upon receipt of the notice and proposed schedule, the environmental bureau in the division's Santa Fe office shall review the current closure plan for adequacy and inspect the site.

Closure report. (19.15.17.13 K)

Within 60 days of closure completion, the operator shall submit a closure report on form C-144, with necessary attachments to document all closure activities including sampling results; information required by 19.15.17 NMAC; a plot plan; and details where applicable. In the closure report, the operator shall certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in the approved closure plan.

Attachment E

Best management practice plan to ensure protection of fresh water, public health, safety and the environment.

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Best management practice plan to ensure protection of fresh water, public health, safety and the environment.

Best Management Practices:

- Water loading and off-loading taps will have **ABOVE Ground** drip sumps provided
  - Drip sump diagram is provided in Attachment G
- Loading and off-loading drip sumps will be checked every 24 hours to monitor for valve leaks
- The treatment facility, including all storage tanks, is located within the limits of a lined, bermed area,
  - The volume of the bermed area is aproximately 320% of the total available volume of water contained in all vessels and piping.
  - The berm is lined with a welded 60 mil, LLPDE liner
  - The LLPDE Liner is anchored in an anchor trench to ensure that the liner remains in place for the lifetime of the installation.
- All of the produced water storage and treatment equipment is located within the lined, bermed area
- All water delivered to the facility or transported from the facility will be documented with a water transfer ticket.
- All water delivered to the facility or transported from the facility will be transported by a state approved produced water hauler with a current, approved form C-133.
- All water transported from the facility for disposal by **Nabors Well Service Waste hauler #: 214 to: SWD Nix-Ann - owned by: Mesquite SWD, Inc 1031 EDDY STREET Carlsbad, NM 88220 Well is on Rockin' R Red Road API #30-015-24305**
- Record keeping:
  - All water transfer tickets will document the well which produced the water or the disposal well which received the water.
  - Log sheets will be kept for daily operation and will be available on-site as well as periodically transmitted to CAS offices.
  - See **Attachment I** for a sample copy of the facility and process log sheet.
  - All water transfers will be subject to form C-138, specifying that all produced water is ONLY exempt or non-hazardous waste with exceptions stated in Subsection F of 19.15.36.13 NMAC.
    - A form C-138 signed by the generator or the generator's agent, will be provided and maintained on-site and updated on a monthly, weekly or per-load basis. These certificates will be available for the division's inspection upon request.

- All tanks will be labeled in accordance with **19.15.18.16 NMAC.**
- **In the case of an unauthorized release, CAS will comply with 19.15.29 NMAC (Attachment N) and 19.15.30 NMAC (Attachment O).**

Attachment F

Water transfer form for receipt and release of produced water

Submit a single copy to Santa Fe Office

State of New Mexico
Energy Minerals and Natural Resources

Form C-133
Revised May 27, 2004

Oil Conservation Division
1220 South St. Francis Dr
Santa Fe, NM 87505

AUTHORIZATION TO MOVE PRODUCED WATER

Transporter Name NABORS WELL SERVICES LTD.

Address	Office Location (If different)
515 W. GREENS RD. STE. 1170	P.O. BOX 5208
HOUSTON, TX 77067	HOBBS, NM 88241

Phone Numbers(s) 281-874-0035(CORPORATE) 505-392-2577(HOBBS)

State Corporation Commission Permit No. 2395

Please attach a copy of the New Mexico Public Regulation Commission (PRC) Warrant for Transportation Services. If a corporation name or LLC that not been established with the PRC or a partnership has not been established with the New Mexico Secretary of State Office. In accordance with Section 51 of 19.6.2 NMAC, "the division may deny approval of a form C-133 if

(1) the applicant is a corporation or limited liability company, and is not registered with the public regulation commission to do business in New Mexico;

(2) the applicant is a limited partnership, and is not registered with the New Mexico secretary of state to do business in New Mexico;

(3) the applicant does not possess a carrier permit under the single state registration system the public regulation commission administers, if it is required to have such a permit under applicable statutes or rules; or

(4) the applicant or an officer, director or partner in the applicant, or a person with an interest in the applicant exceeding 25 percent, is or has within the past five years an officer, director, partner or person with an interest exceeding 25 percent in another entity that possesses or has possessed an approved form C-133 that has been cancelled or suspended, has a history of violating division rules or other state or federal environmental laws; is subject to a commission or division order, issued after notice and hearing, finding such entity to be in violation of an order requiring corrective action; or has a penalty assessment for violation of division or commission rules or orders that is unpaid more than 70 days after issuance of the order assessing the penalty."

NOTE: It is the responsibility of each holder of an approved Form C-133 to familiarize its personnel with the content of Sections 51 and 52 of 19.15.2 NMAC and to assure operations in compliance therewith. Failure to move and dispose of produced water in accordance with Sections 51 and 52 of 19.15.2 NMAC are cause for cancellation of Form C-133 and the authority to move produced water.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

Signature W.D. EHLERT Date 09/14/07

Printed Name W.D. EHLERT Title VICE PRESIDENT

E-mail Address

(This space for State Use)

Approved by EBC Title

Date 10/2/07

CAS Produced Water Remediation Site
157 Lake Road Artesia, NM 88210

Water transfer form for receipt and release of produced water

Date: _____

Water received from producer:	Water released to disposal:
Well API#: _____	Well API#: _____

Volume of water transfered (bbl): _____

Water hauler: _____

(Copy of form C-133 must be produced on request)

Attachment G

Loading/Unloading drip sump diagram

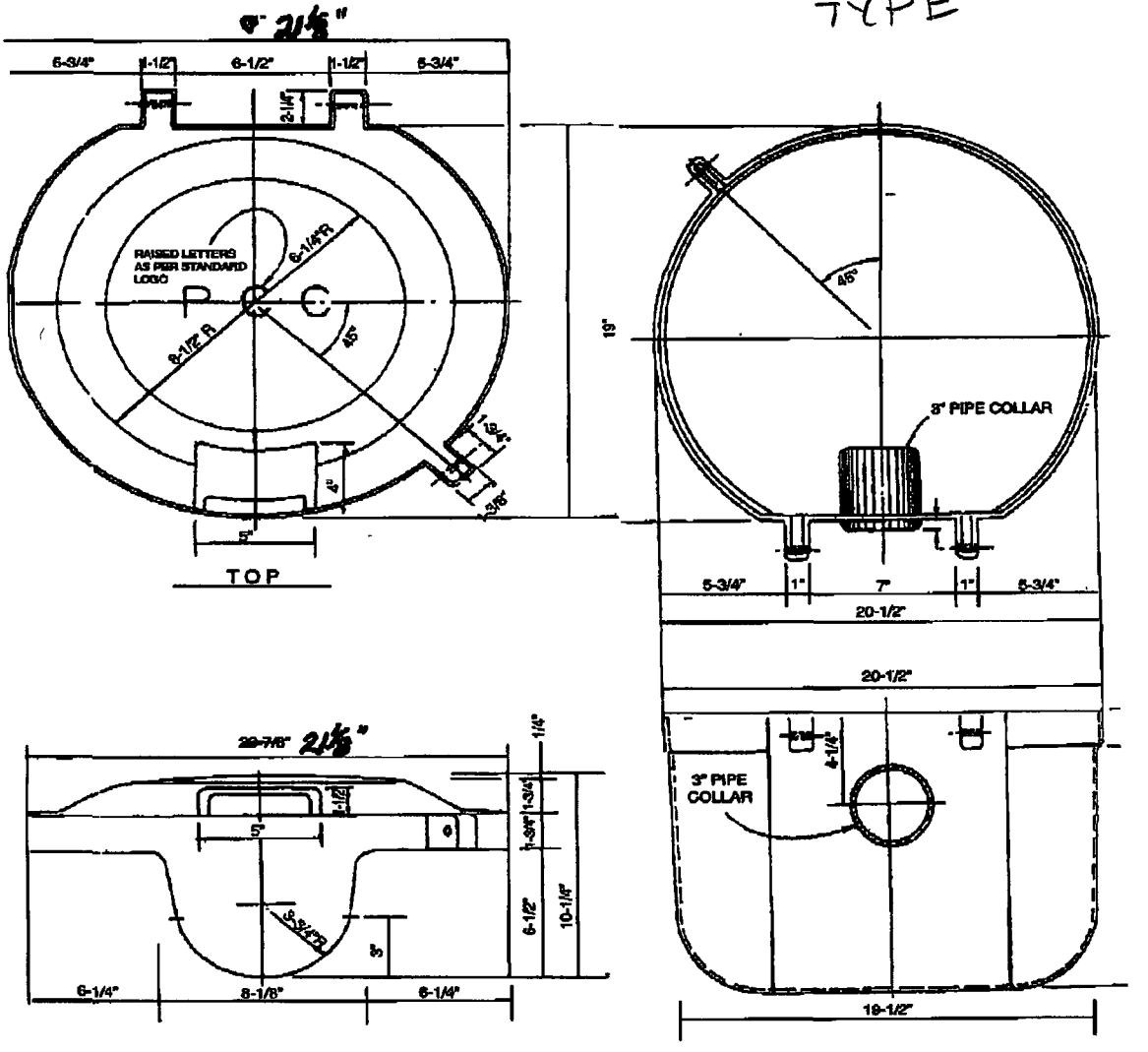
Attachment G

Loading/Unloading drip sump diagram

Loading/Unloading Drip Sump Diagram

PCC 301

ABOVE GRADE TYPE



RFAR

Attachment H

Ozone Emission Potential from the CAS Produced Water Remediation System

Ozone Emission Potential from the CAS Produced Water Remediation System

May 30, 2010

Disclosure

Stray Ozone gas emissions from the CAS system are not a part or consequence of its operation.

Ozone is recognized as a pollutant both by the EPA and NMED. Therefore it is critical to guard against any emission. The air quality focus is on 185 nm wavelength ozone, and it is is the subject of this regulation as its presence typically indicates a condition of smog or VOC's which when deteriorated, produce low level (185 nm) ozone as a byproduct.

In the CAS process, all ozone gas generated is 254 nm and is completely injected directly into the fluid being treated. The contaminants in the produced water totally consume the ozone in the oxidation process. The ozone generation system is controlled by an ORP process control system. (Oxidation Reduction Potential - the industry standard system of control for waste water remediation systems using ozone, since patented in 1993) The byproduct of ozone's oxidation is O2, (oxygen).

The generators are variable output by necessity to avoid any ozone residual being present at the input of the final stage of treatment polishing- Reverse Osmosis.

USPatent # 5,236,673 Aug 16, 1993

Attachment I

Process and Facility Inspection Log Sheet

Daily Log Sheet

Date / /	Reading	Reading
Site Conditions		
Check Site for Water leaks		
Skimmer #1 Flow Rate est.		
Skimmer #2 Flow Rate est.		
Skimmer #3 Flow Rate est.		
Foam level and Presence		
Skimmer #4 Flow Rate est.		
Foam level and Presence		
Skimmer #5 Flow Rate est.		
Foam level and Presence		
Skimmer #6 Flow Rate est.		
Foam level and Presence		
Wind Direction		
Air Temperature		
Weather		
H2S ppm by Personal Monitor		
Ozone Gen. On		
Ozone Supply Pressure		
Ozone flow #2		
Ozone flow #3		
Ozone flow #4		
Ozone flow #5		
Ozone flow #6		
Ozone Power lights Off?		
Mixer system		
Mixer Amps Tank #1		
Mixer Amps Tank #2		
Mixer Amps Tank #3		
Mixer Amps Tank #4		
Mixer Amps Tank #5		
Mixer Amps Tank #6		
Mixer flush		
Air Compressor		
Drain A/C pressure sensor		
Drain A/C Moisture traps		
Chiller		
Discharge Temperature		
O2 Concentrator		
Power On		
Supply Pressure		
O2 Discharge Pressure		
Drain O2 Moisture trap		
Drain O2 concentrator traps		

Comments

R/O Process		
Inlet PSI		
ORP		
R/O #1 Reject Flow		
R/O #1 Discharge Flow		
R/O #1 ORP		
R/O Exit Temp		
Pre-Filter Delta P		
Discharge Pump Press.		
TOC Instrument		
TOC		
Furnace Temp		
Air Pressure		
Inlet Air Flow		
Outlet Air Flow		
Acid Level		
Distilled Level		
Sample Frequency		
Highest TOC prev. 24 hours		
Lowest TOC preV. 24 hours		
Clean Sample Flask		
Sample Filtration		
On Line/ Off Line		
Supply Water Source		
Filter Color		
Date filters were changed		
R/O on line /off line		
Fittings tight?		
Solids Removal Sys		
Filter Inlet Pressure		
Filter Discharge Pressure		
Settling Tank Level		
Cyclone Tank Level		
Filter pump hz.		
Backwash Sample Taken		
Fittings tight?		
Cyclone Discharge Pressure		
Test Float Switches		
Dumpster Solids level		
Dump Red Dewater System		
BSW System		
Process Vessel #1		
Process Vessel #2		
Process Vessel#3		
Process Vessel #4		
Process Vessel #5		
Process Vessel #6		

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Attachment J

State of New Mexico Energy Minerals and Natural Resources form C-138,

"REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE"

District I
1625 N French Dr , Hobbs, NM 88240
District II
1301 W Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S St Francis Dr , Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-138
Revised March 12, 2007

*Surface Waste Management Facility Operator and Generator shall maintain and make this documentation available for Division inspection.

REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE

1. Generator Name and Address:

2. Originating Site:

3. Location of Material (Street Address, City, State or ULSTR):

4. Source and Description of Waste:

Estimated Volume _____ yd^3 / bbls Known Volume (to be entered by the operator at the end of the haul) _____ yd^3 / bbls

5. GENERATOR CERTIFICATION STATEMENT OF WASTE STATUS

I, _____, representative or authorized agent for _____ do hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is: (Check the appropriate classification)

☐ RCRA Exempt: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste. *Operator Use Only: Waste Acceptance Frequency* ☐ *Monthly* ☐ *Weekly* ☐ *Per Load*

☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24, or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items)

☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description in Box 4)

GENERATOR 19.15.36.15 WASTE TESTING CERTIFICATION STATEMENT FOR LANDFARMS

I, _____, representative for _____ do hereby certify that representative samples of the oil field waste have been subjected to the paint filter test and tested for chloride content and that the samples have been found to conform to the specific requirements applicable to landfarms pursuant to Section 15 of 19.15.36 NMAC. The results of the representative samples are attached to demonstrate the above-described waste conform to the requirements of Section 15 of 19.15.36 NMAC.

5. Transporter:

OCD Permitted Surface Waste Management Facility

Name and Facility Permit #:

Address of Facility:

Method of Treatment and/or Disposal:

☐ Evaporation ☐ Injection ☐ Treating Plant ☐ Landfarm ☐ Landfill ☐ Other

Waste Acceptance Status:

☐ **APPROVED** ☐ **DENIED** (Must Be Maintained As Permanent Record)

PRINT NAME: _____ TITLE: _____ DATE: _____

SIGNATURE: _____ TELEPHONE NO.: _____

Surface Waste Management Facility Authorized Agent

Attachment K

H2S

As indicated by OCD, any potential release of H2S from CAS's tank would not involve a potentially hazardous volume of H2S that might reach a public area or road. We agree that CAS is not required to have a Part 11 H2S Contingency Plan for this project, and we have eliminated that from section K.

Safety Precautions

Pursuant to 19.15.11.12E NMAC, when ladders and scaffolding are installed on the tanks, CAS will chain and mark with appropriate signage the ladders attached to the tanks involved.

Attachment L

Commitment from Occidental Petroleum to provide produced water

Oxy USA, Inc.
A subsidiary of Occidental Petroleum Corporation

1502 W. Commerce Drive
Carlsbad, NM 88220
575-628-4100 (o)
575-628-4126 (f)

CAS
Timothy Coakley, President
3801 W. Country Club Road
Roswell, NM 88201
575-623-3201

July 7, 2010

Dear Mr. Coakley,

Please consider this my approval for Tim Coakley (bda Controlled Aqua Systems) to contract Nabors Well services LTD to haul approximately two loads of produced water per week from the Oxy MOC-SWD # 1 (API 30-015-21669) located section 7, Township 20 S, Range25 E. The water is to be hauled from the MOC-SWD directly to the site at 157 Lake Road Artesia, NM 88210.
This approval is with the understanding and condition that this site will be permitted by the NMOCD prior to the transport of any water. If at any time the NMOCD withdraws or terminates the permit, this approval is automatically canceled.

Sincerely,

Van Barton
Production Coordinator
1502 W. Commerce Dr.
Carlsbad, New Mexico 88220

Attachment M

LLPDE 60 mill Liner specification sheet

Instructions and covenants pertinent to the waterproof installation of this liner

RECEIVED OCD

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I. LLPDE UNLOADING/STORAGE

A. LLPDE rolls will be unloaded under supervision of the liner installer – SouthWest Liner, using straps or other devices that will prevent damage to the liner material.
B. Rolls should be stored on subgrade that is clean, dry, and well compacted. LLPDE materials shall be stacked not more than two rolls high.
C. If any material damage is noted during unloading, the damaged areas are to be marked with a permanent marker, and a notation made as to the roll number, location of damage, and type of damage. Recording of minor damage to the outer wraps of liner material is not required.

II. MATERIAL DEPLOYMENT

A. Prior to placement of any liner materials, the subgrade is to be inspected and approved by the CAS Project Superintendent. Any areas found to be unacceptable are to be corrected prior to placement of liner material. Documentation of this inspection is to be provided if required by the project specifications.
B. Materials will not be deployed when moisture, high winds, or other adverse weather conditions are expected.
C. LLPDE materials are to be deployed using methods that will not crimp, bend, or otherwise damage the material. Unless otherwise approved, LLPDE materials are to be deployed using a "spreader bar" manufactured especially for this purpose.
D. If a Liner Installation Plan has been submitted, the geomembrane shall be installed in accordance with said Plan. The panel layout may be adjusted in the field if required by site conditions. Panels are to be identified with a Panel Number that allows ready identification of the location of the panel. The Panel Number is to be written on the liner material with a permanent marker.
E. Temporary sand bags are to be used to prevent material uplift and movement from winds during liner installation.
F. The liner panels shall be oriented at right angles to the toe of the berm (down slope) where possible. Except for roll end (butt) seams, horizontal seams are not allowed on slopes steeper than 2:1. Transition seams between vertical slope panels and horizontal panels will be located at least 5 feet from the toe of the slope. Liner panels are to be deployed in a manner that minimizes field seams.
G. No motorized equipment will be allowed to operate directly over the geomembrane material. Portable equipment (portable generators, compressors, etc.) will be mounted on rubber tires or placed on a sacrificial sheet of material.

H. LLPDE liner materials are to be deployed in a manner that minimizes wrinkling, but allows for sufficient material slack to properly conform to the subgrade. Ambient weather conditions and liner temperature are to be taken into account when

making this determination.

I. When LLPDE materials are deployed at temperatures greater than 80° F and in direct sunlight, the material will be allowed to stabilize overnight before the anchor trenches are backfilled. Stabilizing is accomplished using the following techniques:

1. Leave sufficient excess liner material on the outboard side of the anchor trench to allow for anticipated liner shrinkage.
2. Temporarily weight the liner in the anchor trench using sandbags.
3. Place sufficient sandbags at the toe of the slope to allow the liner to pull the excess material from the anchor trench as it shrinks. The number and placement of sandbags will vary according to the pond design and expected weather conditions.
4. Inspect the liner material while the material is still cool the following morning. If sufficient liner shrinkage has occurred, backfill the anchor trench that is to be backfilled.

III. MATERIAL SEAMING – DUAL HOT WEDGE WELDING

A. After allowing the liner temperature to stabilize, overlap adjacent panels a minimum of 4". Remove any excessive wrinkles prior to seaming.
B. Field seams are to be made using the dual-hot-wedge welding method whenever possible.
C. Prior to seaming any materials, trial seams shall be made. Trial seams are made on scrap pieces of geomembrane to verify that the seaming conditions and equipment are acceptable. At least (3) peel and (3) shear tests are to be conducted on each trial seam, using a field tensiometer furnished by the liner installer. The peel and shear values for trial seams are to meet or exceed the project specifications.

D. Upon completion of a successful test, the date, time, seamer name, wedge welding machine number, machine temperature setting, machine speed setting, and test results are to be recorded in the Trial Seam Log. No seaming is to be done until a successful test seam has been completed and recorded.
E. If a trial seam fails the test, the entire process will be repeated. If the same welding machine and seamer fail the testing a second time, the welding machine and the seamer will not be used for seaming until the deficiencies are corrected and two consecutive successful trial seams are completed
F. Trial seams are to be conducted at immediately prior to the start of any welding period, if the welding equipment has been shut down for a period of more than (10) minutes, or if a substantial change in weather conditions occurs. A trial seam

is to be done for each piece of welding equipment to be used during that welding period.

G. The area to be seamed is to be clean and dry. If required, a protective layer is to be placed under the seam to prevent dust or moisture from entering the seam area, and/or the liner material in the seam area is to be wiped with a clean rag.

H. At the start of each seam, the machine operator is to mark the date, time, machine number, machine temperature, machine speed, and operator initials on the lining material with a permanent marker. This information is to be recorded in the project log.

I. The machine operator is responsible for ensuring that the area to be seamed is clean and dry. If any questionable seam areas are noted, the operator is to mark these areas for later inspection and testing.

J. The machine operator is to read the machine temperature at intervals of approximately 100 feet, and mark the temperature on the lining material. This procedure will ensure that seams are made at the proper temperature. If an excessively high or low temperature reading is noted, the operator is to stop seaming and mark the affected area for testing. The cause of the problem is to be located and corrected, and a new trial seam made and tested before seaming resumes.

IV. DUAL HOT WEDGE WELDING – AIR PRESSURE TESTING

A. Wedge welded seams consist of a double seam with an air channel between the seams. Upon completion of a wedge seam, the open ends of the air channel are sealed off and a needle inserted into the air channel. The air channel is pressurized, allowed to stabilize, and the initial pressure reading is taken.

Continued on page 4

B. The minimum starting test pressure is 30 PSIG. The maximum allowable pressure drop during the five minute test is 4 PSIG.

C. After five minutes, the final pressure reading is taken. The date, test start and ending times, and starting and ending pressures are to be written on the material with a permanent marker. This information is also to be recorded in the project log.

D. At the conclusion of the test, a small hole is cut in the air channel at the end of the seam opposite the inflation needle. The air pressure should drop to 0 PSIG with ten seconds of the cut being made. This procedure ensures that the air channel is not blocked. If the air pressure does not drop to 0 PSIG, the cause of the problem is to be located and the seam re-tested.

E If a wedge welded seam area does not pass the air pressure test, the cause of the failure is to be located and repaired, and the seam is to be re-tested. If the cause of the failure cannot be located, the failed seam area must be sealed with an extrusion weld and fully vacuum tested.

V. MATERIAL SEAMING - EXTRUSION WELDING

A. Extrusion welding is to be used for detail work, repairs, and in other areas where wedge welding cannot be used.
B. Prior to the start of any extrusion welding, trial seams are to be conducted per Item III.C through G.
C. Areas to be extrusion welded are to be clean and dry. Surface oxidation is to be removed by grinding. Grinding is to be done not more than one hour prior to the time the extrusion weld is made, using the procedures listed below:
    1. The grinding shall not extend more than ¼ inch beyond the limit of the extrudate after seam completion.
    2. Grinding shall be performed preferentially in a perpendicular path across the seam.
    3. The depth of grinding shall be less than 10 percent of the sheet thickness.
    4. All shavings produced from grinding shall be removed from the seaming area prior to welding.

D. Where patches are required, the patches are to be round or oval in shape, and are to overlap the damaged area by a minimum or 4" on all sides. Patches are to be heat sealed to the main liner prior to extrusion welding to prevent the edge of the patch from lifting when the extrudate is applied. The extrusion welder shall be purged prior to beginning a seam until all potentially heat-degraded extrudate has been removed from the barrel.
E. Extrusion welds are to be tested by use of a vacuum box. A soap solution is applied to the area to be tested, and a vacuum applied to the area. The tested area is then observed for soap bubbles. Any defective areas must be marked, repaired, and retested until passing results are achieved.

VI. SEAM TESTING

The following values are considered acceptable for seam adhesion tests. All values are expressed in ponds per inch of material width. All testing is done at the speed of two (2) inches per minute. All failures are to exhibit Film Tearing Bond (FTB).

Material Thickness (PPI)	Shear Strength (PPI)	Fusion Peel (PPI)	Extrusion Peel (PPI)
40 mil	81	65	52
60 mil	121	98	78
80 mil	162	130	104
100 mil	203	162	130

SMOOTH LLDPE GEOMEMBRANE (ENGLISH UNITS)

Property	Test Method	Minimum Average Values 30 mil	40 mil	60 mil	80 mil
Thickness, mils	ASTM D 5199				
minimum average		30	40	60	80
lowest individual reading		27	36	54	72
Sheet Density, g/cc (max.)	ASTM D 1505/D 792	0.939	0.939	0.939	0.939
Tensile Properties[1]	ASTM D 6693				
1. Break Strength, lb/in		114	152	228	304
2. Break Elongation, %		800	800	800	800
2% Modulus, lb/in^2 (max.)	ASTM D 5323	60,000	60,000	60,000	60,000
Tear Resistance, lb	ASTM D 1004	16	22	33	44
Puncture Resistance, lb	ASTM D 4833	42	56	84	112
Axi-Symetric Break Strain, %	ASTM D 5617	30	30	30	30
Carbon Black Content[2], %	ASTM D 1603	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	--Note 3--			
Oxidative Induction Time (OIT)					
Standard OIT, minutes	ASTM D 3895	100	100	100	100
Oven Aging at 85°C	ASTM D 5721				
High Pressure OIT - % retained after 90 days	ASTM D 5885	60	60	60	60
UV Resistance[4]	GRI GM11				
High Pressure OIT[5] - % retained after 1600 hrs	ASTM D 5885	35	35	35	35
Seam Properties	ASTM D 6392 (@ 2 in/min)				
1. Shear Strength, lb/in		45	60	90	120
2. Peel Strength, lb/in - Hot Wedge		38	50	75	100
- Extrusion Fillet		34	44	66	88
Roll Dimensions					
1. Width (feet):		23	23	23	23
2. Length (feet):		1,000	750	500	375
3. Area (square feet):		23,000	17,250	11,500	8,625
4. Gross weight (pounds, approx.):		3,435	3,435	3,435	3,435

1 Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction. Break elongation is calculated using a gauge length of 2.0 inches.
2 Other methods such as ASTM D 4218 or microwave methods are acceptable if an appropriate correlation can be established.
3 Carbon black dispersion for 10 different views: Nine in Categories 1 and 2 with one allowed in Category 3.
4 The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation at 60°C.
5 UV resistance is based on percent retained value regardless of the original HP-OIT value.

SMOOTH LLDPE GEOMEMBRANE (ENGLISH UNITS)

Property	Test Method	Minimum Average Values 30 mil	40 mil	60 mil	80 mil
Thickness, mils	ASTM D 5199				
minimum average		30	40	60	80
lowest individual reading		27	36	54	72
Sheet Density, g/cc (max.)	ASTM D 1505/D 792	0.939	0.939	0.939	0.939
Tensile Properties[1]	ASTM D 6693				
1. Break Strength, lb/in		114	152	228	304
2. Break Elongation, %		800	800	800	800
2% Modulus, lb/in^2 (max.)	ASTM D 5323	60,000	60,000	60,000	60,000
Tear Resistance, lb	ASTM D 1004	16	22	33	44
Puncture Resistance, lb	ASTM D 4833	42	56	84	112
Axi-Symetric Break Strain, %	ASTM D 5617	30	30	30	30
Carbon Black Content[2], %	ASTM D 1603	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596		–Note 3–		
Oxidative Induction Time (OIT)					
Standard OIT, minutes	ASTM D 3895	100	100	100	100
Oven Aging at 85°C	ASTM D 5721				
High Pressure OIT - % retained after 90 days	ASTM D 5885	60	60	60	60
UV Resistance[4]	GRI GM11				
High Pressure OIT[5] - % retained after 1600 hrs	ASTM D 5885	35	35	35	35
Seam Properties	ASTM D 6392 (@ 2 in/min)				
1. Shear Strength, lb/in		45	60	90	120
2. Peel Strength, lb/in - Hot Wedge		38	50	75	100
- Extrusion Fillet		34	44	66	88
Roll Dimensions					
1. Width (feet):		23	23	23	23
2. Length (feet):		1,000	750	500	375
3. Area (square feet):		23,000	17,250	11,500	8,625
4. Gross weight (pounds, approx.):		3,435	3,435	3,435	3,435

1 Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction. Break elongation is calculated using a gauge length of 2.0 inches.
2 Other methods such as ASTM D 4218 or microwave methods are acceptable if an appropriate correlation can be established.
3 Carbon black dispersion for 10 different views Nine in Categories 1 and 2 with one allowed in Category 3.
4 The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation at 60°C.
5 UV resistance is based on percent retained value regardless of the original HP-OIT value.

Attachment N

OCD Release Notification Guidelines

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☐ Final Report

Name of Company CAS	Contact: Timothy G. Coakley, President
Address: 157 Lake Road Artesia, NM 88210	Telephone No. 575-623-3201
Facility Name	Facility Type

Surface Owner	Mineral Owner	Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
	16	T18S	R26E					

Latitude_____ **Longitude**_____

NATURE OF RELEASE

Type of Release	Volume of Release	Volume Recovered
Source of Release	Date and Hour of Occurrence	Date and Hour of Discovery
Was Immediate Notice Given? ☐ Yes ☐ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☐ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Describe Area Affected and Cleanup Action Taken.*

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION	
Printed Name:	Approved by District Supervisor:	
Title:	Approval Date:	Expiration Date:
E-mail Address:	Conditions of Approval:	Attached ☐
Phone:		

* Attach Additional Sheets If Necessary

CHAPTER 15 OIL AND GAS

PART 29 RELEASE NOTIFICATION

19.15.29.1 ISSUING AGENCY: Energy, Minerals and Natural Resources Department, Oil Conservation Division.

[19.15.29.1 NMAC - N, 12/1/08]

19.15.29.2 SCOPE: 19.15.29 NMAC applies to persons engaged in oil and gas development and production within New Mexico.

[19.15.29.2 NMAC - N, 12/1/08]

19.15.29.3 STATUTORY AUTHORITY: 19.15.29 NMAC is adopted pursuant to the Oil and Gas Act, NMSA 1978, Section 70-2-6, Section 70-2-11 and Section 70-2-12.

[19.15.29.3 NMAC - N, 12/1/08]

19.15.29.4 DURATION: Permanent.

[19.15.29.4 NMAC - N, 12/1/08]

19.15.29.5 EFFECTIVE DATE: December 1, 2008, unless a later date is cited at the end of a section.

[19.15.29.5 NMAC - N, 12/1/08]

19.15.29.6 OBJECTIVE: To require persons who operate or control the release or the location of the release to report the unauthorized release of oil, gases, produced water, condensate or oil field waste including regulated NORM, or other oil field related chemicals, contaminants or mixtures of those chemicals or contaminants that occur during drilling, producing, storing, disposing, injecting, transporting, servicing or processing and to establish reporting procedures.

[19.15.29.6 NMAC - N, 12/1/08]

19.15.29.7 DEFINITIONS:

A. "Major release" means:

(1) an unauthorized release of a volume, excluding gases, in excess of 25 barrels;

(2) an unauthorized release of a volume that:

(a) results in a fire;

(b) will reach a watercourse;

(c) may with reasonable probability endanger public health; or

(d) results in substantial damage to property or the environment;

(3) an unauthorized release of gases in excess of 500 MCF; or

(4) a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

B. "Minor release" means an unauthorized release of a volume, greater than five barrels but not more than 25 barrels; or greater than 50 MCF but less than 500 MCF of gases.

[19.15.29.7 NMAC - Rp, 19.15.3.116 NMAC, 12/1/08]

19.15.29.8 RELEASE NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall notify the division of unauthorized release occurring during the drilling, producing, storing, disposing, injecting, transporting, servicing or processing of oil, gases, produced water, condensate or oil field waste including regulated NORM, or other oil field related chemicals, contaminants or mixture of the chemicals or contaminants, in accordance with the requirements of 19.15.29 NMAC.

B. The person operating or controlling either the release or the location of the release shall notify the division in accordance with 19.15.29 NMAC with respect to a release from a facility of oil or other water contaminant, in such quantity as may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

[19.15.29.8 NMAC - Rp, 19.15.3.116 NMAC, 12/1/08]

19.15.29.9 REPORTING REQUIREMENTS: The person operating or controlling either the release or the location of the release shall provide notification of releases in 19.15.29.8 NMAC as follows.

A. The person shall report a major release by giving both immediate verbal notice and timely written notice pursuant to Subsections A and B of 19.15.29.10 NMAC.

B. The person shall report a minor release by giving timely written notice pursuant to Subsection B of 19.15.29.10 NMAC.

[19.15.29.9 NMAC - Rp, 19.15.3.116 NMAC, 12/1/08]

19.15.29.10 CONTENTS OF NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall provide immediate verbal notification within 24 hours of discovery to the division district office for the area within which the release takes place. In addition, the person shall provide immediate verbal notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief. The notification shall provide the information required on form C-141.

B. The person operating or controlling either the release or the location of the release shall provide timely written notification within 15 days to the division district office for the area within which the release occurs by completing and filing form C-141. In addition, the person shall provide timely written notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief within 15 days after the release is discovered. The written notification shall verify the prior verbal notification and provide appropriate additions or corrections to the information contained in the prior verbal notification.

[19.15.29.10 NMAC - Rp, 19.15.3.116 NMAC, 12/1/08]

19.15.29.11 CORRECTIVE ACTION: The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.

[19.15.29.11 NMAC - Rp, 19.15.3.116 NMAC, 12/1/08]

HISTORY of 19.15.29 NMAC:

History of Repealed Material: 19.15.3 NMAC, Drilling (filed 10/29/2001) repealed 12/1/08.

NMAC History:

That applicable portion of 19.15.3 NMAC, Drilling (Section 116) (filed 10/29/2001) was replaced by 19.15.29 NMAC, Release Notification, effective 12/1/08.

Attachment O

OCD Remediation Guidelines

TITLE 19 NATURAL RESOURCES AND WILDLIFE

CHAPTER 15 OIL AND GAS

PART 30 REMEDIATION

19.15.30.1 ISSUING AGENCY: Energy, Minerals and Natural Resources Department, Oil Conservation Division.

[19.15.30.1 NMAC - N, 12/1/08]

19.15.30.2 SCOPE: 19.15.30 NMAC applies to persons engaged in oil and gas development and production within New Mexico.

[19.15.30.2 NMAC - N, 12/1/08]

19.15.30.3 STATUTORY AUTHORITY: 19.15.30 NMAC is adopted pursuant to the Oil and Gas Act, NMSA 1978, Sections 70-2-6, 70-2-11 and 70-2-12.

[19.15.30.3 NMAC - N, 12/1/08]

19.15.30.4 DURATION: Permanent.

[19.15.30.4 NMAC - N, 12/1/08]

19.15.30.5 EFFECTIVE DATE: December 1, 2008, unless a later date is cited at the end of a section.

[19.15.30.5 NMAC - N, 12/1/08]

19.15.30.6 OBJECTIVE: To abate pollution of subsurface water so that ground water of the state that has a background concentration of 10,000 mg/l or less TDS is either remediated or protected for use as domestic, industrial and agricultural water supply, and to remediate or protect those segments of surface waters that are gaining because of subsurface-water inflow for uses designated in

the water quality standards for interstate and intrastate surface waters in New Mexico, 20.6.4 NMAC; and abate surface-water pollution so that surface waters of the state are remediated or protected for designated or attainable uses as defined in the water quality standards for interstate and intrastate surface waters in New Mexico, 20.6.4 NMAC.

[19.15.30.6 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.7 DEFINITIONS: [RESERVED]

[See 19.15.2.7 NMAC for definitions.]

19.15.30.8 PREVENTION AND ABATEMENT OF WATER POLLUTION:

A. If the background concentration of a water contaminant exceeds the standard or requirement of Subsections A, B or C of 19.15.30.9 NMAC, the responsible person shall abate the pollution to the background concentration.

B. The standards and requirements set forth in of Subsections A, B or C of 19.15.30.9 NMAC are not intended as maximum ranges and concentrations for use, and nothing contained in 19.15.30.9 NMAC limits the use of waters containing higher ranges and concentrations.

[19.15.30.8 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.9 ABATEMENT STANDARDS AND REQUIREMENTS:

A. The responsible person shall abate the vadose zone so that water contaminants in the vadose zone will not with reasonable probability contaminate ground water or surface water, in excess of the standards in Subsections B and C of 19.15.30.9 NMAC, through leaching, percolation or other transport mechanisms, or as the water table elevation fluctuates.

B. The responsible person shall abate ground-water pollution at a place of withdrawal for present or reasonably foreseeable future use, where the TDS concentration is 10,000 mg/l or less, to conform to the following standards:

(1) toxic pollutants as defined in 20.6.2.7 NMAC shall not be present; and

(2) the standards of 20.6.2.3103 NMAC shall be met.

C. The responsible person shall abate surface-water pollution to conform to the water quality standards for interstate and intrastate surface waters in New Mexico, 20.6.4 NMAC.

D. The division shall not consider subsurface-water and surface-water abatement complete until eight consecutive quarterly samples, or an alternate lesser number of samples the director approves, from the compliance sampling stations the director approved meet the abatement standards in Subsections A, B and C of 19.15.30.9 NMAC. The division shall consider abatement of water contaminants measured in solid-matrix samples of the vadose zone complete after one-time sampling from compliance stations the director approves.

E. Technical infeasibility.

(1) If a responsible person is unable to meet the abatement standards set forth in Subsections A and B of 19.15.30.9 NMAC using commercially accepted abatement technology pursuant to an approved abatement plan, the responsible person may propose that abatement standards compliance is technically infeasible.

(a) The director may consider technical infeasibility proposals involving the use of experimental abatement technology.

(b) The responsible person may demonstrate technical infeasibility by a statistically valid extrapolation of the decrease in concentrations of a water contaminant over the remainder of a 20 year period, such that projected future reductions during that time would be less than 20 percent of the concentration at the time the responsible person proposes technical infeasibility. A statistically valid decrease cannot be demonstrated by fewer than eight consecutive quarters.

(c) The technical infeasibility proposal shall include a substitute abatement standard for those contaminants that is technically feasible. The responsible person shall meet abatement standards for other water contaminants not demonstrated to be technically infeasible.

(2) The director shall not approve a proposed technical infeasibility demonstration for a water contaminant if its concentration is greater than 200 percent of the abatement standard for the contaminant.

(3) If the director cannot approve any or all portions of a proposed technical infeasibility demonstration because the water contaminant concentration is greater than 300 percent of the abatement standard for each contaminant, the responsible person may further pursue the issue of technical infeasibility by filing a petition with the division seeking approval of alternate abatement standards pursuant to Subsection F of 19.15.30.9 NMAC.

F. Alternative abatement standards.

(1) At any time during or after the stage 2 abatement plan's submission, the responsible person may file a petition seeking approval of alternative abatement standards for the standards set forth in Subsections A and B of

19.15.30.9 NMAC. The division may approve alternative abatement standards if the petitioner demonstrates that:

(a) either compliance with the abatement standards is not feasible, by the maximum use of technology within the responsible person's economic capability; or there is no reasonable relationship between the economic and social costs and benefits, including attainment of the standards set forth in 19.15.30.9 NMAC to be obtained;

(b) the proposed alternative abatement standards are technically achievable and cost-benefit justifiable; and

(c) compliance with the proposed alternative abatement standard will not create a present or future hazard to public health or undue damage to property.

(2) The responsible person shall file a written petition with the division's environmental bureau chief. The petition may include a transport, fate and risk assessment in accordance with accepted methods, and other information as the petitioner deems necessary to support the petition. The petition shall:

(a) state the petitioner's name and address;

(b) state the date of the petition;

(c) describe the facility or activity for which the petitioner seeks the alternate abatement standards;

(d) state the address or description of the property upon which the facility is located;

(e) describe the water body or watercourse the release affected;

(f) identify the abatement standard from which petitioner wishes to vary;

(g) state why the petitioner believes that compliance with 19.15.30 NMAC will impose an unreasonable burden upon the petitioner's activity;

(h) identify the water contaminant for which the petitioner proposes the alternative standard;

(i) state the alternative standard the petitioner proposes;

(j) identify the three-dimensional body of water pollution for which the petitioner seeks approval; and

(k) state the extent to which the abatement standards set forth in 19.15.30.9 NMAC are now, and will in the future be, violated.

(3) The division's environmental bureau chief shall review the petition and, within 60 days after receiving the petition, submit a written recommendation to the director to approve, approve subject to conditions or disapprove any or all of the proposed alternative abatement standards. The recommendation shall include the reasons for the division's environmental bureau chief's recommendation. The division's environmental bureau chief shall submit a copy of the recommendation to the petitioner by certified mail.

(4) If the division's environmental bureau chief recommends approval, or approval subject to conditions, of any or all of the proposed alternative abatement standards, the division shall hold a public hearing on those standards. If the division's environmental bureau chief recommends disapproval of any or all of the proposed alternative abatement standards, the petitioner may submit a request to the director, within 15 days after the recommendation's receipt, for a public hearing on those standards. If the petitioner does not submit a timely request for hearing, the recommended disapproval shall become a final decision of the director and shall not be subject to review.

(5) If the director grants a public hearing, the division shall conduct the hearing in accordance with division hearing procedures.

(6) Based on the record of the public hearing, the division shall approve, approve subject to condition or disapprove any or all of the proposed alternative abatement standards. The division shall notify the petitioner by certified mail of its decision and the reasons for the decision.

[19.15.30.9 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.10 MODIFICATION OF ABATEMENT STANDARDS: If applicable abatement standards are modified after the division approves the abatement measures, the abatement standards that are in effect at the time that the division approved the abatement measures shall be the abatement standards for the duration of the abatement action, unless the director determines that compliance with those standards may with reasonable probability create a present or future hazard to public health or the environment. In an appeal of the director's determination that additional actions are necessary, the director shall have the burden of proof.

[19.15.30.10 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.11 ABATEMENT PLAN REQUIRED:

A. Unless otherwise provided by 19.15.30 NMAC responsible persons who are abating, or who are required to abate, water pollution in excess of the standards and requirements set forth in 19.15.30.9 NMAC shall do so pursuant to an abatement plan the director approves. When the director has approved an abatement plan, the responsible person's actions leading to and including abatement shall be consistent with the abatement plan's terms and conditions.

B. In the event of a transfer of the ownership, control or possession of a facility for which an abatement plan is required or approved, where the transferor is a responsible person, the transferee also shall be considered a responsible person for the abatement plan's duration, and may jointly share the responsibility to conduct the actions 19.15.30 NMAC requires with other responsible persons.

(1) The transferor shall notify the transferee in writing at least 30 days prior to the transfer that the division has required or approved an abatement plan for the facility, and shall deliver or send by certified mail to the director a copy of the notification together with a certificate or other proof that the transferee has received the notification.

(2) The transferor and transferee may agree to a designated responsible person who shall assume the responsibility to conduct the actions 19.15.30 NMAC requires. The responsible persons shall notify the director in writing if a designated responsible person is agreed upon.

(3) If the director determines that the designated responsible person has failed to conduct the actions 19.15.30 NMAC requires, the director shall notify all responsible persons of this failure in writing and allow them 30 days, or longer for good cause shown, to conduct the required actions before setting a show cause hearing requiring those responsible persons to appear and show cause why they should not be ordered to comply, a penalty should not be assessed, a civil action should not be commenced in district court or the division should not take other appropriate action.

C. If the source of the water pollution to be abated is a facility that operated under a discharge plan, the director may require the responsible person to submit a financial assurance plan that covers the estimated costs to conduct the actions the abatement plan requires. Such a financial assurance plan shall be consistent with financial assurance requirements the division adopts.

[19.15.30.11 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.12 EXEMPTIONS FROM ABATEMENT PLAN REQUIREMENT:

A. Except as provided in Subsection B of 19.15.30.12 NMAC, 19.15.30.11 NMAC and 19.15.30.13 NMAC do not apply to a person who is abating water pollution:

(1) from an underground storage tank, under the authority of the New Mexico environmental improvement board's underground storage tank rules, 20.5 NMAC, or in accordance with the Ground Water Protection Act, NMSA 1978, Section 74-6B-1 *et seq.*;

(2) under the EPA's authority pursuant to either the Federal Comprehensive Environmental Response, Compensation and Liability Act, and amendments, or RCRA;

(3) pursuant to the New Mexico environmental improvement board's hazardous waste management rule, 20.4.1 NMAC;

(4) under the authority of the United States nuclear regulatory commission or the United States department of energy pursuant to the Atomic Energy Act;

(5) under the authority of a ground-water discharge plan the director approved, provided that such abatement is consistent with the requirements and provisions of 19.15.30.8 NMAC, 19.15.30.9 NMAC, Subsections C and D of 19.15.30.13 NMAC, 19.15.30.14 NMAC and 19.15.30.19 NMAC;

(6) under the authority of a letter of understanding, settlement agreement or administrative order on consent or other agreement signed by the director or director's designee prior to March 15, 1997, provided that abatement is being performed in compliance with the terms of the letter of understanding, settlement agreement or administrative order or other agreement on consent; and

(7) on an emergency basis, or while abatement plan approval is pending, or in a manner that will likely result in compliance with the standards and requirements set forth in 19.15.30.9 NMAC within one year after notice is required to be given pursuant to 19.15.29.9 NMAC provided that the division does not object to the abatement action.

B. If the director determines that abatement of water pollution subject to Subsection A of 19.15.30.12 NMAC will not met the standards of Subsections B and C of 19.15.30.9 NMAC, or that additional action is necessary to protect health, welfare, environment or property, the director may notify a responsible person, by certified mail, to submit an abatement plan pursuant to 19.15.30.11 NMAC and Subsection A of 19.15.30.14 NMAC. The notification shall state the reasons for the director's determination. In an appeal of the director's determination under Subsection B of 19.15.30.12 NMAC, the director shall have the burden of proof.

[19.15.30.12 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.13 ABATEMENT PLAN PROPOSAL:

A. Except as provided for in 19.15.30.12 NMAC a responsible person shall, within 60 days of receipt of the director's written notice that the division requires an abatement plan, submit an abatement plan proposal to the director for approval. The responsible person may submit stage 1 and stage 2 abatement plan proposals together. For good cause shown, the director may allow for a total of 120 days to prepare and submit the abatement plan proposal.

B. Voluntary abatement.

(1) A person wishing to abate water pollution in excess of the standards and requirements set forth in 19.15.30.9 NMAC may submit a stage 1

abatement plan proposal to the director for approval. Following the director's approval of a final site investigation report prepared pursuant to stage 1 of an abatement plan, a person may submit a stage 2 abatement plan proposal to the director for approval.

(2) Following approval of a stage 1 or stage 2 abatement plan proposal under Paragraph (1) of Subsection B of 19.15.30.13 NMAC the person submitting the approved plan shall be a responsible person under 19.15.30 NMAC for the purpose of performing the approved stage 1 or stage 2 abatement plan. Nothing in 19.15.30 NMAC precludes the director from applying 19.15.29.11 NMAC to a responsible person if applicable.

C. Stage 1 abatement plan. The stage 1 of the abatement plan's purpose is to design and conduct a site investigation that adequately defines site conditions, and provide the data necessary to select and design an effective abatement option. Stage 1 of the abatement plan may include the following information depending on the media affected; and as needed to select and implement an expeditious abatement option:

(1) descriptions of the site, including a site map, and of site history including the nature of the release that caused the water pollution, and a summary of previous investigations;

(2) site investigation work plan that defines:

(a) site geology and hydrogeology; the vertical and horizontal extent and magnitude of vadose-zone and ground-water contamination; subsurface hydraulic conductivity; transmissivity, storativity and rate and direction of contaminant migration; inventory of water wells inside and within one mile from the perimeter of the three-dimensional body where the standards set forth in Subsection C of 19.15.30.9 NMAC are exceeded; and location and number of wells the pollution actually or potentially affects; and

(b) surface water hydrology, seasonal stream flow characteristics, ground water/surface water relationships, the vertical and horizontal extent and magnitude of contamination and impacts to surface water and stream sediments; the magnitude of contamination and impacts on surface water may be, in part, defined by conducting a biological assessment of fish, benthic macro invertebrates and other wildlife populations; seasonal variations should be accounted for when conducting these assessments;

(3) monitoring program, including sampling stations and frequencies, for the abatement plan's duration that may be modified, after the director's approval, as the responsible person creates additional sampling stations;

(4) quality assurance plan, consistent with the sampling and analytical techniques listed in Subsection B of 20.6.2.3107 NMAC and with 20.6.4.14 NMAC of the water quality standards for interstate and intrastate surface waters in New Mexico, for all work to be conducted pursuant to the abatement plan;

(5) a schedule for stage 1 abatement plan activities, including the submission of summary quarterly progress reports, and the submission, for the director's approval, of a detailed final site investigation report; and

(6) additional information that may be required to design and perform an adequate site investigation.

D. Stage 2 abatement plan.

(1) A responsible person shall submit a stage 2 abatement plan proposal to the director for approval within 60 days, or up to 120 days for good cause shown, after the director's approval of the final site investigation report prepared pursuant to stage 1 of the abatement plan. The responsible person may submit a stage 1 and 2 abatement plan proposal together. Stage 2 of the abatement plan's purpose is to select and design, if necessary, an abatement option that, when implemented, results in attainment of the abatement standards and requirements set forth in 19.15.30.9 NMAC, including post-closure maintenance activities.

(2) Stage 2 of the abatement plan should include, at a minimum, the following information:

(a) a brief description of the current situation at the site;

(b) development and assessment of abatement options;

(c) a description, justification and design, if necessary, of the preferred abatement option;

(d) modification, if necessary, of the monitoring program the director approved pursuant to stage 1 of the abatement plan, including the designation of pre- and post-abatement-completion sampling stations and sampling frequencies to be used to demonstrate compliance with the standards and requirements set forth in 19.15.30.9 NMAC;

(e) site maintenance activities, if needed, the responsible person proposes to perform after abatement activities terminate;

(f) a schedule for the duration of abatement activities, including the submission of summary quarterly progress reports;

(g) a public notification proposal designed to satisfy the requirements of Subsections B and C of 19.15.30.15 NMAC; and

(h) additional information that may be reasonably required to select, describe, justify and design an effective abatement option.

[19.15.30.13 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.14 OTHER REQUIREMENTS:

A. A responsible person shall allow the director's authorized representative upon presentation of proper credentials and with reasonable prior notice to:

(1) enter the facility at reasonable times;

(2) inspect and copy records an abatement plan requires;

(3) inspect treatment works, monitoring and analytical equipment;

(4) sample wastes, ground water, surface water, stream sediment, plants, animals or vadose-zone material including vadose-zone vapor;

(5) use monitoring systems and wells under the responsible person's control in order to collect samples of media listed in Paragraph (4) of Subsection A of 19.15.30.14 NMAC; and

(6) gain access to off-site property the responsible person does not own or control, but is accessible to the responsible person through a third-party access agreement, provided that the agreement allows it.

B. A responsible person shall provide the director, or director's representative, with at least four working days advance notice of sampling to be performed pursuant to an abatement plan, or a well plugging, abandonment or destruction at a facility where the division has required an abatement plan.

C. A responsible person wishing to plug, abandon or destroy a monitoring or water supply well within the perimeter of the three-dimensional body where the standards set forth in Subsection B of 19.15.30.9 NMAC are exceeded, at a facility where the division has required an abatement plan, shall propose such action by certified mail to the director for approval, unless the state engineer's approval is required. The responsible person shall design the proposed action to prevent water pollution that could result from water contaminants migrating through the well or bore hole. The proposed action shall not take place without the director's written approval, unless the responsible person does not receive written approval or disapproval within 30 days after the date the director receives the proposal.

[19.15.30.14 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.15 PUBLIC NOTICE AND PARTICIPATION:

A. Prior to public notice, the applicant shall give written notice, as approved by the division, of stage 1 and stage 2 abatement plans to the following persons:

(1) surface owners of record within one mile of the perimeter of the geographic area where the standards and requirements set forth in 19.15.30.9 NMAC are exceeded;

(2) the county commission where the geographic area where the standards and requirements set forth in 19.15.30.9 NMAC are exceeded is located;

(3) the appropriate city officials if the geographic area where the standards and requirements set forth in 19.15.30.9 NMAC are exceeded is located or is partially located within city limits or within one mile of the city limits;

(4) those persons, the director identifies, who have requested notification, who shall be notified by mail;

(5) the New Mexico trustee for natural resources, and other local, state or federal governmental agencies affected, as the director identifies, which shall be notified by certified mail;

(6) the governor or president of a tribe, pueblo or nation if the geographic area where the standards and requirements set forth in 19.15.30.9 NMAC are exceeded is located or is partially located within tribal boundaries or within one mile of the tribal boundaries, who shall be notified by certified mail;

(7) the director may extend the distance requirements for notice if the director determines the proposed abatement plan has the potential to adversely impact public health or the environment at a distance greater than one mile. The director may require additional notice as needed. The applicant shall furnish a copy and proof of the notice to the division.

B. Within 15 days after the division determines that a stage 1 abatement plan or a stage 2 abatement plan is administratively complete, the responsible person shall issue public notice in a division-approved form in a newspaper of general circulation in the county in which the release occurred, and in a newspaper of general circulation in the state. For the purposes of Subsection B of 19.15.30.15 NMAC, an administratively complete stage 1 abatement plan is a document that satisfies the requirements of Subsection C of 19.15.30.13 NMAC and an administratively complete stage 2 abatement plan is a document that satisfies the requirements of Paragraph (2) of Subsection D of 19.15.30.13 NMAC. The public notice shall include, as approved in advance by the director:

(1) the responsible person's name and address;

(2) the location of the proposed abatement;

(3) a brief description of the source, extent and estimated volume of release; whether the release occurred into the vadose zone, ground water or surface water; and a description of the proposed stage 1 or stage 2 abatement plan;

(4) a brief description of the procedures the director followed in making a final determination;

(5) a statement that the public may view a copy of the abatement plan at the division's Santa Fe office or at the division's district office for the area in which the release occurred, and a statement describing how the public can access the abatement plan electronically from a division-maintained site if such access is available;

(6) a statement that the division will accept the following comments and requests for consideration if the director receives them within 30 days after the date of publication of the public notice:

(a) written comments on the abatement plan; and

(b) for a stage 2 abatement plan, written requests for a public hearing that include reasons why a hearing should be held; and

(7) an address and phone number at which interested persons may obtain further information.

C. A person seeking to comment on a stage 1 abatement plan, or to comment or request a public hearing on a stage 2 abatement plan, shall file written comments or hearing requests with the division within 30 days after the date of public notice, or within 30 days after the director receives a proposed significant modification of a stage 2 abatement plan. Requests for a public hearing shall set forth the reasons why a hearing should be held. The division shall hold a public hearing if the director determines that there is significant public interest or that the request has technical merit.

D. The division shall distribute notice of an abatement plan's filing with the next division and commission hearing docket following the plan's receipt.

[19.15.30.15 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.16 DIRECTOR APPROVAL OR NOTICE OF DEFICIENCY OF SUBMITTALS:

A. The director shall, within 60 days after receiving an administratively complete stage 1 abatement plan, a site investigation report, a technical infeasibility demonstration or an abatement completion report approve the document, or notify the responsible person of the document's deficiency, based upon the information available.

B. If the division does not hold a public hearing pursuant to Subsection C of 19.15.30.15 NMAC then the director shall, within 90 days after receiving a stage 2 abatement plan proposal, approve the plan, or notify the responsible person of the plan's deficiency, based upon the information available.

C. If the division holds a public hearing pursuant to Subsection C of 19.15.30.15 NMAC then the director shall, within 60 days after receiving the required information, approve stage 2 of the abatement plan proposal, or notify the

responsible person of the plan's deficiency, based upon the information contained in the plan and the information submitted at the hearing.

D. If the director notifies a responsible person of a deficiency in a site investigation report, or in a stage 1 or stage 2 abatement plan proposal, the responsible person shall submit a modified document to cure the deficiencies the director specifies within 30 days after receiving the notice of deficiency. The responsible person is in violation of 19.15.30 NMAC if the responsible person fails to submit a modified document within the required time, or if the responsible person does not in the modified document make a good faith effort to cure the deficiencies the director specified.

E. Provided that the responsible person meets the other requirements of 19.15.30 NMAC and provided further that stage 2 of the abatement plan, if implemented, shall result in the standards and requirements set forth in 19.15.30.9 NMAC being met within a schedule that is reasonable given the site's particular circumstances, the director shall approve the plan.

[19.15.30.16 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.17 INVESTIGATION AND ABATEMENT: A responsible person who receives the division's approval for stage 1 or stage 2 of an abatement plan shall conduct investigation, abatement, monitoring and reporting activities in compliance with 19.15.30 NMAC and according to the terms and schedules contained in the approved abatement plans.

[19.15.30.17 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.18 ABATEMENT PLAN MODIFICATION:

A. The division may modify an approved abatement plan at the responsible person's written request in accordance with 19.15.30 NMAC with the director's written approval.

B. If data the responsible person submitted pursuant to monitoring requirements specified in the approved abatement plan or other information available to the director indicates that the abatement action is ineffective, or is creating unreasonable injury to or interference with health, welfare, environment or property, the director may require a responsible person to modify an abatement plan within the shortest reasonable time so as to effectively abate water pollution that exceeds the standards and requirements set forth in 19.15.30.9 NMAC, and to abate and prevent unreasonable injury to or interference with health, welfare, environment or property.

[19.15.30.18 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.19 COMPLETION AND TERMINATION:

A. The division shall consider abatement complete when the responsible person meets the standards and requirements set forth in 19.15.30.9 NMAC. At that time, the responsible person shall submit an abatement completion report, documenting compliance with the standards and requirements set forth in 19.15.30.9 NMAC, to the director for approval. The abatement completion report also shall propose changes to long-term monitoring and site maintenance activities, if needed, to be performed after the abatement plan's termination.

B. Provided that the responsible person meets the other requirements of 19.15.30 NMAC and provided further that the responsible person has met the standards and requirements set forth in 19.15.30.9 NMAC, the director shall approve the abatement completion report. When the director approves the abatement completion report, the director shall also notify the responsible person in writing that the abatement plan is terminated.

[19.15.30.19 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.20 DISPUTE RESOLUTION: In the event of a technical dispute regarding the requirements of 19.15.29 NMAC, 19.15.30.9 NMAC, 19.15.30.12 NMAC, 19.15.30.13 NMAC, 19.15.30.18 NMAC or 19.15.30.19 NMAC, including notices of deficiency, the responsible person may notify the director by certified mail that a dispute has arisen, and the responsible person desires to invoke the dispute resolution provisions of 19.15.30.20 NMAC provided that the responsible person shall send the notification within 30 days after the responsible person receives the director's decision that causes the dispute. Upon the notification, the deadlines affected by the technical dispute shall be extended for a 30 day negotiation period, or for a maximum of 60 days if approved by the director for good cause shown. During this negotiation period, the director or the director's designee and the responsible person shall meet at least once. A mutually agreed upon third part may facilitate the meeting, but the third party shall assume no power or authority granted or delegated to the director by the Oil and Gas Act or by the division or commission. If the dispute remains unresolved after the negotiation period, the director's decision shall be final.

[19.15.30.20 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

19.15.30.21 APPEALS FROM DIRECTOR'S AND DIVISION'S DECISIONS:

A. If the director

(1) determines that an abatement plan is required pursuant to 19.15.29.11 NMAC;

(2) approves or provides notice of deficiency of a proposed abatement plan, technical infeasibility demonstration or abatement completion report; or

(3) modifies or terminates an approved abatement plan

the director shall provide written notice of the action by certified mail to the responsible person and other persons who participated in the action.

B. A person who participated in the action before the director and that the action listed in Subsection A of 19.15.30.21 NMAC adversely affects may file a petition requesting a hearing before a division examiner.

C. The person shall make the petition in writing and file it with the division within 30 days after receiving notice of the director's action. The petition shall specify the portions of the action to which the petitioner objects, certify that the person has mailed or hand-delivered a copy of the petition to the director and to the applicant or permittee if the petitioner is not the applicant or permittee and have attached a copy of the action for which the person seeks review. Unless a person makes a timely petition for hearing, the director's action is final.

D. The hearing before the division shall be conducted in the same manner as other division hearings.

E. The petitioner shall pay the cost of the court reporter for the hearing.

F. A party adversely affected by a division order pursuant to a hearing held by a division examiner, shall have a right to have the matter heard de novo before the commission.

G. The appeal provisions do not relieve the owner, operator or responsible person of their obligations to comply with federal or state laws including regulations or rules.

[19.15.30.21 NMAC - Rp, 19.15.1.19 NMAC, 12/1/08]

HISTORY of 19.15.30 NMAC:

History of Repealed Material: 19.15.1 NMAC, General Provisions and Definitions (filed 04/27/2001) repealed 12/1/08.

NMAC History:

That applicable portion of 19.15.1 NMAC, General Provisions and Definitions (Section 19) (filed 04/27/2001) was replaced by 19.15.30 NMAC, Remediation, effective 12/1/08.

TITLE 19 NATURAL RESOURCES AND WILDLIFE
CHAPTER 15 OIL AND GAS
PART 11 HYDROGEN SULFIDE GAS

19.15.11.1 ISSUING AGENCY: Energy, Minerals and Natural Resources Department, Oil Conservation Division.
[19.15.11.1 NMAC - N, 12/1/08]

19.15.11.2 SCOPE: 19.15.11 NMAC applies to a person subject to the division's jurisdiction, including a person engaged in drilling, stimulating, injecting into, completing, working over or producing an oil, gas or carbon dioxide well or a person engaged in gathering, transporting, storing, processing or refining of oil, gas or carbon dioxide. 19.15.11 NMAC does not exempt or otherwise excuse surface waste management facilities the division permits pursuant to 19.15.36 NMAC from more stringent conditions on the handling of hydrogen sulfide required of such facilities by 19.15.36 NMAC or more stringent conditions in permits issued pursuant to 19.15.36 NMAC, nor shall the facilities be exempt or otherwise excused from the requirements set forth in 19.15.11 NMAC by virtue of permitting under 19.15.36 NMAC.
[19.15.11.2 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.3 STATUTORY AUTHORITY: 19.15.11 NMAC is adopted pursuant to the Oil and Gas Act, NMSA 1978, Section 70-2-6, Section 70-2-11 and Section 70-2-12.
[19.15.11.3 NMAC - N, 12/1/08]

19.15.11.4 DURATION: Permanent.
[19.15.11.4 NMAC - N, 12/1/08]

19.15.11.5 EFFECTIVE DATE: December 1, 2008, unless a later date is cited at the end of a section.
[19.15.11.5 NMAC - N, 12/1/08]

19.15.11.6 OBJECTIVE: To require oil and gas operations be conducted in a manner that protects the public from exposure to hydrogen sulfide gas.
[19.15.11.6 NMAC - N, 12/1/08]

11.7 DEFINITIONS:

A. "ANSI" means the American national standards institute.

B. "Area of exposure" means the area within a circle constructed with a point of escape at its center and the radius of exposure as its radius.

C. "Dispersion technique" is a mathematical representation of the physical and chemical transportation characteristics, dilution characteristics and transformation characteristics of hydrogen sulfide gas in the atmosphere.

D. "Escape rate" means the maximum volume (Q) that is used to designate the possible rate of escape of a gaseous mixture containing hydrogen sulfide, as set forth in 19.15.11 NMAC.

(1) For existing gas facilities or operations, the escape rate is calculated using the maximum daily rate of the gaseous mixture produced or handled or the best estimate thereof. For an existing gas well, the escape rate is calculated using the current daily absolute open flow rate against atmospheric pressure or the best estimate of that rate.

(2) For new gas operations or facilities, the escape rate is calculated as the maximum anticipated flow rate through the system. For a new gas well, the escape rate is calculated using the maximum open-flow rate of offset wells in the pool or reservoir, or the pool or reservoir average of maximum open-flow rates.

(3) For existing oil wells, the escape rate is calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or the best estimate of the maximum daily production rate.

(4) For new oil wells, the escape rate is calculated by multiplying the producing gas/oil ratio by the maximum daily production rate of offset wells in the pool or reservoir, or the pool or reservoir average of the producing gas/oil ratio multiplied by the maximum daily production rate.

(5) For facilities or operations not mentioned, the escape rate is calculated using the actual flow of the gaseous mixture through the system or the best estimate of the actual flow of the gaseous mixture through the system.

E. "GPA" means the gas processors association.

F. "LEPC" means the local emergency planning committee established pursuant to the Emergency Planning and Community Right-To-Know Act, 42 U.S.C. section 11001.

G. "NACE" means the national association of corrosion engineers.

H. "Potentially hazardous volume" means the volume of hydrogen sulfide gas of such concentration that:

(1) the 100-ppm radius of exposure includes a public area;

(2) the 500-ppm radius of exposure includes a public road; or

(3) the 100-ppm radius of exposure exceeds 3000 feet.

I. "Public area" means a building or structure that is not associated with the well, facility or operation for which the radius of exposure is being calculated and that is used as a dwelling, office, place of business, church, school, hospital or government building, or a portion of a park, city, town, village or designated school bus stop or other similar area where members of the public may reasonably be expected to be

present.

J. "Public road" means a federal, state, municipal or county road or highway.

K. "Radius of exposure" means the radius constructed with the point of escape as its starting point and its length calculated using the following Pasquill-Gifford derived equation, or by such other method as the division may approve:

(1) for determining the 100-ppm radius of exposure: $X = [(1.589)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$, where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees fahrenheit);

(2) for determining the 500-ppm radius of exposure: $X = [(0.4546)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$, where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psi absolute and 60 degrees fahrenheit);

(3) for a well being drilled, completed, recompleted, worked over or serviced in an area where insufficient data exists to calculate a radius of exposure but where hydrogen sulfide could reasonably be expected to be present in concentrations in excess of 100 ppm in the gaseous mixture, a 100-ppm radius of exposure equal to 3000 feet is assumed.

[19.15.11.7 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.8 REGULATORY THRESHOLD:

A. Determination of hydrogen sulfide concentration.

(1) Each person shall determine the hydrogen sulfide concentration in the gaseous mixture within wells, facilities or operations either by testing (using a sample from each well, facility or operation); testing a representative sample; or using process knowledge in lieu of testing. If the person uses a representative sample or process knowledge, the concentration derived from the representative sample or process knowledge shall be reasonably representative of the hydrogen sulfide concentration within the well, facility or operation.

(2) The person shall conduct the tests used to make the determination referred to in Paragraph (1) of Subsection A of 19.15.11.8 NMAC in accordance with applicable ASTM or GPA standards or by another division-approved method.

(3) If the person conducted a test prior to January 31, 2003 that otherwise meets the requirements of Paragraphs (1) and (2) of Subsection A of 19.15.11.8 NMAC, new testing is not required.

(4) If a change or alteration may materially increase the hydrogen sulfide concentration in a well, facility or operation, the person shall make a new determination in accordance with 19.15.11 NMAC.

B. Concentrations determined to be below 100 ppm. If the hydrogen sulfide concentration in a given well, facility or operation is an 100 ppm, the person is not required to take further actions pursuant to 19.15.11 NMAC.

C. Concentrations determined to be above 100 ppm.

(1) If the person determines the hydrogen sulfide concentration in a given well, facility or operation is 100 ppm or greater, then the person shall calculate the radius of exposure and comply with applicable requirements of 19.15.11 NMAC.

(2) If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the person shall provide results of the hydrogen sulfide concentration determination and the calculation of the radius of exposure to the division. For a well, facility or operation, the person shall accomplish the determination, calculation and submission 19.15.11.8 NMAC requires before operations begin.

D. Recalculation. The person shall calculate the radius of exposure if the hydrogen sulfide concentration in a well, facility or operation increases to 100 ppm or greater. The person shall also recalculate the radius of exposure if the actual volume fraction of hydrogen sulfide increases by a factor of 25 percent in a well, facility or operation that previously had a hydrogen sulfide concentration of 100 ppm or greater. If calculation or recalculation of the radius of exposure reveals that a potentially hazardous volume is present, the person shall provide the results to the division within 60 days.

[19.15.11.8 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.9 HYDROGEN SULFIDE CONTINGENCY PLAN:

A. When required. If a well, facility or operation involves a potentially hazardous volume of hydrogen sulfide, the person shall develop a hydrogen sulfide contingency plan that the person will use to alert and protect the public in accordance with the Subsections B through I of 19.15.11.9 NMAC.

B. Plan contents.

(1) API guidelines. The person shall develop the hydrogen sulfide contingency plan with due consideration of paragraph 7.6 of the guidelines in the API publication Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide, RP-55, most recent edition, or with due consideration to another division-approved standard.

(2) Required contents. The hydrogen sulfide contingency plan shall contain information on the following subjects, as appropriate to the well, facility or operation to which it applies.

(a) Emergency procedures. The hydrogen sulfide contingency plan shall contain information on emergency procedures the person will follow in the event of a release and shall include, at a minimum, information concerning the responsibilities and duties of personnel the emergency, an immediate action plan as described in the API document referenced in Paragraph (1) of Subsection B of 19.15.11.9 ...C, and telephone numbers of emergency responders, public agencies, local government and other appropriate public authorities. The plan shall also include the locations of potentially affected public areas and public roads and shall describe proposed evacuation routes, locations of road blocks and procedures for notifying the public, either through direct telephone notification using telephone number lists or by means of mass

notification and reaction plans. The plan shall include information on the availability and location of necessary safety equipment and supplies.

(b) Characteristics of hydrogen sulfide and sulfur dioxide. The hydrogen sulfide contingency plan shall include a discussion of the characteristics of hydrogen sulfide and sulfur dioxide.

(c) Maps and drawings. The hydrogen sulfide contingency plan shall include maps and drawings that depict the area of exposure and public areas and public roads within the area of exposure.

(d) Training and drills. The hydrogen sulfide contingency plan shall provide for training and drills, including training in the responsibilities and duties of essential personnel and periodic on-site or classroom drills or exercises that simulate a release, and shall describe how the person will document the training, drills and attendance. The hydrogen sulfide contingency plan shall also provide for training of residents as appropriate on the proper protective measures to be taken in the event of a release, and shall provide for briefing of public officials on issues such as evacuation or shelter-in-place plans.

(e) Coordination with state emergency plans. The hydrogen sulfide contingency plan shall describe how the person will coordinate emergency response actions under the plan with the division and the New Mexico state police consistent with the New Mexico hazardous materials emergency response plan.

(f) Activation levels. The hydrogen sulfide contingency plan shall include the activation level and a description of events that could lead to a release of hydrogen sulfide sufficient to create a concentration in excess of the activation level.

C. Plan activation. The person shall activate the hydrogen sulfide contingency plan when a release creates a hydrogen sulfide concentration greater than the activation level set forth in the hydrogen sulfide contingency plan. At a minimum, the person shall activate the plan whenever a release may create a hydrogen sulfide concentration of more than 100 ppm in a public area, 500 ppm at a public road or 100 ppm 3000 feet from the site of release.

D. Submission.

(1) Where submitted. The person shall submit the hydrogen sulfide contingency plan to the division.

(2) When submitted. The person shall submit a hydrogen sulfide contingency plan for a new well, facility or operation before operations commence. The hydrogen sulfide contingency plan for a drilling, completion, workover or well servicing operation shall be on file with the division before operations commence and may be submitted separately or along with the APD or may be on file from a previous submission. A person shall submit a hydrogen sulfide contingency plan within 180 days after the person becomes aware or should have become aware that a public area or public road is established that creates a potentially hazardous volume where none previously existed.

(3) Electronic submission. A filer who operates more than 100 wells or who operates an oil pump station, compressor station, refinery or gas plant shall submit each hydrogen sulfide contingency plan in electronic format. The file may submit the hydrogen sulfide contingency plan through electronic mail, through an Internet filing or by delivering electronic media to the division, so long as the electronic submission is compatible with the division's systems.

E. Failure to submit plan. A person's failure to submit a hydrogen sulfide contingency plan when required may result in denial of application for permit to drill, cancellation of an allowable for the subject well or other enforcement action appropriate to the well, facility or operation.

F. Review, amendment. The person shall review the hydrogen sulfide contingency plan any time a subject addressed in the plan materially changes and make appropriate amendments. If the division determines that a hydrogen sulfide contingency plan is inadequate to protect public safety, the division may require the person to add provisions to the plan or amend the plan as necessary to protect public safety.

G. Retention and inspection. The hydrogen sulfide contingency plan shall be reasonably accessible in the event of a release, maintained on file at all times and available for division inspection.

H. Annual inventory of contingency plans. On an annual basis, each person required to prepare one or more hydrogen sulfide contingency plans pursuant to 19.15.11 NMAC shall file with the appropriate local emergency planning committee and the state emergency response commission an inventory of the wells, facilities and operations for which plans are on file with the division and the name, address and telephone number of a point of contact.

I. Plans required by other jurisdictions. The person may submit a hydrogen sulfide contingency plan the BLM or other jurisdiction require that meets the requirements of 19.15.11.9 NMAC to the division in satisfaction of 19.15.11.9 NMAC.

[19.15.11.9 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.10 SIGNS, MARKERS: For each well, facility or operation involving a hydrogen sulfide concentration of 100 ppm or greater, the person shall install and maintain signs or markers that conform with the current ANSI standard Z535.1-2002 (Safety Color Code), or some other division-approved standard. The sign or marker shall be readily readable, and shall contain the words "poison gas" and other information sufficient to warn the public that a potential danger exists. The person shall prominently post signs or markers at locations, including entrance points and road crossings, sufficient to alert the public that a potential danger exists.

[19.15.11.10 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.11 PROTECTION FROM HYDROGEN SULFIDE DURING DRILLING, COMPLETION, WORKOVER AND WELL SERVICING OPERATIONS:

A. API standards. The person shall conduct drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publications Recommended Practice for Oil and Well Servicing and Workover Operations Involving Hydrogen Sulfide, RP-68, and Recommended Practices for Drilling and Well Servicing Operations Involving Hydrogen Sulfide, RP-49, most recent editions, or some other division-approved standard.

B. Detection and monitoring equipment. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide

concentration of 100 ppm or greater shall include hydrogen sulfide detection and monitoring equipment as follows.

(1) Each drilling and completion site shall have an accurate and precise hydrogen sulfide detection and monitoring system that automatically activates visible and audible alarms when the hydrogen sulfide's ambient air concentration reaches a predetermined value the operator sets, not to exceed 20 ppm. The operator shall locate a sensing point at the shale shaker, rig floor and bell nipple for a drilling site and the rig floor and circulating tanks or shale shaker for a completion site.

(2) For workover and well servicing operations, the person shall locate one operational sensing point as close to the well bore as practical. Additional sensing points may be necessary for large or long-term operations.

(3) The operator shall provide and maintain as operational hydrogen sulfide detection and monitoring equipment during drilling when drilling is within 500 feet of a zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling.

C. Wind indicators. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 ppm or greater shall include wind indicators. The person shall have equipment to indicate wind direction present and visible at all times. The person shall install at least two devices to indicate wind direction at separate elevations that visible from all principal working areas at all times. When a sustained hydrogen sulfide concentration is detected in excess of 20 ppm at a detection point, the person shall display red flags.

D. Flare system. For drilling and completion operations in an area where it is reasonably expected that a potentially hazardous hydrogen sulfide volume will be encountered, the person shall install a flare system to safely gather and burn hydrogen-sulfide-bearing gas. The person shall locate flare outlets at least 150 feet from the well bore. Flare lines shall be as straight as practical. The person shall equip the flare system with a suitable and safe means of ignition. Where noncombustible gas is to be flared, the system shall provide supplemental fuel to maintain ignition.

E. Well control equipment. When the 100 ppm radius of exposure includes a public area, the following well control equipment is required.

(1) Drilling. The person shall install a remote-controlled well control system that is operational at all times beginning when drilling is within 500 vertical feet of the formation believed to contain hydrogen sulfide and continuously thereafter during drilling. The well control system shall include, at a minimum, a pressure and hydrogen-sulfide-rated well control choke and kill system including manifold and blowout preventer that meets or exceeds the specifications in API publications Choke and Kill Systems, 16C and Blowout Prevention Equipment Systems for Drilling Wells, RP 53 or other division-approved specifications. The person shall use mud-gas separators. The person shall test and maintain these systems pursuant to the specifications referenced, according to the requirements of 19.15.11 NMAC, or as the division otherwise approves.

(2) Completion, workover and well servicing. The person shall install a remote controlled pressure and hydrogen-sulfide-rated well control system that meets or exceeds API specifications or other division-approved specifications that is operational at all times during a well's completion, workover and servicing.

F. Mud program. Drilling, completion, workover and well servicing operations involving a hydrogen sulfide concentration of 100 or greater shall use a hydrogen sulfide mud program capable of handling hydrogen sulfide conditions and well control, including de-gassing.

G. Well testing. Except with prior division approval, a person shall conduct drill-stem testing of a zone that contains hydrogen sulfide in a concentration of 100 ppm or greater only during daylight hours and not permit formation fluids to flow to the surface.

H. If hydrogen sulfide encountered during operations. If hydrogen sulfide was not anticipated at the time the division issued a permit to drill but is encountered during drilling in a concentration of 100 ppm or greater, the operator shall satisfy the requirements of 19.15.11 NMAC before continuing drilling operations. The operator shall notify the division of the event and the mitigating steps that the operator has or is taking as soon as possible, but no later than 24 hours following discovery. The division may grant verbal approval to continue drilling operations pending preparation of a required hydrogen sulfide contingency plan.

[19.15.11.11 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.12 PROTECTION FROM HYDROGEN SULFIDE AT OIL PUMP STATIONS, PRODUCING WELLS, TANK BATTERIES AND ASSOCIATED PRODUCTION FACILITIES, PIPELINES, REFINERIES, GAS PLANTS AND COMPRESSOR STATIONS:

A. API standards. A person shall conduct operations at oil pump stations and producing wells, tank batteries and associated production facilities, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater with due consideration to the guidelines in the API publication Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide, RP-55, latest edition or some other division-approved standard.

B. Security. A person shall protect well sites and other unattended, fixed surface facilities involving a hydrogen sulfide concentration of 100 ppm or greater from public access by fencing with locking gates when the location is within 1/4 mile of a public area. For the purposes of Subsection B of 19.15.11.12 NMAC, a surface pipeline is not considered a fixed surface facility.

C. Wind direction indicators. Oil pump stations, producing wells, tank batteries and associated production facilities, pipelines, refineries, gas plants and compressor stations involving a hydrogen sulfide concentration of 100 ppm or greater shall have equipment to indicate wind direction. The person shall install wind direction equipment that is visible from all principal working areas at all times.

D. Control equipment. When the 100 ppm radius of exposure includes a public area, the following additional measures are required.

(1) The person shall install and maintain in good operating condition safety devices, such as automatic shut-down devices, to prevent hydrogen sulfide's escape. Alternatively, the person shall establish safety procedures to achieve the same purpose.

(2) A well shall possess a secondary means of immediate well control through the use of an appropriate christmas tree or downhole completion equipment. The equipment shall allow downhole accessibility (reentry) under pressure for permanent well control.

E. Tanks or vessels. The person shall chain each stair or ladder leading to the top of a tank or vessel containing 300 ppm or more

of hydrogen sulfide in the gaseous mixture or mark it to restrict entry.
[19.15.11.12 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.13 PERSONNEL PROTECTION AND TRAINING: The person shall provide persons responsible for implementing a hydrogen sulfide contingency plan training in hydrogen sulfide hazards, detection, personal protection and contingency procedures.
[19.15.11.13 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.14 STANDARDS FOR EQUIPMENT THAT MAY BE EXPOSED TO HYDROGEN SULFIDE: Whenever a well, facility or operation involves a potentially hazardous hydrogen sulfide volume, the person shall select equipment with consideration for both the hydrogen sulfide working environment and anticipated stresses and shall use NACE Standard MR0175 (latest edition) or some other division-approved standard for selection of metallic equipment or, if applicable, use adequate protection by chemical inhibition or other methods that control or limit hydrogen sulfide's corrosive effects.
[19.15.11.14 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.15 EXEMPTIONS: A person may petition the director or the director's designee for an exemption to a requirement of 19.15.11 NMAC. A petition shall provide specific information as to the circumstances that warrant approval of the exemption requested and how the person will protect public safety. The director or the director's designee, after considering all relevant factors, may approve an exemption if the circumstances warrant and so long as the person protects public safety.
[19.15.11.15 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

19.15.11.16 NOTIFICATION OF THE DIVISION: The person shall notify the division upon a release of hydrogen sulfide requiring activation of the hydrogen sulfide contingency plan as soon as possible, but no more than four hours after plan activation, recognizing that a prompt response should supersede notification. The person shall submit a full report of the incident to the division on form C-141 no later than 15 days following the release.
[19.15.11.16 NMAC - Rp, 19.15.3.118 NMAC, 12/1/08]

HISTORY of 19.15.11 NMAC:

History of Repealed Material: 19.15.3 NMAC, Drilling (filed 10/29/2001) repealed 12/1/08.

History:
Applicable portion of 19.15.3 NMAC, Drilling (Section 118) (filed 10/29/2001) was replaced by 19.15.11 NMAC, Hydrogen Sulfide Gas, effective 12/1/08.