FORM 27 Rev 6/99

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

FOR OGCC USE ONLY

Rec. 4/4/14

OGCC Employee:
☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV
Tracking No:

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☑ Other (describe): requirement to re-permit facility

OGCC Operator Number: 10119
Name of Operator: Maralex Disposal, LLC
Address: PO Box 338
City: Ignacio State: CO Zip: 81137

Contact Name and Telephone:
Naomi Azulai
No: 970-563-4000
Fax: 970-563-4116

API Number: n/a
County: Mesa
Facility Name: Roan Creek Evaporation Pond
Facility Number: 116525
Well Name: n/a
Well Number: n/a
Location: (QtrQtr, Sec, Twp, Rng, Meridian): NESE Sec 36 T8S R98W
Latitude: 39.31 Longitude: -108.27

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): produced water

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☑ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): non-cropland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Uffens loam, 1-8% slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Coon Hollow dry wash. No water wells within 1/4 mile.

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
☐ Soils	none known	
☐ Vegetation	none known	
☐ Groundwater	none known	
☐ Surface Water	none known	

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

Maralex conformed to all BLM requirements to recommission the facility. This included the removal of contaminated soil (outside the pit fence), redesign of the loadout area to contain spills, securing the facility from unauthorized disposal, revegitating the pond berm, installing appropriate signs, and labeling the storage tank.

Describe how source is to be removed:

There is no source of contamination. The liner has been tested in two areas and the geosynthetics testing lab has determined that the liner is still functioning as required and recommends that we begin to monitor the membrane in 5 years when it is possible that the degradation of the liner might start to render it unsuitable to perform its function (see the attached lab analysis report by TRI). In order to address the COGCC's concerns about the panel that has patches, Maralex proposes to overlay a new panel atop the patched panel. The new panel will be welded and anchored into place.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

Since the liner has tested to be a viable barrier, there is no reason to believe that any impact on soil or water has occured.

Submit Page 2 with Page 1

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Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

Page 2

REMEDIATION WORKPLAN (Cont.)

OGCC Employee:

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

No suspected impact to ground water.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

The site will maintain existing contours in order to re-permit the site for use.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☑ N If yes, describe:

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

This facility is only used to evaporate produced water and no reclamation is proposed, so there is no E&P waste to dispose of.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 06/2013	Date Site Investigation Completed:	Date Remediation Plan Submitted: 8/5/13, 4/3/14
Remediation Start Date:	Anticipated Completion Date:	Actual Completion Date:

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Naomi Azulai Signed: _____

Title: Production Technician Date: 4/4/2014

NOT APPROVED

OGCC Approved: _____ Title: Alex Fischer, Env. Sup. Date: 4/4/14

The operator has not addressed issues outlined in the August 16, 2013 correspondence from the COGCC to Markex (Doc # 2148292). See Attached.
AF 4/4/14

STATE OF COLORADO

Roan Creek Evaporation Pond Form 27

Naomi <naomi@maralexinc.com> Fri, Apr 4, 2014 at 7:28 AM
To: "Lujan - DNR, Carlos" <carlos.lujan@state.co.us>, "Fischer - DNR, Alex" <alex.fischer@state.co.us>

Carlos and Alex,
In light of the results of testing that was performed on two samples of the pond liner at Roan Creek, we have decided to resubmit the Form 27 as attached. The geomembrane assessment by the lab and the results of the tests are attached.
Thank you for your consideration.
–
Naomi Azulai

Production Technician
Maralex Resources, Inc.
(970) 563-4000 Phone
(970) 563-4116 Fax

roan creek evaporation pond Form 27.pdf
163K

Doc # 2148292

STATE OF COLORADO
OIL & GAS
CONSERVATION COMMISSION

DEPARTMENT OF NATURAL RESOURCES
John W. Hickenlooper, Governor
1120 Lincoln St. Suite 801
Denver, CO 80203
Phone: (303) 894-2100
FAX: (303) 894-2109
www.colorado.gov/cogcc

August 16, 2013

Ms. Naomi Azulai

Re: Response to the Form 27 Site Assessment and Remediation Work plan
Draft submitted on August 05, 2013
Roan Creek Evaporation Pit Closure
Location ID # 391314
Pit Facility ID # 116525

Dear Ms. Azulai,

Colorado Oil and Gas Conservation Commission (COGCC) staff has reviewed the Form 27 Site Assessment and Remediation Work plan submitted on August 05, 2013 for the closure of the Roan Creek Evaporation Pit. The pit closure is part of a compliance effort from Maralex, and a first step toward re-purposing the existing facility to construct a Centralized Exploration &Production (E&P) Waste Management facility. COGCC staff has the following comments that need to be addressed in conjunction with re-submitting an updated Form 27 Work Plan for COGCC's review and approval:

Background:

- Maralex operated the evaporation pit for several years prior to taking it out of service. A Pit Permit Form 15 should have been submitted. Operating a pit without permit is a Violation of COGCC Rules and Regulations.
- The evaporation pit has been out of service for at least two years (or more). Maralex has been out of compliance for several years. Rule 1003 b states: "All disturbed areas affected by drilling or subsequent operations, except areas reasonably needed for production operations or for subsequent drilling operations to be commenced within twelve (12) months, shall be reclaimed as early and as nearly as practicable to their original condition or their final land use as designated by the surface owner and shall be maintained to control dust and minimize erosion to the extent practicable." …" Interim reclamation shall occur no later than three (3) months on crop land or six (6) months on non-crop land after such operations unless the Director extends the time period because of conditions outside the control of the operator."

The pit shall therefore be closed (Rule 905 b.) in accordance with an approved Site Investigation and Remediation Workplan, Form 27. Rule 905b. also specifies that:

(1) Operators shall ensure that soils and ground water meet the concentration levels of Table 910-1.
(2) Pit evacuation. Prior to backfilling and site reclamation, E&P waste shall be treated or disposed in accordance with Rule 907.
(3) Liners shall be disposed as follows: A. Synthetic liner disposal. Liner material shall be removed and disposed in accordance with applicable legal requirements for solid waste disposal.

Rule 905 c. states that spill/releases discovered during closure operations, must be reported on the Spill/Release Report Form 19.

To ensure that a proper investigation is conducted the Site Investigation and Remediation Work Plan will include the following points:

1) Removal of waste in the pit is not limited to the debris, pieces of metals, wood, etc. but includes washing the pit lining to remove all sediments accumulated during the operation of the pit, and during the time period the pit has been out of service. Cleaning of the pit lining is a first step for the Site Investigation and must be addressed in the Form 27.

2) A comprehensive sampling plan that describes the sampling locations and depths (and number of samples), sampling procedure, equipment (by hand, geoprobe, etc.) and the protocol for saving and sending samples to an authorized laboratory. A figure that clearly indicates the sampling locations will be submitted along with the sampling plan. Samples must be DISCRETE. Composite samples will not be accepted. As a minimum, samples will be collected from beneath the liner, on the four walls, AND on the bottom of the pit, at a depth of one foot. The number of samples is not rigorously dictated but must be representative of the area investigated. Samples must be taken additionally in the vicinity of the lowest point and wherever staining, odor, high PID readings, or unusual salt deposition might indicate impact to the soil. In locations of suspected impact, enough samples should be taken to define horizontally and vertically the extent of the potential impact.

3) Soil samples will not be restricted to the pit itself but to surrounding areas that could have potentially be impacted by overflow, and other spill/release events. The area near the leak detection sump shall be evaluated to confirm whether an impact had occurred as a result of the operation of the leak detection (the original sump was replaced when it was discovered that it was all rusty and had holes).

4) Maralex shall follow the 900 Series Rules and samples shall be analyzed for Table 910-1 parameters.

5) There is the potential for impact beneath the liners at the bottom of the pit, on the walls, and in the vicinity of the pit. A description of how impacted material would be removed, and remediated or disposed must be included in the Site Assessment and Remediation Work Plan (i.e. submittal of Form 19, excavation of impacted material, placement of impacted material on lined and/or bermed containment, remediation and/or disposal, etc.)

6) Although groundwater impact is not anticipated, the potential for groundwater impact must be considered: Supporting information to discard groundwater impact is suggested. Otherwise an appropriate site specific groundwater sampling, monitoring and remediation plan must be submitted.

7) Disposal versus re-use of lining. It is COGCC staff opinion that the lining must be removed on either cases, a) If the pit will not be re-used and will therefore be backfilled and reclaimed, or b) if the pit will be converted into a Centralized E&P Waste Management Facility. The first case is self-explanatory. If Maralex has the intention to re-use the pit, the pit shall be brought to current, state of the art standards, including the spill detection system, water discharge system to the pit, and lining system.

   The pit has been out of service for several years, exposed to the elements (wind, heat, UVs). During the first site visit conducted by COGCC staff on June 18, 2013, the pit was dry. The bottom of the pit was covered with salty sediment (white material), and sludge. Debris, junk, and weeds transported by the wind were observed mostly on the south west section of the pit.

   The lining has been compromised mostly on the northeast side. The northeast wall of the pit presents more than 60 patches. According to Maralex, the pit is double lined with 4-inchs of sand between the liners. According to Maralex, the 60 plus penetrations are believed to be a result of bullets being shot through the liner(s). If that is the case, the lower lining has the potential to be compromised.

   For the above reasons, COGCC considers that the quality and integrity of the lining has been compromised and is not suited for re-use.

However, if Maralex elects to re-use the liner(s) they have the option of having the pit liner integrity tested and certified by a Professional Engineer with expertise in the field; have a lining company certify the good conditions of the lining material and demonstrate that the leak detection system is functional and present their case to the Commission and obtain approval to re-use the liner.

8) Reclamation: A reclamation plan consistent with the 1000-series Rule will be included with the Form 27. Considering that Maralex current plans are to re-use the pit, COGCC will not require that the pit be backfilled at this moment. However, if Maralex decides not to re-use the pit the pit will need to be reclaimed in accordance with the 1000-series Rule.

9) The Form 27 will address as well all deficiencies and violations described in the Inspection # 671000003 that have not been mentioned in this letter.

Please submit the requested Form 27 Site Assessment and Remediation Work plan for our review by September 16, 2013. If you require any additional information, please call me at 970 625 5682 or send me an email at carlos.lujanstate.co.us

Sincerely,

Carlos A. Lujan, Ph.D.
Environmental Protection Specialist
Northwest Region

Cc: Jim Milne – COGCC Environmental Manager
Alex Fischer – COGCC Environmental Supervisor

- The liner was sampled in October, 2013. Two samples were obtained. The first was an "exposed" sample obtained at a side slope. The second sample was referred to as "Anchor Trench" and was obtained from liner material buried in the anchor trench.
- Repairs to the liner were made the same day by a Grand Junction company contracted by Colorado Lining International of Parker, Colorado. Extrusion test welds were constructed in the field. Samples of the welds were also tested for peal and shear. The results exceeded the respective specifications.
- Both destructive test locations were patched with 40-mill, high density polyethylene geomembrane. The patch locations were then vacuum tested. No evidence of leaks was observed.

TRI / Environmental, Inc.
A Texas Research International Company

November 7, 2013
December 2, 2013 Updated with SP-NCTL results

Mail To:

Naomi Azulai
Maralex Resources, Inc.
775 Goddard Ave.
P.O. Box 338
Ignacio, CO 81137

email: naomi@maralexinc.com
cc email: esi.craig@sopris.net

Bill To:

<= Same

Dear Ms. Azulai:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Roan Creek Evaporation Pond**
TRI Job Reference Number:	E2386-15-03
Material(s) Tested:	Two 40 mil. Ten year old Liner Smooth HDPE Geomembrane(s)
Test(s) Requested:	Thickness (ASTM D 5199) Density (ASTM D 1505) Carbon Content (ASTM D 1603, mod.) Carbon Dispersion (ASTM D 5596) Tensile (ASTM D 6693) Puncture Strength (ASTM D 4833) Tear Resistance (ASTM D 1004) Oxidative Induction Time (ASTM D 3895) SP-NCTL Stress Crack Resistance (ASTM D 5397, App)

Geomembrane Assessment

Both the exposed and trench geomembrane material appear to be in relatively good condition. Minimal OIT remains suggesting that continued monitoring should be practiced as the onset of degradation is likely in the next few months and years. However, the existing material demonstrates good mechanical strength and ductility. Stress crack resistance testing was terminated shortly after 300 hour test duration and we note that this measurement demonstrates compliance with GRI GM 13 requirements for resistance to stress cracking.

TRI recommends that this geomembrane material be monitored again in 5 years for continued performance.

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Sam R. Allen

Sam Allen
Vice President
Geosynthetic Services Division
www.GeosyntheticTesting.com

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

GEOMEMBRANE TEST RESULTS

TRI Client: Maralex Resources, Inc.
Project: Rosn Creek Evaporation Pond

Material: 40 mil. Smooth HDPE Geomembrane (Ten year old material)
Sample Identification: Exposed
TRI Log #: E2385-15-03

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	GM 13 SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5199)													
Thickness (mils)	42	41	41	40	42	41	40	42	42	41	41	1	40
											40	<< min	36
Density (ASTM D 1505)													
Density (g/cm3)	0.951	0.951	0.951								0.951	0.000	> 0.94
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.60	2.63									2.62	0.02	2-3
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								1
Rating - 2nd field view	1	1	1	1	1								1
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	107	120	114	117	116						115	5	84
TD Yield Strength (ppi)	128	132	127	125	121						127	4	84
MD Break Strength (ppi)	184	198	198	193	169						188	12	152
TD Break Strength (ppi)	197	200	179	139	171						177	25	152
MD Yield Elongation (%)	21	21	21	21	21						21	0	12
TD Yield Elongation (%)	18	18	18	18	18						18	0	12
MD Break Elongation (%)	739	731	799	771	648						738	57	700
TD Break Elongation (%)	844	835	771	616	764						766	91	700
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	110	109	109	108	108						109	1	72
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	36	33	31	35	34	35	33	33	35	34	34	1	26
TD Tear Strength (lbs)	34	34	32	34	30	33	33	28	32	33	32	2	26

MD Machine Direction TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: Maralex Resources, Inc.
Project: Roan Creek Evaporation Pond

Material: 40 mil. Smooth HDPE Geomembrane (Ten year old material)
Sample Identification: Exposed
TRI Log #: E2386-15-03

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	GM 13 SPEC.
Oxidative Induction Time (ASTM D 3895)													
OIT (minutes)	20 8	21 4									21.1	0.4	> 100

SP-NCTL Stress Crack Resistance (ASTM D 5397, App)

SURFACTANT	CO-630
EXPOSURE PERIOD	300 hrs
DATE TEST STARTED	4-Nov-13
TEST TEMPERATURE	50C

Transverse direction yield stress	3030	(psi)
x 30%	909	(x 0.30)
x hinge thickness (in)	0.032	(80% of thickness)
x specimen width	0.124	(0.125")
Load	3.61	(lbs)

Mechanical Advantage	5	
Lever Weight	0 33	(lbs)
Grip Weight	0.09	(lbs)

Applied load = (Load - Lever Weight + Grip Weight)/Mechanical Advantage = 0 67 lbs = 306 grams

Replicate No.:	1	2	3	4	5	MEAN		GM 13 SPEC.
No. Hours to Failure:	>300	>300	>300	>300	>300	>300		> 300

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GEOMEMBRANE TEST RESULTS

TRI Client: Maralex Resources, Inc.
Project: Roan Creek Evaporation Pond

Material: 40 mil. Smooth HDPE Geomembrane (Ten year old material)
Sample Identification: Anchor Trench
TRI Log #: E2386-18-03

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	GM 13 SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5199)													
Thickness (mils)	40	41	41	42	42	42	40	41	40	42	41	1	40
											40	<< min	36
Density (ASTM D 1505)													
Density (g/cm3)	0.947	0.947	0.947								0.947	0.000	> 0.94
Carbon Black Content (ASTM D 1603, mod.)													
% Carbon Black	2.16	2.13									2.15	0.02	2-3
Carbon Black Dispersion (ASTM D 5596)													
Rating - 1st field view	1	1	1	1	1								1
Rating - 2nd field view	1	1	1	1	1								1
Tensile Properties (ASTM D 6693, 2 ipm strain rate)													
MD Yield Strength (ppi)	109	109	122	122	110						114	7	84
TD Yield Strength (ppi)	136	118	114	122	109						120	10	84
MD Break Strength (ppi)	145	86	191	212	196						166	51	152
TD Break Strength (ppi)	218	175	169	230	175						193	28	152
MD Yield Elongation (%)	17	17	15	15	15						16	1	12
TD Yield Elongation (%)	15	20	20	15	18						18	3	12
MD Break Elongation (%)	501	89	804	878	869						628	338	700
TD Break Elongation (%)	906	614	636	975	655						757	170	700
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	115	114	109	110	110						112	3	72
Tear Resistance (ASTM D 1004)													
MD Tear Strength (lbs)	35	33	34	36	31	31	34	27	31	33	33	3	28
TD Tear Strength (lbs)	34	32	31	35	32	34	34	29	35	29	33	2	28

MD Machine Direction TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: Maralex Resources, Inc.
Project: Roan Creek Evaporation Pond

Material: 40 mil. Smooth HDPE Geomembrane (Ten year old material)
Sample Identification: Anchor Trench
TRI Log #: E2386-15-03

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	GM 13 SPEC.
Oxidative Induction Time (ASTM D 3895)													
OIT (minutes)	29 5	29.8									29.6	0 2	> 100

SP-NCTL Stress Crack Resistance (ASTM D 5397, App)

SURFACTANT	CO-630
EXPOSURE PERIOD	300 hrs
DATE TEST STARTED	4-Nov-13
TEST TEMPERATURE	50C

Transverse direction yield stress	2880	(psi)	Mechanical Advantage	5	
x 30%	864	(x 0.30)	Lever Weight	0.33	(lbs)
x hinge thickness (in)	0.032	(80% of thickness)	Grip Weight	0 09	(lbs)
x specimen width	0.124	(0 125")			
Load	3.43	(lbs)			

Applied load = (Load - Lever Weight + Grip Weight)/Mechanical Advantage = 0 64 lbs = 290 grams

Replicate No	1	2	3	4	5	MEAN	GM 13 SPEC.
No. Hours to Failure	>300	>300	>300	>300	>300	>300	> 300

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