



December 4, 2023
Kleinfelder Project No.: 24001925.001A

Via E-mail: gerald.a.walker@floridadep.gov

Mr. Gerald Walker
Florida Department of Environmental Protection
Oil and Gas Program
2600 Blair Stone Road, MS 3588
Tallahassee, FL 32399-2600

**SUBJECT: Application for Permit to Drill
 NLT Royalty Partners 10-4 Well at Pad 1
 Clearwater Land & Minerals FLA, LLC**

Dear Mr. Walker,

On behalf of Clearwater Land & Minerals FLA, LLC, Kleinfelder, Inc. (Kleinfelder) has furnished the following information for review and approval of an application for Permit to Drill a new oil and gas well (previously permitted Oil & Gas Drilling Permit No. 1374) in Section 10, Township 3 South, 9 West in Calhoun County, Florida in accordance with Chapter 377, Part I, Florida Statutes (F.S.):

1. The application for Permit to Drill NLT Royalty Partners 10-4 Well at Pad 1 including the below 23 referenced attachments;
2. Permitted Site Plan for NLT Royalty Partners 10-4 Well at Pad 1;
3. Check made payable to the Florida Department of Environmental Protection (FDEP) for the \$2,000.00 processing and regulatory fee per subsection 62C-26.003(8), F.A.C.; and
4. Check made payable to the FDEP for the \$11,798.00 Department of Environmental Protection Petroleum Trust Account surety per subsection 62C-26.002(5)(a), F.A.C.

Performance Security

A check in the amount of \$11,798.00 has been made out to the FDEP Oil and Gas Program for Clearwater Land & Minerals FLA, LLC's participation in the Petroleum Trust Account as performance security for the well.

Confidentiality

Clearwater Land & Minerals FLA, LLC requests that all geologic information submitted to FDEP be held confidential by FDEP for a period of one (1) year after completion of the well in accordance with 377.2408(3), Florida Statutes. Confidentiality extends to geologic data collection during drilling, logging and testing the well.

Mineral Ownership

Clearwater Land & Minerals FLA, LLC has an option agreement from NLT Royalty, LLC as evidenced in Attachment 6. A plat showing Clearwater Land & Minerals' leasehold position is enclosed herewith as Attachment 5.

Surface Ownership

Teal Timber LLC is the surface owner of the drill site tract.

Drilling Program

Details regarding the drilling program can be found in Attachments 13 and 14.

Location, Stormwater Runoff and Roads

A pad at the surface hole location was previously constructed under Environmental Resource Permit (ERP) No. 0367570-001-EI/07. Stormwater runoff is contained by a berm constructed around the pad. A detailed Stormwater Management Plan was prepared and the pad was designed to meet or exceed FDEP and Northwest Florida Water Management District (NFWFMD) stormwater requirements. Since the pad was constructed adjacent to existing silviculture access roads, only a small pad access road was constructed. An as-built survey has been completed for the pad to ensure that it meets and complies with all permit criteria.

Drilling Water Source

The drilling contractor will obtain a NFWFMD consumptive use permit.

Preliminary Site Inspection

Clearwater Land & Minerals FLA, LLC will request a preliminary site inspection after filing of this application.

Environmental Resource Permit

A request to transfer an environmental resource permit (ERP) (Permit No. 0367570-001-EI/07) has been submitted under separate cover to the FDEP Northwest District.

Should you have any questions or concerns regarding this information please do not hesitate to contact me at 321.334.9131.

Sincerely,

KLEINFELDER, INC.



Shannon Freemon
Project Manager

cc: Camp Campbell, Clearwater Land & Mineral FLA, LLC
Timothy Riley, Gunster

Attachments: Attachment 1: Organizational Report (FDEP Oil & Gas Form 1)
Attachment 2: Application for Permit to Drill (FDEP Oil & Gas Form 3)
Attachment 3: Florida Limited Liability Report
Attachment 4: Agent Authorization Letter
Attachment 5: Well Location Plat
Attachment 6: Memorandum of Oil, Gas and Mineral Option Agreement
Attachment 7: Letter of Justification for Non-routine Bottom Hole Location
Attachment 8: Stream Protection Letter
Attachment 9: Spill Prevention, Control & Countermeasure Plan (SPCC)
Attachment 10: H₂S Contingency Plan for Drilling Operations
Attachment 11: Information on RAPAD Diesel Electric Land Rig #36 and Completion Rig
Attachment 12: Geologic Prognosis (Redacted)
Attachment 13: Directional Drilling Plan
Attachment 14: Drilling Procedure
Attachment 15: Drilling Fluids Program
Attachment 16: Safety Data Sheets for Drilling Fluids
Attachment 17: Preliminary Cementing Proposal for the 9 5/8-inch Surface Casing
Attachment 18: Preliminary Cementing Proposal for the 5 1/2-inch Production Casing
Attachment 19: Safety Data Sheets for Cement
Attachment 20: Well Schematic
Attachment 21: Well Control Protocol
Attachment 22: BOP Stack Diagram
Attachment 23: Permitted Site Plan for NLT Royalty Partners 10-4 Well at Pad 1

ATTACHMENT 1
ORGANIZATIONAL REPORT (FDEP OIL & GAS FORM 1)

**Florida
Department of
Environmental Protection**

Oil & Gas Form 1

Form Title: **ORGANIZATION REPORT**
Date Revised: March, 1998
Incorporated by reference: Rule 62C-25.008

All persons exploring for, storing, transporting, reclaiming, treating, or processing crude oil or natural gas shall file this record with the Florida Department of Environmental Protection, Oil and Gas Program, 2600 Blair Stone Road, MS 3588, Tallahassee, Florida 32399-2400 (phone 850/245-8336) Or, Email: OGP@dep.state.fl.us

1. Organization: Clearwater Land & Minerals FLA, LLC 416 Travis St, Suite 715, Shreveport, Louisiana 71101
(Name and Address)

Phone Number: 318-464-207 Fax Number: N/A

2. Type of Organization: Corporation
(Corporation, Joint Association, Firm, Partnership, Individual, etc.)

3. Purpose of Organization: Oil and Gas Operations

4. If Corporation, State and Date of Incorporation: Florida April 21, 2023

Name and Address of Florida Registered Agent: Hand Arendall Harrison Sale LLC 35008 Emerald Coast Parkway Ste 500, Destin, FL 32541

Date Registered with Secretary of State: 04/21/2023

5. Officers, Owners, Directors and Trustees Information (Attach additional sheets as needed):

Name	Title	Address	Phone Number
Edward R. Campbell III	Manager	416 Travis St, Suite 715, Shreveport, Louisiana 71101	318-465-5055
Edward R. Campbell IV	Manager	416 Travis St, Suite 715, Shreveport, Louisiana 71101	318-464-6207

6. Is this a reorganization? No If so, previous name: _____


=====
Organization's Statement

State: Louisiana

County: Caddo

I, Edward R. Campbell IV am the Manager
(Name) (Title)

Of Clearwater Land & Minerals FLA, LLC and attest that all information contained herein is true and correct.
(Organization)

Signature: 

Date: 12/3/23

ATTACHMENT 2
APPLICATION FOR PERMIT TO DRILL (FDEP OIL & GAS FORM 3)

**Florida
Department of
Environmental Protection**

Form Title: **APPLICATION FOR PERMIT TO DRILL**
 Date Revised: April 22, 2014
 Incorporated by Reference in: Section 62C-25.006(4)(a), F.A.C.

For information and fees regarding drilling permits for oil and gas related wells, refer to Chapter 62C-26, Florida Administrative Code. File this form with the Florida Department of Environmental Protection, Oil and Gas Program, 2600 Blair Stone Road, MS 3588, Tallahassee, Florida 32399-2400; (phone 850-245-8336) or, Email: OGP@dep.state.fl.us

Clearwater Land & Minerals, Fla LLC
416 Travis St, Suite 715
Shreveport, Louisiana 71101

(Company's Name and Address)

Phone Number: 318-464-6207 Fax Number: _____

Well Name and Number: NLT Royalty Partners 10-4

Ground Elevation: 36' Acres Assigned to Well: 158 Latitude: 30.23475N Longitude: 85.12548W

SHL: N30.2347566; W85.1254806 Sec. 10 T. 3S R. 9W

BHL: N30.2319513; W85.1226729 Sec. 10 T. 3S R. 9W

Field/Area: Exploratory well County: Calhoun

Distance to nearest drilling unit boundary: 1026' FSL and 702' FEL Proposed Depth: 14,095' MD/13,950' TVD

Do you have all of the mineral interest in the drilling unit under lease or title? Yes (Yes or No) If not, attach lease map showing ownership of all mineral acreage within the drilling unit and list the names and addresses of all nonconsenting mineral owners. (See section 377.2411 and .247, Florida Statutes.)

- (Please answer YES or NO) Is the structure intended for the drilling or production of this well located (See section 377.24, F. S.)
- a) in a municipality? No
 - b) in tidal waters within 3 miles of a municipality? No
 - c) on an improved beach? No
 - d) on any submerged land within a bay, estuary, or offshore waters? No
 - e) within one mile seaward of the coastline of the state? No
 - f) within one mile seaward of the boundary of a local, state or federal park or an aquatic or wildlife preserve? No
 - g) On the surface of a freshwater lake, river or stream? No
 - h) within one mile inland from the shoreline of the Gulf of Mexico, the Atlantic Ocean or any bay or estuary? No
 - i) within one mile of any freshwater lake, river or stream? Yes

If the answer to **a**, **b**, or **c** is YES, attach copies of local governing authorities' permits. If the answer to **h** or **i** is YES, attach a contingency plan specifying safeguards being implemented to prevent accidents and/or blowouts and to protect the natural resources of such bodies of water and shore areas in the event of an accident or blowout.

The security for this well is on file (attached or on file) with the Oil and Gas Program (see Rule 62C-26.002) and bears Serial Number N/A.

=====
 Company's Statement

State: Florida County: Calhoun

I, Edward R. Campbell IV, am the Manager
(Name) (Title)

of Clearwater Land & Minerals, Fla LLC and attest to all information contained herein to be true and correct.
(Organization)

Signature:  Residential Address: 416 Travis St Ste 715

Date: 12/4/23 City/State/Zip: Shreveport, LA 71101

=====
 File Number: _____ Action: _____ Date: _____ A.P. I. Number: _____
(Approved, Denied)

ATTACHMENT 3
FLORIDA LIMITED LIABILITY REPORT

#123000155499 3

Florida Department of State
 Division of Corporations
 Electronic Filing Center

Note: Please print this page and mail as a cover sheet. Type the fax and phone number below (to the top and bottom of all pages of the document)

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#123000155499 3.0

Note: DO NOT hit the REFRESH/RELOAD button on your browser from this page. Doing so will generate another cover sheet.

To:

Division of Corporations
 Fax Number : (956) 617-6383

From:

Account Name : HAND ARLEDALE HARRISON GALE LLC
 Account Number : 120190000128
 Phone : (956) 266-3434
 Fax Number : (251) 544-1543

Enter the email address for this business entity to be used for future annual report mailings. Enter only one email address, please.

Email Address: jcampfield@handfirm.com

LLC AMEND/RESTATE/CORRECT OR M/MIG RESIGN
 CLEARWATER LAND & MINERALS, LLC

Certificate of Status	1
Certified Copy	0
Page Count	05
Estimated Charge	\$30.00

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COVER LETTER

H23000155499 3

**TO: Registration Section
Division of Corporations**

SUBJECT: CLEARWATER LAND & MINERALS, LLC
Name of Limited Liability Company

The enclosed Articles of Amendment and fees) are submitted for filing.

Please return all correspondence concerning this matter to the following:

JESSICA CAMPFIELD
Name of Person
HAND ARENDALL HARRISON SALE, LLC
Firm/Company
35008 Emerald Coast Pkwy, Ste 500
Address
DESTIN, FL 32541
City/State and Zip Code
JCAMPFIELD@HANDFIRM.COM
E-mail address (to be used for future annual report notification)

For further information concerning this matter, please call:

JESSICA CAMPFIELD at 850 460-3697
Name of Person Area Code Daytime Telephone Number

Enclosed is a check for the following amount:

- \$25.00 Filing Fee
- \$30.00 Filing Fee & Certificate of Status
- \$55.00 Filing Fee & Certified Copy (additional copy is enclosed)
- \$60.00 Filing Fee, Certificate of Status & Certified Copy (additional copy is enclosed)

Mailing Address:
Registration Section
Division of Corporations
P.O. Box 6327
Tallahassee, FL 32314

Street Address:
Registration Section
Division of Corporations
The Centre of Tallahassee
2415 N. Monroe Street, Suite 810
Tallahassee, FL 32303

DocuSign Envelope ID: 1E4033AB-9E9C-403F-A901-C8E397F9444D

ARTICLES OF AMENDMENT
TO
ARTICLES OF ORGANIZATION
OF

H23000155499 3

CLEARWATER LAND & MINERALS, LLC

(Name of the Limited Liability Company as it now appears on our records.)
(A Florida Limited Liability Company)

The Articles of Organization for this Limited Liability Company were filed on 04-21-2023 and assigned Florida document number L23000201589.

This amendment is submitted to amend the following:

A. If amending name, enter the new name of the limited liability company here:

CLEARWATER LAND & MINERALS FLA, LLC

The new name must be distinguishable and contain the words "Limited Liability Company," the designation "LLC" or the abbreviation "L.L.C."

Enter new principal offices address, if applicable:

(Principal office address MUST BE A STREET ADDRESS)

Enter new mailing address, if applicable:

(Mailing address MAY BE A POST OFFICE BOX)

B. If amending the registered agent and/or registered office address on our records, enter the name of the new registered agent and/or the new registered office address here:

Name of New Registered Agent:

New Registered Office Address:

Enter Florida street address

Florida

City

Zip Code

New Registered Agent's Signature, if changing Registered Agent:

I hereby accept the appointment as registered agent and agree to act in this capacity. I further agree to comply with the provisions of all statutes relative to the proper and complete performance of my duties, and I am familiar with and accept the obligations of my position as registered agent as provided for in Chapter 605, F.S. Or, if this document is being filed to merely reflect a change in the registered office address, I hereby confirm that the limited liability company has been notified in writing of this change.

Signature of New Registered Agent

DocuSign Envelope ID: 1E4033AB-9B9C-403F-A901-C8E397F9444C

If amending Authorized person(s) authorized to manage, enter the title, name, and address of each person being added or removed from our records:

H23000155499 3

MGR = Manager
AMBR = Authorized Member

<u>Title</u>	<u>Name</u>	<u>Address</u>	<u>Type of Action</u>
_____	_____	_____	<input type="checkbox"/> Add
		_____	<input type="checkbox"/> Remove
		_____	<input type="checkbox"/> Change
_____	_____	_____	<input type="checkbox"/> Add
		_____	<input type="checkbox"/> Remove
		_____	<input type="checkbox"/> Change
_____	_____	_____	<input type="checkbox"/> Add
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		_____	<input type="checkbox"/> Remove
		_____	<input type="checkbox"/> Change
_____	_____	_____	<input type="checkbox"/> Add
		_____	<input type="checkbox"/> Remove
		_____	<input type="checkbox"/> Change

D. If amending any other information, enter change(s) here: *(Attach additional sheets, if necessary.)*

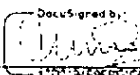
E. Effective date, if other than the date of filing: _____ (optional)

(If an effective date is listed, the date must be specific and cannot be prior to date of filing or more than 90 days after filing.) Pursuant to 605.0207 (3)(b)

Note: If the date inserted in this block does not meet the applicable statutory filing requirements, this date will not be listed as the document's effective date on the Department of State's records.

If the record specifies a delayed effective date, but not an effective time, at 12:01 a.m. on the earlier of: (b) The 90th day after the record is filed.

Dated 4/26/2023 _____

DocuSigned by:

Signature of a member or authorized representative of a member

E. R. CAMPBELL, III

Typed or printed name of signee

L23000201589

H23000149226 3

Florida Department of State
Division of Corporations
Electronic Filing Cover Sheet

Note: Please print this page and use it as a cover sheet. Type the fax audit number (shown below) on the top and bottom of all pages of the document.

((H23000149226 3)))



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To: Division of Corporations
Fax Number : (850)517-6381

From: Account Name : HAND ARENDALL HARRISON SALE LLC
Account Number : I20198000120
Phone : (850)769-3434
Fax Number : (251) 544-1843

Enter the email address for this business entity to be used for future annual report mailings. Enter only one email address please.

Email Address: jcampfield@handfirm.com

FLORIDA LIMITED LIABILITY CO.
CLEARWATER LAND & MINERALS, LLC

Certificate of Status	1
Certified Copy	0
Page Count	03
Estimated Charge	\$130.00

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ARTICLES OF ORGANIZATION
OF
CLEARWATER LAND & MINERALS, LLC

ARTICLE I - NAME

The name of the limited liability company CLEARWATER LAND & MINERALS, LLC,
("company").

ARTICLE II - ADDRESS

The mailing address and street address of the principal office of the Limited Liability
Company is:

Principal Office Address:
416 TRAVIS STREET, SUITE 715
SHREVEPORT, LOUISIANA 71101

Mailing Address:
416 TRAVIS STREET, SUITE 715
SHREVEPORT, LOUISIANA 71101

ARTICLE III - REGISTERED AGENT,
REGISTERED OFFICE, & REGISTERED AGENT'S SIGNATURE

The name and the Florida street address of the registered agent are:

HAND ARENDALL HARRISON SALE, LLC
35008 EMERALD COAST PKWY, STE 500
DESTIN, FL 32541

*Having been named as registered agent and to accept service of process for the above
stated limited liability company at the place designated in this certificate. I hereby accept the
appointment as registered agent and agree to act in this capacity. I further agree to comply with
the provisions of all statutes relating to the proper and complete performance of my duties, and I
am familiar with and accept the obligations of my position as registered agent as provided for in
Chapter 605, F.S.*

DocuSigned by:
Dian J. Moriy
E0040B14E3A7400
HAND ARENDALL HARRISON SALE, LLC

DocuSign Envelope ID: 5246E05A-A82A-41E7-B1E3-C088545C7226

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ARTICLE IV - MANAGERS OR MEMBERS

The name and address of each person authorized to manage and control the Limited Liability Company:

Title:

"MGR" = Manager

"AMBR" = Authorized Member

Name and Address:

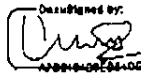
AMBR

CLEARWATER LAND & MINERALS, LLC, a
Louisiana Limited Liability Company
416 TRAVIS STREET, SUITE 715
SHREVEPORT, LA 71101

ARTICLE V - EFFECTIVE DATE

The effective date of the company shall be 4/20/2023.

REQUIRED SIGNATURE:

Digitized by:


Signature of a member or an authorized representative of a member.

This document is executed in accordance with section 605.0203(1)(b), Florida Statutes. I am aware that any false information submitted in a document to the Department of State constitutes a third degree felony as provided for in s.817.155, F.S.

E. R. CAMPBELL, III

Typed or printed name of signer

ATTACHMENT 4
AGENT AUTHORIZATION LETTER

Clearwater Land & Minerals Fla, LLC
416 Travis Street, Suite 715
Shreveport, La 71101
318-425-1680

November 30, 2022

Oil and Gas Program
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 3588
Tallahassee, Florida 32399

SUBJECT: Agent Authorization for Clearwater Land & Minerals FLA, LLC

To Whom It May Concern:

This letter will serve as notice that Shannon Freemon of Kleinfelder, Inc. of Tampa, Florida, is authorized to act as agent on behalf of Clearwater Land & Minerals FLA, LLC. This authorization is solely limited to oil and gas regulatory permitting matters in the State of Florida. Neither Shannon Freemon nor Kleinfelder, Inc. shall have right to make commitments of any kind, for or on behalf of Clearwater Land & Minerals FLA, LLC without its prior written approval. This authorization may be revoked by Clearwater Land & Minerals FLA, LLC at any time.

Sincerely,

Clearwater Land & Minerals FLA, LLC



Camp Campbell
Manager

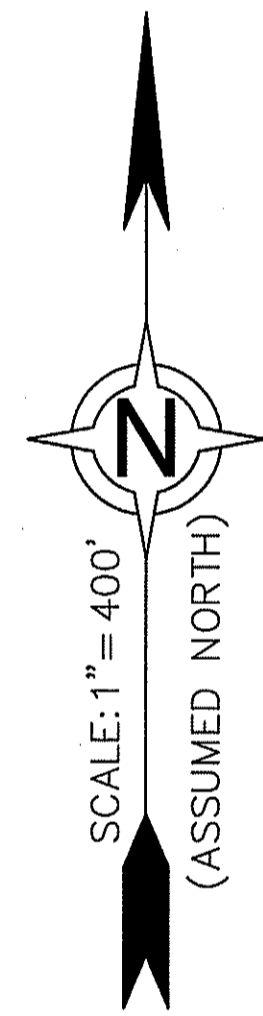
cc: File

ATTACHMENT 5
WELL LOCATION PLAT

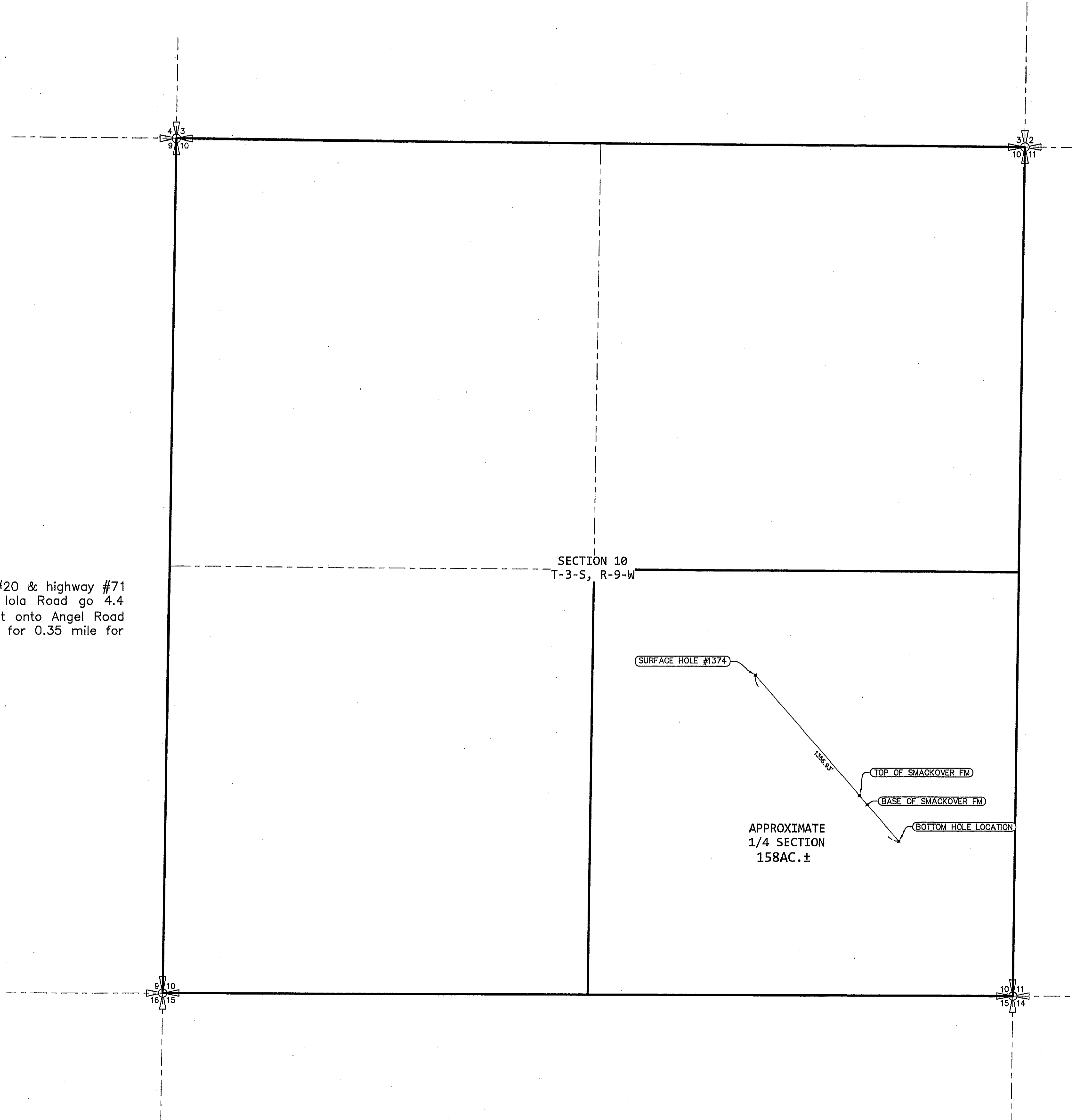
NOTES:

- No improvements were located in this survey other than those shown hereon.
- No underground encroachments, utilities or foundations were located in this survey.
- All measurements shown hereon are Standard U.S. Survey Feet, and decimals thereof.
- The use of this survey is limited to the specific transaction shown hereon.
- Subject to zoning setbacks, easements and restrictions of record.
- Adjoining deeds of record were not provided to this firm.
- Elevations are based on NAVD 88 Datum.
- This survey was performed without benefit of deed.
- Horizontal(NAD 83/90 DATUM) & Vertical(NAVD 88 DATUM) control utilized for this project is the Florida Department of Transportation "Florida Permanent Reference Network" Real Time Correction. NTRIP Caster MSN4 Near RTCM-Ref 0311.
- In accordance with FAC Section 62C-26.003(7)(c) 1/4 section lines on this plat have been established in approximate location by use of a georeferenced USGS quadrangle sheet. This method was utilized because an inordinate amount of surveying would have to be done in order to establish exact section corners.

FDEP OIL & GAS PROGRAM DRILLING PERMIT #1374 NLT ROYALTY PARTNERS 10-4 NON-ROUTINE WELL LOCATION SECTION 10, T-3-S, R-9-W, CALHOUN COUNTY FLORIDA



Accessibility to site: From the intersection of Highway #20 & highway #71 head South for 12.5 miles, turn left onto Southeast Iola Road go 4.4 miles, turn left onto Road #5 go 1.9 miles, turn right onto Angel Road go 0.26 miles to Lower Brown Lake Road, go straight for 0.35 mile for well site on the right



LEGEND

- BOT - BOTTOM
- EL - ELEVATION
- TBM - TEMPORARY BENCHMARK
- M - MEASURED
- FND - FOUND
- BND - BOUNDARY
- INV - INVERT ELEVATION
- T - TOWNSHIP
- R - RANGE
- N - NORTH
- S - SOUTH
- E - EAST
- W - WEST
- - CALCULATED POINT
- RCP - REINFORCED CONCRETE PIPE
- FNL - FROM NORTH LINE
- FSL - FROM SOUTH LINE
- FWL - FROM WEST LINE
- FEL - FROM EAST LINE
- FDEP - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

EDWIN BROWN & ASSOCIATES
SURVEYORS * MAPPERS
(850) 926-3016 888-433-4436 FAX (850) 926-8180
P.O. Box 625 2813 Crawfordville Hwy. Crawfordville, FL 32326

The undersigned surveyor has not been provided a current title opinion or abstract of matters affecting title or boundary to the subject property. It is possible there are deeds of records, unrecorded deeds, easements or other instruments which could affect the boundaries.

Not valid without the signature and the original raised seal of a Florida licensed surveyor and mapper.

WADE G. BROWN
Surveyor & Mapper
Florida Certificate No. 5959
(LB# 6475)

WELL PATH POINT	PUBLIC LAND SURVEY SYSTEM		COORDINATES(NAD 83)				OFFSET FROM NEAREST QUARTER SECTION		
	SECTION	TOWNSHIP	RANGE	NORTHERN	EASTERN	LATITUDE	LONGITUDE		
SURFACE HOLE LOCATION	10	3 SOUTH	9 WEST	449588.48	1770979.46	N30.2347566	W85.1254806	644'± FNL	1006'± FWL
TOP OF SMACKOVER FM	10	3 SOUTH	9 WEST	448846.08	1771623.98	N30.2327250	W85.1234268	1239'± FSL	966'± FEL
BASE OF SMACKOVER FM	10	3 SOUTH	9 WEST	448790.00	1771672.66	N30.2325714	W85.1232721	1183'± FSL	917'± FEL
BOTTOM HOLE LOCATION	10	3 SOUTH	9 WEST	448563.40	1771868.53	N30.2319520	W85.1226454	957'± FSL	726'± FEL

THIS SURVEY IS CERTIFIED TO:
KLEINFELDER

THIS SURVEY WAS PREPARED FOR THE SOLE BENEFIT OF THE ABOVE CERTIFIED EN AND/OR INDIVIDUALS AND IS INTENDED TO BE USED FOR THE CURRENT TRANSACTION INDIVIDUALS OR ENTITIES WHICH ARE NOT SPECIFICALLY LISTED ABOVE ARE NOT ENTITLED TO RELY UPON THIS BOUNDARY SURVEY FOR ANY PURPOSE. FURTHERMORE, THIS SURVEY IS NOT OBLIGATED TO AND WILL NOT SUPPORT THIS BOUNDARY SURVEY TO ANY INDIVIDUAL OR ENTITY WHICH IS NOT SPECIFICALLY LISTED ABOVE.

REVISION	BY	DATE
UPDATED WELL PATH SUMMARY	AA	11/7/2023

PLAT OF SPECIFIC PURPOSE SURVEY TO SHOW PROPOSED WELL LOCATION PREPARED BY
KLEINFELDER

PREPARED BY:
EDWIN G. BROWN AND ASSOCIATES, INC.
2813 CRAWFORDVILLE HWY. P.O. BOX 625 CRAWFORDVILLE, FL 32326 (850)926-3016

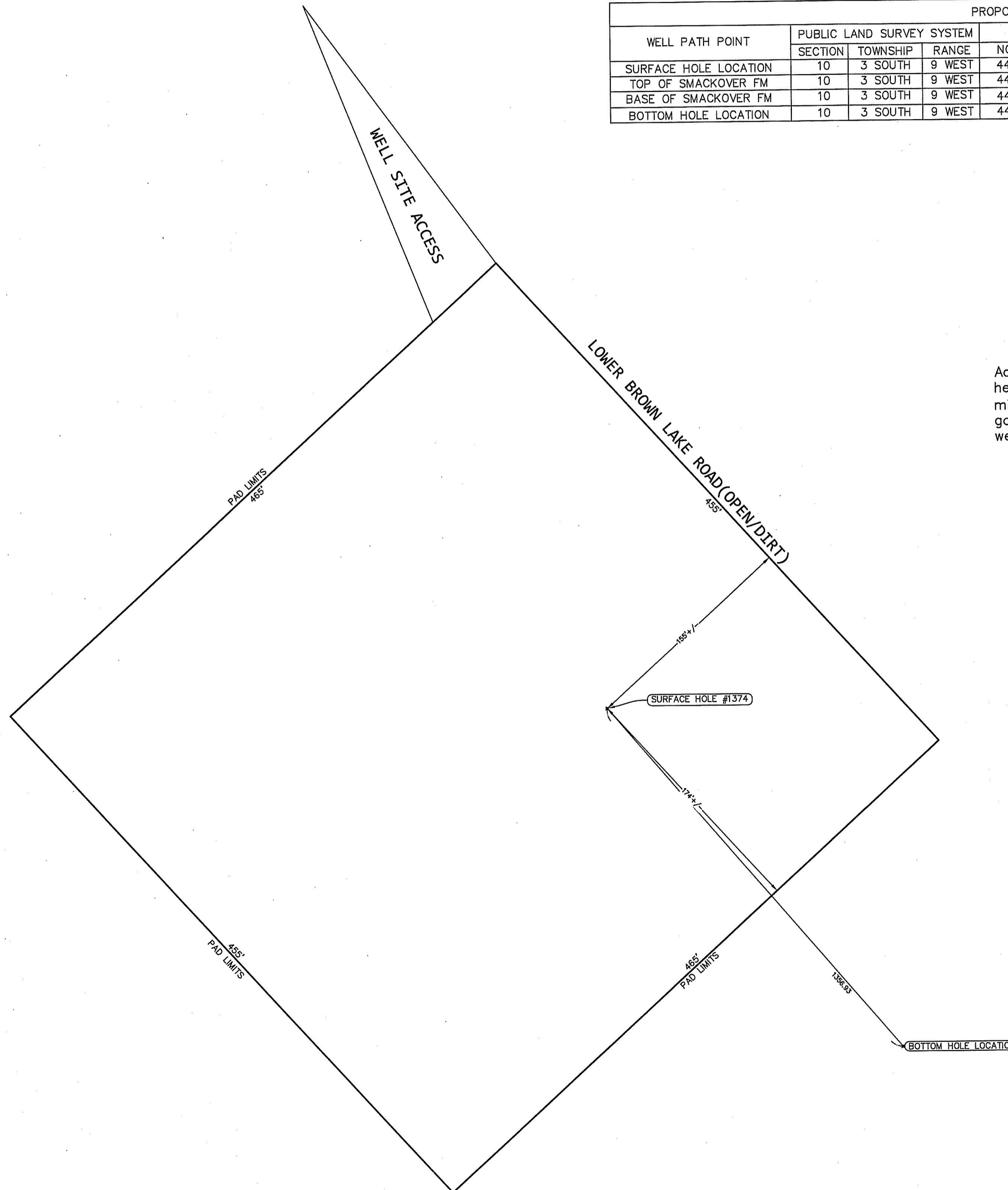
NOTEBOOK/PAGE: 1006/36	COUNTY: CALHOUN	DRAWN BY: AA	REVIEWED BY: V
NOTEBOOK/PAGE:	SECTION: 10	SCALE: 1" = 400'	CHECKED BY: Y
NOTEBOOK/PAGE:	TOWNSHIP: 3-SOUTH	SURVEY DATE: SEPTEMBER 28, 2023	
SHEET: 1 OF 3	RANGE: 9-WEST	JOB NUMBER: 23-485	PSC#: 4853

NOTES:

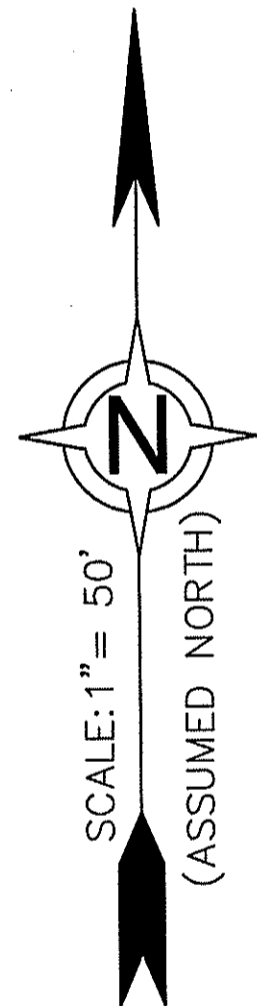
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- This survey was performed without benefit of deed.
- Horizontal(NAD 83/90 DATUM) & Vertical(NAVD 88 DATUM) control utilized for this project is the Florida Department of Transportation "Florida Permanent Reference Network" Real Time Correction. NTRIP Caster MSN4 Near RTCM-Ref 0311.
- In accordance with FAC Section 62C-26.003(7)(c) 1/4 section lines on this plot have been established in approximate location by use of a georeferenced USGS quadrangle sheet. This method was utilized because an inordinate amount of surveying would have to be done in order to establish exact section corners.

FDEP OIL & GAS PROGRAM DRILLING PERMIT #1374 NLT ROYALTY PARTNERS 10-4 NON-ROUTINE WELL LOCATION SECTION 10, T-3-S, R-9-W, CALHOUN COUNTY FLORIDA

WELL PATH POINT	PUBLIC LAND SURVEY SYSTEM			COORDINATES(NAD 83)				OFFSET FROM NEAREST QUARTER SECTION	
	SECTION	TOWNSHIP	RANGE	NORTHERN	EASTERN	LATITUDE	LONGITUDE		
SURFACE HOLE LOCATION	10	3 SOUTH	9 WEST	449588.48	1770979.46	N30.2347566	W85.1254806	644'± FNL	1006'± FWL
TOP OF SMACKOVER FM	10	3 SOUTH	9 WEST	448846.08	1771623.98	N30.2327250	W85.1234268	1239'± FSL	966'± FEL
BASE OF SMACKOVER FM	10	3 SOUTH	9 WEST	448790.00	1771672.66	N30.2325714	W85.1232721	1183'± FSL	917'± FEL
BOTTOM HOLE LOCATION	10	3 SOUTH	9 WEST	448563.40	1771868.53	N30.2319520	W85.1226454	957'± FSL	726'± FEL



Accessibility to site: From the intersection of Highway #20 & highway #71 head South for 12.5 miles, turn left onto Southeast Iola Road go 4.4 miles, turn left onto Road #5 go 1.9 miles, turn right onto Angel Road go 0.26 miles to Lower Brown Lake Road, go straight for 0.35 mile for well site on the right



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EDWIN BROWN & ASSOCIATES
SURVEYORS * MAPPERS
(850) 926-3016 888-433-4436 FAX (850) 926-8180
P.O. Box 625 2813 Crawfordville Hwy. Crawfordville, FL 32326

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Not valid without the signature and the original raised seal of a Florida licensed surveyor and mapper.

WADE G. BROWN
Surveyor & Mapper
Florida Certificate No. 5959
(LB# 6475)

THIS SURVEY IS CERTIFIED TO:
KLEINFELDER

THIS SURVEY WAS PREPARED FOR THE SOLE BENEFIT OF THE ABOVE CERTIFIED ENTITIES AND/OR INDIVIDUALS AND IS INTENDED TO BE USED FOR THE CURRENT TRANSACTION ONLY. INDIVIDUALS OR ENTITIES WHICH ARE NOT SPECIFICALLY LISTED ABOVE ARE NOT ENTITLED TO RELY UPON THIS BOUNDARY SURVEY FOR ANY PURPOSE. FURTHERMORE, THIS SURVEYOR IS NOT OBLIGATED TO AND WILL NOT SUPPORT THIS BOUNDARY SURVEY TO ANY INDIVIDUAL OR ENTITY WHICH IS NOT SPECIFICALLY LISTED ABOVE.

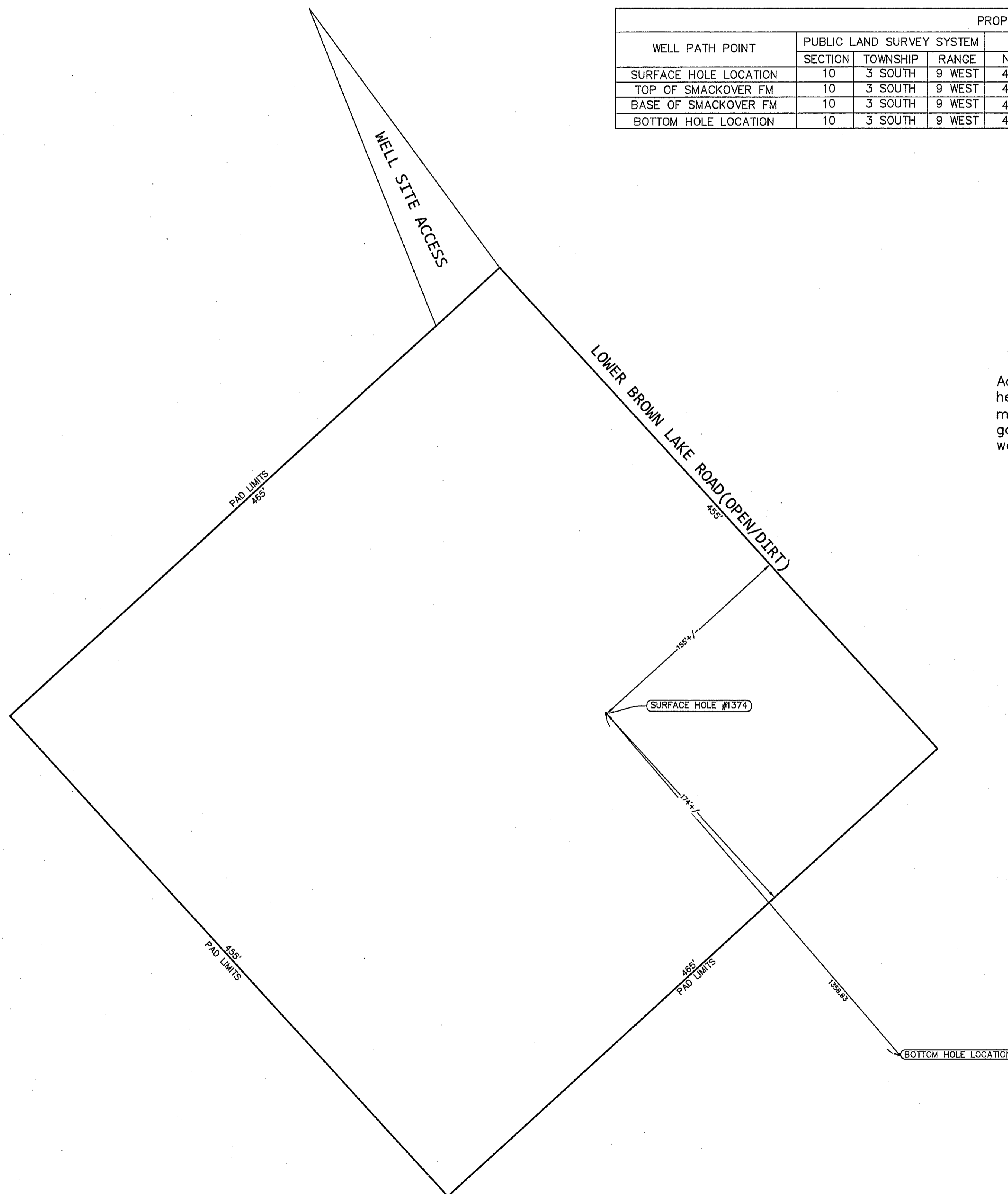
REVISION	BY	DATE
UPDATED WELL PATH SUMMARY	AA	11/7/2023
PLAT OF SPECIFIC PURPOSE SURVEY TO SHOW PROPOSED WELL LOCATION PREPARED FOR: KLEINFELDER		
PREPARED BY: EDWIN G. BROWN AND ASSOCIATES, INC. 2813 CRAWFORDVILLE HWY. P.O. BOX 625 CRAWFORDVILLE, FL. 32326 (850)926-3016		
NOTEBOOK/PAGE: 1006/36	COUNTY: CALHOUN	DRAWN BY: AA
NOTEBOOK/PAGE:	SECTION: 10	SCALE: 1" = 50'
NOTEBOOK/PAGE:	TOWNSHIP: 3-SOUTH	SURVEY DATE: SEPTEMBER 28, 2023
SHEET: 2 OF 3	RANGE: 9-WEST	JOB NUMBER: 23-485
		PSC#: 48530

FDEP OIL & GAS PROGRAM DRILLING PERMIT #1374 NLT ROYALTY PARTNERS 10-4 NON-ROUTINE WELL LOCATION SECTION 10, T-3-S, R-9-W, CALHOUN COUNTY FLORIDA

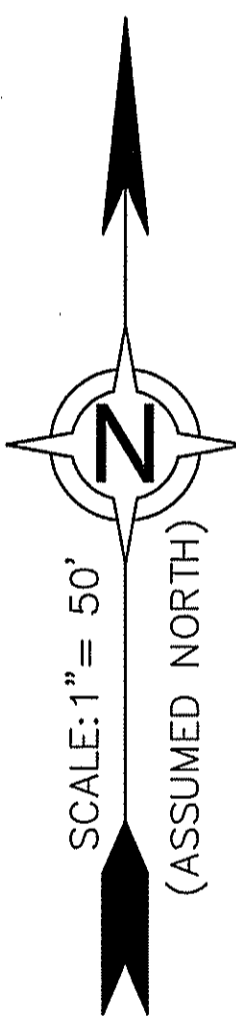
NOTES:

1. No improvements were located in this survey other than those shown hereon.
2. No underground encroachments, utilities or foundations were located in this survey.
3. All measurements shown hereon are Standard U.S. Survey Feet, and decimals thereof.
4. The use of this survey is limited to the specific transaction shown hereon.
5. Subject to zoning setbacks, easements and restrictions of record.
6. Adjoining deeds of record were not provided to this firm.
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EDWIN BROWN & ASSOCIATES

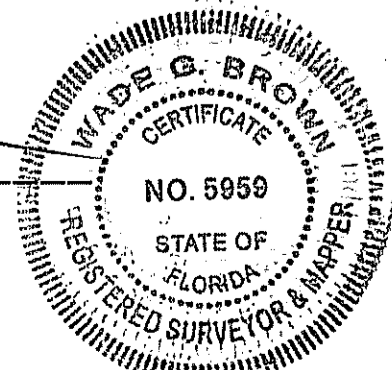
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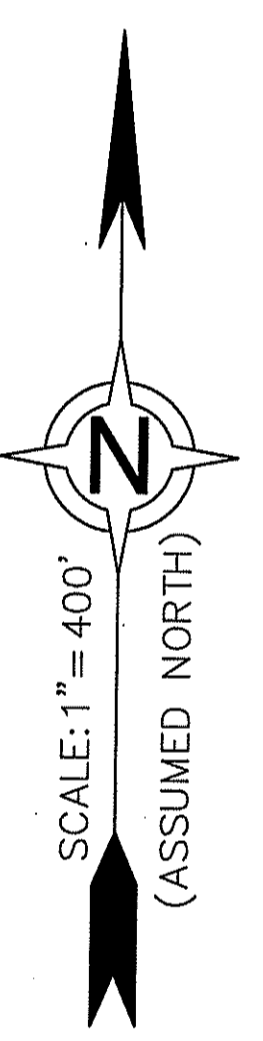
PLAT OF SPECIFIC PURPOSE SURVEY TO SHOW PROPOSED WELL LOCATION PREPARED BY
KLEINFELDER

PREPARED BY:
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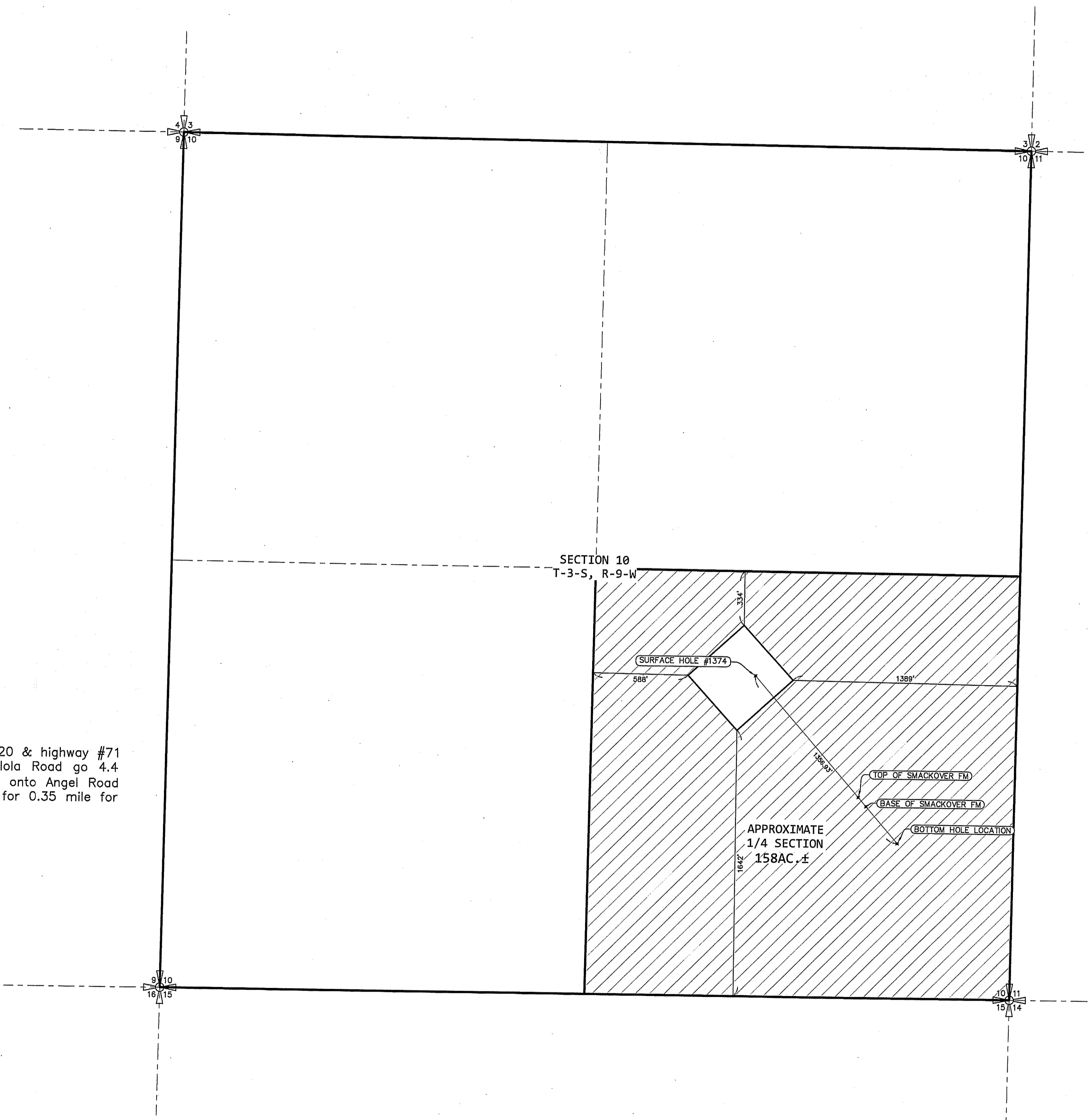
NOTEBOOK/PAGE 1006/38	COUNTY: CALHOUN	DRAWN BY: AA	REVIEWED BY: W
NOTEBOOK/PAGE	SECTION: 10	SCALE: 1" = 50'	CHECKED BY: W
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SHEET: 2 OF 3	RANGE: 9-WEST	JOB NUMBER	PSC#
23-485			48530

FDEP OIL & GAS PROGRAM DRILLING PERMIT #1374 NLT ROYALTY PARTNERS 10-4 NON-ROUTINE WELL LOCATION WITH BUFFER SECTION 10, T-3-S, R-9-W, CALHOUN COUNTY FLORIDA

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WADE G. BROWN
Surveyor & Mapper
Florida Certificate No. 5959
(LB# 6475)

PROPOSED WELL PATH SUMMARY									
WELL PATH POINT	PUBLIC LAND SURVEY SYSTEM			COORDINATES(NAD 83)				OFFSET FROM NEAREST QUARTER SECTION	
	SECTION	TOWNSHIP	RANGE	NORTHERN	EASTERN	LATITUDE	LONGITUDE		
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REVISION	BY	DATE
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PLAT OF SPECIFIC PURPOSE SURVEY TO SHOW PROPOSED WELL LOCATION PREPARED BY		
KLEINFELDER		
PREPARED BY:		
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SHEET: 3 OF 3	RANGE: 9-WEST	JOB NUMBER
		PSC#
	23-485	48530

ATTACHMENT 6
MEMORANDUM OF OIL, GAS AND MINERAL OPTION AGREEMENT

MEMORANDUM OF OIL, GAS AND MINERAL OPTION AGREEMENT

STATE OF FLORIDA

COUNTIES OF LIBERTY, GULF AND CALHOUN

KNOW ALL PEOPLE BY THESE PRESENTS, that NLT Royalty, LLC, whose address 214 Deer Street, Brewton, Alabama 36426, (hereinafter referred to as "Optionor"), and Clearwater Land & Minerals FLA, LLC, whose address is 416 Travis Street, Suite 715, Shreveport, Louisiana 71101, (hereinafter referred to as "Optionee"), hereby acknowledges and gives notice that Optionor has executed and delivered to Optionee an Option Agreement under an effective date of May 10th, 2023, under the terms for which Optionor has granted and assigned and let exclusively unto Optionee (subject to each and all of the other provisions thereof, for the purpose of acquiring one or more oil and gas leases covering all or a portion of the lands herein after described situated in Liberty, Gulf, and Calhoun Counties, Florida, more particularly described in Exhibit "A" attached hereto and hereby made a part hereof (the "Optioned Premises").

Said Option Agreement shall apply to acquire an oil, gas and mineral lease or oil, gas and mineral leases with said lease or leases applying to oil, gas and other gaseous or liquid hydrocarbons, and such other mineral substances as may be produced incidental to and as part of or mixed with oil, gas and other gaseous or liquid hydrocarbons.

Said Option Agreement has been executed and acknowledged by both Optionor and Optionee and provided for a term of three (3) years from the effective date of the Option Agreement unless so extended under the terms therein. Both Optionor and Optionee have possession of a fully executed copy of said Option Agreement.

The purpose of this Memorandum is to evidence the existence of said Option Agreement and this Memorandum is given in lieu of filing said Option Agreement in full for record in the Records of Calhoun County, Florida.

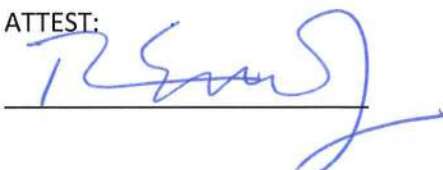
IN WITNESS WHEREOF, this instrument is executed this 28 day of September 2023.

OPTIONOR:

NLT ROYALTY, LLC


By: 
Thomas E. McMillan, III, Manager

ATTEST:



OPTIONEE:

CLEARWATER LAND & MINERALS FLA, LLC

By: 
E. R. Campbell, III, Manager

ATTEST:



ACKNOWLEDGEMENT

STATE OF Alabama
COUNTY OF Escambia

I, Lisa Warren, a Notary Public in and for the State and County aforesaid, hereby certify that Thomas E. McMillan, III, whose name as Manager of NLT Royalty, LLC, is signed to the foregoing instrument and who is known to me, acknowledged before me on this day that being informed of the contents of the aforesaid instrument, he, as such officer and with full authority, executed the same voluntarily for and as the act of said Company.

Given under my hand and official seal on this the 28 day of August, 2023.



Lisa Warren
Notary Public
My Commission Expires: 4-12-26

ACKNOWLEDGEMENT

STATE OF Alabama

COUNTY OF Baldwin

I, Lori K. Globetti, a Notary Public in and for the State and County aforesaid, hereby certify that E. R. Campbell, III, whose name as Manager of Clearwater Land & Minerals FLA, LLC, is signed to the foregoing instrument and who is known to me, acknowledged before me on this day that being informed of the contents of the aforesaid instrument, he, as such officer and with full authority, executed the same voluntarily for and as the act of said Company.

Given under my hand and official seal on this the 3rd day of October, 2023.



Lori K. Globetti
Notary Public
My Commission Expires: 4/14/27

EXHIBIT "A"

All mineral interests owned by Lessor IN AND UNDER THE FOLLOWING DESCRIBED LANDS
AND APPROXIMATE ACREAGE IN Calhoun, Liberty and Gulf Counties, Florida:

Township 3 South, Range 8 West

Section 6:	All West of Apalachicola River	400 ACRES
Section 7:	All West of Apalachicola River *Also described as Lots 1, 2, 3	102 ACRES

Township 2 South, Range 8 West

Section 19:	All of Section 19 1/e 2 acres recorded in Book OR 112, Page 256	534 ACRES
Section 29:	All	542 ACRES
Section 30:	All 1/e 1 Lot	500 ACRES
Section 31:	All	640 ACRES
Section 32:	All	479 ACRES
Section 33:	W/NW	80 ACRES

Township 4 South, Range 9 West

Section 4:	W/SE; E/SE; NE/SW; SE/NW; N/NE; NE/NW; NE/NW/NW; SE/NE West of river W/SW; SE/SW; S/NW; NE/NW/NW	591 ACRES
Section 5:	E/2 1/e SE/SE; Lots 2, 3, 4, 5, 1/e W of Lot 3, 5 acres in SW/NW	519 ACRES
Section 8:	W/E, E/2 1/e NE/NE	321.6 ACRES
Section 9:	All fractional Section 1/e 7.68 acres	617.36 ACRES
Section 16:	N/NW; Lots 3 & 7 1/e 5 acres	214.5 ACRES
Section 17:	E/NE; NW/NE; Lots 1, 2, 5 & 6 being A part of the South Half lying North of Chipola River	200 ACRES

Township 3 South, Range 9 West

Section 1:	All	640 ACRES
Section 2:	All	640 ACRES
Section 3:	All	640 ACRES
Section 4:	All	640 ACRES
Section 5:	E/2 1/e NW/NE; All East of river in W/2 1/e OR 162/618, or 172/173	370.58 ACRES
Section 7:	SE/4; Lots 4, 5, 6, 7; SE/SW	333 ACRES
Section 8:	All	628 ACRES
Section 9:	All (Wildlife Management Area)	640 ACRES
Section 10:	All	640 ACRES
Section 11:	All	640 ACRES
Section 12:	All West of river	580 ACRES
Section 13:	W/NW; NE/NW; Lots 1, 2, 3 (all West of river)	223 ACRES
Section 14:	W/2; Fractional S/SE (Lot 3); SW/NE; SE/NE; Lots 1, 2, 3 being all West of river	587 ACRES
Section 15:	All	640 ACRES
Section 16:	All	640 ACRES
Section 17:	All	640 ACRES
Section 18:	N/NE; SW/NE; NE/NW; Lots 1, 2; Fractional S/2	499.27 ACRES
Section 19:	All	473 ACRES
Section 20:	All	640 ACRES
Section 21:	All	640 ACRES
Section 22:	All	640 ACRES
Section 23:	Lots 1, 2, 3, 4, 5; NW/NW; all West of river	264 ACRES
Section 27:	W/NE; W/2; Lots 1, 2, 3, all West of river	518 ACRES
Section 28:	All	640 ACRES
Section 29:	All	640 ACRES
Section 30:	E/2; Lots 1 & 4, all East of Dead Lakes	543 ACRES

Section 31:	N/NE; Lots 1 & 3; NE/NW East of Creek; SE/ East of creek, All East of Dead Lakes	296 ACRES
Section 32:	All	640 ACRES
Section 33:	All	590 ACRES

Township 2 South, Range 9 West

Section 13:	All l/e SW/SE	600 ACRES
Section 14:	NE/NE; S/NE; E/SE l/e road	190 ACRES
Section 23:	E/2 l/e Railroad; SE/NW; NE/SW l/e 5 acres	395 ACRES
Section 24:	NE/; NW/SE; W/SW l/e 15 acres in SW cor; W/NW; NE/SE; S/SE	543 ACRES
Section 25:	NE/NE; SW/SW; NW/SW; SE/SE NE/NW	200 ACRES
Section 26:	W/NE; SE/4; E/W; W/SW; SW/SW	520 ACRES
Section 27:	SE/NE; E/SE; S/SW; SW/SE	240 ACRES
Section 32:	All lying South and East of river	200 ACRES
Section 33:	E/E; SW/NE; SE/SW; NW South and East of River l/e OR 43/359; W/SE; SW l/e SE/SW NW/NE	557.22 ACRES
Section 34:	All l/e S/NW/NE	620 ACRES
Section 35:	All	640 ACRES
Section 36:	SW/NE; NW/NE; SE/SW; NW/SW; SW/SW; SE/NE; W/SE; NW4/; NE/NE; SE/SE	560 ACRES

ATTACHMENT 7
LETTER OF JUSTIFICATION FOR NON-ROUTINE BOTTOM HOLE LOCATION



December 4, 2023
Kleinfelder Project No.: 24001925.001A

Mr. Gerald Walker
Florida Department of Environmental Protection
Oil and Gas Program
2600 Blair Stone Road, MS 3588
Tallahassee, FL 32399-2600

**SUBJECT: Letter of Justification for Non-Routine Well Location
Application for Permit to Drill
NLT Royalty Partners 10-4 Well at Pad 1
Clearwater Land & Minerals FLA, LLC
Calhoun County, Florida**

Dear Mr. Walker,

On behalf of Clearwater Land & Minerals FLA, LLC (Clearwater), Kleinfelder, Inc. (Kleinfelder) has assembled the information provided in this letter in support of a request for a non-routine bottom hole location at the NLT Royalty Partners 10-4 Well at Pad 1. The Florida Department of Environmental Protection (FDEP) issued Oil and Gas Drilling Permit No. 1374 to Cholla Petroleum, Inc. on December 4, 2019, which has subsequently expired on December 3, 2020. Clearwater is submitting a request for a new Oil and Gas Drilling Permit for the same well location. Pursuant to Chapter 62C-26.004(6), Florida Administrative Code, Clearwater is requesting the FDEP re-authorize a new Oil and Gas Drilling Permit for this non-routine bottom hole location. Clearwater has retained the same bottom hole location as permitted previously. Clearwater and their geologists have developed the attached information to demonstrate the need for this location.

Clearwater has carefully reviewed, analyzed, and interpreted public and privately available geological and geophysical data, including geophysical seismic 2D data specific to the project area and have provided the attached Geological Opinion (Attachment 1). This Geological Opinion was prepared by a professional geologist pursuant to Chapter 492, Florida Statutes. Attachment 1 only includes the redacted version of the Geological Opinion, please refer to the complete Geological Opinion provided under confidentiality.

This site was selected based upon the same techniques proven successful in the Jurassic Smackover Formation. This data has demonstrated that a non-routine bottom hole is necessary. The bottom hole location was selected following review of 2-D seismic data, which included proprietary seismic lines (Attachment 1). The surface hole location was selected based upon constraints identified at the surface. The surface hole location was selected to avoid impacts to jurisdictional wetlands that were identified during the field review.

We trust this information will support the reissuance of a non-routine bottom hole location. Should you have any questions or concerns regarding this information please do not hesitate to contact me at 813.887.3900.

Sincerely,

KLEINFELDER, INC.



Edward Murawski
Program Manager

cc: Camp Campbell, Clearwater Land & Mineral FLA, LLC
Timothy Riley, Gunster

Attachments: Attachment 1: Geological Opinion

ATTACHMENT 1
GEOLOGICAL OPINION (REDACTED)

November 26, 2023

Gerald Walker
Environmental Administrator
Oil and Gas Program
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 3588
Tallahassee, Florida 32399-2600

RE: Geological Opinion as to the Proven or Indicated Likelihood of the Presence of Oil and Gas in support of Drilling Permit Applications for Clearwater Land & Mineral FLA, LLC

Dear Mr. Walker:

We are providing the below provided geological discussion and opinion in support of the above-referenced applications for drilling permits for exploratory oil and gas wells in Calhoun County, Florida, filed by Clearwater Land & Mineral FLA, LLC ("Clearwater"). We have carefully reviewed, analyzed, and interpreted public and privately available geological and geophysical data, including geophysical seismic 2D data specific to the project area, in rendering the opinion provided below.

Proven or Indicated Likelihood of the Presence of Oil and Gas

Clearwater believes the likelihood of the presence of oil and gas at this location is high. The site was selected after years of study of the Jurassic Deposition of the Apalachicola Embayment as it lies under Calhoun, Gulf, and Liberty Counties. Studies included detailed analysis of prior Jurassic wells drilled, review of pre-existing seismic surveys, detailed study of the Cholla seismic survey, and generation of subsurface maps. Clearwater believes that these studies indicate that the Apalachicola Embayment is a direct analog to the known Jurassic oil field production lying approximately 125 miles to the Northwest at the Little Cedar Creek and Brooklyn Oil Fields located in Conecuh County, Alabama, which have now exceed production of 50 Million Barrels Oil Equivalent. An assessment of remaining oil and gas reserves in the target Upper Jurassic Smackover Formation for Onshore U.S. is found in USGS publication: Assessment of Continuous Oil and Gas Resources in the Upper Jurassic Smackover Formation of the Onshore U.S. Gulf Coast, 2022.

Site Selection based on Geology and Geophysics

Clearwater's site selection is based on using the same techniques proven to be successful for exploration, discovery and development of the Little Cedar Creek and Brooklyn Fields. The Little Cedar Creek and Brooklyn Fields produce oil and gas from the Jurassic Smackover Formation (Smackover) where the oil reservoir rocks consist of nearshore oolite bars and reefs which were deposited near the updip limits of the shallow seas of the Smackover. The Smackover shoreline is confined updip by the pre-existing metamorphic, Paleozoic basement rock which was created by, and is part of, the Appalachian Mountain range.

The key to locating the areas most likely to find the prospective oil and gas field, or potentially, fields, in the Apalachicola Embayment is in the location of the primary target reservoir rocks comprising

the Smackover reefs and oolite bars that are proximal to the effective shoreline with the similar geometry and depositional components as those that are found in the proven Little Cedar Creek and Brooklyn Fields. The most reliable method for the location and identification of these targeted reservoir rocks is to use the same methods that were used and proven successful for development of the Little Cedar Creek and Brooklyn Fields. These methods include the very specific and targeted geological and geophysical understanding of the major components that are involved in the creation of the updip reservoir fields which include understanding of 1) the Smackover's carbonate depositional system — overall, sequence and location, 2) the Smackover's initiation depositional surface— Norphlet, pre-Jurassic gravels, and Basement, 3) the subsurface structure and, 4) the source, migration, and trapping components.

Data used to understand the major components includes data on 1) prior Smackover depth wells drilled— logs, cores, and drilling data, and 2) pre-existing geophysical data (including the Cholla Seismic Survey). Subsurface maps of the Smackover Formation with the datasets help integrate the geological and the geophysical which help to predict the targeted thicknesses which are most likely to hold the targeted reservoir rocks. Geophysical data is used to locate and image the Smackover Formation and to confirm that it is analogous to the oil filled reservoir rocks of Little Cedar Creek and Brooklyn Fields. These proven techniques have been employed by both geologists and geophysicists resulting in the agreement that the surface and bottom hole locations are located where there is a high chance for all these conditions to be met.

The Primary and Secondary Targets— Top Seal and Floor

The Smackover Formation is the primary target and is a carbonate depositional system deposited in the oceans of the Jurassic. In the Apalachicola Embayment, the Smackover has varying deposition of nearshore environments, ranging from tight limestones and shales to porous and permeable reefs and oolite bars. The total thickness for the Smackover seen in wells drilled to date ranges from 0' to 170'. The thickest reef seen to date is 120' and the oolite bars are generally 10-20' with 1-3 oolite bars being considered normal and typical. These same nearshore deposits are seen in the analogous Little Cedar Creek and Brooklyn Fields and surrounding areas.

The Smackover is overlain by Buckner anhydrites and Haynesville shales. Buckner deposits are typically 10-20' in thickness and the overlying Haynesville shales are typically 370' thick but generally thicken to the north and are seen in the 400-500' thick range. Both the Buckner and Haynesville shales act as top seals for the underlying Smackover Formation.

The Norphlet Formation (Norphlet) is a secondary target. In the Apalachicola Embayment, the Smackover is underlain by the Norphlet, Pre-Jurassic Gravel, and/or Paleozoic Basement, whichever was present and exposed at the time of the initial Smackover transgression. The Norphlet is a sandstone of varying quality and was deposited in an arid environment and can be seen as desert dunes, wadi, or stream deposits. If the Norphlet is exposed at the time of Smackover transgression, the upper portion may be reworked by the incoming Smackover ocean. The Norphlet can be productive of oil and gas when the overlying Smackover is 1) oil or gas filled, or 2) impermeable and serving as a cap rock. There are numerous oil fields producing from the Norphlet in South Alabama and the pan handle of Florida as well as offshore Alabama. The Pre-Jurassic Gravel and Basement have not produced any significant oil or gas to date in South Alabama or Northern Florida.

CONFIDENTIAL-TRADE SECRET INFORMATION

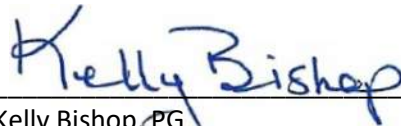
CONFIDENTIAL-TRADE SECRET INFORMATION

Exhibit B to this report contains geological and geophysical data, information, and professional geological interpretations that are proprietary trade secrets. This information is submitted reserving all rights as provided by statute and rule in sections 815.045, 812.081, 377.24075, and 377.22(h), Florida Statutes (2023). This information contained in Exhibit B is used by Clearwater in the operation of its business, and which provides a business advantage and opportunity to obtain an advantage over those who do not know or use it. Clearwater considers the information in the documents to be secret, of value, and solely for the use in its business. Clearwater considers and has treated the information as a confidential business trade secret. Consequently, the undersigned request that you treat in all manners and at all times these documents and the information contained therein as confidential business trade secrets. If you have any questions or dispute the confidential trade secret status of the materials, please immediately contact, Timothy Riley with the law firm of Gunster, Yoakley & Stewart, at triley@gunster.com, or 850-521-1727.

Sincerely,



Steven H. Craft, Sr.
Craft Operating Company XXXII, LLC
Petroleum Geologist
BS College of Engineering – 1984
University of Southwest Louisiana



Kelly Bishop, PG
Brightwater Solutions, LLC
Professional Geology License (Florida)
No. 2590

ATTACHMENTS:

Exhibit A (Public) Supporting Materials

Exhibit B (Confidential Proprietary) Supporting Materials and Analysis

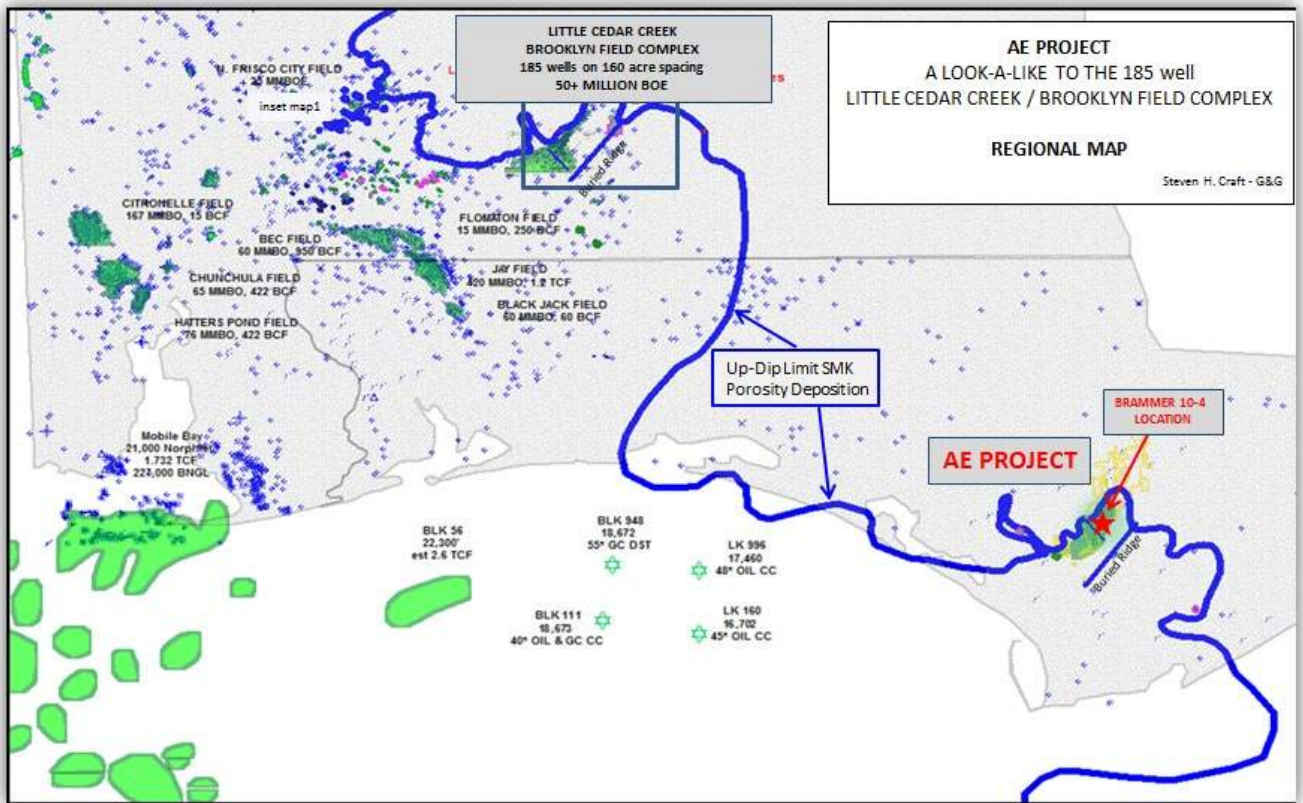
Exhibit A (Public) Supporting Materials

STRATIGRAPHIC SECTION: SOURCE: ALABAMA STATE OIL AND GAS BOARD

ERATHEM	SYSTEM	SERIES	STAGE	FORMATION	
MESOZOIC	CRETACEOUS	Upper	Maastrichtian	Selma Group	
			Campanian		
			Santonian	Eutaw Formation	
			Coniacian	Tuscaloosa Group	
			Turonian		"Upper Tuscaloosa"
			Cenomanian		"Marine Tuscaloosa"
		"Lower Tuscaloosa"			
		Lower	Albian	Washita and Fredericksburg Groups undifferentiated	Lower Cretaceous undifferentiated
				Paluxy Formation	
				Mooringsport Formation	
				Ferry Lake Anhydrite	
			Aptian	Rodessa Formation	
			Barremian	Sligo Formation	
			Hauterivian	Hosston Formation	
	Valanginian		Cotton Valley Group		
	Berriasian				
	Tithonian				
	JURASSIC	Upper	Kimmeridgian	Haynesville Formation	
			Oxfordian	Buckner Anhydrite Mbr.	
				Smackover Formation	
		Middle	Norphlet Fm.	Denkman 5s. Mbr.	
			Pine Hill Anhydrite Member		
			Louann Salt		
	Lower	Callovian	Werner Formation		
		Bathonian			
		Bejucan			
	Triassic	Upper		Eagle Mills Formation	
				"Basement"	
		Paleozoic-Precambrian	Pre-Mesozoic sedimentary and crystalline rocks		

★ SMACKOVER (PRIMARY TARGET)
 ★ NORPHLET (SECONDARY TARGET)

Regional Smackover Trend Map



The Apalachicola Embayment Prospect is analogous to the 50+ Million Barrel Jurassic Smackover Fields developed by Craft and others at the Little Cedar Creek and Brooklyn Fields System which are 17+ miles in length from 11-13,500' deep trapped by the up-dip termination of the Smackover Formation, where along the Western shoreline controlled by a major positive structural feature the Smackover sets up a nearshore reef and bar beach system and depositional environment trapped by its own up-dip termination. Thereefs and oolite bars are up-dip to and flanking the deeper water basinal deposits which de-water and source the flanking up-dip porous and permeable perched shelf deposits.

ATTACHMENT 8
STREAM PROTECTION LETTER



November 28, 2023
Kleinfelder Project No.: 24001925.001A

Mr. Gerald Walker, Environmental Administrator
Oil and Gas Program
Florida Department of Environmental Protection
2600 Blair Stone Road M.S. 3500
Tallahassee, Florida 32399

**Subject: Adequate Protection of Streams in the Event of Accident of Blowout
Application for Permit to Drill
Clearwater Land & Minerals FLA, LLC – NLT Royalty Partners 10-4 Well at Pad 1
Gulf County, Florida**

Dear Mr. Walker.:

The following letter is in support of an Application for Permit to Drill #1374, NLT Royalty Partners 10-4 Exploration Well No. 1 Oil Well Pad (**Figure 1**), in accordance with the requirements of Florida Statutes 377.242(1)(a)(4) and Application for Permit to Drill – Oil & Gas, Form 3.

Pursuant to Florida Statute 377.242(1)(a)(4),

“No structure intended for the drilling for, or production of, oil, gas, or other petroleum products may be permitted or constructed within 1 mile inland from the shoreline of the Gulf of Mexico, the Atlantic Ocean, or any bay or estuary or within 1 mile of any freshwater lake, river, or stream unless the department is satisfied that the natural resources of such bodies of water and shore areas of the state will be adequately protected in the event of accident or blowout.”

This letter describes all water bodies listed above and within one mile of the proposed well, and details mitigation of risk due to a variety of factors. In summary, the geologic, engineering, and topographic factors present, as well as the operational safeguards and contingencies built into the drilling program, the risk of a well control event leading to a blowout at the surface is extremely low and all bodies of water located within one mile of the proposed well are adequately protected. The following is a description of the site and protection measures that will be implemented.

SITE DESCRIPTION

Watershed

The proposed well sits within the Apalachicola watershed basin (**Figure 2**). National Hydrologic Data (NHD) defined perennial, intermittent streams and artificial paths within one mile of the proposed well occur within the Apalachicola watershed basin.

National Hydrologic Data

Within one mile of the proposed well location there is one NHD defined intermittent stream, and three perennial streams, all of which are tributaries to the named Apalachicola River (**Figure 2**).

Topography

Based on a review of USGS quadrangle map (**Figure 3**), the proposed well location is located at approximately 40-ft. NGVD. The USGS quadrangle depicts topography surrounding the site as generally sloping towards the north, west, south, and southeast.

National Wetland Inventory

National Wetland Inventory (NWI) defined surface waters and wetlands occur within the project boundary as well as within one mile of the proposed well as associated with previously described streams (**Figure 4**). Two ponds and two streams are located within the one-mile radius of the proposed well site. One of the two ponds is known as Brown Lake and is located approximately 4,950 ft east southeast of the proposed surface hole location. Brown Lake slough connects Brown Lake to Apalachicola River which is approximately 4,820 ft southeast of the surface hole location.

An unnamed pond is approximately 2,300 ft east southeast of the surface hole location. The feature is not connected to any perennial or intermittent feature. There are unnamed channels within the one-mile radius of the proposed well location. The closest channel is approximately 4,680 ft northeast and is an intermittent hydraulic feature that is seasonally inundated.

ADEQUATE PROTECTION OF STREAMS

Geologic Factors

The shorelines at the Little Cedar Creek / Brooklyn Field System and the Apalachicola Embayment are both controlled by pre-Jurassic mountain ranges of paleozoic basement (the buried foothills of the Appalachian Mountain range). The shorelines are created as the maximum transgression and highstand (the highest ocean water levels) as the Smackover reaches its most Northern push and gets halted by the exposed mountain ranges. These basement mountain ranges were exposed on the highest ridges and peaks and were covered by pre-Jurassic gravels and/or Norphlet Sands on the flanks.

A beach along a shoreline, or a reef - in either case, this 'created on the shoreline' reservoir rock is limited basinward (as the beach or reef doesn't go way out into the deep ocean), and the reservoir rock is limited shoreward (as the beach or reef doesn't extend inland) and now all that is left for a trap is the beach or reef's lateral extent. The lateral break at Little Cedar Creek Field was 17 miles up from the oil water contacts.

After reviewing 100's of lines of 2-D shelf data, we acquired the 2 key 2-D shelf lines and then shot 6 proprietary 2-D lines across the prospective shoreline reefs and bars. The prospect area is on the depositional shelf on the Eastern and protected side of a major basement ridge - being on the Eastern side of the major ridge is another major key, and is similar to what has been observed at the Analogous Little Cedar Creek/Brooklyn Field System (LCCBFS).

During the development of LCCBFS, and in 102 consecutive months, Craft Companies participated in 56 newly completed producing wells which had an average IP Rate of 295 BOPD and 248 MCFPD with an average Cum of 313,956 BO and 544,898 MCF thru 05/2022 with 36 of the 56 wells still producing 37,238

BOPM. The best IP rate was 627 BOPD and 540 MCF from 12/64 choke with 1850# FTP. The best Cum was 1,783,101 BO and 3,199,961 MCF. In addition to the four fields developed in the LCCBFS, Craft Companies also participated in an additional 19 new field discoveries and/or field extensions in the South Alabama Smackover arena. Of this total of 23 new fields and/or field extensions, 19 were generated by Craft.

Engineering Factors

The proposed well will be drilled on a newly constructed 440-ft. x 425-ft. pad designed in accordance with Northwest Florida Water Management District stormwater requirements. Construction will include an outer berm to surround the drill pad and is designed to contain any surface fluids and retard run-off into local water bodies. A secondary containment stormwater management system will contain runoff from the rig mat area and the fuel storage tanks, during the 2-year, 24-hour storm event. This system will collect stormwater runoff and operation fluid volumes that could run off the drill rig during drilling operations (i.e. drilling mud, drill water, etc.); two sump pumps in the containment ditch which will direct the volumes into collection tanks. The storage capacity of the onsite retention system and perimeter berm is designed to mitigate risk of run-off during a 100-year storm event.

Additional operational safeguards are described in documents to be submitted in support of this application. These include the Drilling Program, and Additional Well Control Measures, which outlines practices and mechanical systems, such as the BOP stack, which are designed to meet or exceed FDEP standards and prevent surface blowouts. Also described are contingency plans developed to respond to hypothetical well control events.

CONCLUSION

The referenced Application for Permit to Drill #1374, NLT Royalty Partners 10-4 Exploration well No. 1 Oil Well Pad provides for the adequate protection of surface waters pursuant to Florida Statutes 377.242(1)(a)(4). Due to the low-to-normally pressured nature of the Smackover Formation and the implementation of cultural and operational safeguards, the risk of a surface blowout at the proposed well should be considered low. Should a well control event result in surface fluids, the engineered system control including the 3-ft. perimeter berm and secondary containment around the drill rig mitigates the risk of discharge into local water bodies. Well control protocols are in place and blowout preventions are in place for drilling. Equipment for spill cleanup and personnel will be available during drilling.

We trust the attached information is sufficient to provide reasonable assurance for adequate protection of surface waters. If you have any questions or need anything else regarding these responses, please don't hesitate to contact me. Thanks so much, and all the best.

Sincerely,

KLEINFELDER, INC.



Shannon Freemon
Project Manager

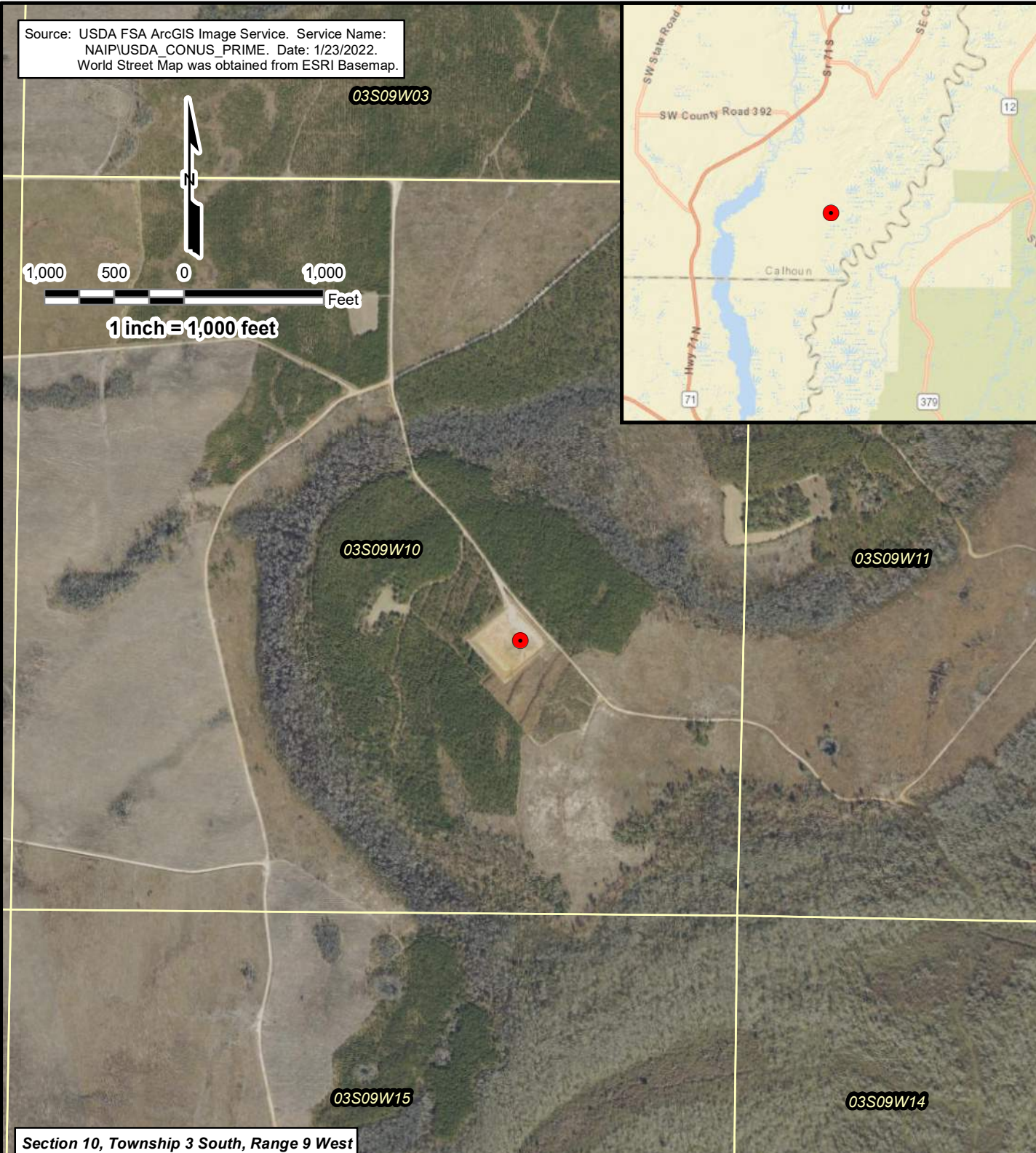
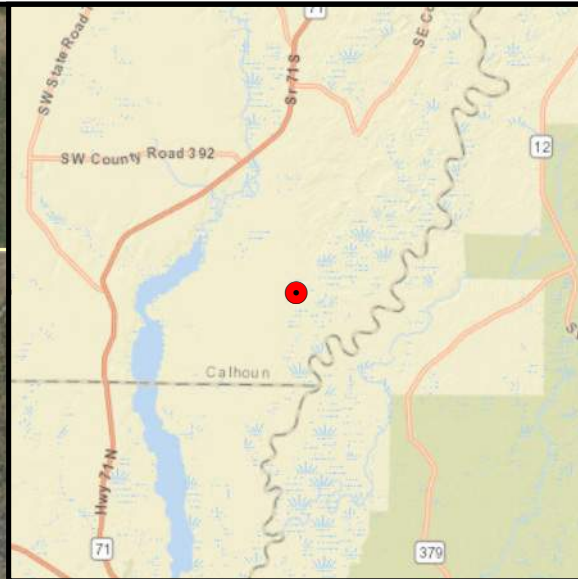
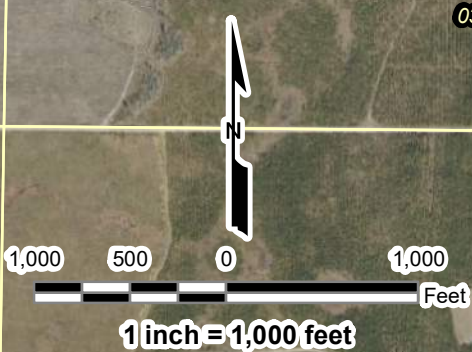


Ed Murawski
Program Manager

cc: Camp Campbell, Clearwater Land & Minerals FLA, LLC
Timothy Riley, Gunster

Attachments: Figure 1 – Location Map
Figure 2 – Watershed Boundary Map
Figure 3 – USGS Topo Map
Figure 4 – National Wetlands Inventory Map

Source: USDA FSA ArcGIS Image Service. Service Name: NAIP/USDA_CONUS_PRIME. Date: 1/23/2022. World Street Map was obtained from ESRI Basemap.



Section 10, Township 3 South, Range 9 West

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Legend

● Well Location

03S09W10 = Township South, Range West, Section

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	DRAWN: 10/30/2023
	DRAWN BY: NL
	CHECKED BY: DSP
	FILE NAME: 23-1030-CLM Well 1374Pad1-Location.mxd

Location Map

Clearwater Land & Minerals FLA, LLC
FDEP Oil & Gas Program - Permit to Drill
Stream Protection Letter
NLT Royalty Partners 10-4 Well at Pad 1
Calhoun, Florida

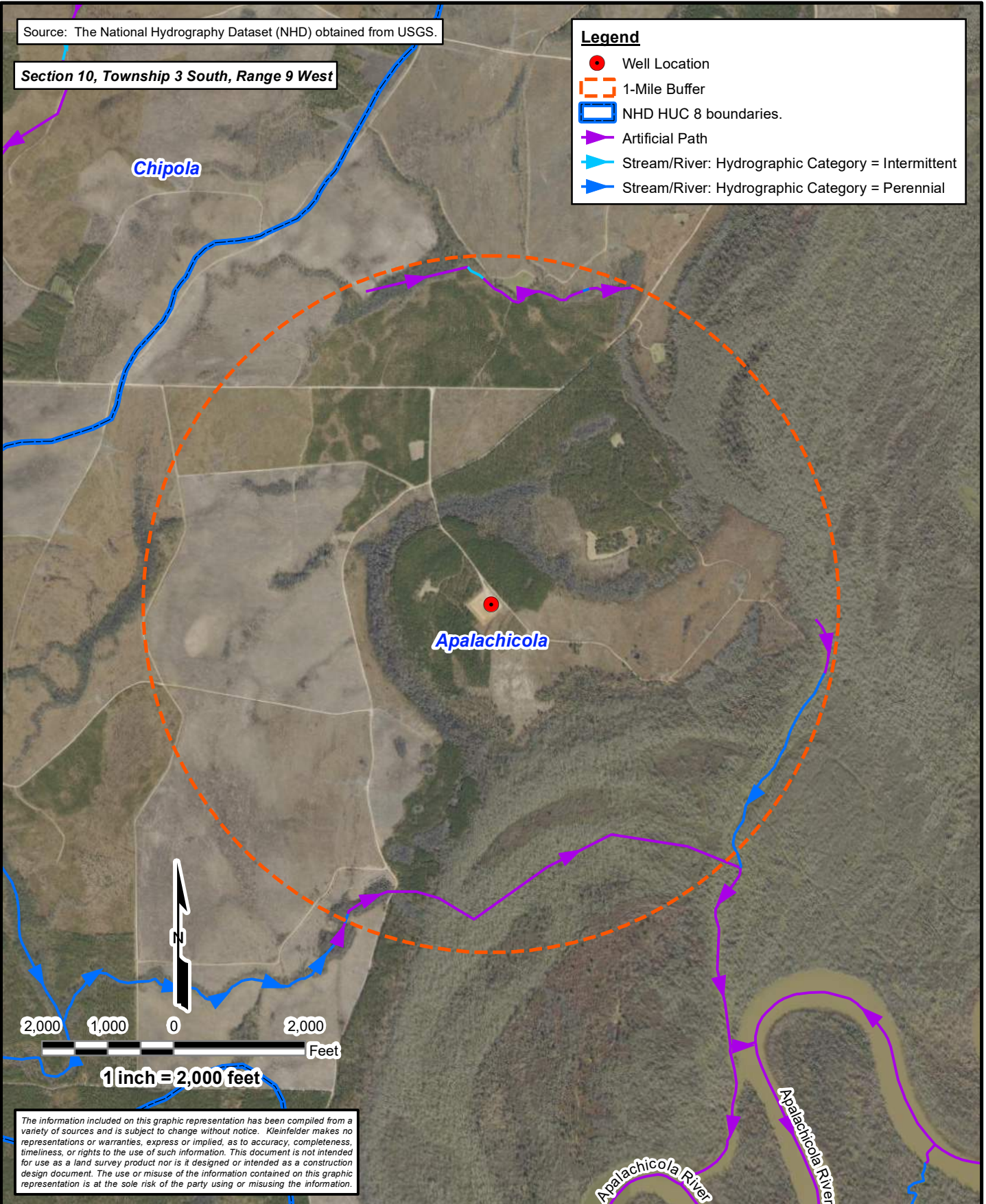
FIGURE
1

Source: The National Hydrography Dataset (NHD) obtained from USGS.

Section 10, Township 3 South, Range 9 West


Legend

- Well Location
- 1-Mile Buffer
- NHD HUC 8 boundaries.
- ▶ Artificial Path
- ▶ Stream/River: Hydrographic Category = Intermittent
- ▶ Stream/River: Hydrographic Category = Perennial



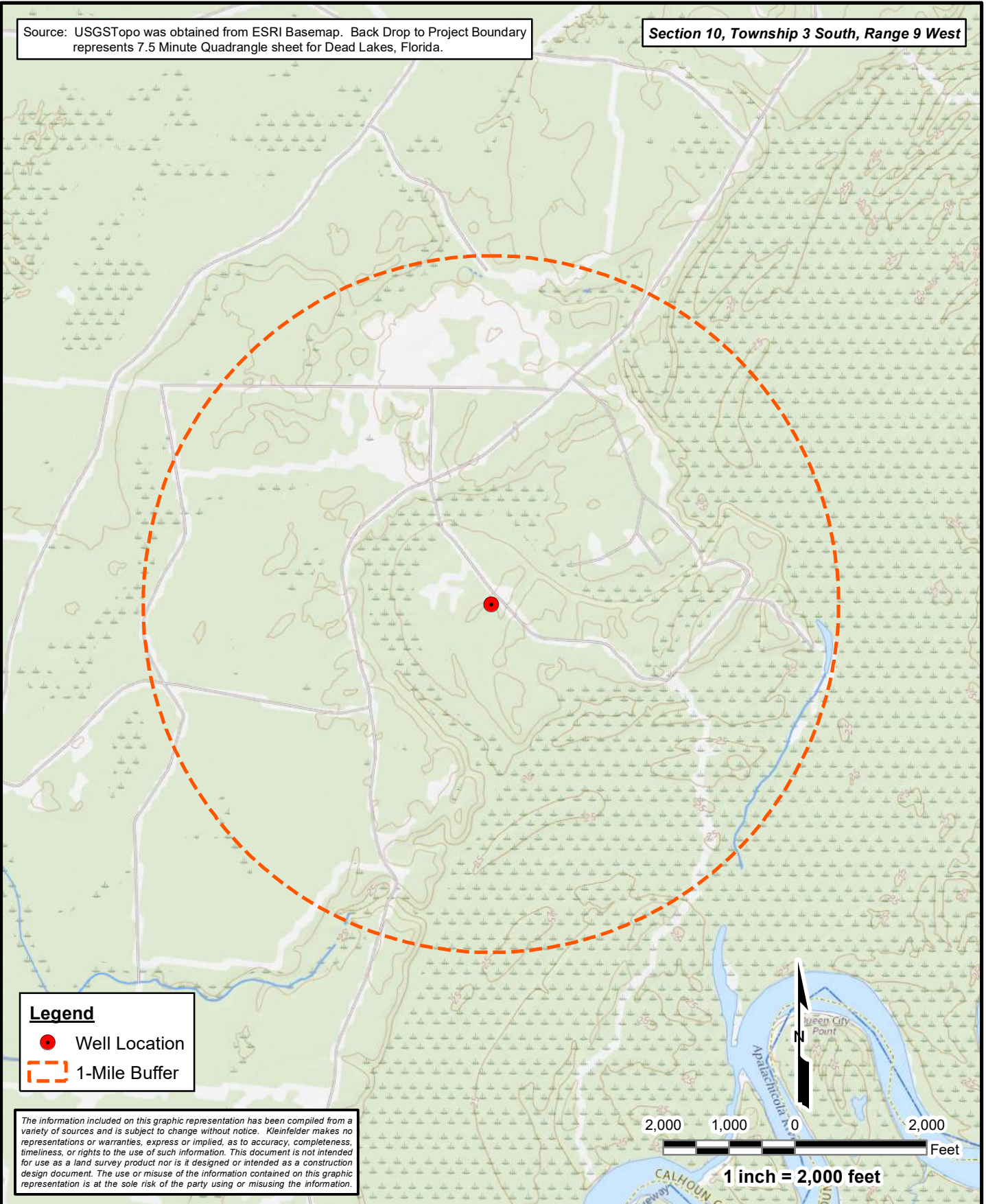
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 <p>KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com</p>	PROJECT NO. 24001925.001A	<p>Watershed Boundary Map</p> <p>Clearwater Land & Minerals FLA, LLC FDEP Oil & Gas Program - Permit to Drill Stream Protection Letter NLT Royalty Partners 10-4 Well at Pad 1 Calhoun, Florida</p>	FIGURE
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	DRAWN BY: NL		
	CHECKED BY: DSP		
FILE NAME: 23-1030-CLM Well 1374Pad1-Watershed.mxd			

Source: USGSTopo was obtained from ESRI Basemap. Back Drop to Project Boundary represents 7.5 Minute Quadrangle sheet for Dead Lakes, Florida.

Section 10, Township 3 South, Range 9 West



Legend

- Well Location
- 1-Mile Buffer

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PROJECT NO.	24001925.001A
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FILE NAME:	23-1030-CLM Well 1374Pad1-USGS.mxd

USGS Topo Map

Clearwater Land & Minerals FLA, LLC
FDEP Oil & Gas Program - Permit to Drill
Stream Protection Letter
NLT Royalty Partners 10-4 Well at Pad 1
Calhoun, Florida

FIGURE
3

Section 10
Township 3 South
Range 9 West




Legend

- Well Location
- 1-Mile Buffer
- National Wetlands Inventory (NWI)
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

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Source: USFWS National Wetland Inventory obtained from U.S. Fish & Wildlife Service in the form Geodatabase Feature Class. Date: October 23, 2023.

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 KLEINFELDER Bright People. Right Solutions. www.kleinfelder.com	PROJECT NO. 24001925.001A	National Wetlands Inventory Map Clearwater Land & Minerals FLA, LLC FDEP Oil & Gas Program - Permit to Drill Stream Protection Letter NLT Royalty Partners 10-4 Well at Pad 1 Calhoun, Florida	FIGURE
	DRAWN: 10/30/2023		4
	DRAWN BY: NL		
	CHECKED BY: DSP		
FILE NAME: 23-1030-CLM Well 1374Pad1-NWI.mxd			

ATTACHMENT 9
SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN (SPCC)

SPILL PREVENTION CONTROL & COUNTERMEASURE PLAN (SPCC)

DRILLING OPERATIONS:
RAPAD DRILLING COMPANY LLC
ONSHORE DRILLING RIGS
RIGS 31, 32, 33, 34, 35, 36, 41, 42, 43
TEXAS, LOUISIANA, MISSISSIPPI, ALABAMA, FLORIDA

PREPARED FOR:



RAPAD DRILLING COMPANY LLC
1309 HILLCREST DR.
LAUREL, MS 39440

FEBRUARY 2019

Prepared By:



APEX Environmental Consultants
1002 Terminal Dr. 2nd Floor
Hattiesburg, MS 39401
Phone: (601) 544-1477

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION.....	i
MANAGEMENT APPROVAL.....	i
CERTIFICATION.....	ii
1.0 INFORMATION - DRILLING OPERATIONS.....	1
2.0 DESCRIPTION OF DRILLING OPERATIONS.....	2
3.0 SPILL HISTORY.....	2
4.0 SPILL CONTROL EQUIPMENT.....	2
5.0 SPILL POTENTIAL.....	2
6.0 CONTAINMENT AND/OR DIVERSIONARY SYSTEMS.....	3
7.0 DRAINAGE.....	3
8.0 LOADING AREAS.....	4
9.0 FLOWLINES.....	5
10.0 BLOWOUT PREVENTERS.....	5
11.0 INSPECTIONS AND RECORDS.....	5
11.1 Secondary Containment Rainwater/Condensate Removal Procedure.....	5
11.2 Spill Prevention Inspection Checklist Procedures.....	6
12.0 SECURITY.....	6
13.0 PERSONNEL, TRAINING AND SPILL PREVENTION PROCEDURES.....	6
14.0 SPILL CONTINGENCY PLAN.....	7
14.1 Action Steps For an Oil Spill Incident.....	7

FIGURES: Figure showing general layout for each drilling rig (31, 32, 33, 34, 35, 36, 41, 42, 43)

TABLES: Fact sheet / equipment list for each drilling rig (31, 32, 33, 34, 35, 36, 41, 42, 43)

APPENDICES:

- Appendix A:..... Spill Response Telephone Listing
- Appendix B:..... AST Secondary Containment Draining Record
- Appendix C:..... Spill Prevention Inspection Checklist
- Appendix D:..... Spill Incident Report Form
- Appendix E:..... Personnel Training Form
- Appendix F:..... Certification of No Substantial Harm Facility
- Appendix G:..... SPCC Training, Inspection, and Record Keeping
- Appendix H:..... EPA SPCC Plan Regulatory Cross-Reference
- Appendix I:..... Record of Changes to SPCC Plan & Plan 5-Year Review

INTRODUCTION

RAPAD Drilling Company LLC (RAPAD Drilling) pursuant to 40 CFR 112 hereby establishes a Spill Prevention Control & Countermeasure Plan (SPCC Plan), which shall be maintained, at each drilling rig operation. The management of RAPAD Drilling acknowledges its responsibility to its neighbors, employees, and the community to take all reasonable steps necessary to prevent spills from its Drilling Operations in order to protect human health and the environment. If, despite RAPAD Drilling efforts a spill does occur, the agents and employees of RAPAD Drilling shall take all necessary steps as outlined in the SPCC Plan to minimize the impact of such a spill.

The SPCC Plan is a working document designed to be a tool RAPAD Drilling uses regularly to prevent or minimize spills. As such, RAPAD Drilling shall inform its agents and employees of the provisions of the SPCC Plan so they know their role in maintaining the SPCC Plan and mitigating the impact of a spill. RAPAD Drilling is committed to providing the necessary resources to establish and maintain the SPCC Plan set forth herein. Administrative changes, such as a change of phone numbers, do not require certification and must be implemented as soon as possible to this Plan, but not later than 6 months after such change has occurred.

The Plan shall be reviewed every five years by the owner and operators in accordance with 40 CFR 112.5(b) or sooner if any changes impact the Plan. The Plan shall be amended within six months of the review. The review and amendments must be documented and amendments to the Plan must be certified (112.5(c)).

MANAGEMENT APPROVAL

This SPCC Plan will be implemented as herein described.

Rob Holbrook

Print Name:



Signature:

V.P.

Title:

2-18-19

Date:

Note: Management signature above indicates RAPAD Drilling commitment to implementing the SPCC Plan and engaging the resources needed to respond and remediate a spill to protect human health and the environment.

CERTIFICATION:

In accordance with 40 CFR Part 112.3(d), I hereby certify that I or my agent has visited the site and examined the facility and being familiar with the provisions of 40 CFR Part 112 attest that this Plan has been prepared in accordance with good environmental engineering practices and applicable industry standards; the procedures for SPCC required inspections and testing are established herein; and this SPCC Plan is adequate for this facility with exceptions if noted.

Limitations: Neither Apex Environmental Consultants, Inc., Nor Derrick Charbonnet P.E. assumes any liability or Responsibility for implementation of this plan or its procedures. Design of Containment and diversionary structures is by "others", Comments contained herein are based on visual inspection only. The Information contained herein regarding the site is based on "visual" observation only.

Derrick Charbonnet
Printed Name of Registered Professional Engineer

MS 13283
Registration No.


Signature of Registered Professional Engineer

2/8/19
Date

Seal:



1.0 INFORMATION - DRILLING OPERATIONS

This Spill Prevention, Control and Countermeasure (SPCC) Plan was prepared at the request of Mr. David Byrd (HSE) of RAPAD Drilling for their Onshore Oil Well Drilling Operations. All questions relating to this SPCC Plan or the Drilling Operations should be directed to RAPAD Drilling personnel as indicated below.

Onshore Drilling Rigs: RAPAD Drilling Rigs 31, 32, 33, 34, 35, 36, 41, 42, 43 (9-drilling rigs)

Drilling Rig Locations: Drilling rigs are mobile and setup at various locations in Texas, Louisiana, Mississippi, Alabama, and Florida.

Owner or Operator Name: RAPAD Drilling LLC

Owner or Operator Address: 1309 Hillcrest Drive

City: Laurel State: Mississippi ZIP: 39440

County: Jones Tel. Number: (601) 649 – 0760

Designated Responsible Persons for Spill Prevention and Emergency Coordination:

Primary Contact:

Drilling Rig Tool Pusher
601-649-0760

Secondary Contact:

David Byrd, HSE Manager
601-310-7800

2.0 DESCRIPTION OF DRILLING OPERATIONS

RAPAD Drilling consists of nine (9) mobile onshore drilling rigs. The drilling rigs operate at various locations in Texas, Louisiana, Mississippi, Alabama, and Florida. Detailed information on each drilling rig and a general site layout is presented in the Figures and Tables section of this document.

3.0 SPILL HISTORY

The following table lists spills that have occurred:

Date	Product Spilled	Amount Spilled (gals)	Spill Contained Onsite Yes/No	Soil Remediation Yes/No	Ground Water Remediation Yes/No	Comments
No spills have occurred.						

Note: See onsite files for specific details regarding spill history.

4.0 SPILL CONTROL EQUIPMENT (Aboveground Storage Tank - AST)

Spill Control Equipment (absorbent material) is stored on the rig. Additional equipment is available from spill response contractor.

5.0 SPILL POTENTIAL

The following table presents the spill potential from for each drilling rig showing the type and volume of materials onsite (§112.7(a)(3)(i)) :

RIG #	MATERIAL	STORAGE CONTAINER	VOLUME
31	Diesel Fuel	One Single-Walled, Steel AST	14,000 gallons
31	Drilling Mud	Three Single-Walled, Steel AST	67,200 gallons
32	Diesel Fuel	One Single-Walled, Steel AST	9,000 gallons
32	Drilling Mud	Two Single-Walled, Steel AST	39,480 gallons
33	Diesel Fuel	One Single-Walled, Steel AST	14,000 gallons
33	Drilling Mud	Two Single-Walled, Steel AST	50,400 gallons
34	Diesel Fuel	One Single-Walled, Steel AST	14,000 gallons
34	Drilling Mud	Three Single-Walled, Steel AST	66,570 gallons
35	Diesel Fuel	One Single-Walled, Steel AST	10,000 gallons
35	Drilling Mud	Two Single-Walled, Steel AST	40,320 gallons
36	Diesel Fuel	One Single-Walled, Steel AST	14,000 gallons
36	Drilling Mud	Two Single-Walled, Steel AST	53,760 gallons
41	Diesel Fuel	One Single-Walled, Steel AST	20,000 gallons
41	Drilling Mud	Two Single-Walled, Steel AST	59,010 gallons
42	Diesel Fuel	One Single-Walled, Steel AST	20,000 gallons
42	Drilling Mud	Two Single-Walled, Steel AST	52,500 gallons
43	Diesel Fuel	One Single-Walled, Steel AST	20,000 gallons
43	Drilling Mud	Two Single-Walled, Steel AST	52,500 gallons

6.0 CONTAINMENT AND/OR DIVERSIONARY SYSTEMS

Appropriate secondary containment and/or diversionary structures or equipment is provided for all oil handling containers, equipment, and transfer areas to prevent a discharge to navigable waters or adjoining shorelines. The entire secondary containment system, including walls and floor, is capable of containing oil and is constructed so that any discharge from a primary containment system, such as a tank or pipe, will not escape the containment system before cleanup occurs.

- Drainage is directed into the wellhead cellar when and where practical. Precautionary ditching and sump pit(s) or catch basins exist or are dug to insure containment of any possible spill. The reserve pit, if present, is used and when required by local, state, and /or federal agencies. A perimeter dike or berm may be used to isolate and prevent possible spills migrating offsite §112.10(c).
- Drilling rigs are positioned or located so that the risk of a spill reaching navigable waters is minimized §112.10(b).
- During drilling operations a blowout preventer (BOP) assembly appropriate for the work will be used and tested as required to insure good working order.
- Absorbent materials are stored on the rig §112.10(d).
- Additional materials such as booms and other barriers are available from the designated spill response contractor.

The use of the existing containment and diversionary structures, combined with readily available equipment to prevent the release of diesel fuel or other petroleum products from reaching navigable waters, appears to be practical and effective for the drilling operations. Use of the following methods of secondary containment or its equivalent will be implemented: (1) Dikes, berms, or retaining walls sufficiently impervious to contain oil; (2) Curbing; (3) Culverting, gutters, or other drainage systems; (4) Weirs, booms, or other barriers; (5) Spill diversion ponds; (6) Detention ponds; or (7) Sorbent materials (§§112.6(a)(3)(i) and (ii), 112.7(c) and 112.9(c)(2)).

7.0 FACILITY DRAINAGE

Figures showing general Site Layout of each rig is presented in the Figures section of this document. The figures show how the rigs will possibly be positioned to prevent spill runoff. Well sites that are in close proximity to surface water such as rivers or creeks, special care will be taken to protect these sensitive areas.

- In the event of a spill from an AST an earthen dam will be immediately constructed along the drainage system down gradient from the spill area to contain the release for proper cleanup and disposal. When necessary, vacuum trucks and truck transports may be utilized or the use of a dirt moving contractor may be employed to aid in the construction of dikes, berms, spill diversion pits, and /or additional containment volume capacity. All rig personnel will work with diligence to prevent any spill from reaching any wetland, stream, lake, pond, navigable waters, or surface waters of any state.
- Site drainage systems and emergency contingency plans appear to be adequate to prevent petroleum products from reaching navigable water in the event of equipment failure or human error.

8.0 LOADING AREAS

Drip pans are used under hose connections and absorbent materials are available in case of a spill. Spill containment and absorbent materials are kept on the rigs. Appropriate personnel, using the following procedures, continually monitor unloading activities will be utilized to prevent discharge.

8.1 Loading Operation Procedures

A tanker truck operator will deliver fuel on a routine basis with proper certifications for transport of petroleum products in the state where the well site is located. The tanker truck transfers the petroleum products into designated tanks according to regulated procedures. To minimize the potential release during these transfer operations, the following procedures shall be observed.

- Upon arrival of the tanker truck, the truck driver shall inspect and gauge the contents of the on-site AST being filled.
- Prior to the commencement of the transfer operations, the operator/driver shall check for the following:
 - ◇ All connections between the truck and the material to be transferred are properly tightened to prevent leakage during transfer.
 - ◇ All secondary containment structures are intact and in good condition.
 - ◇ Spill/containment materials are readily available within the vicinity of the loading area.
 - ◇ No visible leaks are observed during the transfer operations.
- Should a leak in the connections or the transfer hose occur during transfer operations, the operator shall immediately cease the transfer operations until the leakage is corrected.
- If leakage is observed and is determined not to be correctable by either the operator or a representative, the operator shall discontinue the transfer operations and notify RAPAD Drilling site representative immediately of the spill. Site management will implement response procedures in the SPCC Plan.
- Upon completion of the loading operation, the representative shall verify:
 - ◇ That all transfer hoses have been disconnected
 - ◇ All storage tank valves or bung-hole covers have been closed/replaced.
 - ◇ That the tanker truck has no visible leaks.
 - ◇ All spilled material has been cleaned-up.
 - ◇ Proper material identification for the material being transferred via a bill of lading or a shipping manifest.

9.0 FLOWLINES

This SPCC plan covers rig operations during oil well drilling activities. All flowlines are inspected routinely during well drilling operations.

10.0 BLOWOUT PREVENTION

When moving mobile equipment onto a well site for any purpose, position or locate mobile drilling equipment to minimize discharge to water bodies. Prior to initial drilling operations, as per well-site operator, a blowout preventer (BOP) assembly and well control system is installed that is capable of controlling well head pressure expected during drilling operations. Casing and BOP installations are in accordance with state and regulatory agency requirement. Drilling fluids will be managed in accordance with the State and regulatory agency requirements. During drilling operations, a BOP assembly will be used and tested as necessary to ensure good working order. Fluids or gas shall be directed to appropriate operations (frac tank, storage tank, reserve pit) to ensure that produced materials do not escape.

11.0 INSPECTIONS AND RECORDS

Inspections will be conducted on a regular basis in order to reduce the likelihood of a spill occurring as a result of a mechanical failure, or as the result of corrosion or other failure. Written procedures for inspections have been developed and are attached with this SPCC Plan. A monthly inspection will be conducted utilizing the form in Appendix C, signed by the inspector, and maintained on file for documentation. Inspection records will show the date, time, necessary maintenance, and general condition. The facility inspector will note any problems observed and sign the Spill Prevention Inspection Checklist (Appendix C).

These inspections include an inspection of existing drainage systems per 40 CFR § 112.9(b) (2). Any oil accumulations will be cleaned up immediately. When an inspection indicates equipment requires upgrading to prevent discharge, a supervisor will be notified and equipment replaced as soon as possible per 40 CFR § 112.9(d) (4) (iii). During any inspection if leak or discharge is found cleanup will take place as fast as safely and logically possible per 40 CFR § 112.9(d)(4)(iv).

11.1 Secondary Containment Rainwater Removal Discharge Procedure

Above ground Storage Tanks (AST) containment or diversionary structures should be inspected on a routine basis for the presence of rainwater. While performing the inspection, indicate on the attached checklist (Appendix B) whether any oil product is visible on containment water by indicating Yes or No in the column "Sheen/Product Observed". Include the date the water was inspected, time the water was evacuated, approximate quantity evacuated, and the signature of the person who inspected and drained the rainwater from the AST. **IF PETROLEUM OR CHEMICAL IS PRESENT DURING THIS INSPECTION, NOTIFY MANAGEMENT AND DO NOT DRAIN THE WATER.**

11.2 Spill Prevention Inspection Checklist Procedures

The Spill Prevention Inspection Checklist (Appendix C) is used during monthly inspections of the Drilling Rig operations. While performing the inspection, place a check in the space provided on the checklist for those items inspected and indicates under "Remarks" those items that require repair or other action, such as dispatch to outside service contractors and/or mechanics.

12.0 SECURITY §112.7(g)

All personnel entering the drill site must check-in with onsite management and sign a roster/log.

Any valves which permit direct outward flow of a tank's contents are locked in the closed position when in non-operating or standby status. yes

Lighting is sufficient for discovery of spills occurring during hours of darkness and for prevention of spills occurring through acts of vandalism. yes

Other Security:

Site personnel conduct inspections of the facility on a routine basis.

13.0 PERSONNEL TRAINING AND SPILL PREVENTION PROCEDURES

Personnel are instructed in the operation and maintenance of equipment to prevent the discharges of petroleum products at the facility. Petroleum product transfer is limited to personnel that have been instructed in the safety and operation of the equipment during their initial training of their assigned classification. Personnel have been trained to inspect the AST's and facility piping. Personnel responsible for spill prevention and clean-up are aware of all Safety Data Sheet information including safety and health precautions, personal protective equipment, spills, and disposal information §112.7(f).

Spill Prevention briefings are conducted for personnel to assure adequate understanding of this SPCC Plan. This SPCC Plan incorporates applicable pollution control laws, rules and regulations.

Personnel responsible for spill prevention are required to have reviewed this SPCC Plan. Personnel should be made aware of regulations governing petroleum product spills and emergency response as part of their training. All personnel should sign the Personnel Review Listing in Appendix E of the SPCC Plan. Briefings are also conducted to update personnel of changes to the SPCC Plan. Copies of this SPCC Plan have been distributed to the Drilling Rig Tool Pushers, Safety Coordinator, and RAPAD Drilling Management. The Drilling Rig Tool Pushers and the Safety Coordinator are the persons accountable for petroleum product spill prevention at RAPAD Drilling Operations.

14.0 SPILL CONTINGENCY PLAN

This Spill Contingency Plan has been prepared for RAPAD Drilling operations. A list of names and telephone numbers are included in the following sections and as Appendix A of this plan. The Spill Incident Report Form is included as Appendix D for notification purposes in the event of a spill. In the event of a Reportable Quantity (RQ) spill the Rapid Drilling Qualified Individual (QI) will make appropriate notifications. In the event of a spill that threatens to enter or enters a water body or becomes unmanageable, RAPAD Drilling will contact a spill response contractor to assist in managing the spill.

The qualified individuals (QI) listed below have been granted full authority to implement spill response activities (§112.7(a)(3)(vi)):

QI Primary Contact:

Drilling Rig Tool Pusher
Phone: 601-649-0760

QI Secondary Contact:

David Byrd, HSE Manager
Phone: 601-649-0760 | Cell: 601-310-7800

14.1 Action Steps for an Oil Spill Incident for RAPAD Drilling Operations

Immediate Actions:

Any employee observing or receiving knowledge of an oil spill must immediately take actions to minimize injuries, damage, and notify RAPAD Drilling Qualified Individual (QI) to implement this response plan. The priority in all circumstances, in order of importance, is:

- 1) **Ensure safety of spill responders and the public.**
- 2) **Stop economic and environmental losses.**
- 3) **Report the spill to federal, state and local agencies as required.**

FIRST TEN ACTION STEPS

Step 1. Evaluate situation for safety hazards. Take immediate measures to minimize the threat to human life or health -- provide safe rescue or first aid as required. Remember to:

- avoid direct contact with the spilled material
- stay upwind to avoid inhalation hazards
- determine and remove all ignition sources
- secure incident area and keep on-lookers/people away from the incident scene
- assess injuries and notify emergency agencies for assistance if needed

Step 2. Stop discharge as soon as safe to do so. Shut down operation in progress following pre-established procedures to prevent further damage.

Step 3. Contact RAPAD Drilling Operations qualified individual (QI). Provide the following information:

- type of material spilled
- estimate of quantity discharged
- rate of discharge
- time, location, cause, and source of spill
- size of area impacted and description of affected medium (i.e., air, water, soil).
- actions being used to stop, remove, and mitigate spill

Step 4. QI will approve the commencement of response activities until his on-scene arrival. In the event a spill is unmanageable or threatens to enter a water body, the QI will contact the designated OSRO (Oil Spill Response Organization) for spill response assistance.

Step 5. Determine source of spill using appropriate personal protection equipment.

Step 6. Secure source of spill or minimize the potential discharge by transferring or isolating product.

Step 7. Contain spill as close to source as possible to minimize spread. Get assistance to contain spill if necessary. Protect sensitive areas such as water bodies if possible.

Step 8. QI or designee will contact RAPAD Drilling corporate officials. QI or designee will simultaneously with other activities, contact federal, state, and local emergency response officials listed on the following page and Appendix A. Also QI or designee will complete the Spill Incident Report Form in Appendix D.

Step 9. QI or designee will contact other entities that could be impacted by the spill.

Step 10. Begin cleanup and product recovery.

The qualified individuals (QI) listed below have been granted full authority to implement spill response activities (§112.7(a)(3)(vi)):

QI Primary Contact:
 Drilling Rig Tool Pusher
 Phone: 601-649-0760

QI Secondary Contact:
 David Byrd, HSE Manager
 Phone: 601-649-0760
 Cell: 601-310-7800

Emergency Notification Phone List (§112.7(a)(3)(vi)):

External Contacts - Local Emergency Assistance

Sheriff's Department	911
Highway Patrol	911
Emergency (ambulance, fire, etc.)	911
Hospital	911

Spill Response Contractors (OSRO) (§112.7(a)(3)(vi)):

1. Kelly Brothers / Complete Environmental (office 601-794-2300)	24-Hr: 800-689-5656
2. Oil Recovery Company (ORC) (office 251-690-9010)	24-Hr: 800-350-0443
3. US Environmental (office 601-372-3232 281-606-4960)	24-Hr: 601-735-2541

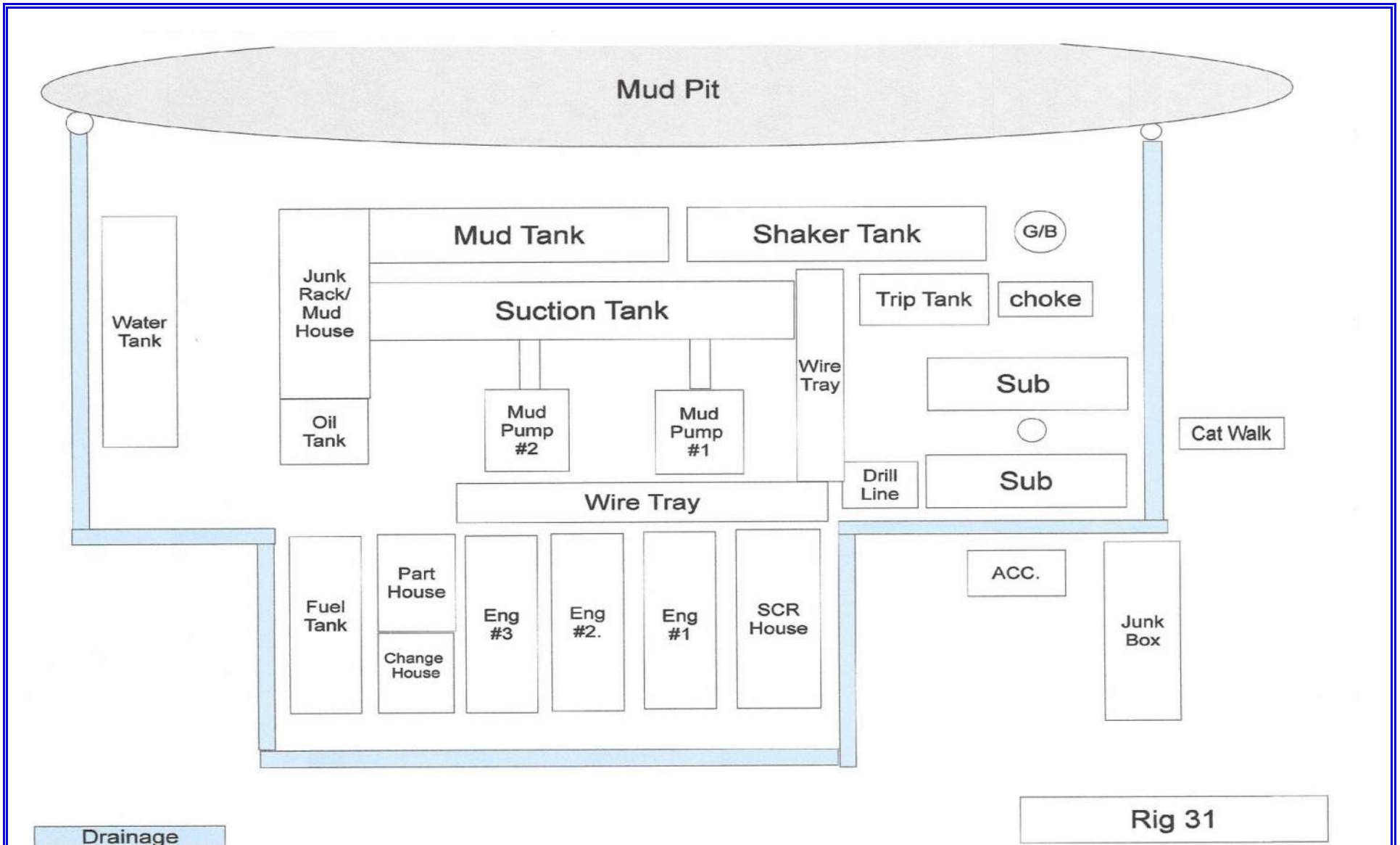
External Contacts - Federal and State Agencies (§112.7(a)(3)(vi)):

National Response Center	(800) 424-8802	Verbal within 1-hour as soon as possible with as much information as possible if reportable quantity (RQ) spill as defined by 40 CFR 112*. (§112.7(a)(4) and (a)(5)): See footnote below for RQ
State Contacts for Mississippi		
Mississippi Department of Environmental Quality	(601) 961-5171	Verbal within 1 hour with as much info as possible
Mississippi State Oil & Gas Board	(601) 576-4900	Verbal within 1 hour with as much info as possible
State Contacts for Alabama		
Alabama Department of Environmental Management	(251) 450-3400	Verbal within 1 hour with as much info as possible
Alabama State Oil & Gas Board	(205) 349-2852	Verbal within 1 hour with as much info as possible
State Contacts for Florida		
Florida Department of Environmental Protection, Emergency Response	(850) 245-2010	Verbal within 1 hour with as much info as possible
Florida State Watch Office	(800)-320-0519	
Florida Department of Environmental Protection, Oil and Gas	(850) 717-9110	Verbal within 1 hour
State Contacts for Louisiana		
Louisiana Department of Environmental Quality	1-888-763-5424	Verbal within 1 hour with as much info as possible
Louisiana State Police	(877) 925-6595	Verbal as soon as possible
Louisiana Office of Conservation	(225) 342-5515	Verbal after State Police
State Contact for Texas		
Texas Spill Reporting Hotline	800-832-8224	Verbal within 1 hour with as much info as possible
<i>Note: The hotline is a clearing house for Texas Commission Environmental Quality & Texas Railroad Commission.</i>		
Federal Contacts		
Environmental Protection Agency, Region IV. Mississippi, Alabama, Florida	(404) 562-8700	Submit required written information within 60 days if reportable quantity exceeds 25 gals or spill into water that creates a sheen on waterbody as defined by 40 CFR Part 112.4(a).
Environmental Protection Agency, Region VI. Louisiana and Texas	866-372-7745	Submit required written information within 60 days if reportable quantity exceeds 25 gals or spill into water that creates a sheen on waterbody as defined by 40 CFR Part 112.4(a).

* **Reportable Quantity (RQ)** – 25 gals or discharges of such quantities of oil into or upon navigable waters of the U.S., adjoining shorelines that creates a sheen, or into or upon the waters of the contiguous zone determined to be harmful to the public health or welfare of the U.S., including those that:

1. Violate applicable water quality standards; or
2. Cause a sheen or film upon or discoloration of the water surface or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the water surface or upon adjoining shorelines.

FIGURES
Figures Showing General Rig Layout
Rigs 31, 32, 33, 34, 35, 36, 41, 42, 43



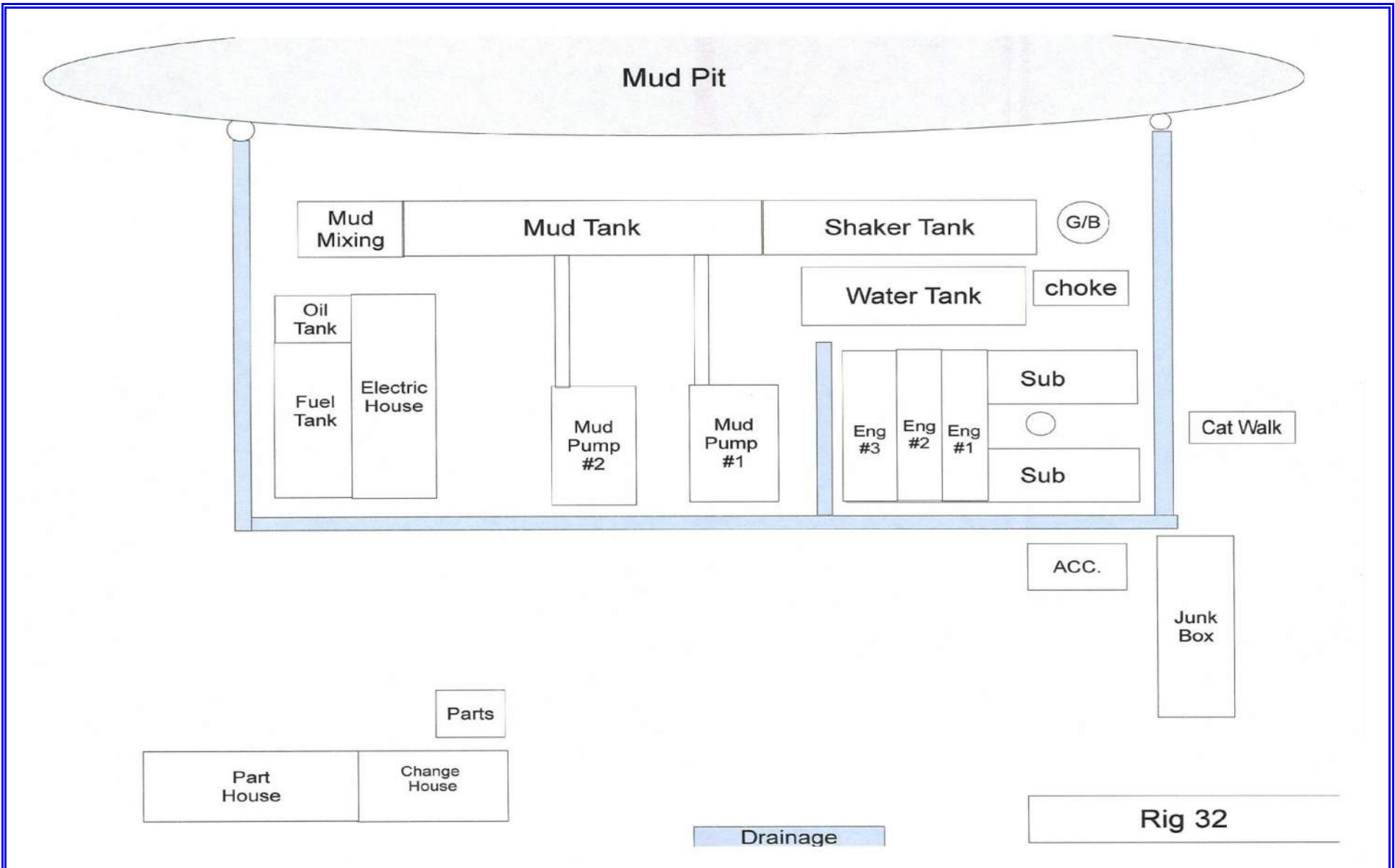
General Layout

RAPAD Rig 31
 Diesel Electric
 Capability 30,000 ft

Reference: CW Miller 10-1-2010

Date:	2/4/2019	Project #	RAPAD Rig 31
Scale:	NTS	Figure:	1





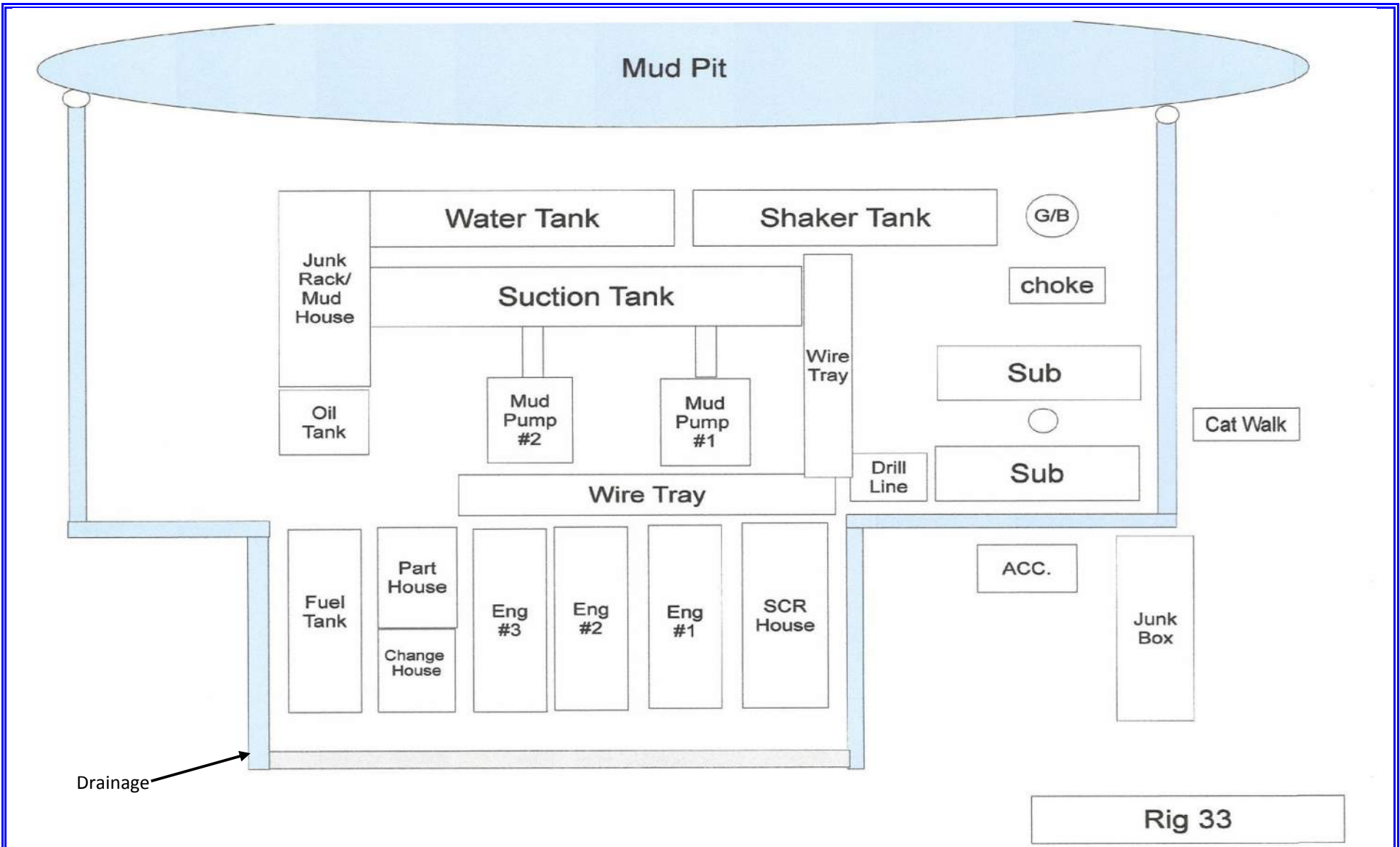
General Site Layout

RAPAD Rig 32
 Mechanical Rig
 Capability 16,500 ft

Reference: CW Miller 10-1-2010

Date:	2/4/2019	Project #	RAPAD Rig 32
Scale:	NTS	Figure:	2





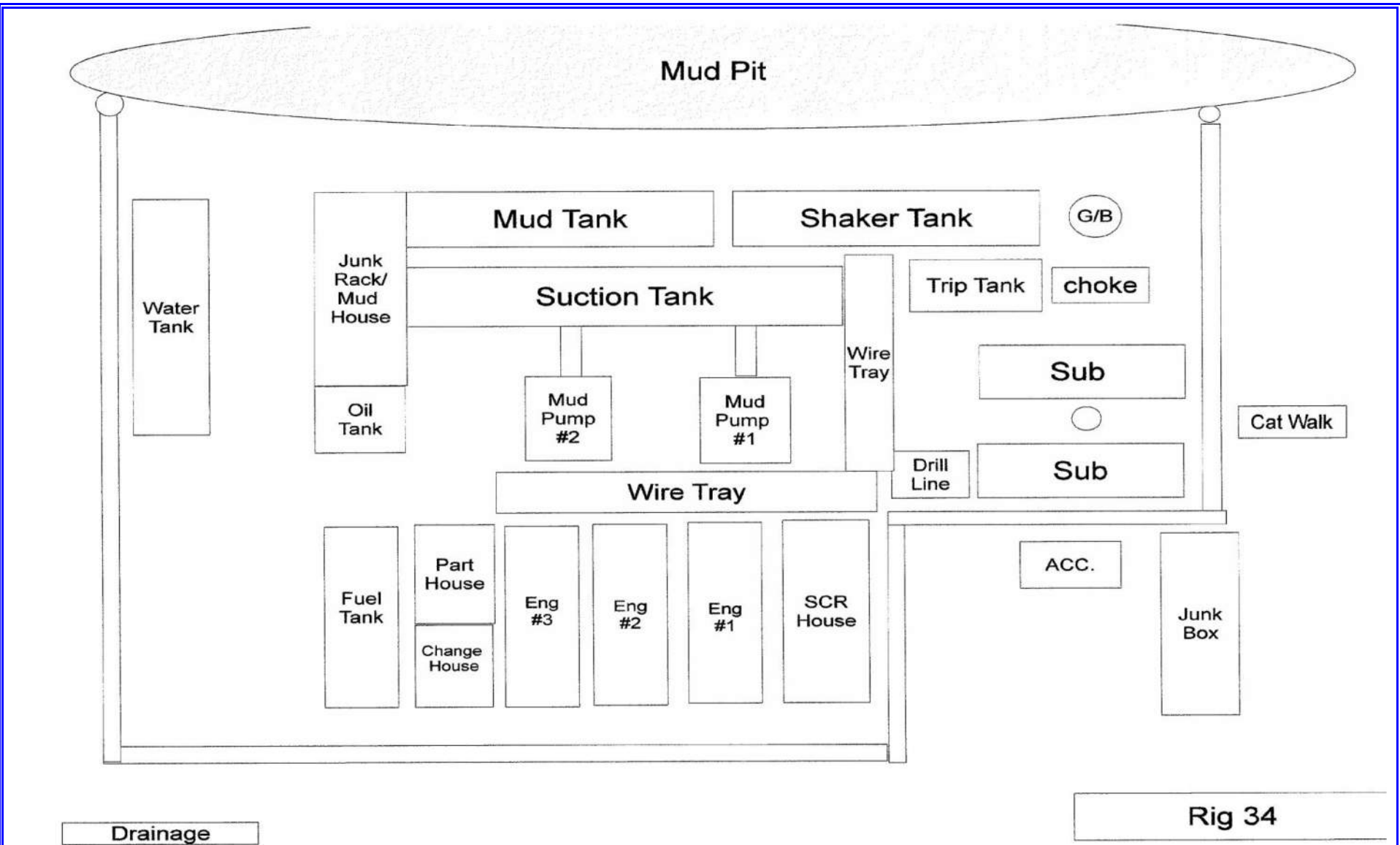
General Site Layout

RAPAD Rig 33
 Diesel Electric
 Capability 22,000 ft

Reference: CW Miller 10-1-2010

Date:	2/4/2019	Project #	RAPAD Rig 33
Scale:	NTS	Figure:	3





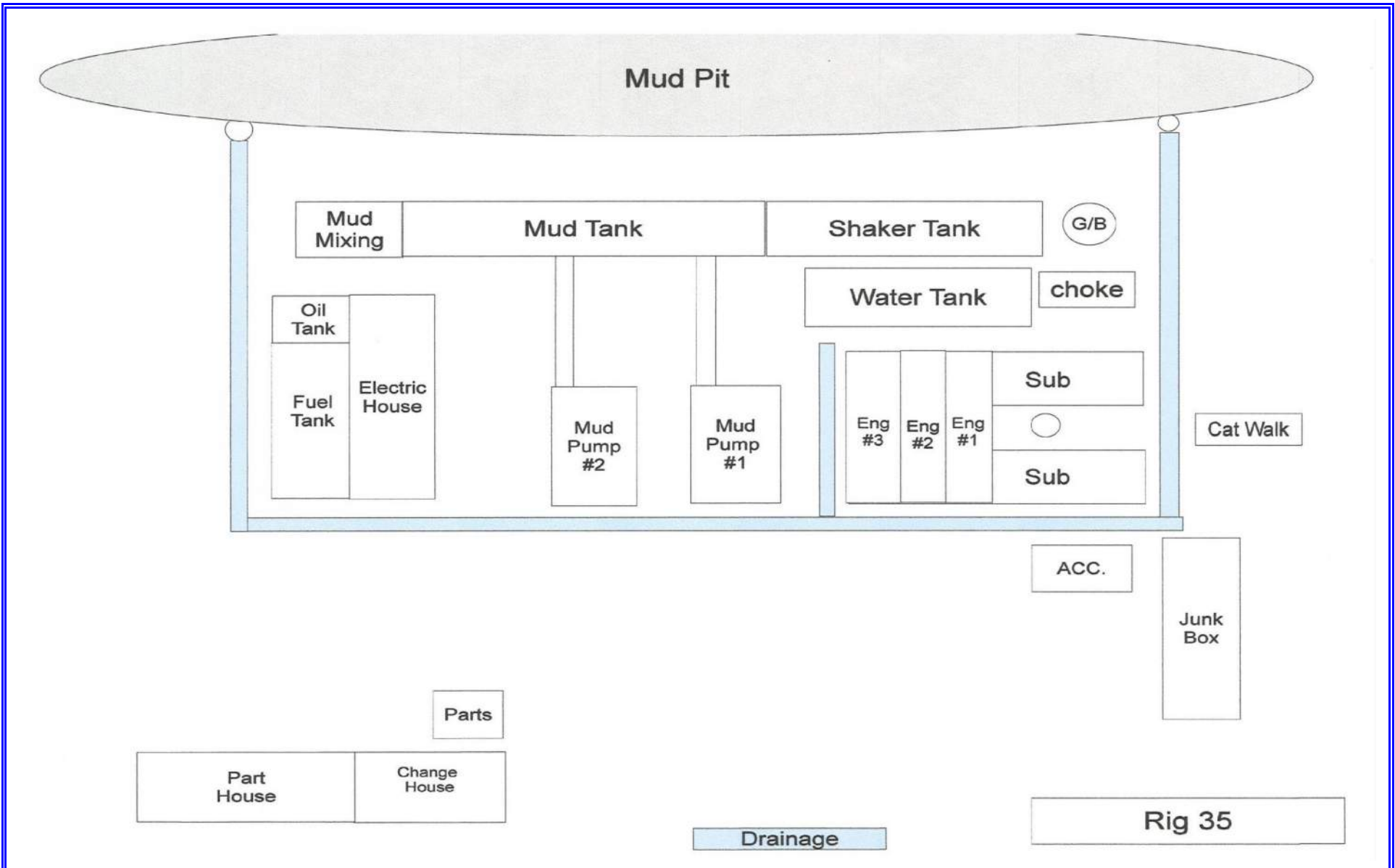
General Site Layout

RAPAD Rig 34
 Diesel Electric
 Capability 30,000 ft

Reference: CW Miller 10-1-2010

Date:	2/4/2019	Project #	RAPAD Rig 34
Scale:	NTS	Figure:	4





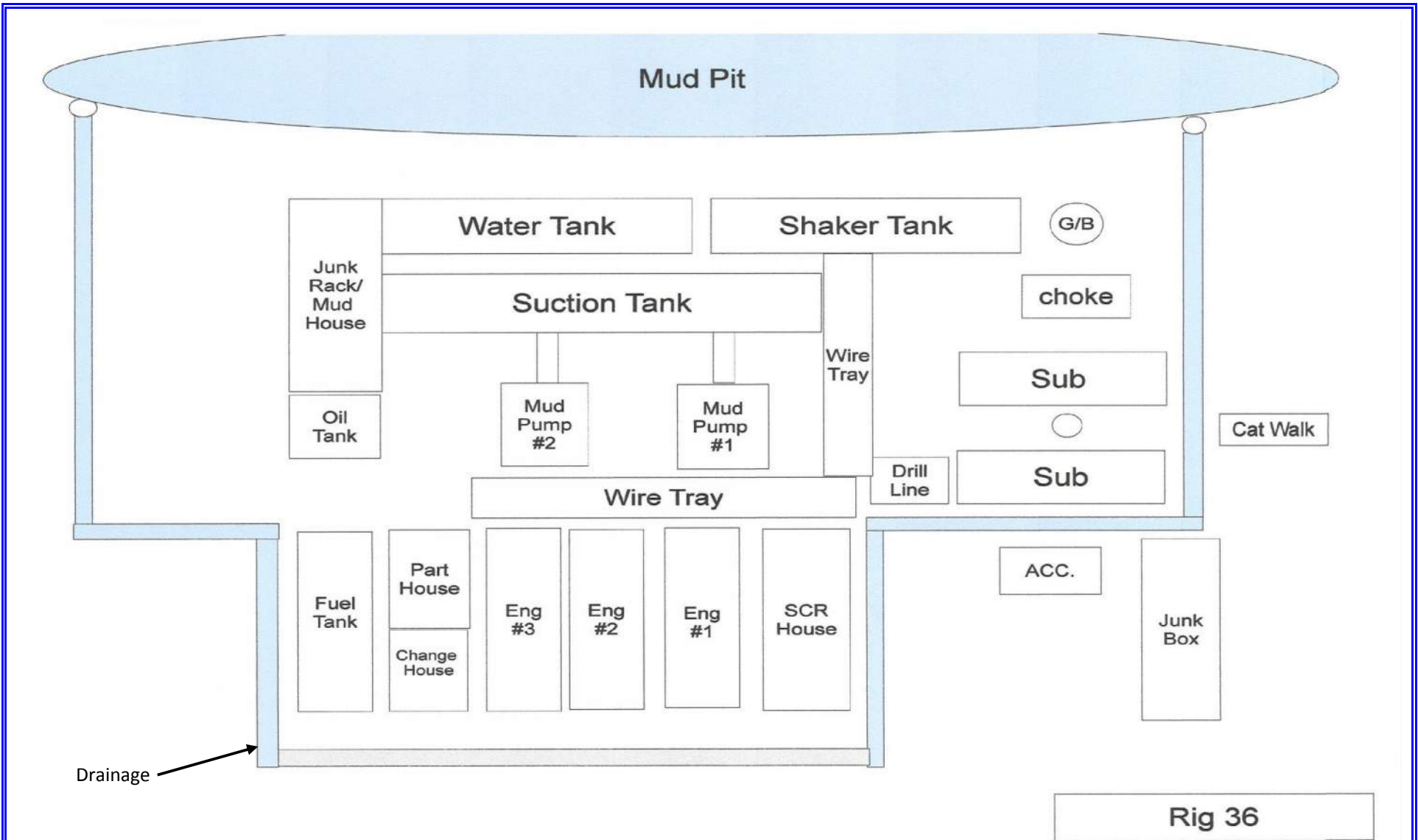
General Site Layout

RAPAD Rig 35
 Mechanical Rig
 Capability 16,500 ft

Reference: CW Miller 10-1-2010

Date:	2/4/2019	Project #	RAPAD Rig 35
Scale:	NTS	Figure:	5





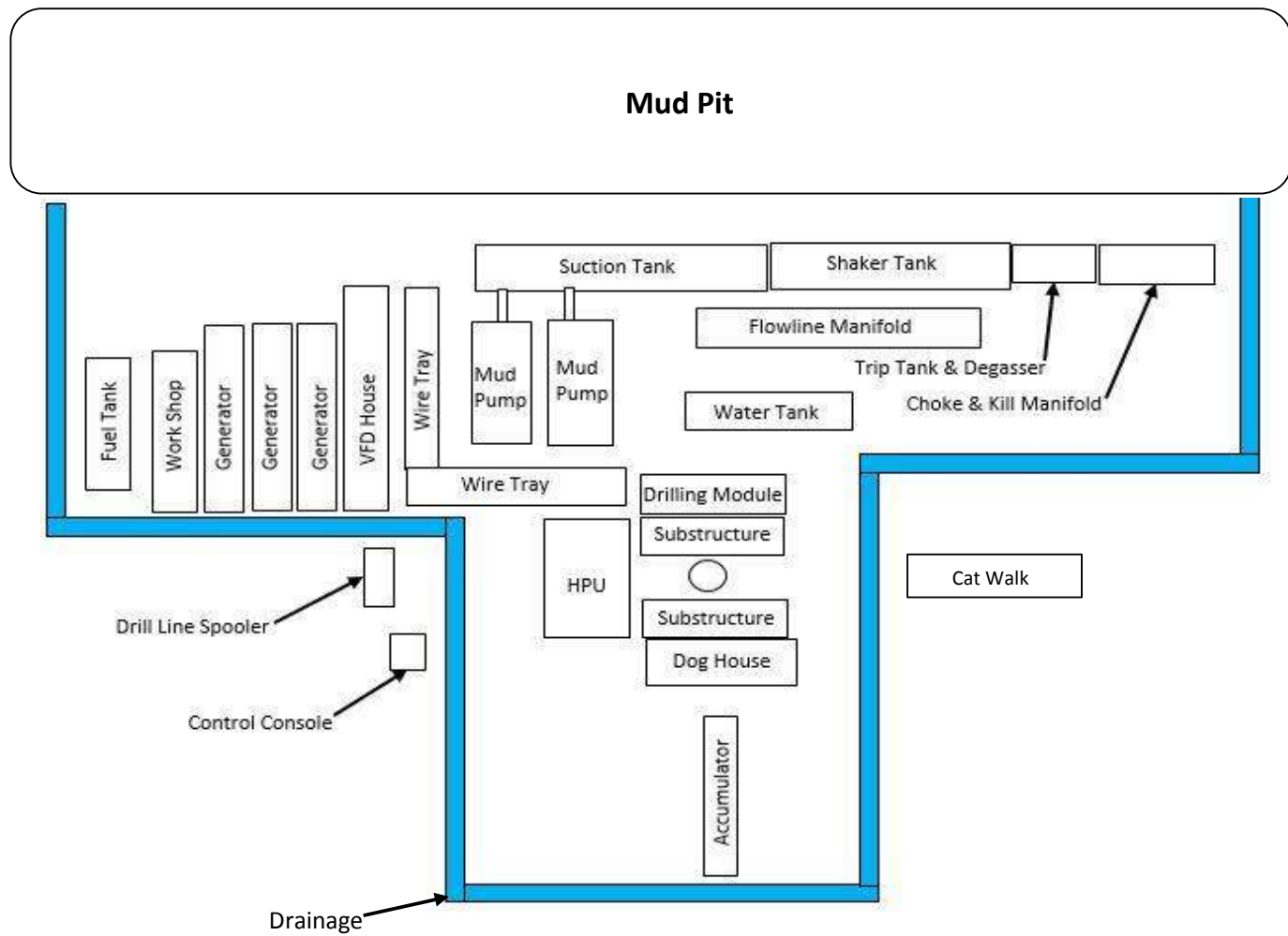
General Site Layout

RAPAD Rig 36
 Diesel Electric
 Capability 22,000 ft

Reference: CW Miller 10-1-2010

Date:	2/4/2019	Project #	RAPAD Rig 36
Scale:	NTS	Figure:	6





Rig 41

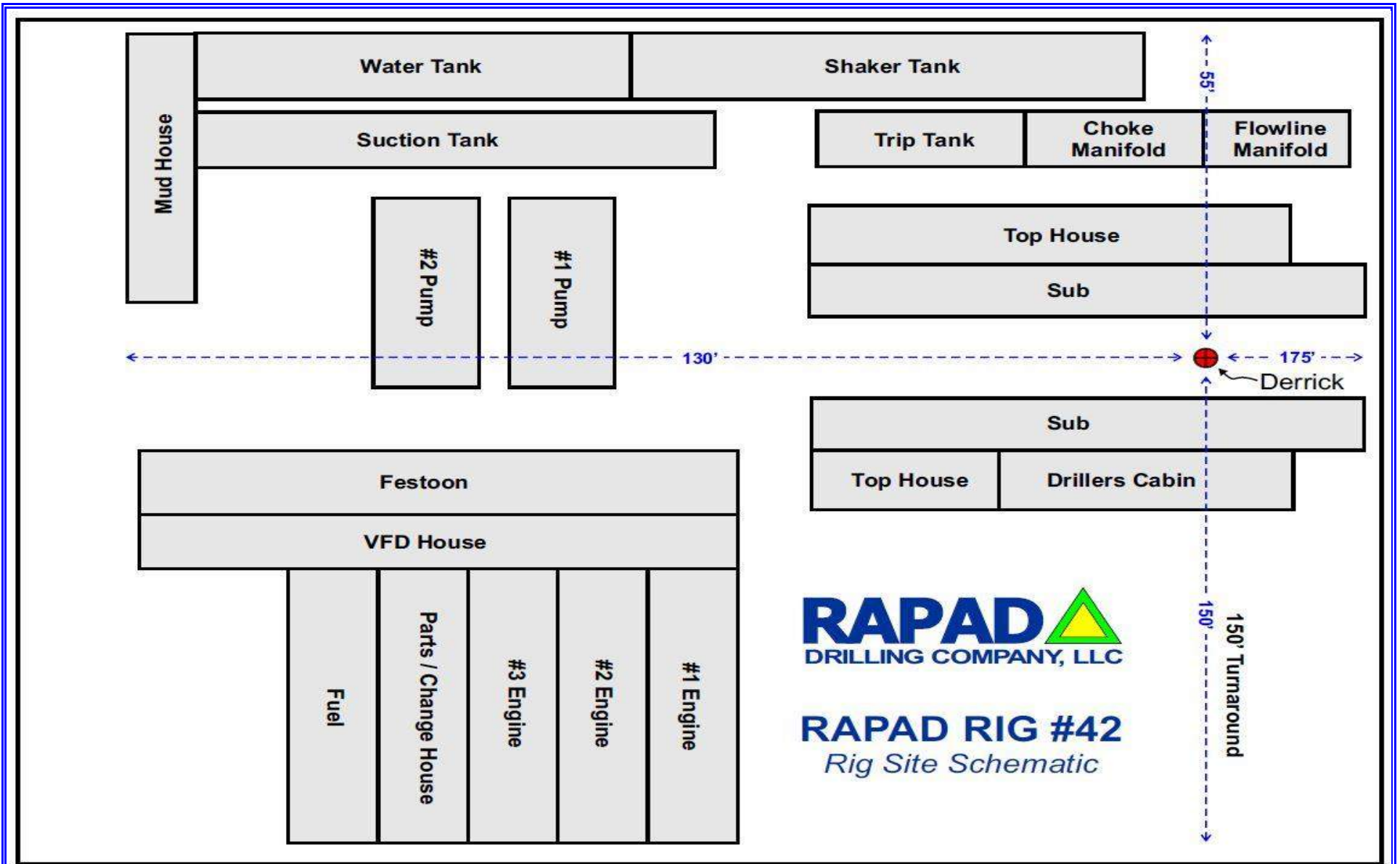
General Layout

Rig 41
Topdrive Varco
1100 HP

Reference: National Oilwell Varco Figure

Date:	2/4/2019	Project #	RAPAD Rig 41
Scale:	NTS	Figure:	7





RAPAD RIG #42
Rig Site Schematic

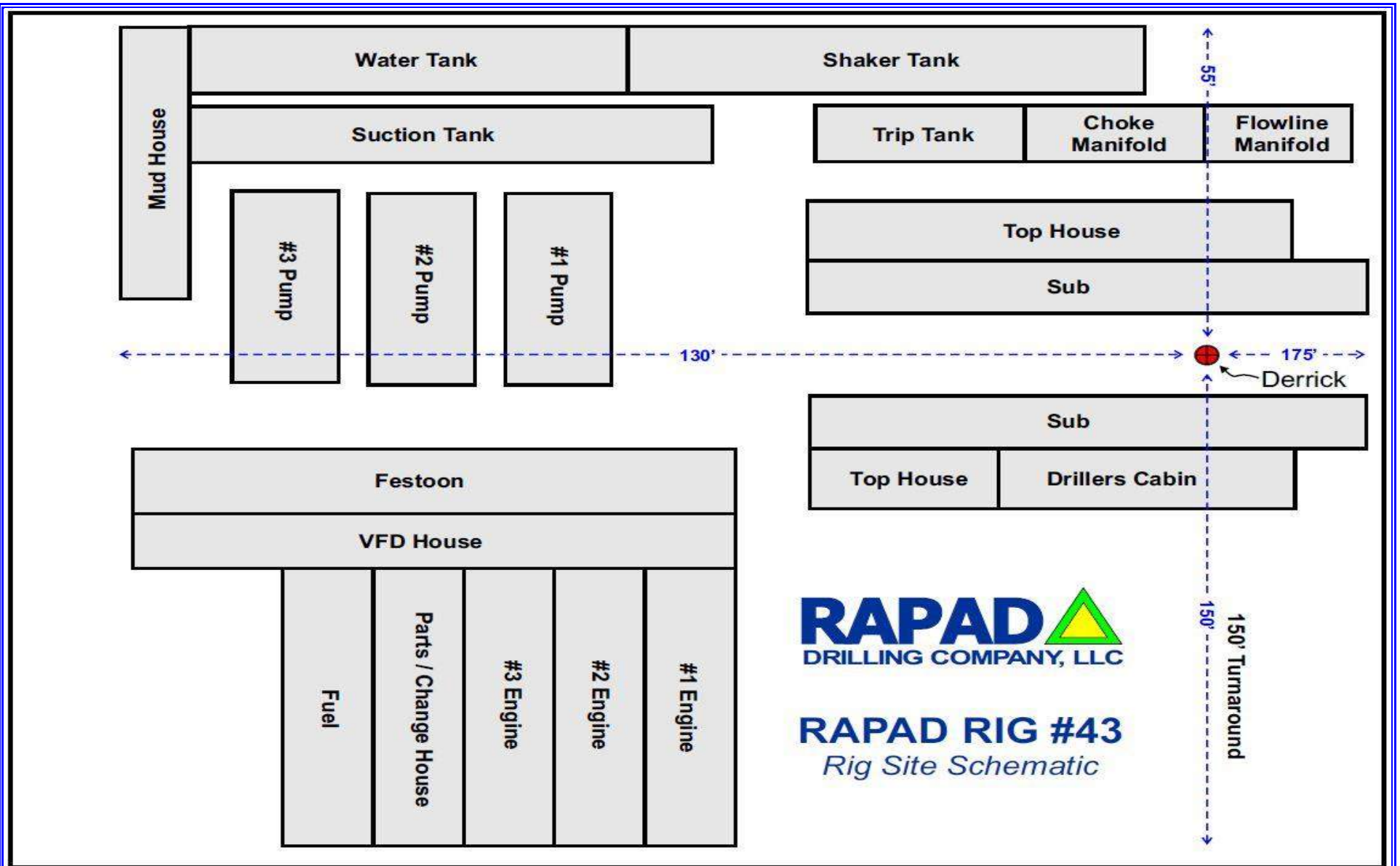
General Site Layout

RAPAD Rig 42
Topdrive 500 Ton 800 HP
Mast 1,000,000 lbs
NOV AC 2000HP Walking Rig

Reference: RAPAD 2019

Date:	2/4/2019	Project #	RAPAD Rig 42
Scale:	NTS	Figure:	8





General Site Layout

RAPAD Rig 43
 Topdrive 500 Ton 800 HP
 Mast 900,000 lbs
 NOV AC 2000HP Walking Rig

Reference: RAPAD 2019

Date:	2/4/2019	Project #	RAPAD Rig 43
Scale:	NTS	Figure:	9



TABLES
Fact Sheets / Equipment Lists
Rigs 31, 32, 33, 34, 35, 36, 41, 42, 43



RIG 31

Diesel Electric Land Rig

Capable of Drilling to 30,000 ft.

Drawworks: Continental Emsco C-3 type II, powered by two GE 752 electric motors with Baylor 7838 electric brake

Primary Power: Ross Hill 3 bay SCR, three Caterpillar 3512 engines 1475 HP each with Kato 1365 KW generators

Mast: Dreco cantilever mast 147 ft, 1,300,000 lbs static hook load

Substructure: Dreco slingshot structure, 30 ft floor height with 1,300,000 lbs rotary capacity

Block/Hook: Continental Emsco RA-60-7 750 ton traveling block with BJ 750 ton Dynaplex hook with automatic positioner

Mud Pumps: Two National 12P-160 pumps 1600 H.P. powered by two GE electric motors each, three 6x8 mission magnum centrifugal mixing pumps powered by 100 H.P. electric motors

Mud Tanks: Three mud tank system with 1500 BBL capacity with 100 BBL slugging tank, five Brandt mud agitators powered by 10 H.P. electric motors, 10'x36' mud house with mud hopper inside mud house

Solids Control: Two linear Motion Derrick Flowline Cleaner Shale Shakers, Swaco 16 Cone Desilter, Swaco 2 Cone Desander

Water Storage: 500 BBL capacity

Fuel storage: 20,000 gallon capacity

Rotary: Continental Emsco T3750 37-1/2" dead load rating 650 tons

Swivel: Continental Emsco LB-650, 650 ton capacity

Blowout Preventers: One 13-5/8" 10,000 psi Single Ram Preventer, One 13-5/8" 10,000 psi Double Ram Preventer, One 13-5/8" 5,000 psi Annular Preventer, 10,000 psi Choke Manifold, Mud Gas Separator (shop built)

Accumulator: Koomey seven-station closing unit with remote station 300 gallon capacity

Drill Pipe: 5" G-105 19.50# and G-105 25.60#

Drill Collars: 8" spiral DCs with NC 56 connection, 7" spiral DCs with NC 50 connection

Miscellaneous Equipment: Three Air Hoist, Kelly Spinner, Three Air Compressors, Drilling Recorder, Seven Degree Drift Indicator, Vapor-Proof Florescent Lighting System, Upper Kelly Valve, Lower Kelly Valve, Inside Bop, Spinning Wrench, Automatic Driller, Wireline Unit 0.108



RIG 32

Mechanical Land Rig

Capable of Drilling to 16,500 ft.

Drawworks: Gardner Denver 800 drawworks rated at 1000 H.P. grooved for 1-1/4 line with Dretec 5250 electric brake
Primary Power: Three CAT 3456 engines rated at 550 H.P. each on compound, two 400 KW generator sets powered by 3406 CAT engines

Mast: Skytop Brewster 136 ft rated to 650,000 lbs. hook load

Substructure: Skytop Brewster box structure, 20 ft floor height, 650,000 lbs rotary capacity with 400,000 lbs setback capacity

Block/Hook: Continental Emsco RA-42-5 350 ton block with BJ 350 ton Unimatic hook

Mud Pumps: Two Continental Emsco F-1000 triplex pumps, 1000 H.P. independent driven with CAT 3512 engines charged by two 5x6 mission magnum pumps powered by 40 H.P. electric motors

Mud Tanks: Two mud tank system with 880 BBL capacity with 60 BBL slugging tank, three mission mud agitators powered by 10 H.P. electric motors, two Mission Magnum 6x8 mixing pumps powered by 75 H.P. electric motors

Solids Control: Two Linear Motion Fluid System Shale Shaker, Brandt 16 Cone Desilter, Brandt 2 Cone Desander

Water Storage: 500 BBL capacity

Fuel Storage: 9,000 gallon capacity

Rotary: Oil 27-1/2" rotary table with dead load rating 600 tons

Swivel: Continental Emsco LB-300, 300 ton capacity

Blowout Preventers: One 11" 10,000 psi Double Ram Preventer, One 11' 5000# Annular Preventer, 10,000 psi Choke Manifold

Accumulator: Valvcon five-station closing unit

Drill Pipe: 4 1/2" G-105 16.60#, 4 1/2" G-105 20#

Drill Collars: 18-7" spiral DCs with NC 46 connection

Miscellaneous Equipment: Two Air Hoist, Kelly Spinner, Three Air Compressors, Drilling Recorder, Seven Degree Drift Indicator, Vapor-Proof, Florescent Lighting System, Upper Kelly Valve, Lower Kelly Valve, Inside Bop, Spinning Wrench, Automatic Driller, Wireline Unit 0.092



RIG 33

Diesel Electric Land Rig

Capable of Drilling to 22,000 ft.

Drawworks: National 110 UE, powered by 2 GE 752 electric motors with Baylor 7040 electric brake

Primary Power: Ross hill 3 bay SCR, three Caterpillar 3512 engines, 1475 H.P. each with Kato 1365 KW generators

Mast: Modified Continental Emsco mast 142 ft, 900,000 lbs static hook load

Substructure: Modified Continental Emsco box-on-box structure, 22 ft floor height with 900,000 lbs rotary capacity

Block/Hook: Continental Emsco RA-60-6 650 ton traveling block with BJ 500 ton Dynaplex hook with automatic positioner

Mud Pumps: Two Continental Emsco FB-1600 Triplex pumps 1600 H.P. powered by 2 GE 752 electric motors, three 6x8 Mission Magnum centrifugal mixing pumps powered by 75 H.P. electric motors

Mud Tanks: Two tank mud system with 1200 BBL capacity, four Mission mud agitators powered by 10 H.P. electric motors, 10'x36' mudhouse with mud hopper inside mudhouse

Solids Control: Two Linear Motion Fluid Systems Shale Shakers, Swaco 16 Cone Desilter, Swaco 2 Cone Desander,

Water Storage: 420 BBL capacity

Fuel Storage: 14,000 gallon capacity

Rotary: National 27 1/2" dead load rating 500 tons

Swivel: Continental Emsco LB-650, 650 tons capacity

Blowout Preventers: One 13-5/8" 10,000 psi Single Ram Preventer, One 13-5/8" 10,000 psi Double Ram Preventer, One 13-5/8" 5,000 psi Annular Preventer, 10,000 psi Choke Manifold, Mud Gas Separator (shop built)

Accumulator: Koomey five-station closing unit with remote station, 280 gallon capacity

Drill Pipe: 5" G-105 19.50# and G-105 25.60#

Drill Collars: 8" spiral DCs with 6 5/8" regular connection, 7" spiral DCs with NC 50 connection

Miscellaneous Equipment: Three Air Hoist, Kelly Spinner, Three Air Compressors, Drilling Recorder, Seven Degree Drift Indicator, Vapor-Proof, Florescent Light System, Upper Kelly Valve, Lower Kelly Valve, Inside Bop, Spinning Wrench, Automatic Driller, Wireline Unit 0.108



RIG 34

Diesel Electric Land Rig

Capable of Drilling to 30,000 ft

Drawworks: Continental Emsco C-3, powered by 2 GE 752 electric motors with Baylor 7838 electric brake

Primary Power: Ross hill 3 bay SCR, three Caterpillar 3512 engines, 1475 H.P. each with Kato 1365 KW generators

Mast: Modified Continental Emsco mast 150 ft, 1,500,000 lbs, static hook load

Substructure: Modified box-on-box Structure, 30 ft. floor height with 1,500,000 lbs, rotary capacity

Block/Hook: Continental Emsco RA-60-7 650 ton traveling block with BJ 750 ton Dynaplex hook with automatic positioner

Mud Pumps: Two Continental Emsco FB-1600 Triplex pumps 1600 H.P. powered by 2 GE 752 electric motors each, three 6 X 8 Mission Magnum centrifugal mixing pumps powered by 100 H.P. electric motors

Mud Tanks: Three mud tank system with 1500 BBL, capacity with 85 BBL slugging tank, six Brandt mud agitators powered by 10 H.P. electric motors, 10' X 36' mud house with mud hopper inside mudhouse

Solids Control: Two linear motion Fluid Systems, Black Thunder shale shakers, Brandt 16 Cone Desilter, Brandt 2 Cone Desander

Water Storage: 500 BBL Capacity

Fuel Storage: 14,000 gallon capacity

Rotary: National C375 37-1/2" dead load rating 650 tons

Swivel: Continental Emsco LB-650, 650 ton capacity

Blowout Preventers: One 13-5/8" 10,000 psi Single Ram Preventer, One 13-5/8" 10,000 psi Double Ram Preventer, One 13-5/8" 5,000 psi Annular Preventer, 10,000 psi Choke Manifold, Mud Gas Separator (shop built)


Accumulator: Koomey five-station closing unit with remote station. 180 gallon capacity

Drill Pipe: 5" G-105 19.50# and G-105 25.60#

Drill Collars: 8" spiral DCs with NC 56 connection, 7" spiral DCs with NC 50 connection

Miscellaneous Equipment: Three Air Hoist, Kelly Spinner, Three Air Compressors, Drilling Recorder, Seven Degree Drift Indicator, Vapor-Proof Florescent Lighting System, Upper Kelly Valve, Lower Kelly Valve, Inside BOP, Spinning Wrench, Automatic Driller, Wireline Unit 0.108

TABLES: Rig Fact Sheets / Equipment Lists

	<h1>RIG 35</h1> <p>Mechanical Land Rig</p> <p>Capable of Drilling to 16,500 feet</p> <p>Drawworks: Continental Emsco D-3 Type III drawworks rated at 1000 H.P. grooved for 1 1/4" line with Baylor 6032 electric brake</p> <p>Primary Power: Three CAT 3456 engines rated at 550 H.P. each on compound, two 450 KW generator sets powered by 3456 CAT Engines</p> <p>Mast: Full Circle Enterprises 142 ft rated to 650,000 lbs hook load</p> <p>Substructure: 20 ft Full Circle Enterprises box structure with 650,000 lbs rotary capacity with 400,000 lbs setback capacity</p>
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Block/Hook: 350 ton National block/hook combination

Mud Pumps: Two National 9-P-100 triplex pumps, 1000 H.P. independent driven with CAT 3508 engines, charged by two 5x6 Mission Magnum pumps powered 40 H.P. electric motors

Mud Tanks: Two mud tank system with 900 BBL capacity with 60 BBL slugging tank, three Brandt mud agitators powered by 10 H.P. electric motors, two Mission Magnum 6x8 mixing pumps powered by 75 H.P. electric motors

Solids Control: Two Brandt Cobra linear motion shale shakers, Brandt 16 cone desilter, Brandt 2 cone desander

Water Storage: 500 BBL capacity

Fuel Storage: 10,000 gallon capacity

Rotary: Continental Emsco 27 1/2" rotary table with dead load rating 500 tons

Swivel: Continental Emsco LB-300, 300 ton

Blowout Preventers: One 11" 10,000 psi Double Ram Preventer, One 11' 5000# Annular Preventer, 10,000 psi Choke Manifold

Accumulator: Valvcon five-station closing unit

Drill Pipe: 4 1/2" G-105 16.60#

Hevi-Wate: 12-4 1/2" HWT with 4 1/2" XH connection

Drill Collars: 6 1/2" DCs with 4 1/2" XH connection, 3 - 8" DCs with NC-56 connection

Miscellaneous Equipment: Three Air Hoists, Kelly Spinner, Upper Kelly Valve, Lower Kelly Valve, Two Air Compressors, Drilling Recorder, Seven Degree Drift Indicator, Vapor-Proof Fluorescent Lighting System, Inside BOP, Spinning Wrench, Pilot Automatic Driller, Wireline Unit 0.092

TABLES: Rig Fact Sheets / Equipment Lists



RIG 36

Diesel Electric Land Rig

Capable of Drilling to 22,000 feet

Drawworks: National 110 UE, powered by 2 GE 752 electric motors with Baylor 7040 electric brake

Primary Power: Ross Hill 3 bay SCR, Three Caterpillar 3512 engines 1475 HP each with Kato 1365 KW generators

Mast: Modified Continental Emsco mast 142 ft, 900,000 lbs static hook load

Substructure: Modified Continental Emsco box-on-box structure, 21 ft floor height with 900,000 lbs rotary capacity

Block/Hook: Continental Emsco RA-52-6 500 ton traveling block with BJ 500 ton Dynaplex hook with automatic positioner

Mud Pumps: Two Continental Emsco FB-1600 triplex pumps 1600 H.P. powered by two GE 752 electric motors each, three 6 X 8 Mission Magnum centrifugal mixing pumps powered by 75 H.P. electric motors

Mud Tanks: Two mud tank system with 1200 BBL capacity with 80 BBL slugging tank, four Mission mud agitators powered by 10 H.P. electric motors, 10' X 36' mud house with mud hopper inside mudhouse

Solids Control: Two Brandt King Cobra linear motion shale shakers, Brandt 16 cone desilter, Brandt 2 cone desander

Water Storage: 500 BBL capacity

Fuel Storage: 14,000 gallon capacity

Rotary: Continental Emsco 27 1/2" dead load rating 500 tons

Swivel: Continental Emsco LB-650, 650 ton capacity


Blowout Preventers: One 13-5/8" 10,000 psi Single Ram Preventer, One 13-5/8" 10,000 psi Double Ram Preventer, One 13-5/8" 5,000 psi Annular Preventer, 10,000 psi Choke Manifold, Mud Gas Separator (shop built)

Accumulator: BOPC six-station closing unit with remote station, 250 gallon capacity

Drill Pipe: 5" G-105 19.50# and G-105 25.60#

Drill Collars: 8" spiral DCs with NC 56 connection, 7" spiral DCs with NC 50 connection

Miscellaneous Equipment: Three Air Hoists, Kelly Spinner, Upper Kelly Valve, Lower Kelly Valve, Three Air Compressors, Drilling Recorder, Seven Degree Drift Indicator, Vapor-Proof Fluorescent Lighting System, Inside BOP, Spinning Wrench, Pilot Automatic Driller, Wireline Unit 0.108

	<h2 style="text-align: center;">RIG 41</h2> <p>Drawworks: NOV ADS-10SD AC Electric Gear Driven Drawworks rated at 2000 HP with 1-3/8' Drill Line</p> <p>Primary Power: NOV VFD House Ross Hill AC Drives, with Amphion Intergrated Drilling Control System and climate controled drillers cabin. Three CAT 3512C Engines with Kato 1365 KW Generators. Fourth CAT 3512C Genset upgrade available.</p> <p>Mast: NOV Ideal Telescoping Mast with 1,000,000 lbs. capacity capable of racking and walking with 25,000 ft. of 5" drill pipe</p> <p>Substructure: NOV Hydraulically Raised Structure, 25 ft. Floor Height with 1,000,000 lbs. Rotary Capacity with 600,000 lbs. setback capacity with NOV Steel Toe walking System.</p>
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Topdrive: VARCO TDS-11 SH 500 Ton 1100 HP with NOV Twister Directional Drilling Optimation System capable of delivering 51,000 ft-lb of torque at 110 rpm

Mud Pumps: Two National 12P-160 Triplex Pumps 1600 H.P. Powered by dual AC motors with 7500 psi fluid ends and 7500 psi standpipe system. Third 12P-160 mud pump upgrade available.

Mud System: Two Tank Mud System with 1285 bbl. Capacity with 120 bbl. Premix tank. Seven Mission mud agitators powered by 10 h.p. electric motors. Three Brandt King Cobra Venom Linear Motion Shale Shakers. Brandt 3 cone desander. Brandt 20 cone desilter. Model DG-10 Degasser.

Water Storage: 500 bbl. Capacity

Fuel Storage: 20,000 gal. capacity

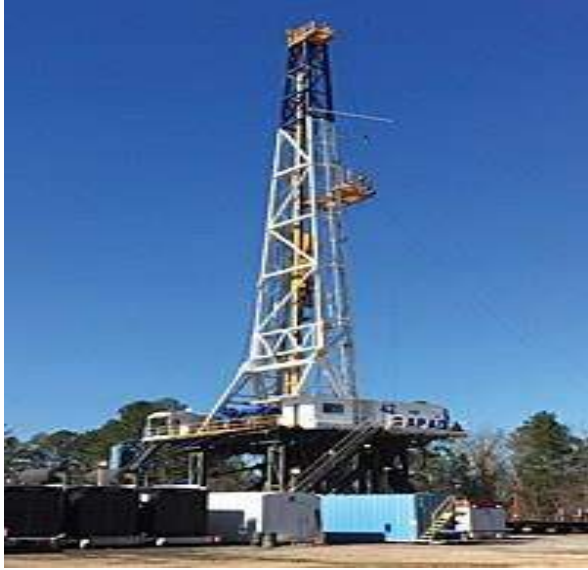
Rotary: National C375 37-1/2" Dead Load Rating 500 Tons.

Pipe Handling: Varco ST-80CL Iron Roughneck, Varco Power Slip Frame, Pipecat Hydraulic Catwalk Laydown System

Blowout Preventers: One 13-5/8" 10,000 psi Single Ram Preventer, One 13-5/8" 10,000 psi Double Ram Preventer, One 13-5/8" GK-5000 Annular Preventer, 10,000 psi Choke Manifold, 4 ft. diameter 15 ft. long Mud Gas Sperator skidded with 100 bbl trip tank, Hydraulic BOP Transporter

Accumulator: BOPC Six Station Closing Unit with Remote Station. 180 gal. Capacity

Miscellaneous Equipment: Well Data Drilling Report System, Rig Sense Electronic Drilling Recorder, E-Totco Survey Tool, Wireline Unit 0.108, Vapor-Proof Florescent Lighting System, Upper Kelly Valve, Lower Kelly Valve, Inside BOP, Three Air Compressors, Two Hydraulic Utility Winches

	<h2 style="text-align: center;">RIG 42</h2> <p>Drawworks: NOV DSDG-CX425 AC Electric Gear Driven Drawworks rated at 2000 HP with 1-3/8' Drill Line</p> <p>Primary Power: NOV VFD House Ross Hill AC Drives, with Amphion Intergrated Drilling Control System and climate controled drillers cabin. Three CAT 3512C Engines with CAT 1225 KW Generators Fourth CAT 3512C Genset upgrade available</p> <p>Mast: 1,000,000 lbs. capacity capable of racking and walking with 25,000 ft. of 5" drillpipe</p> <p>Substructure: Hydraulically Raised Structure, 30 ft. Floor Height with 1,000,000 lbs. rotary capacity with 800,000 lbs. setback capacity.</p>
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Topdrive: VARCO TDS-11 SA 500 Ton 800 HP with NOV Twister Directional Drilling Optimation System

Mud Pumps: Two National 12P-160 Triplex Pumps 1600 H.P. Powered by dual AC motors with 7500 psi fluid ends and 7500 psi standpipe system. Third 12P-160 mud pump upgrade available.

Mud Tanks: Two Mud Tank System with 1250 bbl. Capacity with 85 bbl. Slugging tank. Four Brandt mud agitators powered by 10 h.p. electric motors. Model DG-10 Degasser

Solids Control: Three Brandt King Cobra Venom Linear Motion Shale Shakers Brandt 16 cone desilter Brandt 2 cone desander

Water Storage: 500 bbl. Capacity

Fuel Storage: 20,000 gal. capacity

Rotary: National C375 37-1/2" Dead Load Rating 650 Tons.

Blowout Preventers: One 13-5/8" 10,000 psi Single Ram Preventer, One 13-5/8" 10,000 psi Double Ram Preventer, One 13-5/8" 5000 psi Annular Preventer, 10,000 psi Choke Manifold, Mud Gas Seperator (shop built)

Accumulator: Six Station Closing Unit with Remote Station. 180 gal. Capacity

Pipe Handling: NOV ST-80CL Iron Roughneck, Pipecat Hydraulic Catwalk Laydown System

Drill Pipe: 5" S-135 19.50# with NC50 connections

DRILL COLLARS: 7" with NC50 connections 8" with NC56 connections

MISC. EQUIPMENT: Well Data Drilling Report System, Rig Sense Electronic Drilling Recorder, E-Totco Survey Tool, Wireline Unit 0.108, Vapor-Proof Florescent Lighting System, Upper Kelly Valve, Lower Kelly Valve, Inside BOP, Three Air Compressors, Two Hydraulic Utility Winches

NOVOS reflexive drilling system available

TABLES: Rig Fact Sheets / Equipment Lists

<p>Photo available February 2019</p>	<p style="text-align: center;">RIG 43</p> <p>Drawworks: NOV DSDG-CX425 AC Electric Gear Driven Drawworks rated at 2000 HP with 1-3/8' Drill Line</p> <p>Primary Power: NOV VFD House Ross Hill AC Drives, with Amphion Intergrated Drilling Control System and cilmate controled drillers cabin. Three CAT 3512C Engines with Kato 1365KW Generators Fourth CAT 3512C Genset upgrade available</p> <p>Mast: 900,000 lbs. capacity capable of racking and walking with 25,000 ft. of 5" drillpipe</p> <p>Substructure: Hydraulically Raised Structure, 30 ft. Floor Height with 1,000,000 lbs. rotary capacity with 675,000 lbs. setback capacity</p>
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Topdrive: VARCO TDS-11 SA 500 Ton 800 HP with NOV Twister Directional Drilling Optimation System

Mud Pumps: Two Emsco FB-1600 Triplex Pumps 1600 H.P. Powered by dual AC motors with 7500 psi fluid ends and 7500 psi standpipe system. Third mud pump upgrade available.

Mud Tanks: Two Mud Tank System with 1250 bbl. Capacity with 85 bbl. Slugging tank. Four Brandt mud agitators powered by 10 h.p. electric motors. Model DG-10 Degasser

Solids Control: Three Brandt King Cobra Venom Linear Motion Shale Shakers Brandt 16 cone desilter Brandt 2 cone desander

Water Storage: 500 bbl. Capacity

Fuel Storage: 20,000 gal. capacity

Rotary: National C375 27-1/2" Dead Load Rating 500 Tons.

Blowout Preventers: One 13-5/8" 10,000 psi Single Ram Preventer, One 13-5/8" 10,000 psi Double Ram Preventer, One 13-5/8" 5000 psi Annular Preventer, 10,000 psi Choke Manifold, Mud Gas Seperator (shop built)

Accumulator: Six Station Closing Unit with Remote Station. 180 gal. Capacity

Pipe Handling: NOV ST-80CL Iron Roughneck, Pipecat Hydraulic Catwalk Laydown System

Drill Pipe: 5" S-135 19.50# with NC50 connections

DRILL COLLARS: 7" with NC50 connections 8" with NC56 connections

MISC. EQUIPMENT: Well Data Drilling Report System, Rig Sense Electronic Drilling Recorder, E-Totco Survey Tool, Wireline Unit 0.108, Vapor-Proof Florescent Lighting System, Upper Kelly Valve, Lower Kelly Valve, Inside BOP, Three Air Compressors, Two Hydraulic Utility Winches

NOVOS reflexive drilling system available

APPENDIX A

SPILL RESPONSE TELEPHONE LISTING

The qualified individuals (QI) listed below have been granted full authority to implement spill response activities (§112.7(a)(3)(vi)):

QI Primary Contact:
 Drilling Rig Tool Pusher
 Phone: 601-649-0760

QI Secondary Contact:
 David Byrd, HSE Manager
 Phone: 601-649-0760
 Cell: 601-310-7800

Emergency Notification Phone List (§112.7(a)(3)(vi)):

External Contacts - Local Emergency Assistance

Sheriff's Department	911
Highway Patrol	911
Emergency (ambulance, fire, etc.)	911
Hospital	911

Spill Response Contractors (OSRO) (§112.7(a)(3)(vi)):

1. Kelly Brothers / Complete Environmental (office 601-794-2300)	24-Hr: 800-689-5656
2. Oil Recovery Company (ORC) (office 251-690-9010)	24-Hr: 800-350-0443
3. US Environmental (office 601-372-3232 281-606-4960)	24-Hr: 601-735-2541

External Contacts - Federal and State Agencies (§112.7(a)(3)(vi)):

National Response Center	(800) 424-8802	<i>Verbal within 1-hour as soon as possible with as much information as possible if reportable quantity (RQ) spill as defined by 40 CFR 112*. (§112.7(a)(4) and (a)(5)): See footnote below for RQ</i>
State Contacts for Mississippi		
Mississippi Department of Environmental Quality	(601) 961-5171	<i>Verbal within 1 hour with as much info as possible</i>
Mississippi State Oil & Gas Board	(601) 576-4900	<i>Verbal within 1 hour with as much info as possible</i>
State Contacts for Alabama		
Alabama Department of Environmental Management	(251) 450-3400	<i>Verbal within 1 hour with as much info as possible</i>
Alabama State Oil & Gas Board	(205) 349-2852	<i>Verbal within 1 hour with as much info as possible</i>
State Contacts for Florida		
Florida Department of Environmental Protection, Emergency Response Florida State Watch Office	(850) 245-2010 (800)-320-0519	<i>Verbal within 1 hour with as much info as possible</i>
Florida Department of Environmental Protection, Oil and Gas	(850) 717-9110	<i>Verbal within 1 hour</i>
State Contacts for Louisiana		
Louisiana Department of Environmental Quality	1-888-763-5424	<i>Verbal within 1 hour with as much info as possible</i>
Louisiana State Police	(877) 925-6595	<i>Verbal as soon as possible</i>
Louisiana Office of Conservation	(225) 342-5515	<i>Verbal after State Police</i>
State Contact for Texas		
Texas Spill Reporting Hotline	800-832-8224	<i>Verbal within 1 hour with as much info as possible</i>
<i>Note: The hotline is a clearing house for Texas Commission Environmental Quality & Texas Railroad Commission.</i>		
Federal Contacts		
Environmental Protection Agency, Region IV. <u>Mississippi, Alabama, Florida</u>	(404) 562-8700	<i>Submit required written information within 60 days if reportable quantity exceeds 25 gals or sheen on water as defined by 40 CFR Part 112.4(a).</i>
Environmental Protection Agency, Region VI. <u>Louisiana and Texas</u>	866-372-7745	<i>Submit required written information within 60 days if reportable quantity exceeds 25 gals or sheen on water as defined by 40 CFR Part 112.4(a).</i>

* **Reportable Quantity (RQ) – 25 gals or discharges of such quantities of oil into or upon navigable waters of the U.S that causes a sheen on adjoining shorelines, or into or upon the waters of the contiguous zone determined to be harmful to the public health or welfare of the U.S., including those that:**

1. **Violate applicable water quality standards; or**
2. **Cause a sheen or film upon or discoloration of the water surface or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the water surface or upon adjoining shorelines.**

APPENDIX B

AST SECONDARY CONTAINMENT DRAINING RECORD

Note: Storm water impacted with oil, salt water, or chemical CANNOT BE RELEASED. Impacted storm water must be captured and placed in tanks or sent offsite for disposal. If oil or chemical is present in secondary containment notify RAPAD Drilling onsite management for response action.

Facility Name: _____

SPCC Plan – Stormwater Inspection Form – Secondary Containment for Fuel Tanks

This Form is to be completed prior to draining secondary containment area. After completion, Inspection Form must be kept for 5-years for documentation. Use additional sheets as needed.

[\S§112.8(b)(1) and 112.12(b)(1)]

DATE	Containment Area Inspected	Appearance of Water – is there sheen? (i.e., is oil/fuel present in the water?) ** Yes or No	Signature of Inspector

**** If sheen is present on the water or if water is impacted with salt water or chemical, briefly state who was notified and how the water was removed from the containment area (i.e. was it pumped out or were pads used to remove sheen). Use an additional page if needed to document. Completed forms must be kept for 5-years.**

APPENDIX C

SPILL PREVENTION INSPECTION CHECKLIST

SPCC Monthly Equipment Inspection Report

Circle the Rig: 31, 32, 33, 34, 35, 36, 41, 42, 43

Equipment Being Inspected: See description below shown as Inspection Areas.
 (Use a new sheet for each piece of equipment/tank being inspected.)

Date of Inspection _____ Inspector _____

Routine In-Service Inspection taken from Section 6.3.1.1 of API Standard 653 Equipment Inspection, Repair, Alteration, and Reconstruction				
6.3.1.1 The external condition of the equipment shall be monitored by close visual inspection from the ground on a routine basis. Owner/operator personnel may do this inspection, and or an authorized inspector as defined in 3.5. Personnel performing this inspection should be knowledgeable of the storage facility operations, the tanks & equipment, and the characteristics of the product stored.				
6.3.1.2 The interval of such inspections shall be MONTHLY.				
6.3.1.3				
Inspection Areas:	Diesel Tank	Diesel Tank	Hydraulic tank	Mud Tanks
Is there any evidence of leaks?	Yes / No	Yes / No	Yes / No	Yes / No
Is there a bulge or dent in the shell?	Yes / No	Yes / No	Yes / No	Yes / No
Is there any sign of settlement?	Yes / No	Yes / No	Yes / No	Yes / No
Is there any excessive corrosion?	Yes / No	Yes / No	Yes / No	Yes / No
Is the foundation in good condition?	Yes / No	Yes / No	Yes / No	Yes / No
Are any of the paint coatings peeling or flaking off?	Yes / No	Yes / No	Yes / No	Yes / No
Are the container's supports and foundations in good condition?	Yes / No	Yes / No	Yes / No	Yes / No
Is there any accumulation of oil or chemical inside the diked areas?	Yes / No	Yes / No	Yes / No	Yes / No
Are the tank vents, inlet and outlet pipes, ladder and manway in good condition?	Yes / No	Yes / No	Yes / No	Yes / No
Any Issues are to be documented for follow-up action by an authorized inspector.				
Person contacted for follow-up action:			Comments (write on back of page if needed):	

APPENDIX D

**SPILL INCIDENT REPORT FORM
(use this form to report to agencies)**

Spill Incident Report Form – If spill exceeds RQ report within 1-hour.

Description of Discharge

Date/time	Release date: Release time: Duration:	Discovery date: Discovery time:
Reporting Individual	Name: Tel. #:	
Location of discharge	Latitude: Longitude:	Description:
Equipment source	<input type="checkbox"/> piping <input type="checkbox"/> flow line <input type="checkbox"/> well <input type="checkbox"/> unknown <input type="checkbox"/> stock, flare	Description: Equipment ID:
Product	<input type="checkbox"/> crude oil <input type="checkbox"/> saltwater <input type="checkbox"/> other*	* Describe other:
Appearance and description		
Environmental conditions	Wind direction: Wind speed:	Rainfall: Current:

Impacts

Quantity	Released:	Recovered:
Receiving medium	<input type="checkbox"/> water** <input type="checkbox"/> land <input type="checkbox"/> other (describe):	<input type="checkbox"/> Release confined to drill site area. <input type="checkbox"/> Release migrated off drill site area. ** If release migrated to water body, indicate extent and body of water:
Describe circumstances of the release		
Assessment of impacts and remedial actions		
Disposal method for recovered material		
Action taken to prevent incident from reoccurring		
Safety issues	<input type="checkbox"/> Injuries <input type="checkbox"/> Fatalities <input type="checkbox"/> Evacuation	

Notifications

Agency	Name	Date/time reported & Comments
Company Spill Response Coordinator		
National Response Center 1-800-424-8802		
State police		
County Emergency Response Commission		
oil spill removal organization/cleanup contractor		

*** Notification must not be delayed if information or individuals are not available. Use backside of page if needed. Document as much information as possible. Use a notebook or ledger to document detailed information and keep a chronological diary of activities till the project is complete.

APPENDIX E

PERSONNEL TRAINING FORM

APPENDIX F

CERTIFICATION OF NO SUBSTANTIAL HARM FACILITY

NO SUBSTANTIAL HARM FACILITY CERTIFICATION

40 CFR (Code of Federal Regulations), Part 112, Attachment C-II
Certification of the Applicability of the Substantial Harm Criteria

Name: RAPAD Drilling LLC (Onshore Drilling Rig Operations)
Address: Drilling Rig Operations, Various locations Texas, Louisiana, Mississippi, Alabama, Florida

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

Yes _____ No X _____

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?

Yes _____ No X _____

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?

Yes _____ No X _____

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?

Yes _____ No X _____

5. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil discharge in an amount greater than or equal to 10,000 gallons within the last 5 years?

Yes _____ No X _____

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Owner/Operator Signature: Rob Holbrook Date: 2-18-19

Printed Name: Rob Holbrook Title: V.P.

APPENDIX G

SPCC TRAINING, INSPECTION, AND RECORD KEEPING PROCEDURE

SPCC INSPECTIONS, TRAINING & RECORD KEEPING

An effective inspection (including necessary testing) and maintenance program is critical to preventing environmental incidents. The main objective of this program is to uncover conditions that could cause breakdowns or failures that could potentially result in environmental impacts and then have a system to adjust, repair, or replace equipment as necessary. The record system then documents any incidents and repairs and provides the means to analyze for trends.

Inspections: Equipment/tank inspections shall be performed on a monthly basis. In addition, following a storm event, the secondary containment areas will be inspected for stormwater accumulation. The water in the containment will not be released from the containment if a sheen is noticed, but rather will be pumped from the containment by a certified contractor for offsite disposal. After the inspection sheets are completed, the records must be maintained in the files.

Inspections should include:

- ✓ Fueling areas
- ✓ Material storage areas (tank farms, drum storage)
- ✓ Waste receptacles (including waste generation, storage, treatment, and disposal areas)
- ✓ Shipping & receiving areas
- ✓ Vehicle parking areas
- ✓ Storm water outfalls
- ✓ Areas around all equipment scheduled for preventative maintenance
- ✓ Areas where spills and leaks have occurred in the past
- ✓ Outdoor material processing areas

Testing: Integrity testing of tanks must be conducted every **5 years** at a minimum or whenever a major repair is done to a tank with secondary containment. Records are maintained with the SPCC Plan.

Recordkeeping: Document all inspections. Inspection worksheets, integrity testing results, training records, and spill notifications **MUST** be maintained for a **minimum of 5 years** with the SPCC Plan. Inspection reports should include what areas were inspected, the inspector, the date and time, what problems were found, and what corrective steps were taken, including who was notified.

SPCC TRAINING

Spill prevention and response training will be conducted at least annually for all appropriate personnel. This training may be incorporated into monthly safety meetings periodically through the year to update employees on changes in the regulations, laws, or in-house procedures. New employees should be trained the first week of work, before assuming duties in operating areas, as part of new employee orientation. Additionally, this training may be conducted in conjunction with stormwater training programs.

Training records should be maintained with the SPCC Plan for 5 years. The session leader should provide a schedule and have all employees who attend the training session sign-in. For your convenience a proposed sign-in sheet is attached. **These sign-in sheets must be retained in your files.**

The purpose of an SPCC Plan is to prevent discharges of oil from non-transportation facilities and may also address the issues of hazardous substances.

Topics to be covered include:

- ✓ The laws and regulations regarding spills and releases of pollution control
 - The purpose is to prevent the discharge of oil and oil products or hazardous substances into the environment, especially surface water.
 - A discharge is specifically prohibited by law if:
 - It affects water quality;
 - Causes a film, sheen, or discoloration of the water surface or upon water or adjoining shorelines; or
 - Causes a sludge or emulsion to be deposited beneath the surface of the water or upon adjoining shorelines.
- ✓ The contents of the facilities SPCC Plan
 - Facility Drainage
 - Includes discussion of facility drainage patterns and identify the storage areas for petroleum products at the facility.
 - Storage Capacity
 - A description of the unit storage capacity should include the quantity and type of material being stored so that in the event of a spill, information is in one location.
- ✓ The operation and maintenance of equipment to prevent discharges
- ✓ Initial Response Measures and Spill Reporting
 - **IF AT ALL POSSIBLE, STOP THE SOURCE OF THE SPILL IMMEDIATELY**
 - Close the valve, shut down pumping, or take whatever actions are necessary to stop any release
 - If conditions are hazardous (i.e., fire, potential explosion) **do not approach.**
 - If safety is not an issue, call other nearby employees for assistance in stopping the release as appropriate.
 - As soon as possible, notify the area or shift supervisor.
 - **Call the Facility Response Coordinator** (instruct employees of who this person is and how to contact them). Upon his arrival, all other response actions are under his control.
 - The FRC will designate the appropriate personal safety equipment.
 - The FRC will determine the necessary response including whether or not evacuation of parts or all of the facility are necessary.
 - **Confine the release to the smallest area possible.**
 - Take immediate action to prevent the spill from reaching surface waters.
 - Use booms, sandbags, dig small trenches, or place absorbent pads to stop the spread.
 - If the release reaches surface water, attempt to place booms to contain the release, or if necessary, block drainage downstream of spill to prevent further migration
 - The Facility Response Coordinator will determine if the spill is reportable and contact the appropriate parties in compliance with the SPCC plan. Copies of such notifications must be maintained for 5 years at the facility.
 - Remedial Action – for small spills, leaks, or drips, remedial action must be taken within 72 hours of a spill or release.

The level of detail for employee training will depend on the person's level of responsibility with regard to fuel handling and spill control.

APPENDIX H
EPA SPCC PLAN REGULATORY CROSS-REFERENCE

Cross Reference of Federal SPCC Plan Regulations

Rule	Requirement*	Location in this Document
112.3(d)	Professional Engineer Certification	Page ii
112.5	Plan Review	Page i, Appendix I
112.7	Management Approval	Page i
112.7	Cross-Reference with SPCC Rule	Appendix H
112.7(a)(3) Facility Layout	Describe physical layout of the facility and include facility diagram	Page 2, Figures, Tables
112.7(a)(4) Discharge Notification	Provide procedures for discharge notification.	Page 7, 8 Appendix A
112.7(b) Direction and Route of Flow	Where experience indicates a reasonable potential for equipment failure (such as tank overflow, rupture or leakage, or any other equipment known to be a source of a discharge), the Plan must include a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each type of major equipment failure.	Page 3, 4
112.7(c) Containment and Diversion	Provide appropriate containment and/or diversionary structures or equipment to prevent discharged oil from reaching a navigable water course. At a minimum, one of the following preventative systems or its equivalent must be used: <ol style="list-style-type: none"> 1) Dikes, berms or retaining walls sufficiently impervious to contain spilled oil; 2) Curbing; 3) Culverting, gutter or other barriers; 4) Weirs, booms, or other barriers; 5) Spill diversion ponds; Retention ponds; or 6) Sorbent materials <p>The capacity of the secondary containment requires is that which is necessary to meet the general containment requirement based on a likely discharge.</p>	Page 3, 4
112.7(e) Inspections, Tests, and Records	Inspections required by this part should be in accordance with written procedures developed for the facility. Written procedures and a record of inspections and tests, signed by the appropriate supervisor or inspector, must be kept for 3 years.	Page 5, 6, Appendix B, C
112.7(f) Personnel Training	At a minimum, train all oil handling personnel in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution prevention laws, rules and regulations; general facility operations; and, the contents of the facility SPCC Plan.	Page 6, Appendix E, G
112.7(g) Security	Security at facility.	Page 6
112.7(h) Tank Car or Truck Loading/Unloading Rack	Loading/unloading rack areas must be designed to have secondary containment to hold at least the maximum capacity of any single compartment of a tank car or truck loaded or unloaded at the facility.	Page 4
112.9(b) Facility Drainage	Facility Drainage <ol style="list-style-type: none"> 1) Restrain drainage from diked storage areas by valves to prevent a discharge. Pumps or ejectors may be used to drain diked areas, but they must be manually operated and water must be inspected before drainage. 2) Use valves or manual, open-and-closed design to drain diked areas. Stormwater must be inspected before release. 3) Design facility drainage systems from undiked areas where a discharge is possible to flow into ponds, lagoons, or catchment basins designed to retain or return oil to the facility. 	Page 3, Appendix B

Rule	Requirement*	Location in this Document
	<p>4) If facility drainage is not engineered as in (3) above, equip the final discharge of all ditches inside the facility with a diversion system that would in the event of an uncontrolled discharge, retain oil at the facility.</p> <p>5) Where drainage waters are treated in more than one treatment unit and treatment is continuous, and pump transfer is needed, provide two “lift” pumps and permanently install one of the pumps. Whatever techniques are used, the facility drainage systems must be engineered to prevent a discharge in case there is an equipment failure or human error at the facility.</p>	
112.9(c) Bulk Storage Container: Construction	Only use containers for the storage oil if its materials and construction are compatible with the material stored and condition of storage such as pressure and temperature.	Page 2, Tables
112.9(c)(2) Bulk Storage Container: Secondary Containment	Construct all bulk storage tanks to provide secondary containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. This specific containment requirement is based on a major container failure in which the entire capacity of the container is discharged.	Page 3
112.9(b) Drainage of Diked Areas	Do not allow drainage of uncontaminated rainwater from diked areas into a storm drain or open watercourse, lake or pond without treatment unless you: <ol style="list-style-type: none"> 1) Normally keep the bypass valve sealed closed; 2) Inspect the retained rainwater to ensure that its presence will not cause an oil discharge; 3) Open the bypass valve and reseal it under supervision; 4) Keep adequate records of such events. 	Page 3, Appendix B
112.9 (c) (6) Produced water	Produced water containers. For each produced water container, comply with §112.9(c)(1) and (c)(4); and §112.9(c)(2) and (c)(3)	Page 5
112.9 c (5) Flow through process equipment	(5) Flow-through process vessels. The owner or operator of a facility with flow-through process vessels may choose to implement the alternate requirements as described below in lieu of sized secondary containment required in paragraphs (c)(2) and (c)(3) of this section.	Page 3, 4
112.9 (d) Flowlines	Facility transfer operations, oil production facility. (1) Periodically and upon a regular schedule inspect all aboveground valves and piping associated with transfer operations for the general condition of flange joints, valve glands and bodies, drip pans, pipe supports, pumping well polish rod stuffing boxes, bleeder and gauge valves, and other such items.	Page 5
109	Spill Contingency Plan	Page 7, Appendix A
112.9(d)(3)(ii)	Written commitment of manpower	Page i
112.20(e) Certification of Substantial Harm Determination	Certification of Substantial Harm Determination must be completed and kept at the facility.	Appendix F

* Only selected excerpts of relevant rule text are provided. For a complete list of SPCC requirements, refer to the full text of 40 CFR part 112.

APPENDIX I

RECORD OF CHANGES TO SPCC PLAN

RAPAD DRILLING OPERATIONS **WHAT TO DO IF YOU HAVE AN OIL SPILL**

**SPILL QUICK REFERENCE GUIDE
TEXAS, LOUISIANA, MISSISSIPPI, ALABAMA, FLORIDA**

The following pages of this document are a quick reference guide in the event of an oil spill. The pages are an excerpt from RAPAD Drilling Spill Prevention Control and Countermeasure (SPCC) plan.

For assistance and additional information regarding oil spills contact:

David Byrd, HSE Manager

RAPAD Drilling LLC

601-310-7800

dbyrd@rapad.net

Updated: 02-07-2019

The qualified individuals (QI) listed below have been granted full authority to implement spill response activities (§112.7(a)(3)(vi)):

QI Primary Contact:

Drilling Rig Tool Pusher

Phone: 601-649-0760

QI Secondary Contact:

David Byrd, HSE Manager

Phone: 601-649-0760 | Cell: 601-310-7800

14.1 Action Steps for an Oil Spill Incident for RAPAD Drilling Operations

Immediate Actions:

Any employee observing or receiving knowledge of an oil spill must immediately take actions to minimize injuries, damage, and notify RAPAD Drilling Qualified Individual (QI) to implement this response plan. The priority in all circumstances, in order of importance, is:

- 1) **Ensure safety of spill responders and the public.**
- 2) **Stop economic and environmental losses.**
- 3) **Report the spill to federal, state and local agencies as required.**

FIRST TEN ACTION STEPS

Step 1. Evaluate situation for safety hazards. Take immediate measures to minimize the threat to human life or health -- provide safe rescue or first aid as required. Remember to:

- avoid direct contact with the spilled material
- stay upwind to avoid inhalation hazards
- determine and remove all ignition sources
- secure incident area and keep on-lookers/people away from the incident scene
- assess injuries and notify emergency agencies for assistance if needed

Step 2. Stop discharge as soon as safe to do so. Shut down operation in progress following pre-established procedures to prevent further damage.

Step 3. Contact RAPAD Drilling Operations qualified individual (QI). Provide the following information:

- type of material spilled
- estimate of quantity discharged
- rate of discharge
- time, location, cause, and source of spill
- size of area impacted and description of affected medium (i.e., air, water, soil).
- actions being used to stop, remove, and mitigate spill

Step 4. QI will approve the commencement of response activities until his on-scene arrival. In the event a spill is unmanageable or threatens to enter a water body, the QI will contact the designated OSRO (Oil Spill Response Organization) for spill response assistance.

Step 5. Determine source of spill using appropriate personal protection equipment.

Step 6. Secure source of spill or minimize the potential discharge by transferring or isolating product.

Step 7. Contain spill as close to source as possible to minimize spread. Get assistance to contain spill if necessary. Protect sensitive areas such as water bodies if possible.

Step 8. QI or designee will contact RAPAD Drilling corporate officials. QI or designee will simultaneously with other activities, contact federal, state, and local emergency response officials listed on the following page and Appendix A. Also QI or designee will complete the Spill Incident Report Form in Appendix D.

Step 9. QI or designee will contact other entities that could be impacted by the spill.

Step 10. Begin cleanup and product recovery.

Updated: 02-07-2019

The qualified individuals (QI) listed below have been granted full authority to implement spill response activities (§112.7(a)(3)(vi)):

QI Primary Contact:
Drilling Rig Tool Pusher
Phone: 601-649-0760

QI Secondary Contact:
David Byrd, HSE Manager
Phone: 601-649-0760
Cell: 601-310-7800

Emergency Notification Phone List (§112.7(a)(3)(vi)):

External Contacts - Local Emergency Assistance

Sheriff's Department	911
Highway Patrol	911
Emergency (ambulance, fire, etc.)	911
Hospital	911

Spill Response Contractors (OSRO) (§112.7(a)(3)(vi)):

1. Kelly Brothers / Complete Environmental (office 601-794-2300)	24-Hr: 800-689-5656
2. Oil Recovery Company (ORC) (office 251-690-9010)	24-Hr: 800-350-0443
3. US Environmental (office 601-372-3232 281-606-4960)	24-Hr: 601-735-2541

External Contacts - Federal and State Agencies (§112.7(a)(3)(vi)):

National Response Center	(800) 424-8802	Verbal within 1-hour as soon as possible with as much information as possible if reportable quantity (RQ) spill as defined by 40 CFR 112*.(§112.7(a)(4) and (a)(5)): See footnote below for RQ
State Contacts for Mississippi		
Mississippi Department of Environmental Quality	(601) 961-5171	Verbal within 1 hour with as much info as possible
Mississippi State Oil & Gas Board	(601) 576-4900	Verbal within 1 hour with as much info as possible
State Contacts for Alabama		
Alabama Department of Environmental Management	(251) 450-3400	Verbal within 1 hour with as much info as possible
Alabama State Oil & Gas Board	(205) 349-2852	Verbal within 1 hour with as much info as possible
State Contacts for Florida		
Florida Department of Environmental Protection, Emergency Response	(850) 245-2010	Verbal within 1 hour with as much info as possible
Florida State Watch Office	(800)-320-0519	
Florida Department of Environmental Protection, Oil and Gas	(850) 717-9110	Verbal within 1 hour
State Contacts for Louisiana		
Louisiana Department of Environmental Quality	1-888-763-5424	Verbal within 1 hour with as much info as possible
Louisiana State Police	(877) 925-6595	Verbal as soon as possible
Louisiana Office of Conservation	(225) 342-5515	Verbal after State Police
State Contact for Texas		
Texas Spill Reporting Hotline	800-832-8224	Verbal within 1 hour with as much info as possible
Note: The hotline is a clearing house for Texas Commission Environmental Quality & Texas Railroad Commission.		
Federal Contacts		
Environmental Protection Agency, Region IV. Mississippi, Alabama, Florida	(404) 562-8700	Submit required written information within 60 days if reportable quantity exceeds 25 gals or sheen on water as defined by 40 CFR Part 112.4(a).
Environmental Protection Agency, Region VI. Louisiana and Texas	866-372-7745	Submit required written information within 60 days if reportable quantity exceeds 25 gals or sheen on water as defined by 40 CFR Part 112.4(a).

* **Reportable Quantity (RQ)** – 25 gals or discharges of such quantities of oil into or upon navigable waters of the U.S. that causes a sheen on adjoining shorelines, or into or upon the waters of the contiguous zone determined to be harmful to the public health or welfare of the U.S., including those that:

1. Violate applicable water quality standards; or
2. Cause a sheen or film upon or discoloration of the water surface or adjoining shorelines or cause a sludge or emulsion to be deposited beneath the water surface or upon adjoining shorelines.

Spill Report Form. Information reported to the National Response Center in the Event of a Discharge			
Discharge/Discovery Date	█	Time	█
Facility Name	█		
Facility Location (Address/Lat-Long/Section Township Range)	█		
Name of reporting individual	█	Telephone #	█
Type of material discharged	█	Estimated total quantity discharged	Gallons/Barrels █
Source of the discharge	█	Media affected	<input type="checkbox"/> Soil
			<input type="checkbox"/> Water (specify) █
			<input type="checkbox"/> Other (specify) █
Actions taken	█		
Damage or injuries	<input type="checkbox"/> No <input type="checkbox"/> Yes (specify) █	Evacuation needed?	<input type="checkbox"/> No <input type="checkbox"/> Yes (specify) █
Organizations and individuals contacted	<input type="checkbox"/> National Response Center 800-424-8802 Time █		
	<input type="checkbox"/> Cleanup contractor (Specify) Time █ █		
	<input type="checkbox"/> Facility personnel (Specify) Time █ █		
	<input type="checkbox"/> State Agency (Specify) Time █ █		
	<input type="checkbox"/> Other (Specify) Time █ █		

Note: Use this form to gather information and document reporting to agencies. Document as much information as possible. Use a notebook or ledger to document detailed information and keep a chronological diary of activities till the project is complete.

ATTACHMENT 10
H₂S CONTINGENCY PLAN FOR DRILLING OPERATIONS



Safety, It's Our Only Business

**H₂S CONTINGENCY PLAN
FOR
DRILLING OPERATIONS**

BRAMMER ENGINEERING, INC

NLT Royalty Partner 10-4

Section 10, T3S – R9W

**Lat: 30.2348
Long: -85.1255**

CALHOUN COUNTY, FLORIDA

10/16/23

This plan is subject to updating

H₂S LAND CONTINGENCY PLAN TABLE OF CONTENTS

- Plan Implementation and Responsibility
- I. Introduction
 - II. Location Layout
 - A. Safe Briefing Areas
 - B. Wind Indicators
 - C. Danger Signs
 - D. H₂S Detectors and Alarms
 - E. Breathing Air System
 - F. List of Safety Equipment
 - G. Ventilation Devices
 - III. Normal Operating Procedures
 - A. Prior to Compliance Depth
 - B. Below Compliance Depth
 - IV. Emergency Procedures for H₂S Releases
 - V. Special Operations
 - A. Coring
 - B. Well Testing
 - VI. Well Control
 - VII. Igniting the Well
 - VIII. Responsibilities and Duties
 - A. All Personnel
 - B. Operator's Representative
 - C. Contractor's Drilling Foreman
 - D. Mud Engineer
 - E. H₂S Safety Technician
 - IX. Procedure for Informing Personnel of H₂S Contingency Plan
 - X. APPENDIX
 - A-1 Considerations During the Drilling of a Sour Gas Well
 - A-2 General Operating Conditions
 - A-3 Equipment List

A-4 Training Considerations and Handout
A-5 Emergency Telephone Notification List
A-6 Government Agency Notification Log

XI. Evacuation of Public

Attachment-1 List of Residents/Landowners/Users
Attachment-2 Map
Attachment-3 Directions

H₂S CONTINGENCY PLAN

I. INTRODUCTION

This plan specifies precautionary measures, safety equipment, emergency procedures, responsibilities, and duties pertaining to drilling operations.

This plan was developed because of the potential hazards involved when drilling formations that may contain hydrogen sulfide (H₂S). It was written in compliance with state regulations and in accordance with the recommendations of the American Petroleum Institute publication API-RP49 "Recommended Practices for Safe Drilling of wells containing Hydrogen Sulfide".

To be effective, this plan requires the cooperation and effort of each individual participating in the drilling of a potential H₂S well. Each individual should know his responsibilities and duties in regard to normal drilling operations and emergency procedures. He should thoroughly understand and be able to use, at a moment's notice, all safety equipment on board the rig. He should familiarize himself with the location of all safety equipment and see that his equipment is properly stored, easily accessible, and routinely maintained.

The ideas and suggestions of each individual involved in the drilling of a potential sour gas well are highly welcomed and is an asset for providing the safest working conditions possible.

II. LOCATION LAYOUT

A. Safe Briefing Areas

Two areas will be designated as "SAFE BRIEFING AREAS". These areas will be located, in as much as feasible, at 180 degrees to one another on opposite sides of the location. The Briefing Area which is predominately upwind of the well bore will be designated as "BRIEFING AREA NO. 1" or the "PRIMARY BRIEFING AREA". If H₂S is detected in concentrations equal to or in excess of 10ppm all personnel not assigned emergency duties are to assemble in the designated Safe Briefing area for instructions.

B. Wind Indicators

Wind socks and/or streamers will be installed at strategic points on the facility. They will be positioned so they can be seen from any location on the mud pits and rig floor.

C. Danger Signs

Warning signs indicating the possible well conditions will be displayed on the user roads around the rig and at the location entrance.

Colored flags will be displayed indicating which of the well conditions indicated on the warning sign is applicable at the time. The green flag will be displayed under normal operating conditions, when H₂S Concentrations are less than 10 ppm. The yellow flag will be displayed when H₂S concentration is present at 10 ppm or greater. The red flag will be displayed at 50 ppm or greater of H₂S in the atmosphere.

D. H₂S Detectors and Alarms

Continuous monitoring type H₂S detectors, capable of sensing a minimum of 5ppm H₂S in air, will be located at each of the following points:

Sensor Locations

- 1) Bell nipple
- 2) Shale shaker
- 3) Drilling fluid pit area
- 4) Driller's station

Automatic H₂S alarms (visual and audible) will be located at appropriate locations throughout the location.

E. Breathing Air System

A system of breathing air manifolds, hoses and masks will be installed at the well site with outlets at heavy work areas.

A system of breathing air cylinders shall be tied into the manifolding system to maintain a sufficient supply of respirable air to these areas.

F. List of Safety Equipment

The location and quantity of all safety equipment (including breathing air equipment, and H₂S and SO₂ detection equipment) can be found in the Appendix.

G. Fans

Electric fans (with explosion-proof motors) will be installed as necessary in areas where the potential for H₂S gas accumulation exists.

III. NORMAL OPERATING PROCEDURES

A. Prior to Compliance Depth

This H₂S Contingency Plan will be operational 1000 feet prior to reaching compliance depth. Manning of the wellsite with H₂S Technicians will be at the Operator's discretion.

1. Lists of emergency phone numbers will be posted at the following locations:
 - A. Operator's Representative office
 - B. Toolpusher's office
2. All safety equipment must be inspected routinely, paying particular attention to breathing air equipment and monitoring equipment.
3. All personnel onsite will be assigned breathing air equipment and, if needed, H₂S detectors.
4. Prior to compliance depth, Rig Contractor's personnel, Operator's personnel, and necessary Service Company personnel must be thoroughly trained in the use of breathing air equipment, emergency procedures, responsibilities and first-aid for H₂S victims. A record must be maintained of all personnel who have been through the H₂S training programs on location.

B. Below Compliance Depth

Below compliance depth the H₂S detection system will be calibrated every week under normal conditions. The time and results of each test must be logged. The SECORP Representative will insure that the H₂S detection equipment calibrations and tests are recorded on the IADC Daily Drilling Report Form.

1. When arriving on location, all personnel, without exception, must proceed directly to the H₂S Safety Technician, if present, Operator's Representative or Tool pusher for assignment of breathing air equipment and, if needed, H₂S detector. An instruction and orientation briefing will also be held, if needed. The H₂S Safety Technician, Operator's Representative or Tool pusher will be responsible for assigning such equipment to the individuals and instructing them in its use.
2. Each person on the location will be instructed in the use of breathing air equipment until supervisory personnel are satisfied that each is capable of using the equipment. This training must include all additional personnel that are allowed onsite during drilling or testing operations.

3. Weekly breathing air equipment drills and H₂S training of attendants should be held. Documentation of these drills and training sessions shall be maintained on location.
4. Rig crews and Service Company personnel should be made aware of the location of breathing air bottles and H₂S detectors. Knowledge of the location of H₂S detector sensors is vital to understanding the "Emergency Conditions". In addition, key personnel must be trained in the use of the resuscitator and H₂S detectors.
5. H₂S detectors shall be available for use by all working personnel. After any device has initially detected H₂S, periodic inspections of all areas of poor ventilation shall be made with a portable H₂S detector instrument.
6. All personnel on the location should become "wind-conscious" and be aware at all times of the direction of the prevailing winds. They should remember that H₂S is heavier than air and will collect in low places in still air.
7. There will be no welding if H₂S is detected at the surface until the surrounding air is thoroughly tested with an explosimeter and hot work permit approved by Operator Representative.
8. After penetration of an H₂S bearing zone, increased monitoring of the working area should be provided when drilling, circulating bottoms up from a drilling break, cementing or logging. If the H₂S concentration reaches 20 ppm in the air, all personnel will wear breathing air equipment, and all personnel not assigned emergency duties should go to the designated Safe Briefing Area.

IV. EMERGENCY PROCEDURES FOR H₂S RELEASES:

1. The person detecting the H₂S must IMMEDIATELY notify the driller.
2. The driller will pick up off bottom until first tool joint is above rotary table and shut down the mud pumps.
3. All working rig personnel will immediately put on their breathing air equipment.
4. Once breathing air equipment is on, the driller should:
 - a. Begin working drill pipe.
 - b. Check well for flow and be ready to close the BOP's.
5. The Contractor's Representative will see to the shut down of the forced air circulation system.

6. All personnel must get their assigned self-contained breathing air equipment and report to the designated safe briefing area for further instructions, unless otherwise instructed. If both your assigned self-contained breathing apparatus and the designated safe briefing area are upwind of the well bore, the self-contained breathing apparatus may be carried to the designated safe briefing area. However, if there is any doubt, don and activate the unit immediately. If it becomes necessary to go through the rig floor or wellhead area to get to the designated safe briefing area, the breathing air equipment will be put on as soon as the equipment is reached. If you are located on the downwind end of the rig when the H₂S alarm is sounded, hold your breath and proceed across then upwind to the designated Safe Briefing Area, donning the nearest breathing air equipment available.
7. Always put on a breathing air unit before proceeding to assist anyone affected by the gas and utilize the "Buddy System". If the affected person is stricken in a high concentration area obtain standby assistance before entering the area. Always use the "Buddy System" when entering possible contaminated areas.
8. Evacuate non-essential personnel when H₂S reaches a concentration exceeding 50ppm in the air.
9. The Operator's Representative and the Contractor's Representative will assess the situation and assign duties to each person needed to bring the situation under control. When the severity of the situation has been determined, all persons will be advised.
10. The Operator's Representative will be responsible for notifying the following regulatory agencies:
 - a. State Regulatory Agency
 - b. Filling out H₂S Government Notification Log

V. SPECIAL OPERATIONS

A. Coring

1. During drilling operations below compliance, it may be decided to core. This operation takes on critical complexities when attempted in a sour gas well. The following practices should be followed during coring operations:
 - a. After a core has been cut, circulate bottoms up and monitor mud for H₂S prior to pulling out of the hole with the core.
 - b. Put on breathing air equipment ten stands before core barrel reaches the surface. If well conditions dictate, or the H₂S concentration reaches 20 ppm, breathing air equipment should be put on sooner. All personnel in the area should wear breathing air equipment while the core barrel is pulled, broken out, and opened. Colorimetric tube type detectors should be used to monitor for H₂S around the core barrel.

When these detectors indicate a safe atmosphere, the breathing air equipment may be removed.

2. The following practices must be followed for every core barrel pulled:
 - a. Due to the difficulty in communicating with breathing equipment on, it is required that a chalkboard and chalk, or note pads, be available during core handling operations.
 - b. The importance of leaving the breathing air equipment on must be stressed to all personnel connected with the coring operation. The most critical moment is when the core barrel is opened.
 - c. All personnel on board not wearing breathing air equipment should stay a safe distance upwind from the core barrel.
 - d. If the core contains H₂S, the cores to be transported must be sealed and marked for the presence of H₂S.
 - e. The cores must not be transported in a closed vehicle.

A. Well Testing

1. Well testing must be performed with the minimum number of personnel and all necessary equipment required to safely perform the test.
2. Prior to initiation of the test, special safety meetings must be conducted for all personnel who will participate with particular emphasis on use of personnel safety equipment, first-aid procedures, and the H₂S Contingency Plan.
3. During the test, the use of H₂S detection equipment will be intensified. All produced gases must be vented and burned through a flare system equipped with continuous pilot and an automatic igniter. Back-up ignition for each flare must be provided. Produced fluids, which are stored in the tanks on the rig, must be vented into the flare system. Vents will have spark arrestors to prevent any possibility of a flash back.
4. "No Smoking" rules will be rigorously enforced.

VI. WELL CONTROL

The following well control practices should be initiated below protective casing:

- A. If high trip gas or high drill gas concentration are encountered, the degasser should be used and the gas separated and flared. The vent line from the degasser will be opened so that gas can be burned at the flare.

If gas is breaking out at the rotary, consider closing the annular BOP and routing the flow through the mud-gas separator. Gas will be burned through the flare vent line.

The flare outlet will be equipped with an automatic ignition system with pilot light gas source.

B. Assume any influx of formation fluid into the well bore contains H₂S. If the decision is made to circulate out the influx, all personnel involved will wear breathing air equipment until it is known that H₂S is not present. The following steps should be taken when the influx occurs:

1. Shut in the well using normal techniques. Record drill pipe pressure, casing pressure, and volume of influx.
2. Notify the Operator's Representative and the Contractor's Rig Representative.

If the mud has been contaminated with H₂S, it may be necessary to treat it with zinc carbonate (or equivalent) to treat out the H₂S. If H₂S is known to be present and an influx occurs, the size of the influx, the casing depth, the leak-off test results, the amount and type of open hole, and weather conditions will enter into the management decision of whether to circulate out the influx or to "pump away" the influx back into the formation.

VII. IGNITING THE WELL

A. Responsibilities for Decision

The Operator's Representative in consultation with the Contractor's Representative would evaluate deliberate ignition of the blowout if there were serious, immediate danger to personnel. In such an event, the Operator's Representative will have the ultimate onsite responsibility while relying on the Contractor's Representative for all input regarding personnel safety. The well will be ignited only after evaluation of the alternatives available and after discussion with the proper government agencies.

In all cases, an attempt should be made to notify the Operator's Chief Operating Officer and the Contractor's Manager of Drilling Operations as soon as possible and prior to igniting the well, if possible.

If the well is ignited, the burning H₂S will be converted to sulfur dioxide (SO₂), which is also highly toxic and heavier than air. Do not assume the area is safe after the well is ignited.

B. Method of Ignition

1. The primary method of igniting the well will be with a 25mm flare gun, which has a range of approximately 500 feet. Always ignite the well from upwind and do not approach the well any closer than is necessary. BEFORE firing the flare gun or igniting flammable material, check the atmosphere at your location for combustible gases with an explosimeter.

2. If the above method of ignition fails or well conditions are such that a safer or better method is apparent, then an alternative method should be used.

VIII. RESPONSIBILITIES AND DUTIES

A. All Personnel

1. It is the responsibility of all personnel on the drilling rig, as well as other personnel utilized to assist in drilling the well to become familiar with the "Hydrogen Sulfide Contingency Plan".
2. Each individual may be assigned his own personnel breathing apparatus and is responsible for assuring that the equipment is properly stored, routinely maintained, and easily accessible.
3. Each person must become familiar with the location of all safety and emergency equipment and SAFE BRIEFING AREAS and must be able to use this equipment at a moment's notice.
4. Report any indications of H₂S to those in the area and to the Operator's Representative and Contractor's Representative.
5. At alarm, go to the designated SAFE BRIEFING AREA. This includes all OFF DUTY and ON DUTY personnel not specifically designated to control the well.
6. All personnel will attend to their personal safety first.
7. Help anyone who may be injured or overcome by toxic gases.

B. OPERATOR'S REPRESENTATIVE

1. Responsible for thoroughly understanding and enforcing all aspects of this "H₂S Contingency Plan".
2. Responsible for ascertaining that the Drilling Contractor, through the Contractor's Representative, is in compliance with and is enforcing all aspects of the "Hydrogen Sulfide Contingency Plan" for drilling where H₂S may be encountered.
3. Responsible for insuring that all other Operator's and third party personnel comply with the "Hydrogen Sulfide Contingency Plan".
4. Responsible for restricting third party personnel and visitors to the site to a minimum, especially during expected hazardous operations.

5. Responsible for notifying all of the personnel of a change in conditions. Operator's Representative will notify regulatory agencies as required when either Condition II or Condition III exists.
6. In conjunction with the Contractor's Representative will initiate the evacuation plan.
7. In conjunction with the Contractor's Representative is responsible for assuring that personnel training is conducted.
8. Responsible for assuring that all H₂S detectors are inspected and functional.
9. Responsible in conjunction with Contractor's Representative for displaying the visible warning system signs and proper flags, as appropriate.
10. Responsible, along with the Contractor's Representative for assuring that all hydrogen sulfide safety programs and training sessions are conducted and those records of attendance are maintained, and kept onsite.

C. CONTRACTOR'S REPRESENTATIVE

1. In conjunction with the Operator's Representative, is responsible for seeing that all personnel on location observe all safety and emergency procedures outlined in this "H₂S Contingency Plan".
2. Shares the responsibility of the Operator's Representative for assuring that training is conducted for all personnel onsite.
3. Responsible for thoroughly understanding the contents of this "H₂S Contingency Plan". In the absence or incapacitation of the Operator's Representative, the Contractor's Representative will assume all responsibilities designated herein to the Operator's Representative.
4. Along with the Operator's Representative, is responsible for assuring that all hydrogen sulfide safety programs and training sessions are conducted and that records of attendance are maintained, and kept onsite.
5. Will check the ventilation needed to keep any H₂S from accumulating in living quarters or unexpected places.
6. Responsible, in conjunction with the Operator's Representative, for displaying the visible warning system signs and flags as appropriate.
7. Will be in charge of SAFE BRIEFING AREA during assembly for evacuation.

D. MUD ENGINEER

1. In addition to the normal duties, the Mud Engineer is responsible for insuring that the drilling rig has a sufficient supply of hydrogen sulfide scavenger available at all times.
2. Must be thoroughly familiar with the procedures for treating hydrogen sulfide-contaminated mud.

E. H₂S SAFETY TECHNICIAN

1. Responsible for performing a weekly inventory to assure that all safety equipment is being properly stored and maintained.
2. Must maintain and repair all personnel's safety equipment.
3. Responsible for the required inspection and sanitizing of the H₂S safety equipment.
4. Testing of the hydrogen sulfide monitors weekly for response.

IX. PROCEDURE FOR INFORMING PERSONNEL OF H₂S CONTINGENCY PLAN

- A. There will be copies of the complete "H₂S Contingency Plan" available in the Operator's Representative's office.
- B. All personnel arriving at the location will report immediately to the H₂S Safety Technician, if present, or the Operator's Representative for familiarization with the Considerations During the Drilling of a Sour Gas Well.
- C. The H₂S Safety Technician will train the crews and familiarize them with the Considerations During the Drilling of a Sour Gas Well. Written records will be maintained at the location and off-site.

Appendix A-1

CONSIDERATIONS DURING THE DRILLING OF A SOUR GAS WELL

This memorandum is intended to familiarize you with the conditions that can exist when drilling a well into formation that may contain Hydrogen Sulfide gas, and the precautions the Operator and drilling contractor have taken in designing the well program and the safety program to provide maximum safety.

You should become familiar with all safety equipment on the site; its use and availability. The windsock and wind streamers are provided to show which direction the wind is blowing so that the 'Safe Briefing Area' can be easily defined. You should become 'wind conscious' and frequently observe these wind direction indicators. All persons on location will receive instructions in the use of safety equipment and what to do during an H₂S emergency. The well will be monitored continuously by a solid-state, fixed monitoring detection system.

During an emergency, all personnel shall utilize the 'buddy system', preventing anyone from entering a potentially toxic area alone, regardless of whether or not they are using breathing apparatus. If you are wearing a respirator, do not remove it until you are absolutely sure the air is safe to breathe. If a sudden gas release occurs, without warning, you should:

- 1) Hold your breath and rapidly evacuate the area containing the H₂S. Move across and upwind, if possible.
- 2) Put on breathing apparatus.
- 3) Help anyone who may have been overcome by the gas, only after you have put on your breathing apparatus, and transport him to a safe upwind area where you can administer resuscitation.
- 4) Evacuate to the upwind 'Briefing Area' where further instructions can be delivered. **DO NOT PANIC!**

The Company intends to keep all formations overbalanced with mud weight so that no influx of toxic gas will occur. However, these plans have been provided so that such an influx can be handled with a minimum of difficulty. It is important that you follow the directives of the Operator's Representative and the Contractor's Representative during any emergency, to insure the safety of all personnel.

Appendix A-2
GENERAL OPERATING CONDITIONS

Drilling operations in known H₂S zones, or when H₂S has been detected in the drilling fluid, will be performed under the following described conditions:

A. Possible Hazardous Conditions (H₂S Not Present)

1. Warning Signs: A green flag will remain displayed at the well entrance
2. Alarm: (For notification of rig crew) None
3. Characterized by: H₂S concentration is less than 10 ppm.
4. General Action:
 - a. Be alert for a condition change. There will be no smoking except in designated areas.
 - b. Check safety equipment for proper functioning. Keep it available. No welding or open fire without hot work permit approved by Operator's Representative.
 - c. Perform all drills for familiarization and proficiency.

B. CONDITION I - Potential Danger - H₂S Present at 10ppm or Greater

1. Warning Sign: A yellow flag shall replace the green flag at the well site entrance.
2. Alarm: Continuous flashing amber light when the concentration exceeds 10 ppm. All alarm signals will continue as long as the H₂S concentration is present at greater than 10ppm or until deactivated by the H₂S Safety Technician or Operator's Representative.
3. Characterized by: H₂S concentration is equal to or greater than 10ppm.

4. General Action:

- a. All personnel not specifically assigned to correct or control the situation will report to the upwind briefing area. The number of essential personnel may be modified at the time of operation due to prevailing circumstances as determined by the Operator Representative.
- b. If the alarm sounds and it has not been preceded by Condition I, the actions of Condition II will be taken. Circulation will be stopped, self-contained breathing apparatus and airline work units will be donned by all working personnel and all non-essential personnel shall proceed to the upwind safe briefing areas.

C. CONDITION II - Extreme Danger - H₂S Present at 20ppm or greater

1. Warning Sign: Same as condition I.
2. Alarm: Continuous flashing red light and continuous sounding of audible H₂S siren when the concentration exceeds 20 ppm. All alarm signals will continue as long as the H₂S concentration is present at greater than 20 ppm or until deactivated by the H₂S Safety Technician or Operator's Representative.
3. Characterized by: H₂S concentration is equal to or greater than 20 ppm.
4. General Action:
 - a. All non-essential personnel will be evacuated in an orderly manner, immediate notification shall be given to local civil authorities, and traffic in the immediate vicinity of the facility shall be diverted.
 - b. The Operator's Representative and the Contractor's Drilling Foreman will determine which personnel are to remain onsite.
 - c. If necessary, all personnel will be evacuated.
 - d. The Contractor's Drilling Foreman and the Operator's Representative will jointly determine if ignition of the well is warranted. If the well is ignited, the burning hydrogen sulfide will be converted to sulfur dioxide (SO₂), which is also highly toxic. Remain on the upwind side of the location.

D. CONDITION III - Extreme Danger - H₂S Present at 50ppm or greater

1. Warning Sign: A red flag shall replace the yellow flag at the well site entrance.
2. Alarm: Continuous flashing of both amber and red lights and continuous sounding of solid tone H₂S siren when the concentration exceeds 50 ppm. All alarm signals will continue as long as the H₂S concentration is present at greater than 50ppm or until deactivated by the H₂S Safety Technician or Operator's Representative.
3. Characterized by: H₂S concentration is equal to or greater than 50 ppm.
4. General Action:
 - a. All non-essential personnel will be evacuated in an orderly manner, immediate notification shall be given to local civil authorities, and traffic in the immediate vicinity of the facility shall be diverted. The State Oil and Gas Board and other appropriate governmental agencies shall be notified.
 - b. The Operator's Representative and the Contractor's Drilling Foreman will determine which personnel are to remain onsite.
 - c. If necessary, all personnel will be evacuated.
 - d. The Contractor's Drilling Foreman and the Operator's Representative will jointly determine if ignition of the well is warranted. If the well is ignited, the burning hydrogen sulfide will be converted to sulfur dioxide (SO₂), which is also highly toxic. Remain on the upwind side of the location.

ACKNOWLEDGEMENT

The undersigned does hereby acknowledge and certify that SECORP Industries, follows the regulations concerning face piece sealing problems listed herein below and further that he has read and understood all the written regulations below and will adhere to these regulations whenever applicable in his work environment. 29 CFR 1910.134 (g)(1)(i)(A) and (B)

(g) *Use of respirators.* This paragraph requires employers to establish and implement procedures for the proper use of respirators. These requirements include prohibiting conditions that may result in face piece seal leakage, preventing employees from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift, and establishing procedures for the use of respirators in IDLH atmospheres or in interior structural firefighting situations.

(1) *Face piece seal protection.* (i) The employer shall not permit respirators with tight-fitting face pieces to be worn by employees who have:

(A) Facial hair that comes between the sealing surface of the face piece and the face or that interferes with valve function; or

(B) Any condition that interferes with the face-to-face piece seal or valve function.

29 CFR 1910.134 (g)(1)(ii)

(ii) If an employee wears corrective glasses or goggles or other personal protective equipment, the employer shall ensure that such equipment is worn in a manner that does not interfere with the seal of the face piece to the face of the user.

ANSI Z88.2-1992 (7.5.1)

A respirator, either positive or negative pressure, equipped with a face piece (tight or loose fitting) shall not be worn if facial hair comes between the sealing surface of the face piece and the face or if facial hair interferes with valve function.

ANSI Z88.2-1992 (7.5.3.1)

When a respirator user must wear corrective lenses, a protective spectacle or goggle, a face shield, a welding helmet, or other eye- and face-protective devices, the item shall be fitted to provide good vision and shall be worn in such a manner as not to interfere with the seal of the respirator.

ANSI Z88.2-1992 (7.5.3.2)

Spectacles with straps or temple bars that pass through the sealing surface of either negative- or positive-pressure, tight-fitting, full-face piece respirators shall not be used.

Signed on the _____ day of _____, 20____

Signature

I, _____, an employee of _____
(please print)

have been given a copy of "CONSIDERATIONS DURING OPERATIONS IN HYDROGEN SULFIDE AREAS", have read it, and thoroughly understand it.

Signature

Date

20____

Appendix A-3

H₂S Safety Equipment

- 1 Hydrogen Sulfide Safety Trailer Complete with the following contents:
- 8 300 cu. ft. Breathing Air Cylinders, manifold, breathing hose lines with quick connect fittings
- 1 Oxygen resuscitator with two (2) spare oxygen cylinders
- 1 Sensidyne gas detector with H₂S, SO₂ and CO₂ tubes
- 1 Portable four-gas detector for H₂S, LEL and Oxygen Readings
- 1 Flag pole and assembly with three (3) warning flags
- 2 Wind sock holders with two (2) windsocks
- 1 First Aid Kit and Eye Wash Station
- 1 Safety harness with safety line
- 1 Flare pistol and shells
- 2 Dry chemical fire extinguishers
- 15 Sets of earplugs
- 1 Packet "NO SMOKING" signs
- 1 Fire Blankets
- 1 Wire stretcher
- 2 Cleaning sanitizers
- 1 Well condition entrance sign with instructions
- 2 Marker Boards for Communication
- 12 30-Minute air masks with case, lightweight cylinder and stainless steel quick-connect for cascade/houseline use. All units are pressure-demand and hold NIOSH approval.
- 8 5-Minute airline masks with emergency escape cylinders & storage boxes.
- 4 Manifolds for Rig
- 12 Assorted Breathing Air hose lines with quick connect
- 1 4-Channel Hydrogen Sulfide Detection System with (4) sensors
- 2 Explosion Proof Alarms complete with (2) lights and (1) siren

Appendix A-4

TRAINING

All personnel will be informed of the hazards of hydrogen sulfide and sulfur dioxide and instructed in the provisions for personnel safety contained in the H₂S Contingency Plan. All personnel will be instructed in the use of any safety equipment, which they may be required to use. They will also be informed of the location of protective breathing apparatus, H₂S detectors and alarms, ventilation equipment, briefing areas, warning systems, evacuation procedures and the prevailing winds. In addition, personnel will be informed of the restrictions and corrective measures concerning beards, spectacles and contact lenses in accordance with OSHA Standard 29CFR 1910.134 and ANSI Z88.2. First aid procedures applicable to victims of H₂S exposure will be included in the training program.

Instruction of personnel shall be initiated as soon as possible following their arrival on the location.

An H₂S drill and training session will be held for all personnel on location. FULL PARTICIPATION is mandatory. All H₂S drills shall be entered into the IADC Drilling Log.

*Records of all drills and/or training sessions shall be maintained at the facility.

A copy of the training handout, which will be given to each individual trained on site, is included in this Appendix; also included is the guideline for the H₂S drills.

This training will be conducted to instruct personnel in the operation and use of self-contained breathing apparatus and H₂S related emergency equipment and to review various operating procedures in the "H₂S CONTINGENCY PLAN".

Initial drills should include:

1. General information about the self-contained breathing apparatus supply time limit, and proper packing and storage.
2. How to put the mask on and test for leaks around the face and hose connections.

These drills will be conducted as often as necessary to acquaint the crews with the equipment. After the Operator's Representative and the Contractor's Representative are convinced that all personnel are trained, a drill should be conducted. This drill may be initiated any time. The drill will be initiated by the H₂S audible alarm signal given by the Contractor's Representative or the Operator's Representative. At this time, all off-duty personnel will immediately get their assigned self-contained breathing apparatus and report to the designated SAFE BRIEFING AREA with their emergency equipment within three minutes after the alarm is sounded.

A training and information session will be conducted after each drill to answer any H₂S related questions and to cover one or more of the following:

1. Condition II and III alerts and steps to be taken by all personnel.
2. The importance of wind direction when dealing with H₂S.
3. Proper use and storage of all types of breathing equipment.
4. Proper use and storage of oxygen resuscitation.
5. Proper use and storage of H₂S detectors and colormetric tube-type detectors.
6. The "Buddy System" and the rescue procedure for a person overcome by H₂S.
7. Responsibilities and duties.
8. Location of H₂S safety equipment.
9. Other parts of the "H₂S CONTINGENCY PLAN" that should be reviewed.

NOTE: A record of attendance must be kept for drills and training sessions. These drills and training sessions must also be documented on the IADC Report.

Appendix A-5

EMERGENCY TELEPHONE NOTIFICATION LIST

OPERATOR:

Brammer Engineering, Inc.

401 Edwards Street
Suite 1510
Shreveport, LA 71101
Will Ward
Peyton Giddens

Main Line (318) 429-2345

(318) 429-2267
(318) 429-2288

DRILLING CONTRACTOR:

Rapad Drilling & Well Service

Office

(601) 649-0760

1309 Hillcrest Drive
Laurel, MS 39442
Rob Holbrook

H2S SAFETY COMPANY:

Secorp Industries
1010 Palafox St.
Flomaton, AL 36441
Rod Sanders

24 Hours
Fax
Cell

(251) 296-3468
(251) 296-1019
(334) 658-4521

Tallahassee Office

Florida Department of Environmental Protection
Oil and Gas Program
2600 Blair Stone Road, MS 3588
Tallahassee, FL 32399-2600

Name	Phone
Gerald (Gerry) Walker , Environmental Administrator	850-245-8405
Shanin Speas-Frost , Professional Engineer III	850-245-8406
Dave Taylor , Engineer Specialist II	850-245-7536
Lester Williams , Professional Geologist II	850-245-8584

Jay Field Office

Florida DEP / Oil & Gas Program
P.O. Box 306
Jay, FL 32565-0306

Name	Phone
David McCarthy , Engineer Specialist IV	850-675-6558
Marty Lee , Environmental Specialist II	850-675-6558

****RESCUE SERVICES****

(Ambulance, Fire Dept and Law Enforcement)

***911** Calls will be answered by appropriate County Sheriff Departments listed below and they will coordinate the use of any local or volunteer emergency services.

FIRE DEPARTMENT:

Scotts Ferry Vol. Fire Department 911

POLICE DEPARTMENTS:

Florida Highway Patrol *FHP
Calhoun County Sheriff's Dept. 850-674-5049

HOSPITALS:

Calhoun Liberty Hospital 850-674-5411

AMBULANCE:

Calhoun Liberty Ambulance 850-237-1506

VETERNARIAN:

Henderson Veterinarian Clinic 850-674-5933

FEDERAL AGENCYS:

U.S. Government

U.S. Environmental Protection Agency (404) 562-9900
Region #4
61 Forsyth Street
Atlanta, Georgia 30303

U.S. Department of Labor- (601) 960-4604
OSHA Region #4
Federal Building, Suite 1445
100 W. Capitol Street
Jackson, MS

OSHA
1 Government Street, Suite 502 (251) 690-2131
Mobile, AL

Appendix A-6

NOTIFICATION OF GOVERNMENT AGENCIES IN THE EVENT OF A
RELEASE OF HYDROGEN SULFIDE GAS

DATE:

Operating Company:

Operator Representative:

Drilling Contractor/Rig:

Contractor Representative:

Location:

REPORT DATE AND TIME:

ESTIMATED PPM RELEASE:

NOTIFICATION OF GOVERNMENT AGENCIES:

Contact Made By: _____

Individual Contacted Time

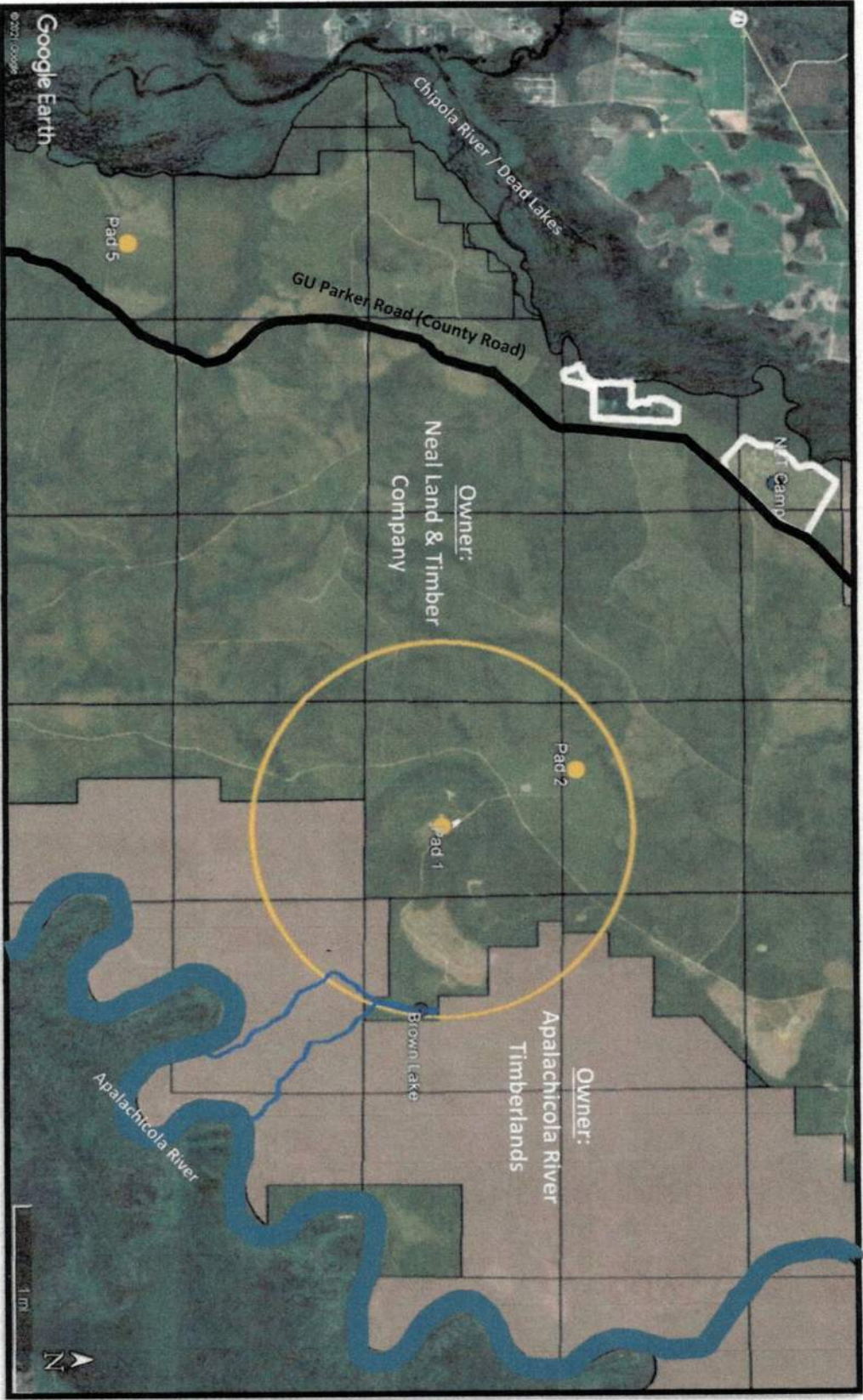
STATE AGENCY: () _____ (phone)

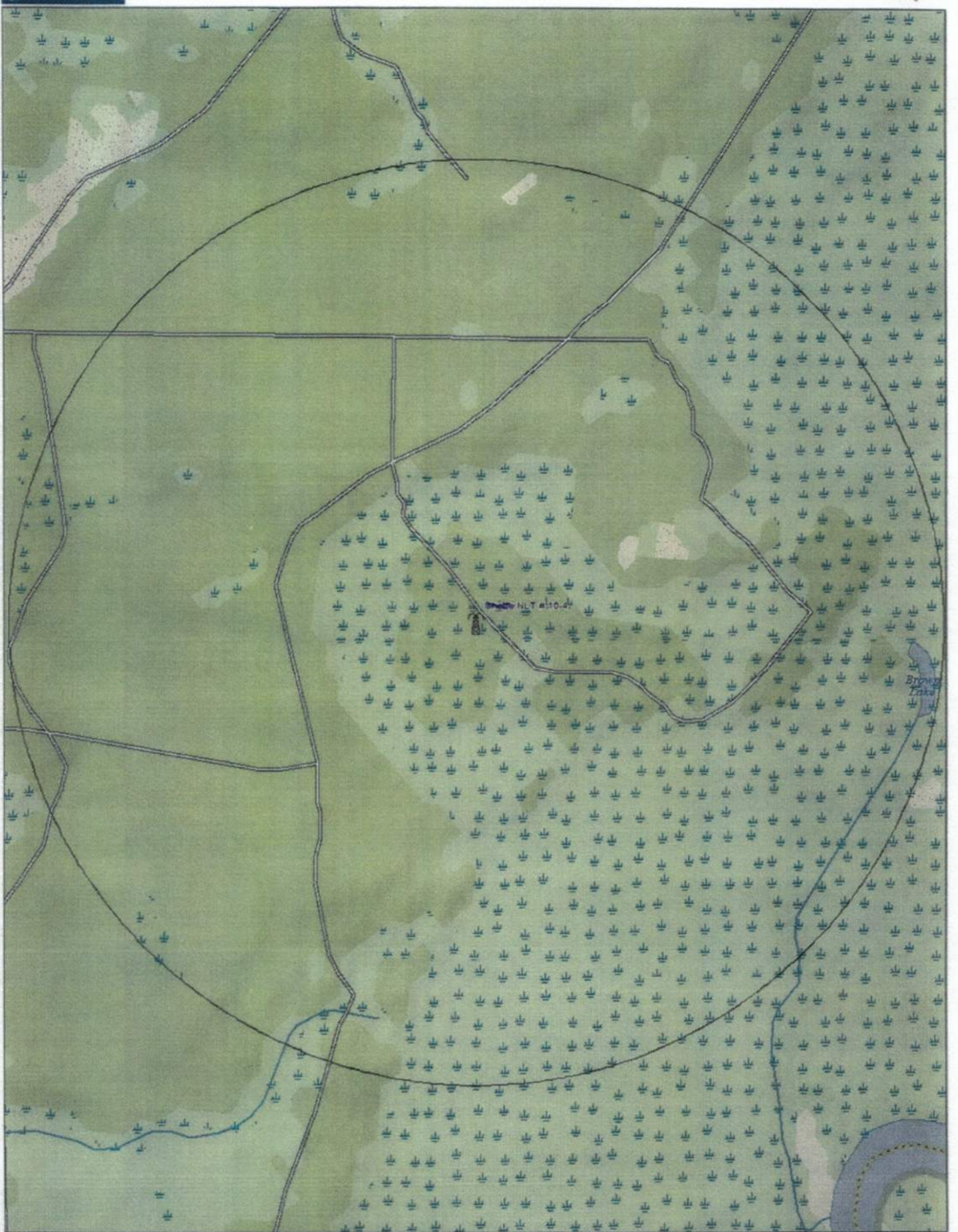
Comments: _____

Attachment 1 - List of Residents/Landowners/Users

Category	Name/Address	Telephone Number	Number of Residents	Special Assistance Needs
Residents	n/a	n/a	n/a	n/a
Landowner	Matt Stokes, General Manager, Neal Land & Timber Company (NLT)	(850) 674-8053	n/a	n/a
Landowner	David Dyson, Manager, Larson & McGowin LLC, Apalachicola River Timberlands (ART)	(229) 376-2116	n/a	n/a
Users with lease on NLT lands	Teedy Nobles Oak Leaf Hunting Club	(850) 340-1592	n/a	n/a
Users with lease on NLT lands	Mike Leonard Games Reserves Hunt Club	(850) 643-7125	n/a	n/a
Users with lease on NLT lands	Jason Martin Hunter Heights Reserve Club	(850) 899-0202	n/a	n/a
Users with lease on ART lands	Teedy Nobles Oak Leaf Hunting Club	(850) 340-1592	n/a	n/a
Users with lease on ART lands	William Leonard D.B. Hayes Club	(850) 815-2578	n/a	n/a
Users with lease on ART lands	John Sanders Flint River Timber	(850) 643-7575	n/a	n/a
Users with lease on ART lands	Steve McMillan McMillan Logging	(850) 643-7998	n/a	n/a
Users with lease on ART lands	Tim Dean Oak Crest Lumber	(229) 649-9328	n/a	n/a
Users with lease on ART lands	Clay Shannon Cedar Creek Timber Co.	(850) 674-1380	n/a	n/a
Users with lease on ART lands	RG Brown R&S Excavation	(850) 379-8674	n/a	n/a

Attachment 2 – Map of users located within a one-mile radius of wellheads at Pad 1





Data use subject to license.

© DeLorme. XMap® 7.

www.delorme.com



MN (4.2° W)



Data Zoom 13-5

Directions:

From the intersection of Hwy 20 and Hwy 71 in Blountstown, FL
Take Hwy 71 South and go about 12.5 miles
Turn Left on G U Parker Road and go about 3.8 miles
Turn Left on Unnamed Road and go about 1.9 miles
Turn Right on Unnamed Road and go about .7 tenths mile
Location Road on Right

ATTACHMENT 11
INFORMATION ON RAPAD DIESEL ELECTRIC LAND RIG #36 AND COMPLETION RIG



RIG 36

Diesel Electric Land Rig

Capable of Drilling to 22,000 feet

<https://rapaddrilling.com/rig-36/>



RIG 36

Diesel Electric Land Rig
Capable of Drilling to 22,000 ft.

Drawworks: National 110 UE, powered by 2 GE 752 electric motors with Baylor 7040 electric brake

Primary Power: Ross Hill 3 bay SCR, Three Caterpillar 3512 engines 1475 HP each with Kato 1365 KW generators

Mast: Modified Continental Emsco mast 142 ft, 900,000 lbs static hook load

Substructure: Modified Continental Emsco box-on-box Structure, 21 ft floor height with 900,000 lbs rotary capacity

Block/Hook: Continental Emsco RA-52-6 500 ton traveling block with BJ 500 ton Dynaplex hook with automatic positioner

Mud Pumps: Two Continental Emsco FB-1600 triplex pumps 1600 HP powered by two GE 752 electric motors each, Three 6 X 8 Mission Magnum centrifugal mixing pumps powered by 75 HP electric motors

Mud Tanks: Two mud tank system with 1200 BBL capacity with 80 BBL slugging tank, Four Mission mud agitators powered by 10 HP electric motors, 10'x36' mud house with mud hopper inside mud house

Solids Control: Two Brandt King Cobra linear motion shale shakers, Brandt 16 cone desilter, Brandt 2 cone desander

Water Storage: 500 BBL capacity

Fuel Storage: 14,000 gallon capacity

Rotary: Continental Emsco 27 1/2" dead load rating 500 tons

Swivel: Continental Emsco LB-650, 650 ton capacity

Blowout Preventers: One 13-5/8" 10,000 psi Single Ram Preventer, One 13-5/8" 10,000 psi Double Ram Preventer, One 13-5/8" 5,000 psi Annular Preventer, 10,000 psi Choke Manifold, Mud Gas Separator (shop built)

Accumulator: BOPC six-station closing unit with remote station, 250 gallon capacity

Drill Pipe: 5" G-105 19.50# and G-105 25.60#

Drill Collars: 8" spiral DCs with NC 56 connection, 7" spiral DCs with NC 50 connection

Miscellaneous Equipment: Three Air Hoists, Kelly Spinner, Upper Kelly Valve, Lower Kelly Valve, Three Air Compressors, Drilling Recorder, Seven Degree Drift Indicator, Vapor-Proof Fluorescent Lighting System, Inside BOP, Spinning Wrench, Pilot Automatic Driller, Wireline Unit 0.108

Completion Rig

Diesel Electric Land Rig

Capable of Drilling to 14,000 ft.

<http://rapaddrilling.com/well-service/>



Rig Information:

- Make: Loadcraft
- Model: LCI 350
- Year: 2011
- Power: 435 H.P. Caterpillar C-13
- Mast*: 96'
- Capacity: 225,000 #
- Depth: 14,000'

Equipment Includes:

- Reverse Units
- Mud Pumps
- Mud Tanks
- BOP's & TIW valves
- Forklifts
- Hydraulic catwalks
- Pipe Racks
- Haul Trucks
- Power Swivels

ATTACHMENT 12
GEOLOGIC PROGNOSIS (REDACTED)

November 26, 2023

Gerald Walker
Environmental Administrator
Oil and Gas Program
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 3588
Tallahassee, Florida 32399-2600

RE: Geological Opinion as to the Proven or Indicated Likelihood of the Presence of Oil and Gas in support of Drilling Permit Applications for Clearwater Land & Mineral FLA, LLC

Dear Mr. Walker:

We are providing the below provided geological discussion and opinion in support of the above-referenced applications for drilling permits for exploratory oil and gas wells in Calhoun County, Florida, filed by Clearwater Land & Mineral FLA, LLC ("Clearwater"). We have carefully reviewed, analyzed, and interpreted public and privately available geological and geophysical data, including geophysical seismic 2D data specific to the project area, in rendering the opinion provided below.

Proven or Indicated Likelihood of the Presence of Oil and Gas

Clearwater believes the likelihood of the presence of oil and gas at this location is high. The site was selected after years of study of the Jurassic Deposition of the Apalachicola Embayment as it lies under Calhoun, Gulf, and Liberty Counties. Studies included detailed analysis of prior Jurassic wells drilled, review of pre-existing seismic surveys, detailed study of the Cholla seismic survey, and generation of subsurface maps. Clearwater believes that these studies indicate that the Apalachicola Embayment is a direct analog to the known Jurassic oil field production lying approximately 125 miles to the Northwest at the Little Cedar Creek and Brooklyn Oil Fields located in Conecuh County, Alabama, which have now exceed production of 50 Million Barrels Oil Equivalent. An assessment of remaining oil and gas reserves in the target Upper Jurassic Smackover Formation for Onshore U.S. is found in USGS publication: Assessment of Continuous Oil and Gas Resources in the Upper Jurassic Smackover Formation of the Onshore U.S. Gulf Coast, 2022.

Site Selection based on Geology and Geophysics

Clearwater's site selection is based on using the same techniques proven to be successful for exploration, discovery and development of the Little Cedar Creek and Brooklyn Fields. The Little Cedar Creek and Brooklyn Fields produce oil and gas from the Jurassic Smackover Formation (Smackover) where the oil reservoir rocks consist of nearshore oolite bars and reefs which were deposited near the updip limits of the shallow seas of the Smackover. The Smackover shoreline is confined updip by the pre-existing metamorphic, Paleozoic basement rock which was created by, and is part of, the Appalachian Mountain range.

The key to locating the areas most likely to find the prospective oil and gas field, or potentially, fields, in the Apalachicola Embayment is in the location of the primary target reservoir rocks comprising

the Smackover reefs and oolite bars that are proximal to the effective shoreline with the similar geometry and depositional components as those that are found in the proven Little Cedar Creek and Brooklyn Fields. The most reliable method for the location and identification of these targeted reservoir rocks is to use the same methods that were used and proven successful for development of the Little Cedar Creek and Brooklyn Fields. These methods include the very specific and targeted geological and geophysical understanding of the major components that are involved in the creation of the updip reservoir fields which include understanding of 1) the Smackover's carbonate depositional system — overall, sequence and location, 2) the Smackover's initiation depositional surface— Norphlet, pre-Jurassic gravels, and Basement, 3) the subsurface structure and, 4) the source, migration, and trapping components.

Data used to understand the major components includes data on 1) prior Smackover depth wells drilled— logs, cores, and drilling data, and 2) pre-existing geophysical data (including the Cholla Seismic Survey). Subsurface maps of the Smackover Formation with the datasets help integrate the geological and the geophysical which help to predict the targeted thicknesses which are most likely to hold the targeted reservoir rocks. Geophysical data is used to locate and image the Smackover Formation and to confirm that it is analogous to the oil filled reservoir rocks of Little Cedar Creek and Brooklyn Fields. These proven techniques have been employed by both geologists and geophysicists resulting in the agreement that the surface and bottom hole locations are located where there is a high chance for all these conditions to be met.

The Primary and Secondary Targets— Top Seal and Floor

The Smackover Formation is the primary target and is a carbonate depositional system deposited in the oceans of the Jurassic. In the Apalachicola Embayment, the Smackover has varying deposition of nearshore environments, ranging from tight limestones and shales to porous and permeable reefs and oolite bars. The total thickness for the Smackover seen in wells drilled to date ranges from 0' to 170'. The thickest reef seen to date is 120' and the oolite bars are generally 10-20' with 1-3 oolite bars being considered normal and typical. These same nearshore deposits are seen in the analogous Little Cedar Creek and Brooklyn Fields and surrounding areas.

The Smackover is overlain by Buckner anhydrites and Haynesville shales. Buckner deposits are typically 10-20' in thickness and the overlying Haynesville shales are typically 370' thick but generally thicken to the north and are seen in the 400-500' thick range. Both the Buckner and Haynesville shales act as top seals for the underlying Smackover Formation.

The Norphlet Formation (Norphlet) is a secondary target. In the Apalachicola Embayment, the Smackover is underlain by the Norphlet, Pre-Jurassic Gravel, and/or Paleozoic Basement, whichever was present and exposed at the time of the initial Smackover transgression. The Norphlet is a sandstone of varying quality and was deposited in an arid environment and can be seen as desert dunes, wadi, or stream deposits. If the Norphlet is exposed at the time of Smackover transgression, the upper portion may be reworked by the incoming Smackover ocean. The Norphlet can be productive of oil and gas when the overlying Smackover is 1) oil or gas filled, or 2) impermeable and serving as a cap rock. There are numerous oil fields producing from the Norphlet in South Alabama and the pan handle of Florida as well as offshore Alabama. The Pre-Jurassic Gravel and Basement have not produced any significant oil or gas to date in South Alabama or Northern Florida.

CONFIDENTIAL-TRADE SECRET INFORMATION

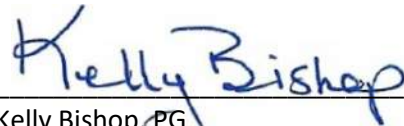
CONFIDENTIAL-TRADE SECRET INFORMATION

Exhibit B to this report contains geological and geophysical data, information, and professional geological interpretations that are proprietary trade secrets. This information is submitted reserving all rights as provided by statute and rule in sections 815.045, 812.081, 377.24075, and 377.22(h), Florida Statutes (2023). This information contained in Exhibit B is used by Clearwater in the operation of its business, and which provides a business advantage and opportunity to obtain an advantage over those who do not know or use it. Clearwater considers the information in the documents to be secret, of value, and solely for the use in its business. Clearwater considers and has treated the information as a confidential business trade secret. Consequently, the undersigned request that you treat in all manners and at all times these documents and the information contained therein as confidential business trade secrets. If you have any questions or dispute the confidential trade secret status of the materials, please immediately contact, Timothy Riley with the law firm of Gunster, Yoakley & Stewart, at triley@gunster.com, or 850-521-1727.

Sincerely,



Steven H. Craft, Sr.
Craft Operating Company XXXII, LLC
Petroleum Geologist
BS College of Engineering – 1984
University of Southwest Louisiana



Kelly Bishop, PG
Brightwater Solutions, LLC
Professional Geology License (Florida)
No. 2590

ATTACHMENTS:

Exhibit A (Public) Supporting Materials

Exhibit B (Confidential Proprietary) Supporting Materials and Analysis

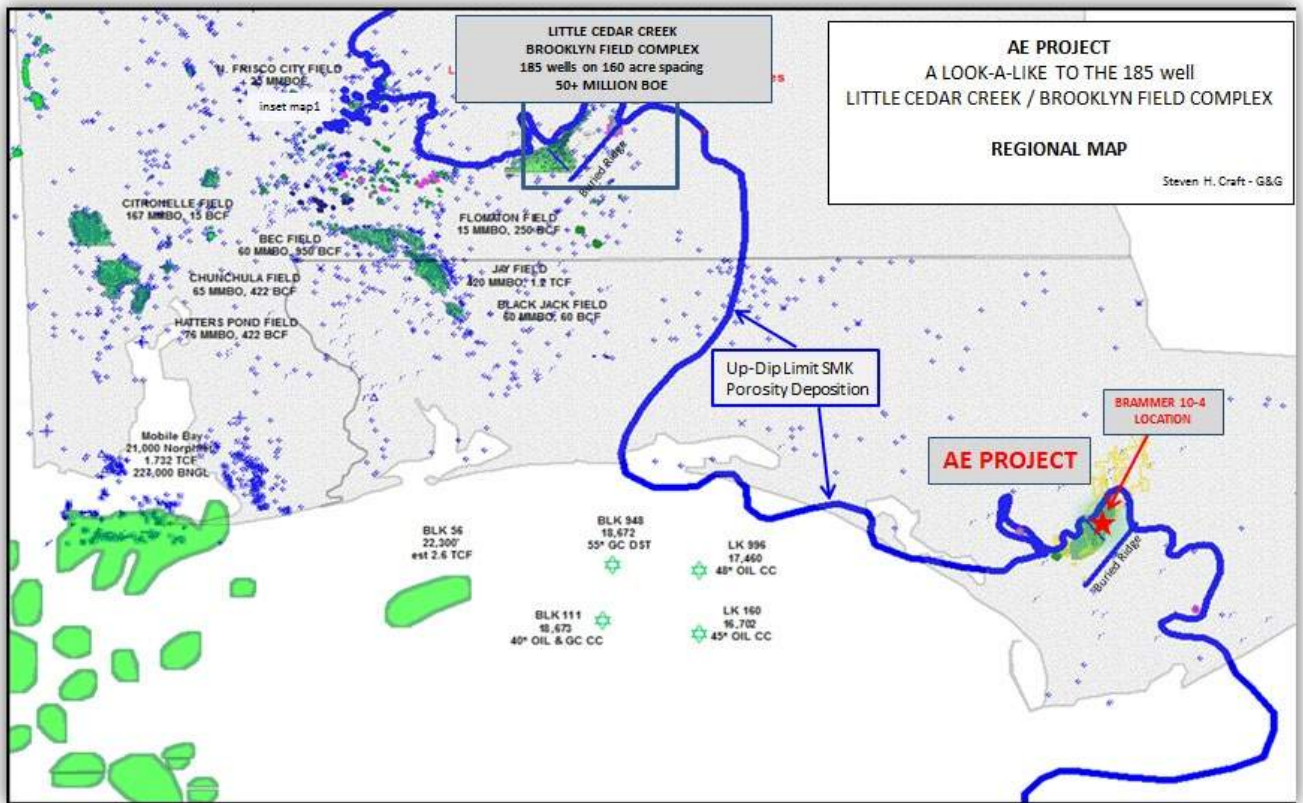
Exhibit A (Public) Supporting Materials

STRATIGRAPHIC SECTION: SOURCE: ALABAMA STATE OIL AND GAS BOARD

ERATHM	SYSTEM	SERIES	STAGE	FORMATION	
MESOZOIC	CRETACEOUS	Upper	Maastrichtian	Selma Group	
			Campanian		
			Santonian	Eutaw Formation	
			Coniacian	Tuscaloosa Group	
			Turonian		"Upper Tuscaloosa"
			Cenomanian		"Marine Tuscaloosa"
		"Lower Tuscaloosa"			
		Lower	Albian	Washita and Fredericksburg Groups undifferentiated	Lower Cretaceous undifferentiated
				Paluxy Formation	
				Mooringsport Formation	
				Ferry Lake Anhydrite	
			Aptian	Rodessa Formation	
			Barremian	Sligo Formation	
			Hauterivian	Hosston Formation	
	Valanginian		Cotton Valley Group		
	Berriasian				
	JURASSIC	Upper	Tithonian	Haynesville Formation	
			Kimmeridgian		
			Middle	Oxfordian	Buckner Anhydrite Mbr.
		Callovian		Smackover Formation	
				Bathonian	Norphlet Fm. Denkman 5s. Mbr.
		Lower	Bajocian	Pine Hill Anhydrite Member	
	Louann Salt				
	Triassic	Upper		Werner Formation	
				Eagle Mills Formation	
			Paleozoic-Precambrian	"Basement"	
				Pre-Mesozoic sedimentary and crystalline rocks	

★ SMACKOVER (PRIMARY TARGET)
 ★ NORPHLET (SECONDARY TARGET)

Regional Smackover Trend Map



The Apalachicola Embayment Prospect is analogous to the 50+ Million Barrel Jurassic Smackover Fields developed by Craft and others at the Little Cedar Creek and Brooklyn Fields System which are 17+ miles in length from 11-13,500' deep trapped by the up-dip termination of the Smackover Formation, where along the Western shoreline controlled by a major positive structural feature the Smackover sets up a nearshore reef and bar beach system and depositional environment trapped by its own up-dip termination. Thereefs and oolite bars are up-dip to and flanking the deeper water basinal deposits which de-water and source the flanking up-dip porous and permeable perched shelf deposits.

ATTACHMENT 13
DIRECTIONAL DRILLING PLAN

Brammer Engineering

Calhoun County, FL

NLT Royalty Partners - Pad 1 (Revised SHL)

NLT Royalty Partners 10-4

OH

Plan: Plan 4

Standard Planning Report

05 October, 2023

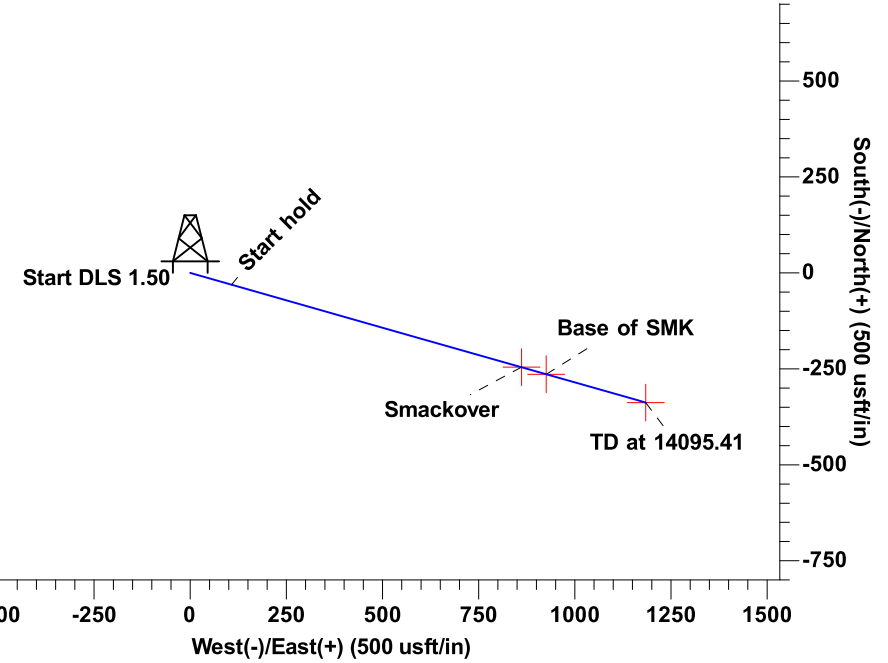
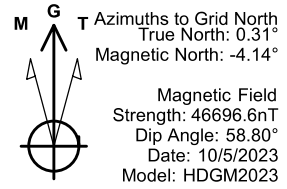
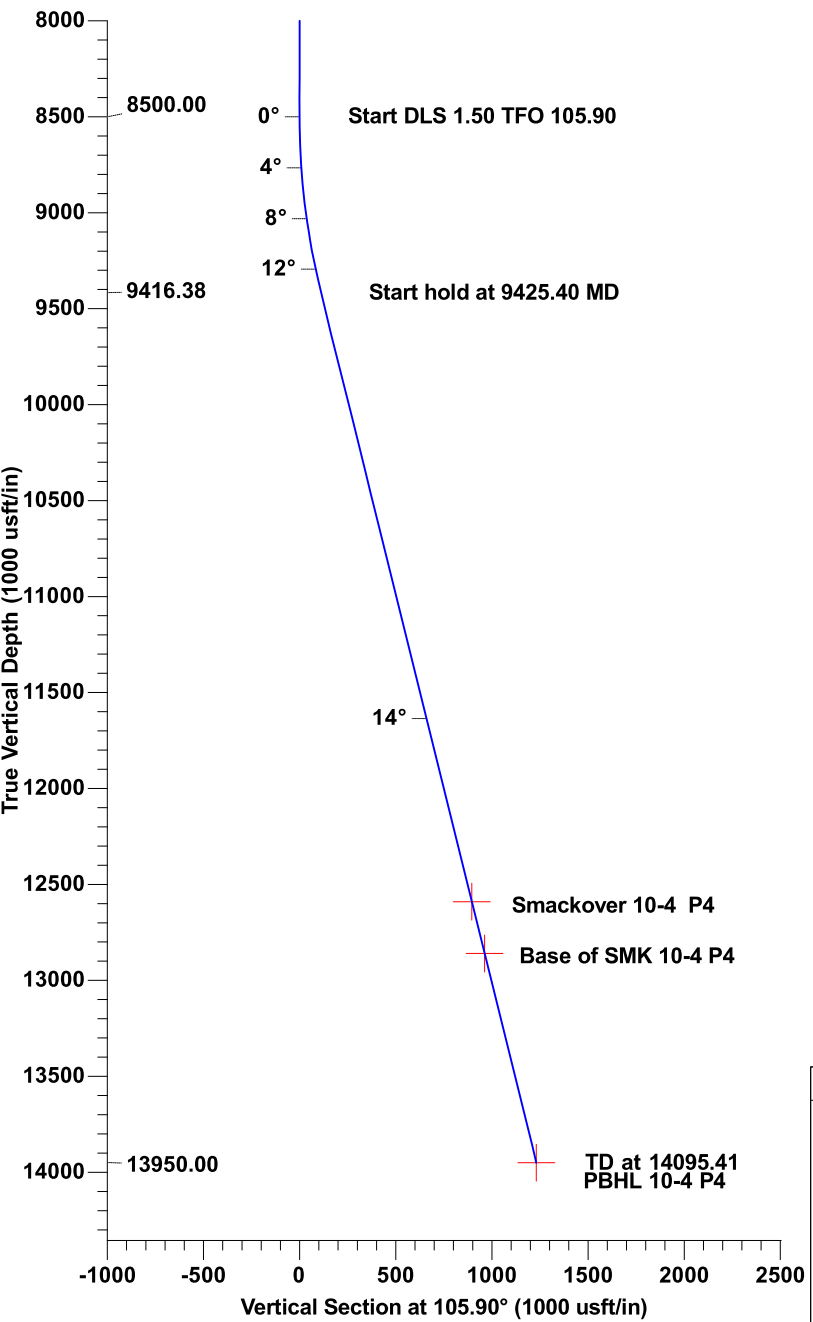




Brammer Engineering



Project: Calhoun County, FL
 Site: NLT Royalty Partners - Pad 1 (Revised SHL)
 Well: NLT Royalty Partners 10-4
 Wellbore: OH
 Plan: Plan 4



WELL DETAILS: NLT Royalty Partners 10-4					
+N/-S	+E/-W	Northing	KB @ 60.00usft Easting	Latitude	Longitude
0.00	0.00	449588.48	1770979.46	30.234757	-85.125481

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape	
Smackover 10-4 P4	12590.00	-245.48	861.54	449343.00	1771841.00	Point	
Base of SMK 10-4 P4	12860.00	-263.77	925.71	449324.71	1771905.17	Point	
PBHL 10-4 P4	13950.00	-337.58	1184.76	449250.90	1772164.22	Point	

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	8500.00	0.00	0.00	8500.00	0.00	0.00	0.00	0.00	0.00	
3	9425.40	13.88	105.90	9416.38	-30.57	107.28	1.50	105.90	111.55	
4	12694.50	13.88	105.90	12590.00	-245.48	861.54	0.00	0.00	895.83	Smackover 10-4 P4
5	12972.62	13.88	105.90	12860.00	-263.77	925.71	0.00	0.00	962.55	Base of SMK 10-4 P4
6	14095.41	13.88	105.90	13950.00	-337.58	1184.76	0.00	0.00	1231.92	PBHL 10-4 P4

Planning Report

Database:	Lafayette	Local Co-ordinate Reference:	Well NLT Royalty Partners 10-4
Company:	Brammer Engineering	TVD Reference:	KB @ 60.00usft
Project:	Calhoun County, FL	MD Reference:	KB @ 60.00usft
Site:	NLT Royalty Partners - Pad 1 (Revised SHL)	North Reference:	Grid
Well:	NLT Royalty Partners 10-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 4		

Project	Calhoun County, FL		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Florida Northern Zone		

Site	NLT Royalty Partners - Pad 1 (Revised SHL)				
Site Position:	Northing:	449,588.48 usft	Latitude:	30.234757	
From: Map	Easting:	1,770,979.46 usft	Longitude:	-85.125481	
Position Uncertainty:	0.00 usft	Slot Radius:	0.000 in	Grid Convergence:	-0.31 °

Well	NLT Royalty Partners 10-4					
Well Position	+N/-S	0.00 usft	Northing:	449,588.48 usft	Latitude:	30.234757
	+E/-W	0.00 usft	Easting:	1,770,979.46 usft	Longitude:	-85.125481
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	37.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2023	10/5/2023	-4.45	58.80	46,696.60

Design	Plan 4			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	105.90

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,425.40	13.88	105.90	9,416.38	-30.57	107.28	1.50	1.50	11.44	105.90	
12,694.50	13.88	105.90	12,590.00	-245.48	861.54	0.00	0.00	0.00	0.00	Smackover 10-4 P4
12,972.62	13.88	105.90	12,860.00	-263.77	925.71	0.00	0.00	0.00	0.00	Base of SMK 10-4 P4
14,095.41	13.88	105.90	13,950.00	-337.58	1,184.76	0.00	0.00	0.00	0.00	PBHL 10-4 P4

Planning Report

Database:	Lafayette	Local Co-ordinate Reference:	Well NLT Royalty Partners 10-4
Company:	Brammer Engineering	TVD Reference:	KB @ 60.00usft
Project:	Calhoun County, FL	MD Reference:	KB @ 60.00usft
Site:	NLT Royalty Partners - Pad 1 (Revised SHL)	North Reference:	Grid
Well:	NLT Royalty Partners 10-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 4		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00	

Planning Report

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Design:	Plan 4		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
Start DLS 1.50 TFO 105.90									
8,600.00	1.50	105.90	8,599.99	-0.36	1.26	1.31	1.50	1.50	0.00
8,700.00	3.00	105.90	8,699.91	-1.43	5.03	5.23	1.50	1.50	0.00
8,800.00	4.50	105.90	8,799.69	-3.23	11.32	11.77	1.50	1.50	0.00
8,900.00	6.00	105.90	8,899.27	-5.73	20.12	20.92	1.50	1.50	0.00
9,000.00	7.50	105.90	8,998.57	-8.95	31.43	32.68	1.50	1.50	0.00
9,100.00	9.00	105.90	9,097.54	-12.89	45.23	47.03	1.50	1.50	0.00
9,200.00	10.50	105.90	9,196.09	-17.53	61.51	63.96	1.50	1.50	0.00
9,300.00	12.00	105.90	9,294.16	-22.87	80.27	83.47	1.50	1.50	0.00
9,400.00	13.50	105.90	9,391.70	-28.92	101.50	105.54	1.50	1.50	0.00
9,425.40	13.88	105.90	9,416.38	-30.57	107.28	111.55	1.50	1.50	0.00
Start hold at 9425.40 MD									
9,500.00	13.88	105.90	9,488.80	-35.47	124.49	129.45	0.00	0.00	0.00
9,600.00	13.88	105.90	9,585.88	-42.05	147.57	153.44	0.00	0.00	0.00
9,700.00	13.88	105.90	9,682.95	-48.62	170.64	177.43	0.00	0.00	0.00
9,800.00	13.88	105.90	9,780.03	-55.19	193.71	201.42	0.00	0.00	0.00
9,900.00	13.88	105.90	9,877.11	-61.77	216.78	225.41	0.00	0.00	0.00
10,000.00	13.88	105.90	9,974.19	-68.34	239.85	249.40	0.00	0.00	0.00
10,100.00	13.88	105.90	10,071.27	-74.92	262.93	273.39	0.00	0.00	0.00
10,200.00	13.88	105.90	10,168.35	-81.49	286.00	297.38	0.00	0.00	0.00
10,300.00	13.88	105.90	10,265.43	-88.07	309.07	321.37	0.00	0.00	0.00

Planning Report

Database:	Lafayette	Local Co-ordinate Reference:	Well NLT Royalty Partners 10-4
Company:	Brammer Engineering	TVD Reference:	KB @ 60.00usft
Project:	Calhoun County, FL	MD Reference:	KB @ 60.00usft
Site:	NLT Royalty Partners - Pad 1 (Revised SHL)	North Reference:	Grid
Well:	NLT Royalty Partners 10-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 4		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,400.00	13.88	105.90	10,362.51	-94.64	332.14	345.36	0.00	0.00	0.00
10,500.00	13.88	105.90	10,459.59	-101.21	355.22	369.36	0.00	0.00	0.00
10,600.00	13.88	105.90	10,556.67	-107.79	378.29	393.35	0.00	0.00	0.00
10,700.00	13.88	105.90	10,653.75	-114.36	401.36	417.34	0.00	0.00	0.00
10,800.00	13.88	105.90	10,750.83	-120.94	424.43	441.33	0.00	0.00	0.00
10,900.00	13.88	105.90	10,847.91	-127.51	447.51	465.32	0.00	0.00	0.00
11,000.00	13.88	105.90	10,944.99	-134.08	470.58	489.31	0.00	0.00	0.00
11,100.00	13.88	105.90	11,042.07	-140.66	493.65	513.30	0.00	0.00	0.00
11,200.00	13.88	105.90	11,139.15	-147.23	516.72	537.29	0.00	0.00	0.00
11,300.00	13.88	105.90	11,236.23	-153.81	539.80	561.28	0.00	0.00	0.00
11,400.00	13.88	105.90	11,333.31	-160.38	562.87	585.27	0.00	0.00	0.00
11,500.00	13.88	105.90	11,430.39	-166.95	585.94	609.26	0.00	0.00	0.00
11,600.00	13.88	105.90	11,527.47	-173.53	609.01	633.25	0.00	0.00	0.00
11,700.00	13.88	105.90	11,624.55	-180.10	632.09	657.24	0.00	0.00	0.00
11,800.00	13.88	105.90	11,721.63	-186.68	655.16	681.23	0.00	0.00	0.00
11,900.00	13.88	105.90	11,818.71	-193.25	678.23	705.23	0.00	0.00	0.00
12,000.00	13.88	105.90	11,915.79	-199.83	701.30	729.22	0.00	0.00	0.00
12,100.00	13.88	105.90	12,012.86	-206.40	724.38	753.21	0.00	0.00	0.00
12,200.00	13.88	105.90	12,109.94	-212.97	747.45	777.20	0.00	0.00	0.00
12,300.00	13.88	105.90	12,207.02	-219.55	770.52	801.19	0.00	0.00	0.00
12,400.00	13.88	105.90	12,304.10	-226.12	793.59	825.18	0.00	0.00	0.00
12,500.00	13.88	105.90	12,401.18	-232.70	816.66	849.17	0.00	0.00	0.00
12,600.00	13.88	105.90	12,498.26	-239.27	839.74	873.16	0.00	0.00	0.00
12,694.50	13.88	105.90	12,590.00	-245.48	861.54	895.83	0.00	0.00	0.00
12,700.00	13.88	105.90	12,595.34	-245.84	862.81	897.15	0.00	0.00	0.00
12,800.00	13.88	105.90	12,692.42	-252.42	885.88	921.14	0.00	0.00	0.00
12,900.00	13.88	105.90	12,789.50	-258.99	908.95	945.13	0.00	0.00	0.00
12,972.62	13.88	105.90	12,860.00	-263.77	925.71	962.55	0.00	0.00	0.00
13,000.00	13.88	105.90	12,886.58	-265.57	932.03	969.12	0.00	0.00	0.00
13,100.00	13.88	105.90	12,983.66	-272.14	955.10	993.11	0.00	0.00	0.00
13,200.00	13.88	105.90	13,080.74	-278.71	978.17	1,017.10	0.00	0.00	0.00
13,300.00	13.88	105.90	13,177.82	-285.29	1,001.24	1,041.10	0.00	0.00	0.00
13,400.00	13.88	105.90	13,274.90	-291.86	1,024.32	1,065.09	0.00	0.00	0.00
13,500.00	13.88	105.90	13,371.98	-298.44	1,047.39	1,089.08	0.00	0.00	0.00
13,600.00	13.88	105.90	13,469.06	-305.01	1,070.46	1,113.07	0.00	0.00	0.00
13,700.00	13.88	105.90	13,566.14	-311.59	1,093.53	1,137.06	0.00	0.00	0.00
13,800.00	13.88	105.90	13,663.22	-318.16	1,116.61	1,161.05	0.00	0.00	0.00
13,900.00	13.88	105.90	13,760.30	-324.73	1,139.68	1,185.04	0.00	0.00	0.00
14,000.00	13.88	105.90	13,857.38	-331.31	1,162.75	1,209.03	0.00	0.00	0.00
14,095.41	13.88	105.90	13,950.00	-337.58	1,184.76	1,231.92	0.00	0.00	0.00
TD at 14095.41									

Planning Report

Database:	Lafayette	Local Co-ordinate Reference:	Well NLT Royalty Partners 10-4
Company:	Brammer Engineering	TVD Reference:	KB @ 60.00usft
Project:	Calhoun County, FL	MD Reference:	KB @ 60.00usft
Site:	NLT Royalty Partners - Pad 1 (Revised SHL)	North Reference:	Grid
Well:	NLT Royalty Partners 10-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 4		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Smackover 10-4 P4 - plan hits target center - Point	0.00	0.00	12,590.00	-245.48	861.54	449,343.00	1,771,841.00	30.234095	-85.122748
Base of SMK 10-4 P4 - plan hits target center - Point	0.00	360.00	12,860.00	-263.77	925.71	449,324.71	1,771,905.17	30.234045	-85.122545
PBHL 10-4 P4 - plan hits target center - Point	0.00	360.00	13,950.00	-337.58	1,184.76	449,250.90	1,772,164.22	30.233846	-85.121723

Plan Annotations					
Measured	Vertical	Local Coordinates		Comment	
Depth	Depth	+N/-S	+E/-W		
(usft)	(usft)	(usft)	(usft)		
8,500.00	8,500.00	0.00	0.00	Start DLS 1.50 TFO 105.90	
9,425.40	9,416.38	-30.57	107.28	Start hold at 9425.40 MD	
14,095.41	13,950.00	-337.58	1,184.76	TD at 14095.41	

Brammer Engineering

Calhoun County, FL

NLT Royalty Partners - Pad 1 (Revised SHL)

NLT Royalty Partners 10-4

OH

Plan: Plan 4

Standard Planning Report - Geographic

05 October, 2023



Planning Report - Geographic

Database:	Lafayette	Local Co-ordinate Reference:	Well NLT Royalty Partners 10-4
Company:	Brammer Engineering	TVD Reference:	KB @ 60.00usft
Project:	Calhoun County, FL	MD Reference:	KB @ 60.00usft
Site:	NLT Royalty Partners - Pad 1 (Revised SHL)	North Reference:	Grid
Well:	NLT Royalty Partners 10-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 4		

Project	Calhoun County, FL		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Florida Northern Zone		

Site	NLT Royalty Partners - Pad 1 (Revised SHL)				
Site Position:	Northing:	449,588.48 usft	Latitude:	30.234757	
From: Map	Easting:	1,770,979.46 usft	Longitude:	-85.125481	
Position Uncertainty:	0.00 usft	Slot Radius:	0.000 in	Grid Convergence:	-0.31 °

Well	NLT Royalty Partners 10-4					
Well Position	+N/-S	0.00 usft	Northing:	449,588.48 usft	Latitude:	30.234757
	+E/-W	0.00 usft	Easting:	1,770,979.46 usft	Longitude:	-85.125481
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	37.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2023	10/5/2023	-4.45	58.80	46,696.60

Design	Plan 4			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	105.90

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
9,425.40	13.88	105.90	9,416.38	-30.57	107.28	1.50	1.50	11.44	105.90	
12,694.50	13.88	105.90	12,590.00	-245.48	861.54	0.00	0.00	0.00	0.00	Smackover 10-4 P4
12,972.62	13.88	105.90	12,860.00	-263.77	925.71	0.00	0.00	0.00	0.00	Base of SMK 10-4 P4
14,095.41	13.88	105.90	13,950.00	-337.58	1,184.76	0.00	0.00	0.00	0.00	PBHL 10-4 P4

Planning Report - Geographic

Database:	Lafayette	Local Co-ordinate Reference:	Well NLT Royalty Partners 10-4
Company:	Brammer Engineering	TVD Reference:	KB @ 60.00usft
Project:	Calhoun County, FL	MD Reference:	KB @ 60.00usft
Site:	NLT Royalty Partners - Pad 1 (Revised SHL)	North Reference:	Grid
Well:	NLT Royalty Partners 10-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 4		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
100.00	0.00	0.00	100.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
200.00	0.00	0.00	200.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
300.00	0.00	0.00	300.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
400.00	0.00	0.00	400.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
500.00	0.00	0.00	500.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
600.00	0.00	0.00	600.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
700.00	0.00	0.00	700.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
800.00	0.00	0.00	800.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
900.00	0.00	0.00	900.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,800.00	0.00	0.00	2,800.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
2,900.00	0.00	0.00	2,900.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,100.00	0.00	0.00	3,100.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,200.00	0.00	0.00	3,200.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,300.00	0.00	0.00	3,300.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,400.00	0.00	0.00	3,400.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,600.00	0.00	0.00	3,600.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,700.00	0.00	0.00	3,700.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,800.00	0.00	0.00	3,800.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
3,900.00	0.00	0.00	3,900.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,000.00	0.00	0.00	4,000.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,100.00	0.00	0.00	4,100.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,200.00	0.00	0.00	4,200.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,300.00	0.00	0.00	4,300.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,400.00	0.00	0.00	4,400.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,500.00	0.00	0.00	4,500.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,600.00	0.00	0.00	4,600.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,700.00	0.00	0.00	4,700.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,800.00	0.00	0.00	4,800.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
4,900.00	0.00	0.00	4,900.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
5,000.00	0.00	0.00	5,000.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
5,100.00	0.00	0.00	5,100.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
5,200.00	0.00	0.00	5,200.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
5,300.00	0.00	0.00	5,300.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
5,400.00	0.00	0.00	5,400.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	

Planning Report - Geographic

Database:	Lafayette	Local Co-ordinate Reference:	Well NLT Royalty Partners 10-4
Company:	Brammer Engineering	TVD Reference:	KB @ 60.00usft
Project:	Calhoun County, FL	MD Reference:	KB @ 60.00usft
Site:	NLT Royalty Partners - Pad 1 (Revised SHL)	North Reference:	Grid
Well:	NLT Royalty Partners 10-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 4		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,500.00	0.00	0.00	5,500.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
5,600.00	0.00	0.00	5,600.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
5,700.00	0.00	0.00	5,700.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
5,800.00	0.00	0.00	5,800.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
5,900.00	0.00	0.00	5,900.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,000.00	0.00	0.00	6,000.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,100.00	0.00	0.00	6,100.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,200.00	0.00	0.00	6,200.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,300.00	0.00	0.00	6,300.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,400.00	0.00	0.00	6,400.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,500.00	0.00	0.00	6,500.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,600.00	0.00	0.00	6,600.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,700.00	0.00	0.00	6,700.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,800.00	0.00	0.00	6,800.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
6,900.00	0.00	0.00	6,900.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,000.00	0.00	0.00	7,000.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,100.00	0.00	0.00	7,100.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,200.00	0.00	0.00	7,200.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,300.00	0.00	0.00	7,300.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,400.00	0.00	0.00	7,400.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,500.00	0.00	0.00	7,500.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,600.00	0.00	0.00	7,600.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,700.00	0.00	0.00	7,700.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,800.00	0.00	0.00	7,800.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
7,900.00	0.00	0.00	7,900.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
8,000.00	0.00	0.00	8,000.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
8,100.00	0.00	0.00	8,100.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
8,200.00	0.00	0.00	8,200.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
8,300.00	0.00	0.00	8,300.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
8,400.00	0.00	0.00	8,400.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
8,500.00	0.00	0.00	8,500.00	0.00	0.00	449,588.48	1,770,979.46	30.234757	-85.125481	
Start DLS 1.50 TFO 105.90										
8,600.00	1.50	105.90	8,599.99	-0.36	1.26	449,588.12	1,770,980.72	30.234756	-85.125477	
8,700.00	3.00	105.90	8,699.91	-1.43	5.03	449,587.05	1,770,984.49	30.234753	-85.125465	
8,800.00	4.50	105.90	8,799.69	-3.23	11.32	449,585.26	1,770,990.78	30.234748	-85.125445	
8,900.00	6.00	105.90	8,899.27	-5.73	20.12	449,582.75	1,770,999.58	30.234741	-85.125417	
9,000.00	7.50	105.90	8,998.57	-8.95	31.43	449,579.53	1,771,010.89	30.234733	-85.125381	
9,100.00	9.00	105.90	9,097.54	-12.89	45.23	449,575.60	1,771,024.69	30.234722	-85.125337	
9,200.00	10.50	105.90	9,196.09	-17.53	61.51	449,570.96	1,771,040.97	30.234709	-85.125286	
9,300.00	12.00	105.90	9,294.16	-22.87	80.27	449,565.61	1,771,059.73	30.234695	-85.125226	
9,400.00	13.50	105.90	9,391.70	-28.92	101.50	449,559.56	1,771,080.96	30.234679	-85.125159	
9,425.40	13.88	105.90	9,416.38	-30.57	107.28	449,557.91	1,771,086.74	30.234674	-85.125141	
Start hold at 9425.40 MD										
9,500.00	13.88	105.90	9,488.80	-35.47	124.49	449,553.01	1,771,103.95	30.234661	-85.125086	
9,600.00	13.88	105.90	9,585.88	-42.05	147.57	449,546.44	1,771,127.02	30.234643	-85.125013	
9,700.00	13.88	105.90	9,682.95	-48.62	170.64	449,539.86	1,771,150.10	30.234626	-85.124940	
9,800.00	13.88	105.90	9,780.03	-55.19	193.71	449,533.29	1,771,173.17	30.234608	-85.124866	
9,900.00	13.88	105.90	9,877.11	-61.77	216.78	449,526.71	1,771,196.24	30.234590	-85.124793	
10,000.00	13.88	105.90	9,974.19	-68.34	239.85	449,520.14	1,771,219.31	30.234572	-85.124720	
10,100.00	13.88	105.90	10,071.27	-74.92	262.93	449,513.57	1,771,242.39	30.234555	-85.124647	
10,200.00	13.88	105.90	10,168.35	-81.49	286.00	449,506.99	1,771,265.46	30.234537	-85.124574	
10,300.00	13.88	105.90	10,265.43	-88.07	309.07	449,500.42	1,771,288.53	30.234519	-85.124501	
10,400.00	13.88	105.90	10,362.51	-94.64	332.14	449,493.84	1,771,311.60	30.234501	-85.124427	
10,500.00	13.88	105.90	10,459.59	-101.21	355.22	449,487.27	1,771,334.68	30.234484	-85.124354	

Planning Report - Geographic

Database:	Lafayette	Local Co-ordinate Reference:	Well NLT Royalty Partners 10-4
Company:	Brammer Engineering	TVD Reference:	KB @ 60.00usft
Project:	Calhoun County, FL	MD Reference:	KB @ 60.00usft
Site:	NLT Royalty Partners - Pad 1 (Revised SHL)	North Reference:	Grid
Well:	NLT Royalty Partners 10-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 4		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,600.00	13.88	105.90	10,556.67	-107.79	378.29	449,480.69	1,771,357.75	30.234466	-85.124281	
10,700.00	13.88	105.90	10,653.75	-114.36	401.36	449,474.12	1,771,380.82	30.234448	-85.124208	
10,800.00	13.88	105.90	10,750.83	-120.94	424.43	449,467.55	1,771,403.89	30.234431	-85.124135	
10,900.00	13.88	105.90	10,847.91	-127.51	447.51	449,460.97	1,771,426.97	30.234413	-85.124062	
11,000.00	13.88	105.90	10,944.99	-134.08	470.58	449,454.40	1,771,450.04	30.234395	-85.123988	
11,100.00	13.88	105.90	11,042.07	-140.66	493.65	449,447.82	1,771,473.11	30.234377	-85.123915	
11,200.00	13.88	105.90	11,139.15	-147.23	516.72	449,441.25	1,771,496.18	30.234360	-85.123842	
11,300.00	13.88	105.90	11,236.23	-153.81	539.80	449,434.68	1,771,519.26	30.234342	-85.123769	
11,400.00	13.88	105.90	11,333.31	-160.38	562.87	449,428.10	1,771,542.33	30.234324	-85.123696	
11,500.00	13.88	105.90	11,430.39	-166.95	585.94	449,421.53	1,771,565.40	30.234306	-85.123622	
11,600.00	13.88	105.90	11,527.47	-173.53	609.01	449,414.95	1,771,588.47	30.234289	-85.123549	
11,700.00	13.88	105.90	11,624.55	-180.10	632.09	449,408.38	1,771,611.55	30.234271	-85.123476	
11,800.00	13.88	105.90	11,721.63	-186.68	655.16	449,401.81	1,771,634.62	30.234253	-85.123403	
11,900.00	13.88	105.90	11,818.71	-193.25	678.23	449,395.23	1,771,657.69	30.234236	-85.123330	
12,000.00	13.88	105.90	11,915.79	-199.83	701.30	449,388.66	1,771,680.76	30.234218	-85.123257	
12,100.00	13.88	105.90	12,012.86	-206.40	724.38	449,382.08	1,771,703.83	30.234200	-85.123183	
12,200.00	13.88	105.90	12,109.94	-212.97	747.45	449,375.51	1,771,726.91	30.234182	-85.123110	
12,300.00	13.88	105.90	12,207.02	-219.55	770.52	449,368.93	1,771,749.98	30.234165	-85.123037	
12,400.00	13.88	105.90	12,304.10	-226.12	793.59	449,362.36	1,771,773.05	30.234147	-85.122964	
12,500.00	13.88	105.90	12,401.18	-232.70	816.66	449,355.79	1,771,796.12	30.234129	-85.122891	
12,600.00	13.88	105.90	12,498.26	-239.27	839.74	449,349.21	1,771,819.20	30.234111	-85.122818	
12,694.50	13.88	105.90	12,590.00	-245.48	861.54	449,343.00	1,771,841.00	30.234095	-85.122748	
12,700.00	13.88	105.90	12,595.34	-245.84	862.81	449,342.64	1,771,842.27	30.234094	-85.122744	
12,800.00	13.88	105.90	12,692.42	-252.42	885.88	449,336.06	1,771,865.34	30.234076	-85.122671	
12,900.00	13.88	105.90	12,789.50	-258.99	908.95	449,329.49	1,771,888.41	30.234058	-85.122598	
12,972.62	13.88	105.90	12,860.00	-263.77	925.71	449,324.72	1,771,905.17	30.234045	-85.122545	
13,000.00	13.88	105.90	12,886.58	-265.57	932.03	449,322.92	1,771,911.49	30.234040	-85.122525	
13,100.00	13.88	105.90	12,983.66	-272.14	955.10	449,316.34	1,771,934.56	30.234023	-85.122452	
13,200.00	13.88	105.90	13,080.74	-278.71	978.17	449,309.77	1,771,957.63	30.234005	-85.122379	
13,300.00	13.88	105.90	13,177.82	-285.29	1,001.24	449,303.19	1,771,980.70	30.233987	-85.122305	
13,400.00	13.88	105.90	13,274.90	-291.86	1,024.32	449,296.62	1,772,003.78	30.233970	-85.122232	
13,500.00	13.88	105.90	13,371.98	-298.44	1,047.39	449,290.05	1,772,026.85	30.233952	-85.122159	
13,600.00	13.88	105.90	13,469.06	-305.01	1,070.46	449,283.47	1,772,049.92	30.233934	-85.122086	
13,700.00	13.88	105.90	13,566.14	-311.59	1,093.53	449,276.90	1,772,072.99	30.233916	-85.122013	
13,800.00	13.88	105.90	13,663.22	-318.16	1,116.61	449,270.32	1,772,096.07	30.233899	-85.121939	
13,900.00	13.88	105.90	13,760.30	-324.73	1,139.68	449,263.75	1,772,119.14	30.233881	-85.121866	
14,000.00	13.88	105.90	13,857.38	-331.31	1,162.75	449,257.17	1,772,142.21	30.233863	-85.121793	
14,095.41	13.88	105.90	13,950.00	-337.58	1,184.76	449,250.90	1,772,164.22	30.233846	-85.121723	
TD at 14095.41										

Planning Report - Geographic

Database:	Lafayette	Local Co-ordinate Reference:	Well NLT Royalty Partners 10-4
Company:	Brammer Engineering	TVD Reference:	KB @ 60.00usft
Project:	Calhoun County, FL	MD Reference:	KB @ 60.00usft
Site:	NLT Royalty Partners - Pad 1 (Revised SHL)	North Reference:	Grid
Well:	NLT Royalty Partners 10-4	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 4		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Smackover 10-4 P4 - plan hits target center - Point	0.00	0.00	12,590.00	-245.48	861.54	449,343.00	1,771,841.00	30.234095	-85.122748
Base of SMK 10-4 P4 - plan hits target center - Point	0.00	360.00	12,860.00	-263.77	925.71	449,324.71	1,771,905.17	30.234045	-85.122545
PBHL 10-4 P4 - plan hits target center - Point	0.00	360.00	13,950.00	-337.58	1,184.76	449,250.90	1,772,164.22	30.233846	-85.121723

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
		(usft)	(usft)		
8,500.00	8,500.00	0.00	0.00	Start DLS 1.50 TFO 105.90	
9,425.40	9,416.38	-30.57	107.28	Start hold at 9425.40 MD	
14,095.41	13,950.00	-337.58	1,184.76	TD at 14095.41	

ATTACHMENT 14
DRILLING PROCEDURE



DRILLING PROCEDURE

National Land & Trust Royalty Partners 10-4

Sec. 10, T3S-R9W

Calhoun County, FL

Florida Permit #1374

- A. Offset wells: Spooner "Bear Creek 34-4 # 1" & "Hunt 7-3 #1"
- B. Potential Drilling Problems:
- Gravel, gumbo, and/or lost circulation in surface hole.
 - Deviation in the Chalk and Eutaw sections.
 - Keyseating in bottom of the Chalk.
 - Contamination from the Ferry Lake Anhydrite.
 - Possible H₂S in the Smackover formation.
- C. Per Florida requirements:
- a. On all Trips, function test all rams, and record on IADC.
 - b. When POOH, the hole must be filled before the fluid level drops 100' in the annulus.
 - c. Function test annular preventer weekly, and record on IADC.
 - d. Weekly BOP drills must be held with each crew. Record all BOP test and drills on all reports.
 - e. Note: BOP test must be performed every seven days when out of hole but no longer than 14 days between tests. Extension required for 14 days.
 - f. FL DEP notices required: Prior to Spud, running CSG, Cementing, Logging, & reaching TD.
1. Conductor is set w/ 20" driven to 300' or refusal.
 2. MIRU RAPAD Rig #36
 3. Contact FL DEP Representative prior to spud, Bop testing, logging, pressure testing & running casing.
 4. R/U 21-1/4" 2M annular preventer on 20" Conductor.
 5. R/U Closed Loop solids control system & PVT systems.
 6. Mix spud mud w/ 55-70 viscosity.
 7. Test Run Rig/Equipment prior to accepting same on daywork.
 8. PU 12 1/4" PDC bit, bit sub, (2) DC's, stabilizer, (1) DC, stabilizer, (9) DC's, & 30 HWDP.

9. Drill 12 ¼" hole to 3,500' (100' above bottom of chalk) or up to 20' deeper if needed, take inclination surveys @ every 500' (Base of USDW: 1,110' approx)
10. Be aware of likely loss circulation zones from bottom of conductor to 1550'.
11. Notify FLA DEP of upcoming BOP test
12. POOH (SLM) for wiper trip to bit.
13. TIH
14. Circulate/condition hole for running casing.
15. RU casing crews/FU tool to run 9-5/8" casing.
16. MU 9-5/8" 40# J-55 BTC float shoe, 2 shoe jts., Float Collar, and flow check same. Continue running remaining 9-5/8" 40# J-55 Casing to bottom. Place Cement petal basket on next to last joint (100' below rotary). Put makeup torques on report.

Size	Weight	ID	Drift	Grade	Connection	Tension	Burst	Collapse
9 5/8"	40.0#	8.835	8-3/4" (special Drift)	J-55	BT&C	630,000	3,950	2,570

17. RU cementing head and circulate 1 ½ casing volumes or bottoms up, whichever is greater. *If major losses are observed, begin pumping cement.*
18. Transfer mud from active system to vacuum trucks or storage tanks to allow for mud displaced from hole during cement job
19. Cement as per attached procedure. Displace CSG with mud. Bypass shale shakers and catch cement returns in tank prepared with sugar water (10 lbs/bbl) for retarder. Retarded cement will then be trucked to disposal site. Do not over displace cement by more than ½ shoe track volume (approx. 3.4 BBLs). Bump plug with 500 psi over late pumping pressure. Check floats. Top out if cement does not remain at surface.
20. WOC 8 hours before slacking off on CSG.
21. Make rough/final cuts on 20" & 9-5/8" casing. NU 9-5/8" SOW X 11" 5K starting head. Test head to 1,250 psi (less than 50% of 9-5/8" casing collapse).
22. Install 13-5/8" 5M X 13-5/8" 10M DSA. Nipple up 13-5/8" 10M H2S Cameron BOP stack as follows from bottom to top: 13-5/8" Cameron Type U 10M pipe rams w/ 5" rams, 13-5/8" 10M drilling spool, 13-5/8" 10M psi Cameron Type U double ram BOP with blind rams on bottom and 5" pipe rams on top, and 13-5/8" Shaffer 5M annular BOP. Test same 5,000 hi/250 lo, all rams, valves back to pumps, choke manifold, test Hydril to 3,500 hi/250 lo. Test surface Casing to 1500 psi with test unit & record on chart for 30 min.
23. Install wear bushing
24. M/U 8-3/4" PDC, straight hole motor, NMDC, Stab, 1-DC, Stab, 9- DC, 21 HWDP, Jars, & 8 HWDP (stabilizers at 60' & 90').
25. TIH to float collar.
26. Drill float equipment, cement + 10' formation, circ bottoms up
27. Test shoe to 11.5 ppg EMW (509 psi w/ 8.7 MW) for 5 minutes.

28. Drill ahead to directional kick off point (8,500') making wiper trips every 1500-2000 ft of hole drilled, and directional single shot surveys every 500'. Install pipe rubbers every other jt and keep moving same to keep inside surface pipe.
29. At Kick off Point Drop Gyro for tie-in, POOH w/ bit, and L/D (9) DC's. M/U directional BHA & TIH.
30. Continue Drilling ahead as per directional plan.
31. Call surveyors to shoot elevations at the rig before logging point.
32. Rig up mud-loggers by 10,500'.
33. By 11,000' R/U H2S monitoring & train crews, and also R/U Flare-stack.
34. Continue drilling with directional tools as per Plan to core point (12,588'+/-). Core point to be determined by Geologist & verified on bottoms up by Mudlogger.
35. CIRC bottoms up, and POOH to PU core assembly.
36. Cut 90' core as directed. Have H2S rep on location then POOH & check top of core for presence of H2S.
37. LD coring tools, and PU directional BHA if still required. Ream core hole & Continue drilling to TD of 14,095 MD (13,950' TVD).
38. Circulate bottoms up, & pump sweep around.
39. Make wiper trip to shoe & circ another bottoms up & pump sweep around.
40. POOH (SLM).
41. Log well as directed.
42. MU 9-5/8" test Packer, TIH 100' above shoe & test surface casing to 1500 psi for 30 min. on chart. POOH
43. **If well is not productive proceed with the P&A procedure.**
44. TIH laying down DP rubbers. Circulate & condition for running casing.
45. R/U L/D machine & POOH L/D 5" Drill Pipe, BHA, & break Kelly.
46. Install 5-1/2" CSG rams & shell test same.
47. **Remove wear bushing.**
48. M/U 5-1/2" float shoe, (2) shoe Joints, float collar & circulate through same.
49. Run 5-1/2" 17, & 20# L-80 LT&C CSG to bottom. Put makeup torques on report.

Size	Weight	ID	Drift	Grade	Connection	Tension	Burst	Collapse
5 1/2"	17#	4.892	4.767	L-80	LT&C	338,000	7,740	6,290
5 1/2"	20#	4.778	4.653	L-80	LT&C	416,000	9,190	8,830

50. Circulate bottoms up or 1 ½ times casing volume, whichever is greater. *If major losses are observed, begin pumping cement.*
51. The volume of spacer, cement, & displacement will be around 540 BBLs. Be sure to transfer mud to storage tanks to allow room in active system for returns.
52. Cement as per proposal. Make best attempt to reciprocate pipe during CMT job.
53. Displace w/ 2% KCL & bump plug with 1000 psi over late pumping pressure. Do not over displace cement by more than ½ shoe track volume (approx. 1.8 BBLs). Check floats & R/D cementers.

54. Verify that well is static prior to breaking bolts on stack.
55. P/U stack w/ winches & set full weight of CSG on slips. Make rough & final cuts.
56. N/U 11" 5K x 7-1/16" 5K TBG spool. Test void to 2,500 psi (less than 50% of CSG collapse).
57. C/O rams back to 5" & N/D BOPs.
58. Clean tanks, RD Rig, & Release same
59. Before leaving location:
 - a. Haul away all fluids & Solids to disposal.
 - b. Verify all casing valves are properly closed.
 - c. Make sure location is clean and remove all excess tubulars.

Size	Weight	ID	Drift	Grade	Connection	Tension	Burst	Collapse
9 5/8"	40.0#	8.835	8-3/4" (special Drift)	J-55	BT&C	630,000	3,950	2,570
5 1/2"	17#	4.892	4.767	L-80	LT&C	338,000	7,740	6,290
5 1/2"	20#	4.778	4.653	L-80	LT&C	416,000	9,190	8,830

P&A Procedure:

1. Contact FLA DEP to give notice of intent to plug & verify Plug depths.
2. L/D BHA & TIH open ended.
3. Circulate bottoms up.
4. Set CMT Plug #1 on bottom.
5. R/U Laydown machine & POOH L/D drillpipe to 3,500'.
6. POOH & M/U mud disposal PKR.
7. TIH & set PKR 100' above shoe. Test backside to 1500 psi for 30 minutes, per FLA DEP.
8. Pump away mud tanks, all stored mud, and any remaining stormwater.
9. Pump 250' CMT Plug #2 below PKR, & spot 50' CMT on top of PKR.
10. POOH & L/D setting tool.
11. TIH @ set CMT Plug #3 from 1,400-1,000' across USDW.
12. L/D DP & break Kelly.
13. Set top CMT Plug #4 from 400'-0' with 1".
14. ND BOP's, cut off wellhead 5' BGL & weld on steel plate.

ATTACHMENT 15
DRILLING FLUIDS PROGRAM



Quality Drilling Fluids

**RECOMMENDED DRILLING FLUIDS PROGRAM
FOR**

Brammer Engineering, Inc.



QUALITY DRILLING FLUIDS
POST OFFICE BOX 128
ELLISVILLE, MISSISSIPPI 39437
(601) 477-9085
FAX: (601) 477-9028
EMAIL: qualitydrilling@megagate.com
WEBSITE: www.qualitydrillingfluids.com

RECOMMENDED DRILLING FLUIDS PROGRAM

FOR

BRAMMER ENGINEERING, INC.

MR. ANDY SMITH

NLT ROYALTY PARTNERS 10-4

SECTION 10, T3N-R9W

CALHOUN COUNTY, FLORIDA

JULY 25, 2023

**SCOTT WALKER
OPERATIONS MANAGER**

QUALITY DRILLING FLUIDS, INC.

POST OFFICE BOX 128

ELLISVILLE, MS 39437

(601) 477-9085 or 866/ 425-9005

FAX: (601) 477-9028

EMAIL: qdf@qualitydrillingfluids.com

WEBSITE: www.qualitydrillingfluids.com

TABLE OF CONTENTS

- I. Introduction**
- II. Personnel and Facilities**
- III. Casing Program / Days Estimate**
- IV. Drilling Fluid Schedule**
- V. Drilling Fluid Recommendations**
- VI. Product Descriptions**
- VII. Solids Control / Lost Circulation / Sweeps**
- VIII. Reference Material**



Brammer Engineering, Inc.
NLT Royalty Partners 10-4
Section 10, T3S-R9W
Calhoun County, Florida

July 25, 2023

Mr. Andy Smith
Brammer Engineering, Inc.
Shreveport, Louisiana

Re: NLT Royalty Partners 10-4
Section 10, T3S-R9W
Calhoun County, Florida

Dear Mr. Smith:

Quality Drilling Fluids, Inc. is pleased to present our Recommended Drilling Fluids Proposal for your above noted well. Based on the data from offset wells and experience in the area, we are recommending the following systems.

MEASURED DEPTH	RECOMMENDED SYSTEM
0' – 3,500'±	A Flocculated Gel Spud Mud
3,500' - 8,500' (KOP)	Low Solids Non-Dispersed (Gel/Lime Sweeps)
8,500' – 12,000'	Low Solids Slightly Dispersed to a Dispersed
12,000' - 14,095' (MD)	Low Solids Dispersed System

This will be a closed-loop system, so close attention should be paid to dilution rates. Also, the daily additions of thinners/dispersants will increase as penetration rates increase.

The NLT Royalty Partners 10-4 should be spudded with 50 – 55 viscosities to prevent loss circulation or seepage through the sandy gravel section. Keep good thick viscosities in tanks and watch pit levels during these depths. Control drilling may be necessary to maintain low annular fluid weights. Sealing/healing the upper 400' – 600' of hole will be the critical section in the surface. Gumbo stringers may create a packing off or bit balling problem, but control drilling should maintain low annular fluid weights / solids to prevent the situation. After drilling into more dense shale, dilution should control LGS. Gel sweeps will be used to purge the hole of cuttings on a routine basis until T.D. The Midway Shale may show signs of sloughing/ wetting. Treatments of PHPA will inhibit and prevent further sloughing. The surface casing will be set in the top of the Chalk formation to prevent any situation with the sloughing shale. When the surface casing has been set, the active fluids system will be diluted & the settling tank cleaned in preparation of drilling with a Low Solids Non-dispersed fluid. While drilling out of surface casing, the cement contaminated fluid should be treated chemically with additions of SAPP and Sodium Bicarbonate. Maintaining a highly diluted system while utilizing Gel sweeps to maintain a clean hole. Some of the penetration rates will be slow below the Chalk formation. Slow P. Rates may cause deviation situations. For any excess doglegs/deviation that could cause key seats, string reamers may be of value to ream through the spot while drilling ahead. If “fanning” is necessary for deviation problems, thought should be given to the use of a Mud Motor / MWD earlier than the planned KOP. This would allow for constant weight to be maintained in a known direction, possibly saving a slow penetration rate (rig time) that could cause key seats.

Continue:

Below the Lower Tuscaloosa formation, prepare for the Ferry Lake formation. The Ferry Lake Anhydrite should be treated by chemically reducing rheological properties along with additions of Soda Ash to precipitate the excess calcium as it is drilled. Concentrations of 120-160 ppm will be allowed to remain in the system to protect from CO₂ gases that may be encountered. Only slight rheological changes will need to be made to the system during this section.

Proper solids control equipment will be necessary to lessen the dilution rates (cost). Massive dilution along with Gel sweeps will be utilized to +/- 8,000'. Fluids in the cutting tanks may be reclaimed/flocculated in this interval to reduce excess volumes that will accumulate while drilling. Lime additions to the cutting tanks will accelerate the precipitation of drill solids and allow reclamation of drill water.

When nearing 8,500', the system will be conditioned for directional operations and the filtrate will be reduced and maintained with tourly treatments. The KOP is expected to be around 8,500'±. At this point, the filtrate should be reduced to 16-12cc's for directional operations. This will be achieved with treatments with Gel, Lignite and Q-Pac.

While in the hole with a mud motor building angel, wall sticking may become a problem from sands taking fluid. Sweeps with Calcium Carbonate will aid this situation by sealing these porous sands. Calcium Carbonate provides a tough filter cake and aids in filtrate reduction. Should torque and drag become severe, suggest adding 1 – 3ppb of Soltex and/or Graphite for lubricity. Periodic wiper trips are good practice in directional wells to be sure the hole is staying open. The MBT should be increased to 25–30 ppb and filtrate lowered to 15cc before drilling Cotton Valley to lessen the seepage of the fluid to the porous sands. By increasing the MBT of the system, the upcoming weight increases, and lower filtrate values will have a base fluid to be built upon. Only slight weight/rheological adjustments should be necessary to maintain the fluid properties.

At approximately 11,900', we may begin picking up Anhydrite in Haynesville (Approx. 11,986' TVD). Excessive amount of Anhydrite is not expected from Haynesville to the Smackover. The Anhydrite should be pretreated with additions of Soda Ash to lessen the rheological effects of the contamination. Treatment will be by chemically reducing rheological properties with Quality Thin and Lignite along with additions of Soda Ash to precipitate the excess calcium from anhydrite as it is drilled. The hardness content should be allowed to remain in the 100-120 ppm range to prevent any buildup of CO₂ in the system. Increases in alkalinity will become necessary through additions of Caustic Soda. Daily monitoring of the alkalinities / hardness content of the system should be closely observed. Salt stringers may also be penetrated while drilling the Haynesville formation. The salt stringers should be allowed to incorporate in the system. The chlorides of the system are not expected to increase above 5,000 mg/l. By allowing the salt stringers to incorporate into the system will lessen wash-out as they are drilled. Rheological properties can be kept in recommended ranges with additions of Lignite and Quality Thin. Use Caustic Soda as needed to control Ph and Quality Pac for filtrate values. Pit markers, flow checks on connections and drilling breaks should be practiced from the Cotton Valley formation to T.D.



Brammer Engineering, Inc.
NLT Royalty Partners 10-4
Section 10, T3S-R9W
Calhoun County, Florida

Continue:

The filtrate values will be continually lowered until 10-8cc's is reached by the top of Smackover formation (Approx. 12,590'TVD). These lowered filtrate values will be maintained as the Smackover formation is drilled. Proper solids controls will be essential for an economical fluid system. Monitor chlorides closely from top Haynesville to top of Smackover for possible salt stringers. Increase in mud weight may be necessary to prevent salt from invading the well bore.

With all drilling parameters met and without any unforeseen problems, Quality Drilling Fluids, Inc. estimates the NLT Royalty Partners 10-4 will be drilled in (26.5) days with an estimated mud cost of \$232,795. Any unforeseen situations/ problems may alter this estimate. This well will be serviced and engineered out of the Ellisville, Mississippi office. Quality Drilling Fluids, Inc. appreciates the opportunity to submit this proposal. If you have any questions, please feel free to contact me at (601) 477-9085 or (866) 425-9005.

Yours truly,

Scott Walker
Operations Coordinator
Quality Drilling Fluids, Inc.



Brammer Engineering, Inc.
NLT Royalty Partners 10-4
Section 10, T3S-R9W
Calhoun County, Florida

PERSONNEL

Mac McKay 601-319-6010	Owner/President Ellisville, MS	40 Years' Experience
Duane Shelby 601-319-4322	Sales Representative Laurel, MS	35 Years' Experience
Scott Walker 601-580-0746	Operations Coordinator Laurel, MS	28 Years' Experience
Matt Creel 601-270-0798	Engineer Petal, MS	15 Years' Experience
Bill Kolger 601-447-5754	Consultant Hattiesburg, MS	32 Years' Experience
Jim Hebert 337-349-6256	Consultant Lafayette, LA	40 Years' Experience
Allen McInnis 601-422-3412	Warehouse Manager Laurel, MS	16 Years' Experience
Truck Drivers 601-477-9085	Warehouse	30 Years' Experience

Personnel are accessible on a 24-hour basis at (601) 477-9085 or 1-866-425-9005



Brammer Engineering, Inc.
NLT Royalty Partners 10-4
Section 10, T3S-R9W
Calhoun County, Florida

Stockpoint Specifications

Ellisville, Mississippi

Located in Ellisville, Mississippi at #12 Neil Gunn Road- Ellisville Industrial Park. This facility services wells in Mississippi, Alabama, Florida and Louisiana.

Allen McInnis, Warehouse Manager

Warehouse and Yard Facilities	150' x 250' - 37,500 sq. ft. Floor Space 4-acre yard
Bulk Barite Storage Facilities	Plant Capacity - 8,000 sacks or 400 tons
Liquid Mud Plant	2,500 Barrel Storage
Truck Service	Bulk Trucks, Sack Material, Liquid Mud Tanks, available upon request
Portable Mixing Plants	<ol style="list-style-type: none">1. Skid Mounted 150 bbl.2. Fifth Wheel 185 bbl.3. Skid Mounted 225 bbl.4. 6 - Portable Bulk Tanks5. 6 - Frac Tanks



Brammer Engineering, Inc.
 NLT Royalty Partners 10-4
 Section 10, T3S-R9W
 Calhoun County, Florida

III. CASING PROGRAM / DAYS ESTIMATE

CASING PROGRAM

CASING TYPE	CASING SIZE	BIT SIZE	DEPTH
Conductor	20"	DRIVE	80'
Surface	9 5/8"	12 1/4"	3,500'±
Production	OH	8 3/4"	14,095' (MD) 13,950' (TVD)
P. T. D.			

DAYS ESTIMATES

MEASURED DEPTH	DRILLING DAYS	OTHER DAYS	TOTALS
0' – 3,500'	3.5	1	4.5
3,500' - 8,500' (KOP)	5		5
8,500' – 12,000'	9		9
12,000' – 14,095' (MD)	8		8
TOTALS	25.5	1	26.5
P. T. D.			

IV. DRILLING FLUID SCHEDULE

DRILLING FLUIDS PROPERTIES

Measured Depth	Mud Weight	Viscosity	Y.P.	API F.L.	HT-HP F.L.	Ph	% Solids
0' - 3,500'	8.6-9.1	55-36	12-20	No control	N/A	9.0-9.5	2-4
3,500' - 8,500' (KOP)	8.6-9.1	28-40	2-8	N/C-16cc	N/A	9.0-9.5	3-6
8,500' - 12,000'	9.1-9.4	40-42	8-10	16-12cc	N/A	10.0-10.5	5-8
12,000' - 14,095' (MD)	9.4-10.3	42-48	10-14	10-8cc	N/A	10.5-11.0	7-10
P.T.D.							

1. This is a Closed-loop system. Attention should be paid to daily water additions. Also, additional thinners, dispersants and defoamers will be needed as depth increases.
2. Spud with viscous +60 vis. Spud mud.
3. Massive dilutions and / or control drilling to maintain low annular fluid weights.
4. Be aware of possible loss of fluid until the surface is set at 3,500'.
5. Possible Midway shale sloughing to be addresses with PHPA/ treatments.
6. Chalk to be drilled with as near water as possible.
7. Pretreat for Ferry Lake Anhydrite with Soda Ash below the Lower Tuscaloosa
8. System will be conditioned, and filtrate lowered to 20-16cc's before 8,500' in preparation of directional operations.
9. Directional operations (KOP) at 8,500'+/, suggest adding 1-3ppb Soltex and/or Graphite to reduce torque & drag during higher angle of hole if needed
10. "Mud Up" and maintain filtrate 16-12cc's in preparation of Cotton Valley sands
11. Be alert to BBG, chloride increases and other indications of weight up below the Haynesville.
12. Incorporate chloride increases into the system while drilling Salt Stringers.
13. Filtrate to be lowered to 10-8cc's by 12,000' and maintained to TD.
14. Weight increases may become necessary if Smackover formation is pressured.
15. Constant monitoring of pit levels, flow checks on connections and at drilling breaks should be practiced.
16. Monitor solids control equipment constantly for optimum performance.

Drilling Fluids Recommendations

This drilling fluid program is provided as a guideline for operations, valid if real-time drilling conditions agree with engineering predictions. If actual drilling conditions deviate from the plan, take appropriate action to accommodate these changes.

Pre-Spud considerations:

Plan effective solids control energy-

The cost of drilling fluid is related to the amount of dilution that is required to maintain the appropriate mud properties. The dilution is directly related to the following:

- A. Solids generated- dependent upon hole size, washout, interval length and drilling rate.
- B. Solids retained in the system (not removed by the solids removal equipment).
- C. Maximum allowable low gravity solids content of the mud.

Solids control equipment is the first line of defense in minimizing dilution requirements. The more drill solids that are removed from the fluid by the mechanical equipment, the less dilution fluid will be required. The chemical concentrations are calculated on the fluid to be treated which includes the active volume and the dilution required for a given interval. The less dilution-the less total chemical requirement.

The solids Control/ Loss Circulation section of this program discusses general solids removal equipment required to adequately condition drilling fluids. Any additional equipment that will economically and efficiently remove drill solids will further reduce dilution requirements and overall mud cost.

INTERVAL DISCUSSIONS

Interval I	0'-3,500'±
Recommended Interval I system	Flocculated Gel System
Estimated Interval I Cost:	\$41,716

Treatment Procedure:

The recommended fluid for this interval is a flocculated Gel spud mud. Add ¼ ppb. Caustic Soda to fresh water in the mud tanks, then mix Gel to obtain a viscosity of approximately 55-50 sec/qrt. to spud. The sooner the mud is mixed, the more time will allow for better yield of the system. "Control drill," the first 800' – 1,000' to assure hole is adequately cleaned to prevent packing off and losing mud returns when drilling pea gravel sections. Gumbo stringers should not be a problem if control drilling is performed. Control drilling should prevent excess solids build up in the annulus possibly plugging the flow line. Monitor the shale shaker constantly during this interval so appropriate measures can be taken should loss of returns occur. After drilling to 800'-1,000' begin thinning the system with additions of water and light treatments of SAPP, (If needed) maintain a 34-36 viscosity. Be aware of possible loss of fluid during surface section. Suggest having LCM pill mixed and ready to pump if this situation should arise. Operate the mechanical solids control equipment continuously while drilling. Massive dilutions and constant dumping of the sand trap will be necessary to maintain low annular fluid weights. When the Midway Shale is drilled, treatments of PHPA may be necessary to prevent wetting/sloughing shale. Gel/Lime sweeps will be used to insure proper hole cleaning until the top of the Chalk formation. The Chalk may be identified by penetration rate and the change in the color of the drilling fluid to an off-white color. The surface casing will be set 500' into the Chalk section.

After the surface hole has been drilled to total depth, make a wiper trip, then go back to bottom and circulate the hole clean prior to running the 9 5/8" surface casing. The shale shaker should be observed for "clean up" after the short trip with necessary adjustments made to the fluid properties.

Recommend Solids Control Equipment -

- High Speed shale shakers
- Desander / Desilter
- Adequate dilution
- Centrifuge

INTERVAL DISCUSSIONS

Interval II	3,500'± - 8,500' (KOP)
Recommended Interval II System	Low Solids Non-Dispersed System
Estimated Interval II Cost:	\$41,398

Treatment Procedure:

After running the casing and nipping up, the active system should be diluted, the settling pits cleaned and refilled with fresh water. This should dilute the LGS to a minimum level in preparation of drilling out of casing. While drilling out of surface casing, the cement contaminated fluid should be treated chemically with additions of SAPP and Sodium Bicarbonate. As the Selma Chalk is penetrated, the fluid should be as near water as possible to leach/washout the formation to prevent tight hold from swelling. Lime may be added below the shale shaker and the cutting tanks to aid in flocculation of drill solids for maintenance of LGS. Reclamation of the fluids in the cuttings tank will be incorporated into the active system reducing less volume for disposal at TD. Through the Chalk formation, Gel additions/sweeps should be temporarily discontinued since the formation needs to be leached out to prevent swelling/tight hole. Below the chalk formation, Gel/Lime sweeps may be continued to insure a clean hole. The lime added in the sweeps should suffice for maintaining pH (9.0-9.5). After creating the Non-Dispersed Gel system, the solids control will need to be monitored for maximum performance. The less dilution used at this point, the less incurred cost. Shale shaker screens will need to be sized for the smallest micron feasible while not losing excessive amounts of fluids. Solids control equipment should be observed for proper operation and / or proper maintenance. Below the Lower Tuscaloosa formation, prepare for the Ferry Lake formation. The Ferry Lake Anhydrite should be treated by chemically reducing rheological properties along with additions of Soda Ash to precipitate the excess calcium as it is drilled. Concentrations of 120-160 ppm will be allowed to remain in the system to protect from CO₂ gases that may be encountered. Only slight rheological changes will need to be made to the system during this section.

Near the end of this interval, the system will then need to be closed (slow dumping/dilution) by incorporating the sweeps plus tourly treatments of Gel. Solids control equipment should be observed for proper operation and / or proper maintenance. At 8,000' the system will be conditioned for directional operations and the filtrate will be reduced to 16-12cc's with treatments of Q-Pac, Lignite & Gel and maintained with tourly treatments.

Recommend Solids Control Equipment -

- High Speed shale shakers
- Desander / Desilter
- Adequate dilution
- Centrifuge

INTERVAL DISCUSSIONS

Interval III	8,500'-12,000'
Recommended System	Low Solids Slightly Dispersed to a Dispersed System
Estimated Interval III Cost	\$67,167

Treatment Procedure:

The KOP is expected to be around 8,500'±. While in the hole with a mud motor building angel, wall sticking may become a problem from sand taking fluid. Sweeps with Calcium Carbonate will aid this situation by sealing these porous sands. Calcium Carbonate provides a tough filter cake and aids in filtrate reduction. Should torque and drag become severe, suggest adding 1 – 3ppb of Soltex and/or Graphite for lubricity. Periodic wiper trips are good practice in directional wells to be sure the hole is staying open. Suggest increasing MBT of the fluid to 30-25 ppb during this interval in preparation of the upcoming Cotton Valley Sand to minimize fluid loss through these porous sands. The addition of Fine Mica added to the system will also aid in fluid loss. This should allow the sealing properties of the system to be increased by increasing the MBT (Gel content). Shale shaker screens will need to be sized for the smallest micron feasible while not losing excessive amounts of fluids. By maintaining the MBT (Gel content), the sealing properties of the fluid will be sustained along with reduction of the filtrate loss. When Calcium Carbonate is added, we suggest +/- 100 mesh screens. The 100 mesh screens will allow more Calcium Carbonate to remain in the system while stripping out the larger grain solids. Hold the fluid loss at 16-12cc with Lignite and Gel while drilling the upper depths of this interval, especially through the Cotton Valley Formation. Maintain the Low Solids Slightly Dispersed drilling fluid until it becomes necessary to control the rheological properties by dispersing the system fully with Lignite/ Quality Thin. Add Quality Pac as needed to control fluid loss from 12-8cc's as recommended. A pH range of 10.0-10.5 should be maintained with Caustic Soda. Lime should be discontinued in the sweeps to prevent unwanted flocculation in the system. Use Lignite/Quality Thin to maintain rheological properties during this interval and Caustic Soda for alkalinity and pH control. Monitor the shaker screens, background gas, chloride increases, and all other drilling parameters that may indicate a need for mud weight adjustments. The solids control equipment should be evaluated for proper operation in this interval so as to make necessary adjustments. Add Barite to control the mud weight as the holds dictates. Operate the mechanical solids removable equipment continuously while drilling.

Recommend Solids Control Equipment -

- High Speed shale shakers
- Desander / Desilter
- Adequate dilution
- Centrifuge

INTERVAL DISCUSSIONS

Interval IV	12,000' – 14,095' (MD)
Recommended System	Low Solids Dispersed
Estimated Interval IV Cost	\$ 82,514

Treatment Procedure:

The Low Solids Dispersed system will remain in place throughout this interval to protect the wellbore and to provide a base system that allows for any further chloride increases. The fluid weight will be adjusted according to hole indications. Fluid weights of 9.4-9.6 ppg range are expected in the upper section of this interval. However, as the later section of this interval is drilled, fluid weights may increase to 9.8 – 10.0 ppg. Close attention should be observed during drilling breaks. Mud weight may be increased if having problems with salt invading the well bore or increases in pressure. The Gel content of the system should be maintained in the range of 20-22.5 ppb by the top of the Smackover. By decreasing the MBT (Gel content), the less reactive solids will show less flocculation when contaminants such as Anhydrite, salt stringers or even higher downhole temperatures are encountered. Monitor the shaker screens, background gas reading, chloride increases, and all other drilling parameters that may indicate a need for mud weight adjustments. Caustic Soda will be added to maintain 10.5 – 11.0 pH during this interval. We suggest incorporating any salt stringers drilled into the system and allowing the chlorides of the system to lessen wash-out as the stringers are drilled. The chlorides of the system should only slightly increase to less than 5,000 mg/l. Increases in the chlorides will be addressed with Quality Thin and Lignite for rheological control. Alkalinity and pH values will be monitored and adjusted with Caustic Soda. Maintain Calcium to +/- 120 ppm range when drilling the Haynesville formation for better filtrate control. Tourly treatments with Quality Pac and Lignite will be used to keep filtrate in recommended range of 10-8cc's before entering the Smackover formation. These lowered filtrate values will be maintained as the Smackover formation is drilled. Suggest laminar flow properties for better gauged hole through production zone. Suggest drilling with as low weight as possible to lessen the possibility of loss returns in the Smackover until the Basement is reached. Also, be prepared for loss returns with good LCM pill mixed and ready to pump. Operate the solids control equipment continuously while drilling. Monitor the Shale Shaker screens frequently and operate with the smallest mesh feasible. Pit markers, flow checks on connections, and drilling breaks should be practiced. Through this interval, porous sands may tend to seep fluid from higher weights. Additions of Calcium Carbonate will address the problem by plugging these pours. Calcium Carbonate will also aid in lowering filtrate values and provide a tough wall cake.

Suggest making wiper trip through the KOP and circulate hole clean before POOH to log. After logging, monitor gas on bottoms up closely and adjust accordingly if needed. Circulate hole clean before pulling out laying down drill pipe.

Recommend Solids Control Equipment -

- High Speed shale shakers
- Desander / Desilter
- Adequate dilution
- Centrifuge



Brammer Engineering, Inc.
NLT Royalty Partners 10-4
Section 10, T3S-R9W
Calhoun County, Florida

**ESTIMATED FORMATION TOPS
FOR
BRAMMER ENGINEERING, INC.
NLT ROYALTY PARTNERS 10-4
SECTION 10, T3N – R9W
CALHOUN COUNTY, FLORIDA**

	(TVD)
SELMA CHALK	3,000'
EUTAW	3,569'
LOWER TUSCALOOSA	4,581'
BASE OF FERRY LAKE ANHYDRITE	7,367'
COTTON VALLEY	10,481'
HAYNESVILLE	11,986'
FRISCO CITY	12,550'
SMACKOVER	12,590'
NORPHLET	12,860'
BASEMENT	13,749'
TOTAL DEPTH	14,095' (MD) 13,950' (TVD)

PRODUCT DESCRIPTIONS

Bicarbonate of Sodium	Used to precipitate soluble calcium - primarily cement contamination - in water base mud. Sodium bicarbonate provides two basic functions: (1) removes soluble calcium and (2) lowers pH of the drilling mud. Do not use sodium bicarbonate to treat makeup water. Use soda ash for softening water. Over treatment with sodium bicarbonate will result in carbonate and bicarbonate contamination, which will result in rheological and filtrate control problems. The reaction to treat cement contamination is as follows: $\text{Ca (OH) 2} + \text{NaHCO3} \rightarrow \text{NaOH} + \text{H2O} + \text{CaCO3}$. Mix 0.77 lb/bbl for each EPM soluble calcium. The pH of sodium bicarbonate is 8.2.
Caustic Soda	Sodium hydroxide (NaOH) used primarily for pH and alkalinity control. Caustic Soda activates and solubilizes the common products such as Uni-Cal and Ligco in the drilling mud.
Lignite	A highly oxidized leonardite (lignite) used to control filtration and rheological control in water-base mud. Lignite is particularly effective for filtration control when high temperatures are encountered. Lignite can also be used to remove soluble calcium in contaminated mud.
Barite	A high purity barite which is predominantly barium sulfate and is used to increase the density of all types of drilling fluids. Barite is chemically inert to all drilling fluid additives. Barite meets or exceeds all API specifications. The specific gravity of Barite is 4.2 and approximately 14.7 sacks of Barite will result in an increase of 1 barrel of mud. There are approximately 1.2 sacks of Barite in one cubic foot.
Gel	A premium-grade natural western bentonite that will provide viscosity, gels, and colloidal solids for filtration control properties with minimum clay content. The viscosity of Gel can be extended with some water-soluble polymers. Gel suspension can be easily deflocculation with a variety of mud thinners to reduce rheological and filtration values. A concentration of 22.5 ppb of Gel in fresh water will provide a minimum viscosity of 15 centipoise.
Lime	Calcium hydroxide (CaOH ₂) is used as a source of soluble calcium for lime-based mud, and as to maintain alkalinity in oil-based systems. It is also used as a flocculant in upper hole drilling to assist in hole cleaning. Lime is used to remove soluble carbonates from the water - base mud.
Quality Pac	Is a blend of polyanionic cellulose polymer and calcium carbonate. Quality Pac is used to reduce filtrate and provides a tough wall cake.

PRODUCT DESCRIPTIONS

Aqua Pac	A polyanionic cellulose polymer used to control filtration properties of water - base mud. Aqua Pac is effective at low concentrations in reducing filtration properties, is non-biodegradable and resistant to micro - organisms requiring no preservative or biocide and improves filter cake quality.
Quality PHPA	A liquid PHPA polymer is used to provide shale stability, friction reduction, and viscosity in water - base drilling fluids. It is high - molecular - weight, partially hydrolyzed polyacrylamide dispersed in a mineral oil. Poly Plus can be used as a selective flocculant in non-dispersed mud systems and will provide viscosity aid in hole cleaning.
Poly Plus RD	A free - flowing powdered, potassium enhanced polymer composition designed to impart shale stability, friction reduction, viscosity, and fluid loss control to water base drilling fluids. Poly Plus RD absorption greatly reduces the dispersion of drill cuttings, it also improves the performance of solids control equipment. Poly Plus RD will increase the viscosity of the drilling fluids, but, because of the shear thinning nature of the viscosity, Poly Plus RD will improve penetration rates and provide excellent hole cleaning characteristics.
Sapp	A sodium acid pyrophosphate, with a chemical formula of $\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$. SAPP is used to treat cement contaminated mud and as a fast-acting low - cost, fast - acting dispersant in low - weight freshwater mud used in up hole drilling. SAPP is effective in very low concentrations and has a pH of 4.2.
Soda Ash	Sodium carbonate used to treat out soluble calcium in drilling mud. The chemical reaction is as follows. $\text{Na}_2\text{CO}_3 + \text{Ca}^{++} - 2\text{Na}^+ + \text{Ca CO}_3$ Soda Ash is also used in treating the total hardness of sea water to maximize the hydration of bentonite.
Quality Thin	Is a blend of a highly oxidized leonardite and chrome lignosulfonate. Quality Thin is used for dispersing and aids in filtrate reduction.
CLS	A multi-purpose, chrome - treated sodium lignosulfonate deflocculant for use in water base mud. CLS is effective in fresh, salt, and calcium treated water - base mud and provides excellent thermal stability for the control of rheological and filtration properties of water - base fluids at temperatures of up to 350 degrees Fahrenheit. CLS will inhibit the chemical activity of clay solids when used in proper concentrations.
Calcium Carbonate	A calcium carbonate used as a bridging agent and/or weighting material in work over, completion, and drill - in fluids. Calcium Carbonate is available in grades from fine to coarse. Calcium Carbonate is 95 to 98% soluble in hydrochloric acid, which minimizes permanent plugging of the producing formation. Calcium Carbonate is used to prevent fluid invasion of permeable zones, and to prevent loss of circulation during work over, completion, and drilling operations. It can be used to spot a pill for special purposes. Calcium Carbonate fine grade is used as a weighting material (2.7 S.G.) for work over fluids with density requirements of 14.0 ppg or less. The bulk density of Calcium Carbonate is 63 lb / ft ³ .

SWEEP PROGRAM FOR DIRECTIONAL DRILLING

Numerous types and volumes of sweeps should be tried during the drilling of the well. All sweeps should be utilized at different times during the drilling of the wellbore sections so as not to get “locked” into one sweep.

Listed below are examples of the different types of sweeps utilized for the well.

1. **High Density** - These sweeps are low volume so as not to increase the ECD at the shoe to a value above the shoe test. These sweeps are somewhat low in viscosity in an attempt to stir cuttings beds formed in washout areas.
2. **High Viscosity** - These sweeps are large in volume as could be permitted by the pit system of the drilling rig. Attempt to cover 100+ feet of hole. These sweeps are generally made of the existing mud with various types and concentrations of low shear rate viscosifiers.
3. **Low Viscosity** - These sweeps are as large in volume as the pit system allows on the drilling rig. These sweeps are generally made of existing mud plus $\pm 10\%$ dilution and some concentration of a deflocculant to ensure turbulent flow throughout the well bore. The turbulent flow of these sweeps is to stir and dislodge the cuttings beds formed in deviated holes.
4. **Combination** - These sweeps are the above-mentioned sweeps pumped in combination with each other. For example, a low viscosity sweep could be followed by a high viscosity sweep. These sweeps are to be as large in volume as to cover 100+ feet of hole. The combination sweeps should be changed on a regular basis and monitored for their effectiveness.

COMMENTS: All sweeps should be monitored for their effectiveness and altered on a regular basis. The different sweeps will have varying degrees of effectiveness depending on the operation at hand.

SOLIDS CONTROL

1. **Primary shakers (scalping shakers) ***
 - a. First set of shakers at the flowline. These are used normally to improve larger cuttings, so the secondary shakers can be screened down for maximum efficiency. Can also be used as “gumbo busters” if the gumbo problems are not too severe.
 - b. Screen sizes generally range from 10 mesh on surface to < 50 mesh down hole.
 - c. Monitor screen condition and replace when worn.

2. **Flo-Line Cleaners (shakers)***
 - a. Employ the finest screen mesh possible. Experience indicates pyramid type screens will generally allow finer mesh screens to be utilized.
 - b. Utilized ½ to 2/3 screen surface area while in operation. Screen down to finer mesh whenever possible.
 - c. Monitor screen condition and replace when torn.

3. **Desander***
 - a. Provide 40 to 60 psi feet head pressure while operating.
 - b. Operate continuously until fluid density of +/- 10.0 ppg is achieved or until barite discard becomes uneconomical.
 - c. Monitor underflow weight to check efficiency of cut.

4. **Desilter***
 - a. Provide 40 60 psi feet head pressure while operating.
 - b. Operate continuously until fluid density of +/- 10.0 ppg is achieved or until barite discard becomes uneconomical.
 - c. All cones and bladders are fully operational.

5. **Mud Cleaner**
 - a. Operate in desilter mode until fluid density of +/- 10.0 ppg is achieved or until barite discard becomes uneconomical.
 - b. Employ the finest mesh screens allowable.
 - c. Provide 40 to 60 psi feet head pressure while operating.
 - d. Monitor underflow to determine efficiency of unit.

6. **Centrifuge***
 - a. Employ decanting type which will ensure greater process of rates at lower mud densities.
 - b. Monitor effluent and under flow densities and CEC / MBT to determine efficiency of the unit.
 - c. Locate centrifuge down stream of all other solids control equipment to make final cut.
 - d. Operate as needed to conserve barite and maintain low gravity solids in desired ranges.

Process rates of the solids control equipment should be 120 to 150% of the circulating rate (centrifuge excluded).

*** We suggest a flow line cleaner along with the standard rig equipment for this operation. A centrifuge for LGS in the upper hole and then converted to a barite recovery unit after weight up would-be valuable barite saving (cost) item.**

LOSS OF CIRCULATION

Loss of circulation is generally classified by the following categories. Suggested procedures to cure the problem are included but not limited to.

1. Seepage losses - Usually associated with permeable formations such as loosely cemented, porous sands encountered in younger formations. However, seepage losses can occur anywhere in the hole.
 - A. Add and maintain 5 - 15 ppb of Calcium Carbonate to the active system. These products are finely grounded, and most of the product generally will pass through shaker screens of 100 mesh or coarser. This combination will give a wide particle size range to act as bridging agents under dynamic conditions.
 - B. If losses persist and are excessive, spot a pill of the same products and pull to the shoe and wait six to eight hours to allow the hole to heal. Stage back into the hole, breaking circulation periodically.

2. Partial losses - Generally associated with coarse permeable zones, faulty cement jobs, and induced or existing fracturing.
 - A. A defective cement job is normally solved by a cement squeeze.
 - B. Add and maintain 15 - 30 ppb of Calcium Carbonate and to the active system. This product is finely ground, and most of the product generally will pass through shaker screens of 100 mesh or coarser. This combination will give a wide particle size range to act as bridging agents under dynamic conditions.
 - C. If losses persist and are excessive, spot a pill of the same products and pull to the shoe and wait six to eight hours to allow the hole to heal. Stage back into the hole, breaking circulation periodically.

3. Total loss of returns - may result from a faulty cement job around the shoe, induced or natural fractures, or coarse permeable zones such as gravel or reef structures.
 - A. Total losses due to faulty cement jobs are normally cured with standard cement squeezes.
 - B. Total losses other than a faulty cement job at the shoe may be cured with a pill of high concentrations of various LCM materials to give a wide particle size distribution. LCM materials that may be used include but are not limited to Calcium Carbonate, Chek-Loss Fine and Coarse, all grades of Nut-Plug and Mica, all grades of Chek-Loss, Magma Fiber Fine and Medium, Dynamite Red Fine and Medium, and any other available products that will promote a wide range of particle size distribution.
 - C. Additional remedies include standard cement squeezes, Gilsonite/cement slurries, and cross-linked gel/polymer pills, and Diaseal M squeezes.

ATTACHMENT 16
SAFETY DATA SHEETS FOR DRILLING FLUIDS

SAFETY DATA SHEET

ALUMINIUM STEARATE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: ALUMINIUM STEARATE

APPLICATIONS: Defoamer.

EMERGENCY TELEPHONES: 001 281 561 1600 (USA)

SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ

TELEPHONE: 44 (0)1224 - 584336

FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

GROSS FORMULA: Aluminium Stearate

CAS No.: 637-12-7

COMPOSITION COMMENTS:

This product is classified as containing no hazardous ingredients according to the EC Directives.

3. HAZARDS IDENTIFICATION:

Not regarded as a health hazard under current legislation.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water. Contact physician if larger quantity has been consumed. Try to induce vomiting.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist. This material is not combustible.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Can form dust clouds that may explode on contact with flames, heat and oxidizers.

HAZARDOUS COMBUSTION PRODUCTS:

Fire or high temperatures create: Asphyxiating gases/vapors/fumes. Carbon dioxide (CO₂). Carbon monoxide (CO).

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**

This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.

PROTECTIVE EQUIPMENT:

VENTILATION: Provide adequate general and local exhaust ventilation.

RESPIRATORS: Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P2 (for fine dust).

PROTECTIVE GLOVES:

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.
COLOUR:	White.
ODOUR/TASTE:	No characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.
DENSITY/SPECIFIC GRAVITY (g/ml):	1.07
BULK DENSITY:	258 - 330 kg/m ³
pH-VALUE, DILUTED SOLUTION:	7
AUTO IGNITION TEMP. (°C):	>150
	TEMPERATURE (°C): 25
	CONCENTRATION (%M):

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

MATERIALS TO AVOID:
Strong oxidizing agents.

HAZARDOUS DECOMP. PRODUCTS:
Fire or high temperatures create: Asphyxiating gases/vapours/fumes of: Carbon dioxide (CO₂), Carbon monoxide (CO).

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Not regarded as dangerous for the environment.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: Not classified.

UK REGULATORY REFERENCES: Chemicals (Hazard Information & Packaging) Regulations 1993. The Control of Substances Hazardous to Health Regulations 1988.

16. OTHER INFORMATION:

USER NOTES:

Add Data HMIS Health - 1 HMIS Flammability - 1 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES:

Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY:

Dr. Kirsty Walker

REVISION DATE:

09-12-98

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

SAFETY DATA SHEET

BARITE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: BARITE
APPLICATIONS: Weighting agent.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
 Poca Quay,
 Footdee,
 Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
BARITE	7727-43-7	89-95 %		
QUARTZ, CRYSTALLINE SILICA	14808-60-7	1-5 %		

COMPOSITION COMMENTS:

This product contains a small quantity of quartz, crystalline silica.

3. HAZARDS IDENTIFICATION:

This product contains a small quantity of quartz. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

This material is not combustible. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Not relevant.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. May be slippery when wet. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT NAME:	CAS No.:	STD:	LT EXP. 8 HRS:	ST EXP. 15 MIN:
BARITE	7727-43-7	NUL	.	.
QUARTZ, CRYSTALLINE SILICA	14808-60-7	MEL	0.3 mg/m3	.

INGREDIENT COMMENTS:

MEL = Maximum Exposure Limit. * OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. OES TWA 4mg/m³ respirable dust, 10mg/m³ total dust. OES = Occupational Exposure Standard.

PROTECTIVE EQUIPMENT:**VENTILATION:** Provide adequate general and local exhaust ventilation.**RESPIRATORS:** Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).**PROTECTIVE GLOVES:**

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust
COLOUR:	Tan. to Grey.
ODOUR/TASTE:	Odourless or no characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.

MELT/FREEZ POINT (°C, interval): 1580
DENSITY/SPECIFIC GRAVITY (g/ml): 4.2 - 4.25 TEMPERATURE (°C): 20
BULK DENSITY: 1714 - 2163 kg/m³

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid wet and humid conditions.

MATERIALS TO AVOID:
No incompatible groups noted.

HAZARDOUS DECOMP. PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION:

TOXICOLOGICAL DATA:

Acute toxicity. LD50. Oral. Rat. > 20000 mg/kg

INHALATION: Dust may irritate respiratory system or lungs. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

HEALTH WARNINGS:

This product contains small quantities of quartz. Prolonged inhalation of high concentrations may damage respiratory system. Because of quantity and composition, the health hazard is small.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:

Not regarded as dangerous for the environment. This material is a naturally occurring mineral.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:

ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:

RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:

SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: S-22 Do not breathe dust.
S-38 In case of insufficient ventilation, wear suitable respiratory equipment.

UK REGULATORY REFERENCES: The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations 1993. IARC Monographs, Vol.68, 1997.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 0 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

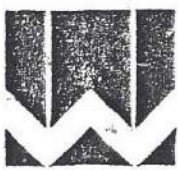
INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 28-1-99

DISCLAIMER:

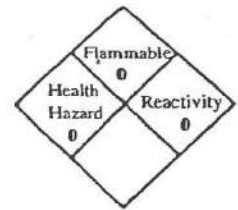
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



WYO-BEN.

Gel
WYO-BEN, INC.

MATERIAL SAFETY DATA SHEET



NFPA FIRE HAZARD IDENTIFICATION SYSTEM

I. PRODUCT IDENTIFICATION

Trade Name(s): **HYDROGEL®**

Generic Name(s): Wyoming (Western) Bentonite; Bentonite Clay (CAS No. 1302-78-9)

Chemical Name(s): Sodium Montmorillonite (CAS No. 1318-93-0)

Manufacturer: **WYO-BEN, INC.**
Address: P.O. Box 1979
Billings, Montana 59103

Telephone Numbers:
Information: (406) 652-6351
EMERGENCY: (406) 652-6351

II. HAZARDOUS INGREDIENTS

Ingredient	CAS NO.	%	Hazard
Crystalline Silica (SiO ₂) as Quartz	14808-60-7	See Note	Low concentrations of crystalline silica (SiO ₂) in the form of quartz may be present in airborne bentonite dust. See Section VI for discussion of health hazard.

Note: Although the typical quartz content of western bentonite is in the range of 2 to 6% most of the quartz particles are larger than the 10 μ respirable threshold size. The actual respirable quartz concentration in airborne bentonite dust will depend upon bentonite source, fineness of product, moisture content of product, local humidity and wind condition at point of use and other use specific factors.

III. PHYSICAL DATA

Boiling Point (°F): NA	Specific Gravity (H ₂ O=1): 2.45-2.55
Vapor Pressure (mm. Hg): NA	Melting Point: Approx. 1450°C
Vapor Density (Air = 1): NA	Evaporation Rate (Butyl Acetate = 1): NA
Solubility in Water: Insoluble, forms colloidal suspension.	pH: 8-10 (5% aqueous suspension)
Density (at 20° C): 55 lbs./cu.ft. as product.	
Appearance and Odor: Bluegray to green as moist solid, light tan to gray as dry powder. No odor.	

IV. FIRE AND EXPLOSION DATA

Flash Point: NA	Flammable Limits: LEL: NA UEL: NA
Special Fire Fighting Procedures: NA	
Unusual Fire and Explosion Hazards: None. Product will not support combustion.	
Extinguishing Media: None for product. Any media can be used for the packaging. Product becomes slippery when wet.	

V. REACTIVITY

Stability: Stable
Hazardous Polymerization: None
Incompatibility: None
Hazardous Decomposition Products: None
NA = Not Applicable ND = Not Determined

Date Prepared: January 4, 2010

Doc #: 1020-00

MATERIAL SAFETY DATA SHEET

SAFE-CARB (all grades)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: SAFE-CARB (all grades)
CHEMICAL CLASS: Naturally occurring mineral.
APPLICATIONS: Oil well drilling fluid additive. Bridging and weighting agent.
EMERGENCY TELEPHONE: 281-561-1600
SUPPLIER: Supplied by a Business Unit of
M-I L.L.C.
P.O. Box 42842, Houston, Texas 77242-2842
See cover sheet for local supplier.
TELEPHONE: 281-561-1509
FAX: 281-561-7240
CONTACT PERSON: Sam Hoskin

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Silica, crystalline, quartz	14808-60-7	0-2 %		
Calcium carbonate	1317-65-3	60-100		

COMPOSITION COMMENTS:
Ground marble.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a/an white powder. Dike and contain spills. Keep out of sewers and waterways. No significant immediate hazards for emergency response personnel are known.

ACUTE EFFECTS:

HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

INHALATION: ~~May be irritating to the respiratory tract if inhaled.~~

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: May be irritating to the skin.

EYES: ~~May be irritating to the eyes.~~

CHRONIC EFFECTS:

CARCINOGENICITY:

IARC: Not listed. OSHA: Not regulated. NTP: Not listed.

ATTENTION! CANCER HAZARD. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

IARC Monographs, Vol. 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

ROUTE OF ENTRY:

Inhalation. Skin and/or eye contact.

TARGET ORGANS:

Respiratory system, lungs. Skin. Eyes.

4. FIRST AID MEASURES

GENERAL: Persons seeking medical attention should carry a copy of this MSDS with them.

INHALATION: Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

INGESTION: Drink a couple of glasses water or milk. Do NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. Get medical attention.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES

AUTO IGNITION TEMP. (°F): N/D
FLAMMABILITY LIMIT - LOWER(%): N/D
FLAMMABILITY LIMIT - UPPER(%): N/D

EXTINGUISHING MEDIA:
Carbon dioxide (CO₂). Dry chemicals. Foam. Water spray, fog or mist. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:
No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:
No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:
No specific hazardous combustion products noted.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:
Wear proper personal protective equipment (see MSDS Section 8).

SPILL CLEAN-UP PROCEDURES:

Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.

7. HANDLING AND STORAGE**HANDLING PRECAUTIONS:**

Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

INGREDIENT NAME:	CAS No.:	OSHA PEL:		ACGIH TLV:		OTHER:		UNITS:
		TWA:	STEL:	TWA:	STEL:	TWA:	STEL:	
Silica, crystalline, quartz	14808-60-7	*		0.1				mg/m ³ resp.dust
Calcium carbonate	1317-65-3	15		10				mg/m ³ total dust

INGREDIENT COMMENTS:

* OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

PROTECTIVE EQUIPMENT:**ENGINEERING CONTROLS:**

Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

VENTILATION: Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

RESPIRATORS: Use at least a NIOSH-approved N95 half-mask disposable or reusable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator. For exposures exceeding 10 x PEL use a NIOSH-approved N100 Particulate Respirator.

PROTECTIVE GLOVES:

Use suitable protective gloves if risk of skin contact.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

PROTECTIVE CLOTHING:

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES:

Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	Powder, dust.
COLOR:	White.
ODOR:	Odorless or no characteristic odor.
SOLUBILITY DESCRIPTION:	Slightly soluble in water. Soluble in: Hydrochloric acid (HCl).
DENSITY/SPECIFIC GRAVITY (g/ml):	2.7 - 2.8 TEMPERATURE (°F): 68
VAPOR DENSITY (air=1):	N/A
VAPOR PRESSURE:	N/A TEMPERATURE (°F):

10. STABILITY AND REACTIVITY

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Not relevant.

HAZARDOUS POLYMERIZATION:
Will not polymerize.

POLYMERIZATION DESCRIPTION:
Not relevant.

MATERIALS TO AVOID:
Strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:
No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:
No ecological information is available for this product.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT:

This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.
Empty containers retain residues. All labeled precautions must be observed.

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

PRODUCT RQ: N/A

U.S. DOT:
U.S. DOT CLASS: Not regulated.

CANADIAN TRANSPORT:
TDGR CLASS: Not regulated.

SEA TRANSPORT:
IMDG CLASS: Not regulated.

AIR TRANSPORT:
ICAO CLASS: Not regulated.

15. REGULATORY INFORMATION

REGULATORY STATUS OF INGREDIENTS:

NAME:	CAS No:	TSCA:	CERCLA:	SARA 302:	SARA 313:	DSL(CAN):
Silica, crystalline, quartz	14808-60-7	Yes	No	No	No	Yes
Calcium carbonate	1317-65-3	Yes	No	No	No	NDSL

US FEDERAL REGULATIONS:
WASTE CLASSIFICATION:

Not a hazardous waste by U.S. RCRA criteria. See Section 13.

REGULATORY STATUS:

This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:

1. Immediate (Acute) Health Effects.
2. Delayed (Chronic) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:

TSCA (U.S.)

STATE REGULATIONS:
STATE REGULATORY STATUS:

This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

Pennsylvania Right-to-Know.

Illinois Right-to-Know.

New Jersey Right-to-Know.

PROPOSITION 65: This product contains the following chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required:

Silica, crystalline Arsenic (7440-38-2) < 1 ppm; Lead (7439-92-1) < 1 ppm.

CANADIAN REGULATIONS:

LABELS FOR SUPPLY:



REGULATORY STATUS:

This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations.

Canadian WHMIS Classification: D2A - Other Toxic Effects: Very Toxic Material

16. OTHER INFORMATION

NPCA HMIS HAZARD INDEX:

* 1 Slight Hazard

FLAMMABILITY:

0 Minimal Hazard

REACTIVITY:

0 Minimal Hazard

NPCA HMIS PERS. PROTECT. INDEX:

E - Safety Glasses, Gloves, Dust Respirator

USER NOTES:

N/A = Not applicable N/D = Not determined

INFORMATION SOURCES:

OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.

ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).

Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, Silica, Some Silicates, Coal Dust, and para-Aramid Fibrils, Vol. 68, World Health Organization, Lyon, France, 1997.

Product information provided by the commercial vendor(s).

PREPARED BY:

Sam Hoskin

REVISION No./Repl. MSDS of:

1 / February 14, 1997

MSDS STATUS:

Approved.

DATE: July 28, 1998

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

Caustic

ChemSol

Chemical Solutions/Economic Answers

601 Carlson Parkway, Suite 400 • Minnetonka, MN 55305
Phone (952) 807-7446 • Fax (952) 807-7479
www.chemsolusa.com

Material Safety Data Sheet
Caustic Soda (99% Beads)
BP/US/FCC/USP24/EU/EU330

Synonyms: Soda lye, lye, white caustic, aetznatron, ascarite, Collo-Grillrein, Sodium Hydroxide Pellets, NaOH

Molecular Formula: NaOH

CAS No: 1310-73-2

EC No: 215-185-5

Manufactured in Tianjin, China by Wanjie International Co., Limited

Supplied by: ChemSol LLC

601 Carlson Parkway, Suite 400

Minnetonka, MN 55305

24 Emergency Contact Information: CHEMTREC 1-800-424-9300

1. Physical Data:

Appearance: Odorless white beads (often sold as pearls/beads)

Melting Point: 318 C

Vapor Pressure: 1390 C

Specific Gravity: 2.12

Water Solubility: High (Note: Dissolution in water is highly exothermic)

2. Stability

Stable. Incompatible with a wide variety of materials including many metals, ammonium compounds, cyanides, acids, nitro compounds, phenols, combustible organics.

Hygroscopic. Heat of solution is very high and may lead to a dangerously hot solution if small amounts of water are used. Absorbs carbon dioxide from the air.

3. Toxicology

Very corrosive. Causes severe burns. May cause serious permanent eye damage. Very harmful by ingestion. Harmful by skin contact or by irritation of dust. Typical TLV 2 mg m-1.

Toxicology Data

IPR-MUS LD50 40 mg kg-1

Irritation Data

EYE-MKY 1%/24h sev

SKN-RBT 500mg/24h sev

EYE-RBT 1% sev

Risk Phrases

R35.

4. Ecological Information

Ecotoxicity Information

LC₁₀₀ Cyprinus Carpio 180ppm/24hr @ 25C TLm, mosquito fish 125ppm/96hr (fresh water); TLm Bluegill 99 mg/L/48 hr (tap water)

Carcinogenicity

Sodium hydroxide is not classified as a carcinogen by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as a carcinogen by OSHA (Occupational Safety and Health Administration), and not listed as a carcinogen by NTP (National Toxicology Program).

Persistence & Degradation

Aquatic: In the case of solid, anhydrous NaOH spill on soil, ground water pollution will occur if precipitation occurs prior to clean up. Precipitation will dissolve some of the solid and create an aqueous solution of NaOH, which then would be able to infiltrate the soil. Degrades readily by reacting with natural carbon dioxide in the air. Does not bioaccumulate.

5. Fire and Explosion Hazard Data

General

Sodium Hydroxide will not burn or support combustion. The reaction of sodium hydroxide with water and a number of commonly encountered materials can generate sufficient heat to ignite nearby combustible materials. Sodium Hydroxide can react with metals, such as aluminum tin and zinc, to form flammable hydrogen gas.

Flashpoint

None

Extinguishing Media

Use extinguishing media suitable for the surrounding fire. If water is used, care should be taken, since it can generate heat and cause and cause spattering if applied directly to Sodium Hydroxide.

Firefighting Equipment

Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. Chemical resistance clothing (e.g. chemical splash suit) and positive pressure self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) may be necessary.

Firefighting Procedures

Evacuate area and fight fire from a safe distance or a protected location. Approach fire from area if it can be done without risk. Water can be used with extreme caution to extinguish fire in an area where Sodium Hydroxide is stored. The water must not come into contact with the Sodium Hydroxide. Water can be used in flooding quantities as a spray of fog to keep fire-exposed containers cool and absorb heat. At high temperatures, fuming may occur, giving off a strong, corrosive gas. Do not enter without wearing specialized protective equipment suitable for the situation.

Evacuation

If tank truck involved in a fire, ISOLATE and consider evacuation of one-half mile radius.

Effects of Overexposure**Acute Eye Contact**

Extremely corrosive. The severity of injury increases with the concentration (for solutions), the duration of exposure, and the speed of penetration into the eye. The solid will absorb moisture from the eye, or water being used for removal, forming a highly concentrated solution. Damage can range from severe irritation and mild scarring to blistering, disintegration, ulceration, severe scarring and clouding.

Skin Contact

Sodium Hydroxide is extremely corrosive and is capable of scarring. It can penetrate to deeper layers of the skin and corrosion will continue until removed. The severity of injury depends on duration of exposure. The solid will also cause severe burns as it can absorb moisture from the skin, air and rinse water used for removal. Burns may not be immediately painful; onset of pain may be delayed minutes to hours. Several human studies and case reports describe the corrosive effects of Sodium Hydroxide.

Ingestion

Severe pain; burning of the mouth, throat and esophagus; vomiting; diarrhea; collapse and possible death may result.

Inhalation

Sodium Hydroxide does not readily form a vapor and inhalation exposure is only likely to occur to aerosols since the solid absorbs moisture from the air and will only form a dust under severe agitation. Due to its corrosive nature, Sodium Hydroxide aerosols could cause pulmonary edema (life threatening lung injury).

Chronic Effects

SKIN: Repeated or prolonged skin contact would be expected to cause drying, cracking, and inflammation of the skin. There was no trend of increased mortality in relation to duration (up to 30 years) or intensity of exposure to (0.5 mg/m³ to 1.5 mg/m³) among 291 workers exposed to Sodium Hydroxide dust during the production of flakes or beads of concentrated Sodium Hydroxide from chlorine cell effluent.

Existing Medical Conditions Possibly Aggravated by Exposure

Asthma, bronchitis, emphysema and other lung diseases and chronic nose, sinus or throat conditions. Skin irritation may be aggravated in individual's with existing skin disorders.

6. Recommended First Aid Measures

Eye Exposure

Immediately flush eyes with running water for a minimum of 20 minutes and upward to 60 minutes is recommended. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention immediately. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Skin Exposure

Immediately flush skin with running water for at least 20 minutes and upward to 60 minutes is recommended. Under running water remove contaminated clothing, jewelry, and shoes. If irritation persists obtain medical attention. Discard contaminated clothing and shoes in a manner, which limits further exposure.

Inhalation Exposure

Move victim to fresh air. Give artificial respiration only if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance: induce artificial respiration with the aid of a pocket mask equipped with a one way valve or other proper respiratory medical device. Give Cardiopulmonary Resuscitation (CPR) only if there is no pulse and no breathing. Obtain medical attention immediately. Symptoms can be delayed up to 48 hours after exposure.

Ingestion Exposure

Do not induce vomiting. If victim is alert and not convulsing, rinse mouth and give as much water as possible to dilute material (8 to 10 oz.). If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Immediately transport victim to an emergency facility.

Notes to Physician

Treat symptomatically

7. Accidental Release Measures

Evacuation Procedure & Safety

Restrict access to area until completion of clean up. Ensure trained personnel conduct clean up.

Containment of Spills

Remove all ignition sources (no smoking, flares, sparks or flames). All equipment should be grounded and non-sparking. Ventilate area. Prevent entry into sewers or waterways. Shovel or sweep up dry Sodium Hydroxide for recycling or disposal. Neutralize the final traces and flush with water.

Land Spill: Cover solids with a plastic sheet to prevent dissolving in rain or fire fighting water. Solutions should be contained by diking with inert material, such as sand or earth.

Water Spill: Neutralize with dilute acid.

Deactivating Chemicals:

Waste Disposal:

Weak acid solutions (vinegar, hydrochloric or sulfuric acid). Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste water with normal garbage or to sewer systems. Clean up material may be a RCRA Hazardous Waste or disposal. Spills are subject to CERCLA reporting requirements: RQ=1000lbs. (454 kgs).

8. Handling and Storage

Handling

Use smallest possible amounts in designated area with adequate ventilation. Keep containers closed when not in use. Empty containers may contain hazardous residues. Transfer solids using tools or equipment, which are corrosion-resistant. Cautiously, transfer which are corrosion-resistant. Cautiously, transfer into sturdy containers made of compatible materials. Never return contaminated material to its original container. Considerable heat is generated when diluted with water. Proper handling procedures must be followed to prevent vigorous boiling, splattering or violent eruption of the diluted solution. Never add water to caustic. Always add caustic to water and provide agitation. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation. In general, keep solid Sodium Hydroxide away from water. Post "DO NOT USE WATER" in area of use to prevent accidental contact.

Storage

Store in a cool, dry, well-ventilated area. This material absorbs water. Keep containers tightly closed when not in use and when empty. Protect from damage. Store away from incompatible materials such as strong acids, nitroaromatic, nitroparaffinic or organohalogen compounds. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. Containers made of nickel alloys are preferred. Steel containers are acceptable if temperatures are not elevated. Nickel is the preferred metal for handling this product. Plastics or plastic-lined steel, or FRP tanks of derakane vinyl ester resin may be suitable. If indoor storage of pearl caustic is unavailable, the pallets should be protected against the extremes of weather. Do not expose containers to temperature above 40 C (104 F).

9. Transportation Information

UN Major Hazard class 8.0. Packing Group II. UN No. 1823. EMS No 8.0-06.

10. Personal Protection

Safety glasses, adequate ventilation, Neoprene or PVC Gloves.

Safety Phrases

S26, S37, S39, S45.

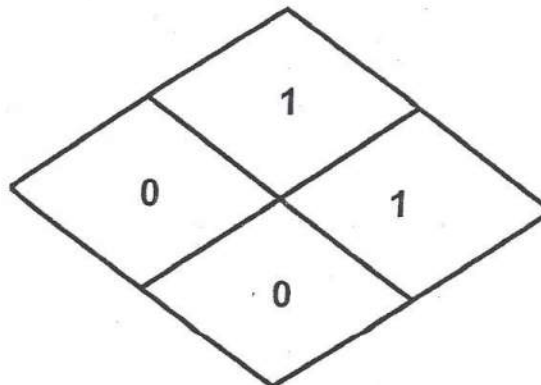
MSDS Status: Revised December 3, 2006 by Technical Services Department of ChemSol LLC.

Information contained herein is believed to be accurate. However, it is provided solely for the customer's consideration, investigation and verification. ChemSol LLC hereby specifically disclaims any and all warranties expressed or implied, regarding the accuracy and completeness of such information, and makes no representation with respect to thereto.

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P. O. Box 5342

Kingsville
361-595-5561
361-595-5588

TX 78363



4031 DEFOAMER 3010

Material Safety Data Sheet

Keep containers tightly closed; store in cool, dry place

Page 6

Handling & Storage

Respiratory Protection
Ventilation
Exhaust
Protective Gloves
Eye Protection
Other Protection

SECTION 9.0

OSHA/NIOSH approved dust/mist respirator in mist conditions
Desired
Mechanical/Electrostatic
Rubber
Safety glasses, goggles
Eye wash/shower; wash after handling

DOT Proper Shipping Name
DOT Hazard Class or Division
DOT Identification Number
DOT Packaging Group
Type Label(s) Required or Exemption Nu

SECTION. 10.0
Not Regulated
Not Hazardous
N/A
N/A
None

DISCLAIMER

DISCLAIMER

DISCLAIMER

DISCLAIMER

SECTION. 11.0

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THE MSDS INFORMATION PROVIDED HEREIN IS APPLICABLE ONLY TO THIS PRODUCT.

Revised Date
Supersedes

SECTION 1.0
02/11/02
09/28/98

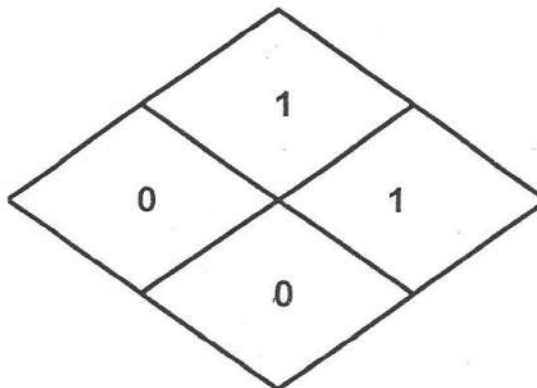
Trade Name
Synonyms/Other Designations
Chemical Formula
Hazard(s)

SECTION 2.0
LIME
Lime
Ca(OH)₂
Breathing Discomfort @ concentrations > 5 mg/m³

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4031 DEFOAMER 3010

Material Safety Data Sheet

Page 7

Boiling Point
Freezing Point
Specific Gravity
Vapor Pressure (mm Hg)
Vapor Density
Solubility in H₂O
Appearance
Odor

SECTION 3.0
Decomposes
N/A
1.02
Nil
N/A
Slight
Clear colorless to amber liquid
Low odor

Stability
Incompatibility
Hazardous Decomposition Products
Hazardous Polymerizations

SECTION 4.0
Stable under normal conditions
Strong mineral acids and oxidizing agents
None known
Will not occur

Flash Point
Extinguishing Media
Special Fire Fighting Procedures
Unusual Fire Hazards
pH

SECTION 5.0
>430 F
Water, dry chemical, foam, CO₂
Normal firefighting procedures
Known known
N/A

Inhalation
Eye Contact
Skin Contact
Ingestion

SECTION 6.0
No adverse effects expected; if breathing difficulties persists after 15 minutes, seek medical assistance.
Wash eye thoroughly for 15 minutes; if irritation persists, seek medical assistance
Wash exposed area with soap and water
No adverse effects expected; if discomfort persists after 15 minutes, seek medical assistance.

Acute
Chronic

SECTION 7.0
None expected
None Known

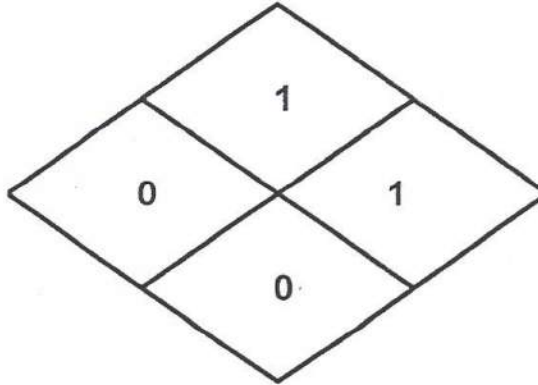
Accidental Spill Procedures
Handling & Storage

SECTION 8.0
Collect or contain for salvage or dispose of according to local, state, & federal regulations.
Keep containers tightly closed; store in cool, dry place

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Material Safety Data Sheet

Page 8

Respiratory Protection	SECTION 9.0
Ventilation	OSHA/NIOSH approved dust/mist respirator in mist conditions
Exhaust	Desired
Protective Gloves	Mechanical/Electrostatic
Eye Protection	Rubber
Other Protection	Safety glasses, goggles
	Eye wash/shower; wash after handling

DOT Proper Shipping Name	SECTION. 10.0
DOT Hazard Class or Division	Not Regulated
DOT Identification Number	Not Hazardous
DOT Packaging Group	N/A
Type Label(s) Required or Exemption Nu	N/A
	None

DISCLAIMER	SECTION. 11.0
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Revised Date	SECTION 1.0
Supercedes	02/11/02
	12/14/98

Trade Name	SECTION 2.0
Synonyms/Other Designations	DRILLING DETERGENT
Chemical Formula	DRILLING DETERGENT, PRODET PLUS
Hazard(s)	Proprietary mixture
	Not Hazardous

Boiling Point	SECTION 3.0
	>200 F



Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Desco® Deflocculant

Product Use: Base Fluid for Drilling Muds
Synonyms: Drilling Mud Deflocculant
Product CAS No.: Mixture

Company Identification:
Chevron Phillips Chemical Company LP
Drilling Specialties Company
10001Six Pines Drive
The Woodlands, TX 77380

Product Information:
MSDS Requests: (800) 852-5530
Technical Information: (800) 221-1956
Responsible Party: Product Safety Group
Email:msds@cpchem.com

Chevron Phillips Chemicals International N.V.
Brusselssesteenweg 355
B-3090 Overijse
Belgium

24-Hour Emergency Telephone Numbers

HEALTH:Chevron Phillips Emergency Information Center 866.442.9628 (North America) and 1.832.813.4984 (International)

TRANSPORTATION: North America: CHEMTREC 800.424.9300 or 703.527.3887
ASIA: +1.703.527.3887
EUROPE: BIG .32.14.584545 (phone) or .32.14.583516 (telefax)
SOUTH AMERICA SOS-Cotec Inside Brazil: 0800.111.767
Outside Brazil: 55.19.3467.1600

SECTION 2 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Fine reddish-brown powder, mild tree bark odor.

- MAY BE HARMFUL OR FATAL IF SWALLOWED
- DUST MAY PRODUCE MECHANICAL IRRITATION TO THE MUCOUS MEMBRANES OF THE EYES, NOSE, THROAT AND UPPER RESPIRATORY TRACT
- CAUSES EYE IRRITATION
- CAUSES SKIN IRRITATION

- SUSPECT CANCER HAZARD - MAY CAUSE CANCER
- MAY CAUSE DAMAGE TO:
- LUNGS
- LIVER
- KIDNEY

IMMEDIATE HEALTH EFFECTS:

Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision. Not expected to cause prolonged or significant eye irritation. Material is dusty and may scratch the surface of the eye.

Skin: Contact with the skin causes irritation. Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Toxic; may be harmful or fatal if swallowed.

Inhalation: The dust from this material may cause respiratory irritation.

DELAYED OR OTHER HEALTH EFFECTS:

Cancer: Prolonged or repeated exposure to this material may cause cancer.

Target Organs: Repeated inhalation of this material at elevated concentrations may cause damage to the following organ(s) based on animal data:- Liver - Kidney - Lung

See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	AMOUNT	EINECS	SYM	R-PHRASES
Proprietary	Proprietary	> 84 % weight	NA	NA	NA
Ferrous Sulfate	17375-41-6	< 10 % weight	NA	NA	NA
Chromium Acetate	1066-30-4	< 5 % weight	NA	NA	NA
Crystalline Silica	14808-60-7	< 1 % weight	238-878-4	NA	NA

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Chromium Acetate	ACGIH	.5 mg/m3	NA	NA	as Cr as Cr
Chromium Acetate	CPCHEM	Not Established	NA	NA	NA
Crystalline Silica	ACGIH	.025 mg/m3	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m3	NA	NA	Respirable Dust
Ferrous Sulfate	ACGIH	1 mg/m3	NA	NA	as Fe as Fe
Proprietary	ACGIH	Not Established	NA	NA	NA

Control as Particulate Not Otherwise Classified (PNOC). The ACGIH Guideline* for respirable dust is 3.0 mg/m3 and 10.0 mg/m3 for total dust. The OSHA PEL for respirable dust is 5.0 mg/m3 and 15.0 mg/m3 for total dust.

* This value is for inhalable (total) particulate matter containing no asbestos and < 1.0% crystalline silica.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with running water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get immediate medical attention.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.
Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Not classified as flammable or combustible.

NFPA RATINGS: Health: 2 Flammability: 0 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: NA

Autoignition: NDA

Flammability (Explosive) Limits (% by volume in air): Lower: NA Upper: NA

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: Material will not burn unless preheated. Clear fire area of all non-emergency personnel. Only enter confined fire space with full gear, including a positive pressure, NIOSH-approved, self-contained breathing apparatus. Cool surrounding equipment, fire-exposed containers and structures with water. Container areas exposed to direct flame contact should be cooled with large quantities of water (500 gallons water per minute flame impingement exposure) to prevent weakening of container structure. This material will burn although it is not easily ignited.
Combustion Products: No data available.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.
Spill Management: Avoid creating dust clouds. Shovel, sweep up or use industrial vacuum cleaner to pick up. Place in container for proper disposal. Reduce airborne dust and prevent scattering by moistening with water.
Reporting: U.S.A. regulations may require reporting spills of this material that could reach any surface waters. Report spills to local authorities and/or the National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL . REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL .

Precautionary Measures: Use caution to avoid creation of dusts and to prevent inhalation of product dust (fines). Avoid contact with product dust. Airborne dust concentrations above 20 mg/L may create a dust explosion hazard. Avoid breathing vapors or fumes which may be released during thermal processing. Do not breathe dust at levels above the recommended exposure limits. Avoid breathing material. Keep container closed. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Discard contaminated clothing and shoes or thoroughly clean before reuse. Do not get in eyes. Do not taste or swallow. Do not breathe dust.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids, National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).
General Storage Information: Treat as a solid that can burn. Store away from oxidizing materials, in a cool, dry place

with adequate ventilation. Bond and ground transfer equipment. DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly. Containers, even those that have been emptied, can contain residues of dusts or solid particulates which may create both health and fire/explosion hazards.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

If heated material generates vapor or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.

Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: Nitrile

Respiratory Protection:

If user operations generate harmful levels of airborne material that is not adequately controlled by ventilation, wear a NIOSH approved respirator that provides adequate protection. Use the following elements for air-purifying respirators: Air-Purifying Respirator for Particulates (HEPA)

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Chromium Acetate	ACGIH	.5 mg/m ³	NA	NA	as Cr as Cr
Chromium Acetate	CPCHEM	Not Established	NA	NA	NA
Crystalline Silica	ACGIH	.025 mg/m ³	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m ³	NA	NA	Respirable Dust
Ferrous Sulfate	ACGIH	1 mg/m ³	NA	NA	as Fe as Fe
Proprietary	ACGIH	Not Established	NA	NA	NA

Control as Particulate Not Otherwise Classified (PNOC). The ACGIH Guideline* for respirable dust is 3.0 mg/m³ and 10.0 mg/m³ for total dust. The OSHA PEL for respirable dust is 5.0 mg/m³ and 15.0 mg/m³ for total dust.

* This value is for inhalable (total) particulate matter containing no asbestos and < 1.0% crystalline silica.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Fine reddish-brown powder, mild tree bark odor.

pH: NA

Flashpoint: NA

VAPOR PRESSURE: NA

VAPOR DENSITY (AIR=1): NA
BOILING POINT: NA
SOLUBILITY (in water): Appreciable

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: No Data Available

Incompatibility With Other Materials: No data available

Hazardous Decomposition Products: No Data.

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: Ferrous Sulfate: LD50 / Species not specified / 1.52 g/kg

Acute Dermal Toxicity: LD50 / not known

Acute Inhalation Toxicity: LC50 / not known

Eye Irritation: This material is irritating to the eyes.

Skin Irritation: This material is irritating to the skin.

ADDITIONAL TOXICOLOGY INFORMATION:

The toxicological properties of this product have not been tested or have not been tested completely and its handling or use may be hazardous. EXERCISE DUE CARE.

This product contains CRYSTALLINE SILICA:

Repeated Dose Toxicity: Up to 420 days / inhalation / rat / Doses: 30,000 particles/ml 18 hrs/day 5days/wk / Silicotic nodules

Genetic Toxicity: AMES test = Negative / Recombination Assay = Negative

Carcinogenicity: 2 yrs / inhalation / rat / Dose: 1 mg/m³ / primary lung tumors in control (3) and treated (18); 150, 300 or 570 days / inhalation / mouse / Doses: 1475 ug/m³ for 150 days, 1800 ug/m³ for 300 days or 1950 ug/m³ for 570 days 8 hrs/day 5days/wk / pulmonary adenomas found in both control (7) and treated (9)

Other: International Agency for Research on Cancer (IARC) classifies crystalline silica as a human carcinogen

Long-term exposure to high dust concentrations may cause non-debilitating lung changes.

This product contains CHROMIUM ACETATE:

REPEATED DOSE TOXICITY: Lifetime / oral / mouse / Dose: 5 ppm in drinking water / decrease longevity in male mice

GENETIC TOXICITY: Sister Chromatid Exchange = Negative / Chromosomal aberrations = Positive

CARCINOGENICITY: Lifetime / oral / rat / Dose: 5 mg/L in drinking water / no increase incidence of tumors

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:

The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

Chromium Acetate - 96 hour(s) / IC50 / rainbow trout (*Salmo gairdneri*) / 59 mg/l

Ferrous Sulfate - 48 hour(s) / LC50 / mysid shrimp (*Mysidopsis bahia*) / 56 ppm

ENVIRONMENTAL FATE:

The environmental fate of this material is not available.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

Shipping Descriptions per regulatory authority.**US DOT**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

ICAO / IATA

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

IMO / IMDG

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

RID / ADR

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

Additional Information: This material is regulated when shipped in bulk quantities (≥ 119 gallons, 882 mass net) only.

SECTION 15 REGULATORY INFORMATION**SARA 311/312 CATEGORIES:**

- | | |
|---------------------------------------|-----|
| 1. Immediate (Acute) Health Effects: | YES |
| 2. Delayed (Chronic) Health Effects: | YES |
| 3. Fire Hazard: | NO |
| 4. Sudden Release of Pressure Hazard: | NO |
| 5. Reactivity Hazard: | NO |

REGULATORY LISTS SEARCHED:

01 = CA Prop 65	17 = FDA 178	33 = RCRA Waste Appendix VIII
02 = LA RTK	18 = FDA 179	34 = RCRA Waste D-List
03 = MA RTK	19 = FDA 180	35 = RCRA Waste P-List
04 = MN Hazardous Substance	20 = FDA 181	36 = RCRA Waste U-List
05 = NJ RTK	21 = FDA 182	37 = SARA Section 302
06 = PA RTK	22 = FDA 184	38 = SARA Section 313
07 = CAA Section 112 HAPs	23 = FDA 186	39 = TSCA 12 (b)
08 = CWA Section 307	24 = FDA 189	40 = TSCA Section 4

09 = CWA Section 311	25 = IARC Group 1	41 = TSCA Section 5(a)
10 = DOT Marine Pollutant	26 = IARC Group 2A	42 = TSCA Section 8(a) CAIR
11 = FDA 172	27 = IARC Group 2B	43 = TSCA Section 8(a) PAIR
12 = FDA 173	28 = IARC Group 3	44 = TSCA Section 8(d)
13 = FDA 174	29 = IARC Group 4	45 = WHIMS - IDL
14 = FDA 175	30 = NTP Carcinogen	46 = Germany D TAL
15 = FDA 176	31 = OSHA Carcinogen	47 = Germany WKG
16 = FDA 177	32 = OSHA Highly Hazardous	48 = DEA List 1
		49 = DEA List 2

The following components of this material are found on the regulatory lists indicated.

Ferrous Sulfate	3, 4, 5, 6, 9, 45
Chromium Acetate	3, 4, 5, 6, 9, 34, 38, 45, 46
Crystalline Silica	1, 3, 4, 5, 6, 25, 30, 45

CERCLA REPORTABLE QUANTITIES(RQ)/SARA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

Component	Component RQ	Component TPQ	Product RQ
Chromium Acetate	1000 lbs	None	20000 lbs
Ferrous Sulfate	1000 lbs	None	16666

WHMIS CLASSIFICATION:

Class D, Division 1, Subdivision B: Toxic Material
 Acute Lethality
 Class D, Division 2, Subdivision A: Very Toxic Material
 Carcinogenicity
 Chronic Toxic Effects
 Class D, Division 2, Subdivision B: Toxic Material
 Chronic Toxic Effects
 Skin or Eye Irritation

CHEMICAL INVENTORY LISTINGS:

AUSTRALIA: This material contains components that require notification before sale or importation into Australia.
 CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL) or are exempt from notification.
 PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the Inventory of Existing Chemical Substances in China.
 EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.
 JAPAN: This material contains components that require notification before sale or importation into Japan.
 KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.
 PHILIPPINES: This material contains components that require notification before sale or importation into the Philippines.
 UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

EU RISK AND SAFETY PHRASES:

R22: Harmful if swallowed.
 R25: Toxic if swallowed.
 R45: May cause cancer.
 R36/38: Irritating to eyes and skin.

- R48/23: Toxic: danger of serious damage to health by prolonged exposure through inhalation.
 S22: Do not breathe dust.
 S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
 S38: In case of insufficient ventilation, wear suitable respiratory equipment.
 S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
 S53: Avoid exposure - obtain special instructions before use.
 S24/25: Avoid contact with skin and eyes.
 S36/37: Wear suitable protective clothing and gloves.

EU Symbols: T - Toxic

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 2 Flammability: 0 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme. PPE:- Personal Protection Equipment Index recommendation, *-Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

REVISION STATEMENT: The following sections have been updated: 1

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	- Threshold Limit Value	TWA	- Time Weighted Average
STEL	- Short-term Exposure Limit	PEL	- Permissible Exposure Limit
ACGIH	- American Conference of Government Industrial Hygienists	OSHA	- Occupational Safety & Health Administration
NIOSH	- National Institute for Occupational Safety & Health	NFPA	- National Fire Protection Agency
WHMIS	- Workplace Hazardous Materials Information System	IARC	- Intl. Agency for Research on Cancer
EINECS	- European Inventory of existing Commercial Chemical Substances	RCRA	- Resource Conservation Recovery Act
SARA	- Superfund Amendments and Reauthorization Act.	TSCA	- Toxic Substance Control Act
EC50	- Effective Concentration	LC50	- Lethal Concentration
LD50	- Lethal Dose	CAS	- Chemical Abstract Service
NDA	- No Data Available	NA	- Not Applicable
<=	- Less Than or Equal To	>=	- Greater Than or Equal To
CNS	- Central Nervous System	MAK	- Germany Maximum Concentration Values

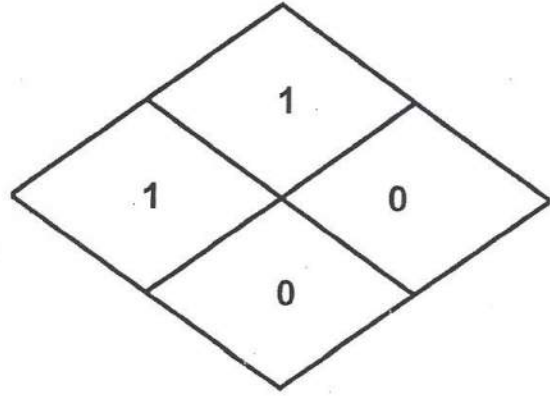
This data sheet is prepared according to the latest adaptation of the EEC Guideline 67/548.
 This data sheet is prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
 This data sheet is prepared according to the ANSI MSDS Standard (Z400.1).
 This data sheet was prepared by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof

Integrity Industries, Inc.
P. O. Box 5342

Kingsville
361-595-5561

TX 78363



Material Safety Data Sheet

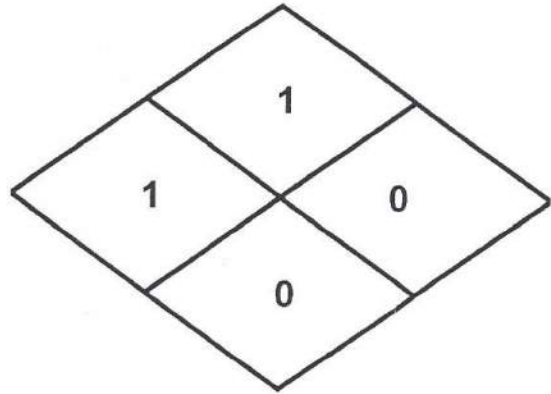
Page 1

Revised Date	SECTION 1.0 02/11/02
Supercedes	12/14/98
Trade Name	SECTION 2.0 DRILLING DETERGENT
Synonyms/Other Designations	DRILLING DETERGENT, PRODET PLUS
Chemical Formula	Proprietary mixture
Hazard(s)	Not Hazardous
Boiling Point	SECTION 3.0 >200 F
Freezing Point	<32 F
Specific Gravity	1.03
Vapor Pressure (mm Hg)	>1.0
Vapor Density	N/A
Solubility in H2O	Soluble
Appearance	Amber liquid
Odor	Bland
Stability	SECTION 4.0 Stable under normal conditions.
Incompatibility	Strong acids and strong bases
Hazardous Decomposition Products	Combustion may cause smoke, carbon dioxide, carbon monoxide
Hazardous Polymerizations	Will not occur
Flash Point	SECTION 5.0 >200 F
Extinguishing Media	Water, dry chemical, foam, CO2
Special Fire Fighting Procedures	Normal firefighting procedures
Unusual Fire Hazards	None known
pH	7.0 - 8.0
Inhalation	SECTION 6.0 Move to well ventilated area; if breathing difficulties persist after 15 minutes, seek medical help
Eye Contact	Wash eye thoroughly for 15 minutes; if irritation persists, seek medical help.
Skin Contact	Wash exposed area with plenty of water
Ingestion	Do not induce vomiting, drink water to dilute, seek medical assistance.

Integrity Industries, Inc.
P. O. Box 5342

Kingsville
361-595-5561

TX 78363



4037 DRILLING DETERGENT

Material Safety Data Sheet

Acute	SECTION 7.0
Chronic	May irritate eyes, skin, and respiratory tract. Ingestion may cause vomiting, diarrhea, and discomfort No data available
Accidental Spill Procedures	SECTION 8.0
Handling & Storage	Absorb with inert material and dispose of according to local, state, and federal regulations. Store in well ventilated area.
Respiratory Protection	SECTION 9.0
Ventilation	NIOSH approved dust/mist respirator in mist conditions
Exhaust	Desired
Protective Gloves	Mechanical
Eye Protection	Rubber gloves
Other Protection	Safety Glasses, Goggles Eye wash/Safety shower
DOT Proper Shipping Name	SECTION 10.0
DOT Hazard Class or Division	Not Regulated
DOT Identification Number	Not Hazardous
DOT Packaging Group	N/A
Type Label(s) Required or Exemption Nu	N/A
DISCLAIMER	SECTION 11.0
DISCLAIMER	SOME INFORMATION PROVIDED HEREIN WAS DRAWN FROM SOURCES OTHER THAN INTEGRITY INDUSTRIES.
DISCLAIMER	THE INFORMATION PROVIDED HEREIN IS BELIEVED BY INTEGRITY INDUSTRIES TO BE CORRECT AND RELIABLE; NO EXPRESSED OR IMPLIED WARRANTY IS PROVIDED HOWEVER.
DISCLAIMER	INTEGRITY INDUSTRIES ASSUMES NO RESPONSIBILITY AND DENIES ALL LIABILITY FOR ANY LOSS, DAMAGE, OR EXPENSE CONNECTED WITH CUSTOMERS' METHOD OF HANDLING, STORAGE, USE, AND DISPOSAL OF THIS PRODUCT.
DISCLAIMER	THE MSDS INFORMATION PROVIDED HEREIN IS APPLICABLE ONLY TO THIS PRODUCT.

SDS no. 10031
Version 7
Revision date 30/Dec/2015
Supersedes date 08/Jun/2015

Mi SWACO

A Schlumberger Company

Safety Data Sheet GELEX†

1. Identification

1.1 Product identifier

Product name GELEX†
Product code 10031

This product may not be distributed or used in Canada.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Drilling fluid additive. Bentonite extender.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I L.L.C.

P.O.Box 42842
Houston, TX 77242
www.miswaco.slb.com
Telephone: 1 281-561-1511

Prepared by
Global Regulatory Compliance - Chemicals (GRC - Chemicals)

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards Not classified
Environmental hazards Not classified

Physical Hazards

Combustible dust

2.2 Label elements

Signal word
WARNING

Hazard statements
May form combustible dust concentrations in air

Precautionary statements

P240 - Ground/bond container and receiving equipment
P241 - Use explosion-proof electrical/ ventilating/ lighting/ equipment
P243 - Take precautionary measures against static discharge

Unknown acute toxicity 93% of the mixture consists of ingredient(s) of unknown toxicity.

3. Composition/information on Ingredients

3.1 Substances

Not Applicable

3.2 Mixtures

Component	CAS-No	Weight % - range
Polyacrylate polyacrylamide blend	Proprietary	60 - 100

Comments
The exact percentage (concentration) of composition has been withheld as a trade secret

4. First aid measures

4.1 First-Aid Measures

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.

Skin contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.

Eye contact Promptly wash eyes with lots of water while lifting eye lids. Remove contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

4.2 Most important symptoms and effects, both acute and delayed

General advice The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation Please see Section 11. Toxicological Information for further information.

Ingestion Please see Section 11. Toxicological Information for further information.

Skin contact Please see Section 11. Toxicological Information for further information.

Handling

Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/precautions Ensure adequate ventilation. Provide appropriate exhaust ventilation at places where dust is formed. Keep airborne concentrations below exposure limits.

Storage precautions Keep away from open flames, hot surfaces and sources of ignition. Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls/personal protection

8.1 Control parameters

Exposure limits Control as an ACGIH particulate not otherwise specified (PNOS): 10 mg/m³ (Inhalable); 3 mg/m³ (Respirable) and an OSHA particulate not otherwise regulated (PNOR): 15 mg/m³ (Total); 5 mg/m³ (Respirable).

Component	ACGIH TLV	OSHA PEL
Polyacrylate polyacrylamide blend	Not Determined	Not Determined

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

Engineering measures to reduce exposure

Ensure adequate ventilation.

Personal protective equipment

Eye protection Tightly fitting safety goggles.

Hand protection Wear chemical resistant gloves such as nitrile or neoprene.

Respiratory protection All respiratory protection equipment should be used within a comprehensive respiratory protection program that meets the requirements of 29 CFR 1910.134 (U.S. OSHA Respiratory Protection Standard) or local equivalent. Use NIOSH approved respirator with dust and mist protection (3M 8210). If dust concentration exceeds 5 times the exposure limit, wear an approved HEPA respirator.

Skin and body protection Wear suitable protective clothing.

Hygiene measures Wash hands before breaks and immediately after handling the product, Remove and wash contaminated clothing before re-use.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state Solid powder

Appearance Opaque

Color White

Odor Odorless

Odor threshold Not applicable

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
-----------------	---------------	----------------

pH	No information available	
pH @ dilution	No information available	
Melting/freezing point	No information available	
Boiling point/range	No information available	
Flash point	Does not flash	PMCC
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	0 mmHg	
Vapor density	Not applicable	
Specific gravity	1.3	
Bulk density	No information available	
Water solubility	Appreciable	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Log Pow	No information available	
Explosive properties	Suspended dust may present a dust explosion hazard	
Oxidizing properties	None known.	

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	None
Density	No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Heat, flames and sparks. Avoid dust formation.

10.5 Incompatible materials

Strong oxidizing agents. Acids. Bases.

10.6 Hazardous decomposition products

Carbon oxides (COx).

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Inhalation Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.

Eye contact Dust may cause mechanical irritation.

Skin contact Repeated exposure may cause skin dryness or cracking.

Ingestion Irritant; may cause pain or discomfort to mouth, throat and stomach.

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Polyacrylate polyacrylamide blend	No data available	No data available	No data available

Component	IARC Group 1 or 2	ACGIH - Carcinogens	OSHA listed carcinogens	NTP
Polyacrylate polyacrylamide blend	No data available	No data available	No data available	No data available

Sensitization This product does not contain any components suspected to be sensitizing.

Mutagenic effects No evidence of mutagenic properties.

Carcinogenicity No evidence of carcinogenic properties.

Reproductive toxicity No evidence of toxicity to reproduction.

Developmental toxicity Not known to cause birth defects or have a deleterious effect on a developing fetus.

Routes of exposure Inhalation. Skin contact. Eye contact.

Routes of entry Inhalation.

Specific target organ toxicity (single exposure) Not classified

Specific target organ toxicity (repeated exposure) Not classified.

Target organ effects Lungs.

Aspiration hazard Not Applicable.

12. Ecological information

12.1 Toxicity

Toxicity to algae
See component information below.

Toxicity to fish
See component information below.

Toxicity to daphnia and other aquatic invertebrates
See component information below.

Component	Toxicity to fish	Toxicity to algae	Toxicity to daphnia and other aquatic invertebrates
Polyacrylate polyacrylamide blend (60 - 100)	No information available	No information available	No information available

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)
This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Disposal Method Disposal should be made in accordance with federal, state and local regulations.
Contaminated packaging Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport information

14.1 UN Number

Not regulated
UN No. (DOT) Not regulated
UN/ID No. (ADR/RID/ADN/ADG) Not regulated
UN No. (IMDG) Not regulated
UN No. (ICAO) Not regulated

14.2 Proper shipping name

14.3 Hazard class(es)

DOT Hazard class Not regulated
ADR/RID/ADN/ADG Hazard class Not regulated
IMDG Hazard class Not regulated
ICAO Hazard class/division Not regulated

14.4 Packing group

DOT Packing group Not regulated
ADR/RID/ADN/ADG Packing group Not regulated
IMDG Packing group Not regulated
ICAO Packing group Not regulated

14.5 Environmental hazard

No

14.6 Special precautions

Not Applicable

15. Regulatory information

International inventories

USA (TSCA)	Complies
Canada (DSL)	Complies.
European Union (EINECS and ELINCS)	Does not Comply
Philippines (PICCS)	Does not Comply
Japan (ENCS)	Does not Comply
China (IECSC)	Complies
Australia (AICS)	Does not Comply
Korean (KECL)	Does not Comply
New Zealand (NZIoC)	Complies

SARA 311/312 Hazard Categories

Not a SARA 311/312 hazard.

Component	SARA 302 / TPQs	SARA 313	CERCLA RQ
Polyacrylate polyacrylamide blend	N/A	N/A	N/A

State Comments

Proposition 65: This product is not known to contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer and/or reproductive toxicity at levels that are expected to pose a significant risk under anticipated use conditions.

This product may not be distributed or used in Canada.

16. Other information

Supersedes date	08/Jun/2015
Revision date	30/Dec/2015
Version	7
The following sections have been revised:	1, 2. Hazards Identification 15,

HMIS classification

Health	1
Flammability	1
Physical hazard	0
PPE	E

N/A - Not Applicable, N/D - Not Determined.

†A mark of M-I L.L.C.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

MATERIAL SAFETY DATA SHEET

GRAPHITE

Date: 07-20-04

1. Product and Company Identification

Product Name: GRAPHITE (All Grades)

Chemical Name: GRAPHITE

Chemical Family: CARBON

Chemical Formula: CARBON

CAS Reg. No. 7782-42-5

SUPPLIER: Grinding & Sizing Co.

515 Industrial Blvd.

Lufkin, Texas 75904

Emergency Phone Number: 936-634-7718

2. Composition:

Graphite, Natural

OSHA PEL: 2.5 mg/m³, ACGIH TLV 2.0mg/m³

May Contain:

Silica, Crystalline Quartz, 14808-60-7

Non-graphitic carbon

OSHA PEL: 0.1 mg/m³, ACGIH TLV 0.1mg/m³

Graphite is on both the DSL and NDSL

Graphite is on the US EPA TSCA Inventory

3. Hazards Identification:

- Acute Effects: Inhalation of dust may irritate mucous membranes.
- Ingestion: none
- Eyes: Dust abrasive to the eyes
- Skin: none
- Inhalation: long term inhalation may result in silicosis or pneumoconiosis.
- Route of entry: inhalation and eye contact

4. First Aid Measures

- Inhalation: Move exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention if breathing becomes difficult.
- Ingestion: Do not induce vomiting. Seek medical attention.
- Skin: Wash skin thoroughly with soap and water. Remove contaminated clothing
- Eyes: promptly wash eyes with lots of water. Continue to rinse for 30 minutes. Get medical attention.

5. Fire Fighting

- Extinguishing media: Water spray, CO₂, dry chemical, foam
- Special fire fighting procedures: None, evacuate all unnecessary personnel. Wear appropriate safety equipment for fire conditions including SCBA.

6. Accidental Release Measures

- Hiway or Rail Spill: Vacuum and sweep up.
- Contact local authorities for specific disposal site information.

7. Handling & Storage

- Handle only in well ventilated areas. Avoid breathing dust.
- Store in cool dry place, keep away from oxidizing agents, ignition sources.
- Exercise caution when handling in areas where contact with electrical circuits is possible as this material conducts electricity.

8. Exposure Controls, Personal Protection

- Ventilation-Local exhaust and ventilation system is recommended if handled in a confined area to control below recommended exposure levels.
- Respiratory Protection- Use NIOSH approved nuisance dust respirator.
- Eye Protection-Use safety glasses with side shields
- Skin Protection-Use long-sleeved clothing and gloves

9. Physical and Chemical Properties

- Appearance: gray/black powder
- Insoluble in water
- Boiling point n/a
- Melting point n/a
- Vapor Pressure n/a
- Specific gravity: 2.2
- Odor: none

10. Stability and Reactivity

- Stability: stable
- Reactivity: avoid excessive heat, ignition sources, acids, alkalis and strong oxidants
- Hazardous Decomposition: CO, CO₂
- Does not polymerize

11. Toxicological Information

- No toxicological information is available on this product

12. Ecological Information

- No ecological information is available

13. Transport Information

- Proper Shipping Name: Not regulated by DOT as a hazardous material
- Hazard class: none
- UN Number: none
- Packing Group: none

14. Regulatory Information

- OSHA (29 CFR 1910.1200) This product should be included in a hazard communication program.
- RCRA: none.
- CERCLA : Not subject to reporting
- NFPA Hazard Codes: Health:1, Flammability: 0, Reactivity: 0, Special hazards: 0



Issue Date: 12-Nov-03
IAW: ANSI Z400.1-1998
Supersedes: 09-Nov-00
Version: 02

Material Safety Data KWIK-SEAL®

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: KWIK-SEAL®

End Use: Oil Field Drilling Fluid Compound

Chemical Name(s): Blend of vegetable and polymer fibers

Chemical Family: mixture

Company: Kelco Oil Field Group, Division of CP KELCO ApS, 10920 W. Sam Houston Parkway North, Suite 800, Texas 77064 USA
(800) 331 3677 For additional non-emergency information
(713) 895 7575 8 a.m. - 5 p.m. (Central Time) weekdays

Emergency telephone number for chemical emergency, spill leak, fire, exposure, or accident:

CHEMTREC

1-800-424-9300 Day or Night -. Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands.
703-527-3887 For calls originating elsewhere, collect calls accepted.

2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT

Blend of vegetable and polymer fibers

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance And Odor: Various sized particles with slight odor

D.O.T. Hazard Classification: Non-hazardous material.

OSHA Hazard: Handle in a manner consistent with good industrial hygiene practices--avoid creating or inhaling aerosols of this or any other material.

Potential Health Effects:

Likely Routes Of Exposure: Skin contact and inhalation

Eye Contact: No more than slightly irritating. The dry particles may cause foreign body irritation in some individuals.

Skin Contact: No more than slightly toxic or slightly irritating. Prolonged contact with the dry powder may cause drying or chapping of the skin.

Inhalation: ~~Inhalation of the dust may cause coughing and sneezing.~~

Ingestion: Is not toxic if swallowed based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed.

Refer to **Section 11** for toxicological information.

4. FIRST AID MEASURES

IF IN EYES OR ON SKIN, immediately flush the area with plenty of water. If easy to do, remove any contact lenses. Remove contaminated clothing. Get medical attention if irritation persists. Wash clothing before reuse.

IF INHALED, immediate first aid is not likely to be required. However, if symptoms occur, remove to fresh air. If discomfort persists, contact a physician. Remove material from eyes, skin and clothing.

IF SWALLOWED, immediate first aid is not likely to be required. A physician or Poison Control Center can be contacted for advice.

5. FIRE FIGHTING MEASURES

Flash point: Not applicable

Hazardous products of combustion: Carbon dioxide, carbon monoxide

Extinguishing media: In case of fire, use water, dry chemical, CO₂, or alcohol foam.

Unusual fire and explosion hazards: None

Fire fighting equipment: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

In case of spill, sweep, blow, or vacuum up spilled material and repackage.

Refer to **Section 13** for disposal information and **Section 15** for reportable quantity information.

7. HANDLING AND STORAGE

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. THESE PRACTICES INCLUDE AVOIDING UNNECESSARY EXPOSURE AND REMOVAL OF MATERIAL FROM EYES, SKIN, AND CLOTHING.

Keep away from heat, sparks and flame. Avoid creating dust cloud in handling transfer and clean up.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE PROTECTION: This product does not cause significant eye irritation or eye toxicity requiring special protection. Use good industrial practice to avoid eye contact.

SKIN PROTECTION: Although this product does not present a significant skin concern, minimize skin contamination by following good industrial practice. Wearing protective gloves is recommended. Wash hands and contaminated skin thoroughly after handling.

RESPIRATORY PROTECTION: Avoid breathing dust. Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure limits are exceeded (see below). Consult the respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 C.F.R. 1910.134.

VENTILATION: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult NFPA standard 91 for design of exhaust systems.

AIRBORNE EXPOSURE LIMITS:

AIRBORNE EXPOSURE LIMITS:

OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for particulates not otherwise regulated (PNOR) and particulates not otherwise classified (PNOC) respectively, which are the least stringent exposure limits applicable to dusts.

OSHA PEL

15 mg/m³ (total dust) 8-hr TWA
5 mg/m³ (respirable) 8-hr TWA

ACGIH TLV

10 mg/m³ (inhalable) 8-hr TWA
10 mg/m³ (inhalable) 8-hr TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Blend of various colored particles
pH: approximately neutral (as a 1% solution)
Solubility in Water: Not soluble.

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Stability: Product is stable under normal conditions of storage and handling. Store in a cool, dry place to maintain product performance.
Materials to avoid: Strong oxidizers
Hazardous decomposition products: Thermal decomposition products may include carbon dioxide and carbon monoxide.
Hazardous polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

The dry powder may cause foreign body irritation in some individuals. Prolonged contact with the dry powder may cause drying or chapping of the skin. Excessive inhalation of dust may be annoying and can mechanically impede respiration.

12. ECOLOGICAL INFORMATION

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity. A legend summarizing the classification scheme appears below.

- 96-hr LC50; mysid shrimp, in standard drilling mud: >1,000,000 ppm suspended particulate phase
- Microtox Toxicity: Photobacterium phosphoreum - Non toxic

Legend for Aquatic Organism Toxicity (Journal of the European Communities, Annex VII A, Section 5.2.1)

Values	Classifications
LC50 or EC50 < or = 1.0 mg/L	Very Toxic
LC50 or EC50 > 1.0 mg/L and < or = 10 mg/L	Toxic
LC50 or EC50 > 10 mg/L < or = 100 mg/L	Harmful
LC50 or EC50 > 100 mg/L	Practically Nontoxic

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local, state, and federal regulations. Dry or wet solid material can be landfilled in accordance with local, state, and federal regulations. Liquids may be sewerage in accordance with local, state, and federal regulations if care is taken to avoid pluggage or blockage of sewer systems recognizing that these materials are intended to increase viscosity and form gels. As a carbohydrate, this material is readily biodegradable, when at low concentrations, in a biological wastewater treatment plant.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

~~This product is not hazardous under the applicable DOT, ICAO/IATA, or IMDG regulations.~~

15. REGULATORY INFORMATION

Chemical Inventory Status

The ingredients of this product are on the TSCA Inventory, Canadian Domestic Substances List and the European Inventory.

SARA Hazard Notification

Hazard Categories Under Title III Rules (40 CFR 370): Fire
Section 302 Extremely Hazardous Substances: Not applicable
Section 313 Toxic Chemical(s): Not applicable

CERCLA Reportable Quantity: Not applicable

Refer to **Section 11** for OSHA Hazardous Chemical(s) and **Section 13** for RCRA classification.

16. OTHER INFORMATION

MSDS produced in accordance with: ANSI Z400.1-1998.

Reason for version: Revised D.O.T / OSHA statements; New format; Company address change

	<i>Health</i>	<i>Fire</i>	<i>Reactivity</i>
<i>HMIS RATINGS:</i>	0	1	0
<i>NFPA RATINGS:</i>	0	1	0

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kofg.help@cpkelco.com

www.kofg.com



SAFETY DATA SHEET

LIGNITE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: LIGNITE

APPLICATIONS: Thinner.

EMERGENCY TELEPHONES: 001 281 561 1600 (USA)

SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen, AB11 5DQ

TELEPHONE: 44 (0)1224 - 584336

FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	0-5 %		
LIGNITE	1415-93-6	95-100 %		

COMPOSITION COMMENTS:

This product contains a small quantity of quartz, crystalline silica.

3. HAZARDS IDENTIFICATION:

This product contains a small quantity of quartz. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water. Get medical attention if any discomfort continues.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Fire can be extinguished using: Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

Use supplied air respirator if substance is involved in a fire. Water spray may be used to flush spills away from exposures and dilute spills to non-flammable mixtures.

UNUSUAL FIRE & EXPLOSION HAZARDS:

High concentrations of dust may form explosive mixture with air.

HAZARDOUS COMBUSTION PRODUCTS:

Asphyxiating gases/vapors/fumes.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Avoid generation and spreading of dust. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT NAME:	CAS No.:	STD:	LT EXP. 8 HRS:	ST EXP. 15 MIN:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	MEL	0.3 mg/m ³	
LIGNITE	1415-93-6	NUL		

INGREDIENT COMMENTS:

MEL = Maximum Exposure Limit. * OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. OES TWA 4mg/m³ respirable dust, 10mg/m³ total dust.

PROTECTIVE EQUIPMENT:

VENTILATION: Provide adequate general and local exhaust ventilation.

RESPIRATORS: Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).

PROTECTIVE GLOVES:

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE: Powder, dust.
COLOUR: Dark brown. to Black.
ODOUR/TASTE: Slight.
SOLUBILITY DESCRIPTION: Soluble in water.
SOLUBILITY VALUE (g/100g H₂O 20°C): 46
DENSITY/SPECIFIC GRAVITY (g/ml): 1.8 TEMPERATURE (°C): 25
pH-VALUE, DILUTED SOLUTION: 5 CONCENTRATION (%M):
FLAMMABILITY LIMIT - LOWER(%): May form explosive dust clouds in air.

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid heat, flames and other sources of ignition.

MATERIALS TO AVOID:
Strong oxidizing agents.

HAZARDOUS DECOMP. PRODUCTS:
Asphyxiating gases/vapours/fumes of: Oxides of Carbon.

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

HEALTH WARNINGS:
This product contains small quantities of quartz. Prolonged inhalation of high concentrations may damage respiratory system. Because of quantity and composition, the health hazard is small.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Not regarded as dangerous for the environment.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: S-22 Do not breathe dust.
S-38 In case of insufficient ventilation, wear suitable respiratory equipment.

UK REGULATORY REFERENCES: The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations 1993. IARC Monographs, Vol.68, 1997.

16. OTHER INFORMATION:

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 15-02-99

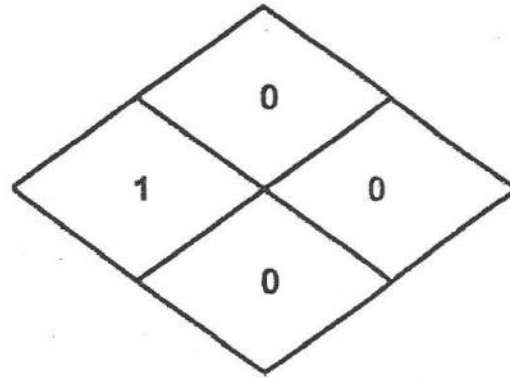
DISCLAIMER:

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Integrity Industries, Inc.
P. O. Box 5342

Kingsville
361-595-5561
361-595-5588

TX 78363



Material Safety Data Sheet

Page 1

Revised Date	SECTION 1.0 02/11/02
Supersedes	09/28/98
Trade Name	SECTION 2.0 LIME
Synonyms/Other Designations	Lime
Chemical Formula	Ca(OH) ₂
Hazard(s)	Breathing Discomfort @ concentrations > 5 mg/m ³
Boiling Point	SECTION 3.0 5162 F
Freezing Point	N/A
Specific Gravity	2.3 - 2.6
Vapor Pressure (mm Hg)	N/A
Vapor Density	N/A
Solubility in H ₂ O	0.185%
Appearance	Dirty white powder
Odor	Earthy
Stability	SECTION 4.0 Stable
Incompatibility	None known
Hazardous Decomposition Products	None known
Hazardous Polymerizations	Will not occur
Flash Point	SECTION 5.0 Non-flammable
Extinguishing Media	N/A
Special Fire Fighting Procedures	None
Unusual Fire Hazards	None
pH	N/A
Inhalation	SECTION 6.0 Move to well ventilated area; if breathing difficulties persists after 15 minutes, seek medical assistance.
Eye Contact	Wash eye thoroughly for 15 minutes; if irritation persists, seek medical assistance
Skin Contact	Wash exposed area with soap and water
Ingestion	Seek medical assistance.

lime

SAFETY DATA SHEET

MICA

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: MICA
APPLICATIONS: Lost circulation material.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
 Pocrá Quay,
 Footdee,
 Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	0-5 %		
MICA	12001-26-2	95-100 %		

COMPOSITION COMMENTS:

This product contains a small quantity of quartz, crystalline silica.

3. HAZARDS IDENTIFICATION:

This product contains a small quantity of quartz. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

This material is not flammable. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

10417 - MICA

UNUSUAL FIRE & EXPLOSION HAZARDS:
No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:
Not relevant.

6. ACCIDENTAL RELEASE MEASURES:

SPILL CLEANUP METHODS:
Shovel into dry containers. Cover and move the containers. Flush the area with water. Avoid generation and spreading of dust. Wear necessary protective equipment.

7. HANDLING AND STORAGE:

USAGE PRECAUTIONS:
Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE PRECAUTIONS:
Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT NAME:	CAS No.:	STD:	LT EXP. 8 HRS:	ST EXP. 15 MIN:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	MEL	0.3 mg/m ³	
MICA	12001-26-2	NUI		

INGREDIENT COMMENTS:
MEL = Maximum Exposure Limit. * OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. OES TWA 4mg/m³ respirable dust, 10mg/m³ total dust.

PROTECTIVE EQUIPMENT:



VENTILATION: Provide adequate general and local exhaust ventilation.

RESPIRATORS: Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).

PROTECTIVE GLOVES:
No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:
Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:
Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.
COLOUR:	Varying. Grey. to Silver.
ODOUR/TASTE:	Odourless or no characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.

10417 - MICA

DENSITY/SPECIFIC GRAVITY (g/ml): 2.6 - 2.9
 PH-VALUE, DILUTED SOLUTION: 9.0
 TEMPERATURE (°C): 20
 CONCENTRATION (%M): 10%

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.
 CONDITIONS TO AVOID: Not known.
 MATERIALS TO AVOID: No incompatible groups noted.
 HAZARDOUS DECOMP. PRODUCTS: Not relevant.

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs. Harmful: danger of serious damage to health by prolonged exposure through inhalation.
 INGESTION: May cause discomfort if swallowed.
 SKIN: Powder may irritate skin.
 EYES: Particles in the eyes may cause irritation and smarting.
 HEALTH WARNINGS: This product contains small quantities of quartz. Prolonged inhalation of high concentrations may damage respiratory system. Because of quantity and composition, the health hazard is small.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION: Not regarded as dangerous for the environment. This material is a naturally occurring mineral.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS: Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT: Not classified for road transport.
 ROAD TRANSPORT NOTES:
 RAIL TRANSPORT: Not classified for rail transport.
 RAIL TRANSPORT NOTES:
 SEA TRANSPORT: Not classified for sea transport.
 SEA TRANSPORT NOTES:
 AIR TRANSPORT: Not classified for air transport.
 AIR TRANSPORT NOTES:

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: S-22 Do not breathe dust.
S-38 In case of insufficient ventilation, wear suitable respiratory equipment.

UK REGULATORY REFERENCES: The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations 1993. IARC Monographs, Vol.68, 1997.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 0 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed, Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 15-2-99

DISCLAIMER:
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

SAFETY DATA SHEET

BARITE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: BARITE

APPLICATIONS: Weighting agent.

EMERGENCY TELEPHONES: 001 281 561 1600 (USA)

SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ

TELEPHONE: 44 (0)1224 - 584336

FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
BARITE	7727-43-7	89-95 %		
QUARTZ, CRYSTALLINE SILICA	14808-60-7	1-5 %		

COMPOSITION COMMENTS:

This product contains a small quantity of quartz, crystalline silica.

3. HAZARDS IDENTIFICATION:

This product contains a small quantity of quartz. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

This material is not combustible. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Not relevant.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. May be slippery when wet. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT NAME:	CAS No.:	STD:	LT EXP. 8 HRS:	ST EXP. 15 MIN:
BARITE	7727-43-7	NUL		
QUARTZ, CRYSTALLINE SILICA	14808-60-7	MEL	0.3 mg/m ³	

INGREDIENT COMMENTS:MEL = Maximum Exposure Limit * OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. OES = Occupational Exposure Standard. TWA 4mg/m³ respirable dust, 10mg/m³ total dust.**PROTECTIVE EQUIPMENT:****VENTILATION:** Provide adequate general and local exhaust ventilation.**RESPIRATORS:** Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).**PROTECTIVE GLOVES:**

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust
COLOUR:	Tan to Grey.
ODOUR/TASTE:	Odourless or no characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.

MELT /FREEZ. POINT (°C, interval): 1580
DENSITY/SPECIFIC GRAVITY (g/ml): 4.2 - 4.25 TEMPERATURE (°C): 20
BULK DENSITY: 1714 - 2163 kg/m³

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid wet and humid conditions.

MATERIALS TO AVOID:
No incompatible groups noted.

HAZARDOUS DECOMP. PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION:

TOXICOLOGICAL DATA:

Acute toxicity. LD50. Oral. Rat. > 20000 mg/kg

INHALATION: Dust may irritate respiratory system or lungs. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

HEALTH WARNINGS:
This product contains small quantities of quartz. Prolonged inhalation of high concentrations may damage respiratory system. Because of quantity and composition, the health hazard is small.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Not regarded as dangerous for the environment. This material is a naturally occurring mineral.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: S-22 Do not breathe dust.
S-38 In case of insufficient ventilation, wear suitable respiratory equipment.

UK REGULATORY REFERENCES: The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations 1993. IARC Monographs, Vol.68, 1997.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 0 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 28-1-99

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



Issue Date: 12-Nov-03
 IAW: ANSI Z400.1-1998
 Supersedes: 09-Nov-00
 Version: 02

Material Safety Data BEN-EX®

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **BEN-EX®**

End Use: Oil Field Drilling Fluid Compound

Chemical Name(s): Blend of polyacrylate and polyacrylamide polymers

Chemical Family: Blend of polyacrylate and polyacrylamide polymers

Company: **Kelco Oil Field Group, Division of CP KELCO ApS, 10920 W. Sam Houston Parkway North, Suite 800, Texas 77064 USA**
 (800) 331 3677 For additional non-emergency information
 (713) 895 7575 8 a.m. - 5 p.m. (Central Time) weekdays

Emergency telephone number for chemical emergency, spill leak, fire, exposure, or accident:

CHEMTREC

1-800-424-9300 Day or Night - Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands.
703-527-3887 For calls originating elsewhere, collect calls accepted.

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>COMPONENT</u>	<u>CAS NO.</u>
Polyacrylate	9033-79-8
Polyacrylamide	9003-05-8

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance And Odor: white powder with slight odor

D.O.T. Hazard Classification: Non-hazardous material.

OSHA Hazard: Warning: Combustible dust. Ensure appropriate electrical classification and avoidance of ignition sources in dusty environments.
 Handle in a manner consistent with good industrial hygiene practices—avoid creating or inhaling aerosols of this or any other material.

Potential Health Effects:

Likely Routes Of Exposure: Skin contact and inhalation

Eye Contact: No more than slightly irritating based on toxicity studies. The dry powder may cause foreign body irritation in some individuals.

Skin Contact: No more than slightly toxic or slightly irritating based on toxicity studies. Prolonged contact with the dry powder may cause drying or chapping of the skin.

Kelco Oil Field Group *Material Safety Data Sheet*
BEN-EX®Page: 2 of 4
Date: 12-Nov-03
Version: 02

Inhalation: Inhalation of the dust may cause coughing and sneezing

Ingestion: Is not toxic if swallowed based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed.

Refer to **Section 11** for toxicological information.

4. FIRST AID MEASURES

IF IN EYES OR ON SKIN, immediately flush the area with plenty of water. If easy to do, remove any contact lenses. Remove contaminated clothing. Get medical attention if irritation persists. Wash clothing before reuse.

IF INHALED, immediate first aid is not likely to be required. However, if symptoms occur, remove to fresh air. If discomfort persists, contact a physician. Remove material from eyes, skin and clothing.

IF SWALLOWED, immediate first aid is not likely to be required. A physician or Poison Control Center can be contacted for advice.

5. FIRE FIGHTING MEASURES

Flash point: Not applicable

Hazardous products of combustion: Carbon dioxide, carbon monoxide

Extinguishing media: In case of fire, use water, dry chemical, CO₂, or alcohol foam.

Unusual fire and explosion hazards: This material as normally packaged and handled can contain sufficient fines to form an explosive mixture if dispersed in a sufficient quantity of air. Surfaces that may be covered with this product will become extremely slippery upon application of water.

Fire fighting equipment: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

In case of spill, do not blow material. Use vacuum equipment designed specifically for handling combustible dusts.

NOTE - The use of water wash down is not recommended unless the spilled material is already wet. Wet material on a walking surface will be extremely slippery. Wet spills should be thoroughly flushed with water until non-slippery.

Refer to **Section 13** for disposal information and **Section 15** for reportable quantity information.

7. HANDLING AND STORAGE

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. THESE PRACTICES INCLUDE AVOIDING UNNECESSARY EXPOSURE AND REMOVAL OF MATERIAL FROM EYES, SKIN, AND CLOTHING.

Keep away from heat, sparks and flame. Avoid creating dust cloud in handling transfer and clean up.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE PROTECTION: This product does not cause significant eye irritation or eye toxicity requiring special protection. Use good industrial practice to avoid eye contact.

SKIN PROTECTION: Although this product does not present a significant skin concern, minimize skin contamination by following good industrial practice. Wearing protective gloves is recommended. Wash hands and contaminated skin thoroughly after handling.

RESPIRATORY PROTECTION: Avoid breathing dust. Use NIOSH approved respiratory protection equipment when airborne exposure is excessive. Consult the respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. Respiratory protection programs must comply with 29 C.F.R. 1910.134.

Kelco Oil Field Group *Material Safety Data Sheet*
BEN-EX®

Page: 3 of 4
 Date: 12-Nov-03
 Version: 02

VENTILATION: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment.

AIRBORNE EXPOSURE LIMITS:

OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for particulates not otherwise regulated (PNOR) and particulates not otherwise classified (PNOC) respectively, which are the least stringent exposure limits applicable to dusts.

OSHA PEL

15 mg/m³ (total dust) 8-hr TWA
 5 mg/m³ (respirable) 8-hr TWA

ACGIH TLV

10 mg/m³ (inhalable) 8-hr TWA
 3 mg/m³ (respirable) 8-hr TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: white powder

pH: approximately neutral (as a 1% solution)

Solubility in Water: soluble, forming viscous solutions, becoming a paste at concentrations greater than about 5%

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Stability: Product is stable under normal conditions of storage and handling. Store in a cool, dry place to maintain product performance.

Materials to avoid: Strong oxidizers

Hazardous decomposition products: Thermal decomposition products may include carbon dioxide and carbon monoxide.

Hazardous polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

The dry powder may cause foreign body irritation in some individuals. Prolonged contact with the dry powder may cause drying or chapping of the skin. Excessive inhalation of dust may be annoying and can mechanically impede respiration. Due to the hygroscopic properties of the gums, they can form a paste or gel in the airway.

12. ECOLOGICAL INFORMATION

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity. A legend summarizing the classification scheme appears below.

- 96-hr LC50; mysid shrimp, in a standard drilling mud: >1,000,000 ppm suspended particulate phase.
- Microtox Toxicity: Photobacterium phosphoreum - Non Toxic.

Legend for Aquatic Organism Toxicity (Journal of the European Communities, Annex VII A, Section 5.2.1)

Values	Classifications
LC50 or EC50 > 10 mg/L	Very Toxic
LC50 or EC50 > 1.0 mg/L and < or = 10 mg/L	Toxic
LC50 or EC50 > 10 mg/L < or = 100 mg/L	Harmful
LC50 or EC50 > 100 mg/L	Practically Nontoxic

Kelco Oil Field Group *Material Safety Data Sheet*
BEN-EX[®]

Page: 4 of 4
 Date: 12-Nov-03
 Version: 02

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local, state, and federal regulations. Dry or wet solid material can be landfilled in accordance with local, state, and federal regulations. Liquids may be sewerred in accordance with local, state, and federal regulations if care is taken to avoid pluggage or blockage of sewer systems recognizing that these materials are intended to increase viscosity and form gels.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

This product is not hazardous under the applicable DOT, ICAO/IATA, or IMDG regulations.

15. REGULATORY INFORMATION

Polyacrylate is listed on the following chemical inventories: TSCA Inventory, Canadian DSL Inventory, Australian Inventory, Philippine Inventory (PICCS), Inventory of Existing Chemical Substances in China

Polyacrylamide is listed on the following chemical inventories: TSCA Inventory, Canadian DSL Inventory, Australian Inventory, Korean Inventory of Chemicals, Japanese Inventory (ENCS), Philippine Inventory (PICCS), Inventory of Existing Chemical Substances in China

SARA Hazard Notification

Hazard Categories Under Title III Rules (40 CFR 370): Fire

Section 302 Extremely Hazardous Substances: Not applicable

Section 313 Toxic Chemical(s): Not applicable

CERCLA Reportable Quantity: Not applicable

Refer to **Section 11** for OSHA Hazardous Chemical(s) and **Section 13** for RCRA classification.

16. OTHER INFORMATION

MSDS produced in accordance with: ANSI Z400.1-1998.

Reason for version: Revised D.O.T / OSHA statements; New format; Company address change

	Health	Fire	Reactivity
HMIS RATINGS:	0	1	0
NFPA RATINGS:	0	1	0

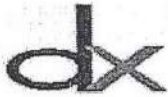
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kofg.help@cpkelco.com

www.kofg.com



CPKelco



**DX OILFIELD PRODUCTS, LLC
300 JACKSON HILL
HOUSTON, TEXAS 77007**

SECTION 1 - IDENTIFICATION

Trade Name: CLS® **Chemical Family/Name:** Chrome Lignosulfonate
Emergency Phone: 1-877-396-4526 **Chemtrec:** 1-800-424-9300
Date of Issue: August 11, 2000 **Revised Date:** July 1, 2013

HMIS HAZARD RATING

Health: 1 **Fire: 1** **Reactivity: 0**
0 = Least **1 = Slight** **2 = Moderate** **3 = High** **4 = Extreme**

SECTION 2 - INGREDIENTS

COMPONENTS	PERCENT	TLV	CAS NO.
Chrome Lignosulfonate		5 mg/m ³ for dust	9066-50-6

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

Flash Point (C.C.): Not Applicable.

Flammable Limits (% in Air): **Lower:** 0.2 oz./cu. ft **Upper:** 3.5 oz./cu. ft.

Extinguishing Media: Use water spray, carbon dioxide, dry chemical, or alcohol type

Special Firefighting Procedures/Precautions:

Wear full protective equipment including self-contained breathing apparatus when fire fighting. Flammable solids may provide conditions for a dust explosion.

SECTION 4 - HEALTH HAZARD DATA

ACGIH - TLV: 5 mg/m³ for dust.

Eye Contact: Moderate irritation.

Skin Contact: Irritation may occur.

Ingestion: Nausea, abdominal cramps.

Inhalation: Upper Respiratory Tract Irritation

Carcinogenicity: **NTP:** NO **IARC:** NO **OSHA:** NO



SECTION 5 - FIRST AID PROCEDURES

- Eye Contact:** Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids open. Get medical attention.
- Skin Contact:** Immediately remove contaminated clothing or shoes, wipe excess from skin and flush with plenty of water for at least 15 minutes. Use soap if available or follow by washing with soap and water. Do not reuse clothing until thoroughly cleaned. Get medical attention.
- Inhalation:** Remove victim to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get medical attention.
- Ingestion:** DO NOT INDUCE VOMITING! Rinse mouth with water. If conscious, give large quantities of water or milk and get immediate medical attention. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON!

SECTION 6 - SPILL OR LEAK PROCEDURES

- For Spill:** Contain material. Place collected material in a disposal container. Area may be washed with water. Prevent rinseate from entering waterways or sewers unless permitted for discharge.
- Waste Disposal:** Dispose of waste materials according to all federal, state, and local regulations.

SECTION 7 - HANDLING & STORAGE

Use local exhaust ventilation to maintain atmosphere in accordance with TLV if dusty conditions.

SECTION 8 - SPECIAL PROTECTION

- Respiratory Protection:** Dust safety masks are recommended where concentration of total dust is more than 5 mg/m³
- | | | | |
|---------------------|-----------------------------------|--------------------|-------------|
| Ventilation: | Local Exhaust: Recommended | Mechanical: | Recommended |
| | Special: None | Other: | None |
- Eye/Face Protection:** Goggles and/or face-shield.
- Skin Protection:** Rubber gloves and an apron.
- Work Practices:** Wash hands before breaks and at the end of workday. Handle in accordance with good industrial hygiene and safety practice.

SECTION 9 - PHYSICAL DATA

Boiling Point	N.E.	Vapor Pressure (mmHg)	N.E.
Freezing Point	N.E.	Vapor Density (Air=1)	N.E.
Solubility (H₂O) %	99 min	Specific Gravity (H₂O=1)	N.E.
pH	5 - 7	Evaporation Rate	N.E.
Appearance/Odor	Brown powder with slight odor.		



SECTION 10 - REACTIVITY DATA

Chemical Stability: Stable under normal operating conditions.

Incompatible materials: Oxidizing materials.

Decomposition products: Carbon monoxide, carbon dioxide, and sulfur dioxide.

Hazardous Polymerization: Will not occur.

SECTION 11 - TRANSPORTATION INFORMATION

DOT Description: Not regulated.

DOT ERG No.:

SECTION 12 - REGULATORY INFORMATION

CERCLA LISTED HAZARDOUS SUBSTANCES:

CHEMICAL	CAS NO.	RO (lbs)
	Not currently listed.	

SARA TITLE III - Section 312 Hazard Categories

ACUTE YES **FLAMMABLE** NO **CHRONIC** NO
REACTIVE NO **SUDDEN RELEASE OF PRESSURE** NO

SARA TITLE III - Section 313 Toxic Materials

CHEMICAL	CAS NO.	% By Wt.
	Not currently listed.	

TSCA (TOXIC SUBSTANCES CONTROL ACT), 40 CFR 710:

Sources of the raw materials used in this mixture assure that all chemical ingredients present are in compliance with Section 8(b) Chemical Substance Inventory, or are otherwise in compliance with TSCA.

Listed on TSCA. Also listed on EINECS (European Inventory of Existing Chemical Substances), Canada's DSL (Domestic Substances List) and the AICS (Australian Inventory of Chemical Substances).

DISCLAIMER

The data presented is true and correct to the best of our knowledge and belief; however, neither seller nor preparer makes any warranties, express or implied, concerning the information presented. The user is cautioned to perform his own hazard evaluation and to rely upon his own determinations.



Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Desco® Deflocculant

Product Use: Base Fluid for Drilling Muds

Synonyms: Drilling Mud Deflocculant

Product CAS No.: Mixture

Company Identification:

Chevron Phillips Chemical Company LP
Drilling Specialties Company
10001Six Pines Drive
The Woodlands, TX 77380

Product Information:

MSDS Requests: (800) 852-5530
Technical Information: (800) 221-1956
Responsible Party: Product Safety Group
Email:msds@cpchem.com

Chevron Phillips Chemicals International N.V.
Brusselsesteenweg 355
B-3090 Overijse
Belgium

24-Hour Emergency Telephone Numbers

HEALTH:Chevron Phillips Emergency Information Center 866.442.9628 (North America) and 1.832.813.4984 (International)

TRANSPORTATION: North America: CHEMTREC 800.424.9300 or 703.527.3887
ASIA: +1.703.527.3887
EUROPE: BIG .32.14.584545 (phone) or .32.14.583516 (telefax)
SOUTH AMERICA SOS-Cotec Inside Brazil: 0800.111.767
Outside Brazil: 55.19.3467.1600

SECTION 2 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Fine reddish-brown powder, mild tree bark odor.

- MAY BE HARMFUL OR FATAL IF SWALLOWED
 - DUST MAY PRODUCE MECHANICAL IRRITATION TO THE MUCOUS MEMBRANES OF THE EYES, NOSE, THROAT AND UPPER RESPIRATORY TRACT
 - CAUSES EYE IRRITATION
 - CAUSES SKIN IRRITATION
-

- SUSPECT CANCER HAZARD - MAY CAUSE CANCER
- MAY CAUSE DAMAGE TO:
 - LUNGS
 - LIVER
 - KIDNEY

IMMEDIATE HEALTH EFFECTS:

Eye: Contact with the eyes causes irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision. Not expected to cause prolonged or significant eye irritation. Material is dusty and may scratch the surface of the eye.

Skin: Contact with the skin causes irritation. Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: Toxic; may be harmful or fatal if swallowed.

Inhalation: The dust from this material may cause respiratory irritation.

DELAYED OR OTHER HEALTH EFFECTS:

Cancer: Prolonged or repeated exposure to this material may cause cancer.

Target Organs: Repeated inhalation of this material at elevated concentrations may cause damage to the following organ(s) based on animal data:- Liver - Kidney - Lung

See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	AMOUNT	EINECS	SYM	R-PHRASES
Proprietary	Proprietary	> 84 % weight	NA	NA	NA
Ferrous Sulfate	17375-41-6	< 10 % weight	NA	NA	NA
Chromium Acetate	1066-30-4	< 5 % weight	NA	NA	NA
Crystalline Silica	14808-60-7	< 1 % weight	238-878-4	NA	NA

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Chromium Acetate	ACGIH	.5 mg/m3	NA	NA	as Cr as Cr
Chromium Acetate	CPCHEM	Not Established	NA	NA	NA
Crystalline Silica	ACGIH	.025 mg/m3	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m3	NA	NA	Respirable Dust
Ferrous Sulfate	ACGIH	1 mg/m3	NA	NA	as Fe as Fe
Proprietary	ACGIH	Not Established	NA	NA	NA

Control as Particulate Not Otherwise Classified (PNOC). The ACGIH Guideline* for respirable dust is 3.0 mg/m3 and 10.0 mg/m3 for total dust. The OSHA PEL for respirable dust is 5.0 mg/m3 and 15.0 mg/m3 for total dust.

* This value is for inhalable (total) particulate matter containing no asbestos and < 1.0% crystalline silica.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with running water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get immediate medical attention.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.
Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Not classified as flammable or combustible.

NFPA RATINGS: Health: 2 Flammability: 0 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: NA

Autoignition: NDA

Flammability (Explosive) Limits (% by volume in air): Lower: NA Upper: NA

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: Material will not burn unless preheated. Clear fire area of all non-emergency personnel. Only enter confined fire space with full gear, including a positive pressure, NIOSH-approved, self-contained breathing apparatus. Cool surrounding equipment, fire-exposed containers and structures with water. Container areas exposed to direct flame contact should be cooled with large quantities of water (500 gallons water per minute flame impingement exposure) to prevent weakening of container structure. This material will burn although it is not easily ignited.
Combustion Products: No data available.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.
Spill Management: Avoid creating dust clouds. Shovel, sweep up or use industrial vacuum cleaner to pick up. Place in container for proper disposal. Reduce airborne dust and prevent scattering by moistening with water.
Reporting: U.S.A. regulations may require reporting spills of this material that could reach any surface waters. Report spills to local authorities and/or the National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL.

Precautionary Measures: Use caution to avoid creation of dusts and to prevent inhalation of product dust (fines). Avoid contact with product dust. Airborne dust concentrations above 20 mg/L may create a dust explosion hazard. Avoid breathing vapors or fumes which may be released during thermal processing. Do not breathe dust at levels above the recommended exposure limits. Avoid breathing material. Keep container closed. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Discard contaminated clothing and shoes or thoroughly clean before reuse. Do not get in eyes. Do not taste or swallow. Do not breathe dust.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids. National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).

General Storage Information: Treat as a solid that can burn. Store away from oxidizing materials, in a cool, dry place

with adequate ventilation. Bond and ground transfer equipment. DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly. Containers, even those that have been emptied, can contain residues of dusts or solid particulates which may create both health and fire/explosion hazards.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

If heated material generates vapor or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.

Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: Nitrile

Respiratory Protection:

If user operations generate harmful levels of airborne material that is not adequately controlled by ventilation, wear a NIOSH approved respirator that provides adequate protection. Use the following elements for air-purifying respirators: Air-Purifying Respirator for Particulates (HEPA)

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Chromium Acetate	ACGIH	.5 mg/m ³	NA	NA	as Cr as Cr
Chromium Acetate	CPCHEM	Not Established	NA	NA	NA
Crystalline Silica	ACGIH	.025 mg/m ³	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m ³	NA	NA	Respirable Dust
Ferrous Sulfate	ACGIH	1 mg/m ³	NA	NA	as Fe as Fe
Proprietary	ACGIH	Not Established	NA	NA	NA

Control as Particulate Not Otherwise Classified (PNOC). The ACGIH Guideline* for respirable dust is 3.0 mg/m³ and 10.0 mg/m³ for total dust. The OSHA PEL for respirable dust is 5.0 mg/m³ and 15.0 mg/m³ for total dust.

* This value is for inhalable (total) particulate matter containing no asbestos and < 1.0% crystalline silica.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Fine reddish-brown powder, mild tree bark odor.

pH: NA

Flashpoint: NA

VAPOR PRESSURE: NA

VAPOR DENSITY (AIR=1): NA
BOILING POINT: NA
SOLUBILITY (in water): Appreciable

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: No Data Available

Incompatibility With Other Materials: No data available

Hazardous Decomposition Products: No Data.

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: Ferrous Sulfate: LD50 / Species not specified / 1.52 g/kg

Acute Dermal Toxicity: LD50 / not known

Acute Inhalation Toxicity: LC50 / not known

Eye Irritation: This material is irritating to the eyes.

Skin Irritation: This material is irritating to the skin.

ADDITIONAL TOXICOLOGY INFORMATION:

The toxicological properties of this product have not been tested or have not been tested completely and its handling or use may be hazardous. EXERCISE DUE CARE.

This product contains CRYSTALLINE SILICA:

Repeated Dose Toxicity: Up to 420 days / inhalation / rat / Doses: 30,000 particles/ml 18 hrs/day 5days/wk / Silicotic nodules

Genetic Toxicity: AMES test = Negative / Recombination Assay = Negative

Carcinogenicity: 2 yrs / inhalation / rat / Dose: 1 mg/m³ / primary lung tumors in control (3) and treated (18); 150, 300 or 570 days / inhalation / mouse / Doses: 1475 ug/m³ for 150 days, 1800 ug/m³ for 300 days or 1950 ug/m³ for 570 days 8 hrs/day 5days/wk / pulmonary adenomas found in both control (7) and treated (9)

Other: International Agency for Research on Cancer (IARC) classifies crystalline silica as a human carcinogen

Long-term exposure to high dust concentrations may cause non-debilitating lung changes.

This product contains CHROMIUM ACETATE:

REPEATED DOSE TOXICITY: Lifetime / oral / mouse / Dose: 5 ppm in drinking water / decrease longevity in male mice

GENETIC TOXICITY: Sister Chromatid Exchange = Negative / Chromosomal aberrations = Positive

CARCINOGENICITY: Lifetime / oral / rat / Dose: 5 mg/L in drinking water / no increase incidence of tumors

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:

The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.

Chromium Acetate - 96 hour(s) / IC50 / rainbow trout (*Salmo gairdneri*) / 59 mg/l

Ferrous Sulfate - 48 hour(s) / LC50 / mysid shrimp (*Mysidopsis bahia*) / 56 ppm

ENVIRONMENTAL FATE:

The environmental fate of this material is not available.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

Shipping Descriptions per regulatory authority.

US DOT

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

ICAO / IATA

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

IMO / IMDG

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

RID / ADR

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

Additional Information: This material is regulated when shipped in bulk quantities (>= 119 gallons, 882 mass net) only.

SECTION 15 REGULATORY INFORMATION

SARA 311/312 CATEGORIES:

- | | |
|---------------------------------------|-----|
| 1. Immediate (Acute) Health Effects: | YES |
| 2. Delayed (Chronic) Health Effects: | YES |
| 3. Fire Hazard: | NO |
| 4. Sudden Release of Pressure Hazard: | NO |
| 5. Reactivity Hazard: | NO |

REGULATORY LISTS SEARCHED:

01 = CA Prop 65	17 = FDA 178	33 = RCRA Waste Appendix VIII
02 = LA RTK	18 = FDA 179	34 = RCRA Waste D-List
03 = MA RTK	19 = FDA 180	35 = RCRA Waste P-List
04 = MN Hazardous Substance	20 = FDA 181	36 = RCRA Waste U-List
05 = NJ RTK	21 = FDA 182	37 = SARA Section 302
06 = PA RTK	22 = FDA 184	38 = SARA Section 313
07 = CAA Section 112 HAPs	23 = FDA 186	39 = TSCA 12 (b)
08 = CWA Section 307	24 = FDA 189	40 = TSCA Section 4

09 = CWA Section 311	25 = IARC Group 1	41 = TSCA Section 5(a)
10 = DOT Marine Pollutant	26 = IARC Group 2A	42 = TSCA Section 8(a) CAIR
11 = FDA 172	27 = IARC Group 2B	43 = TSCA Section 8(a) PAIR
12 = FDA 173	28 = IARC Group 3	44 = TSCA Section 8(d)
13 = FDA 174	29 = IARC Group 4	45 = WHIMS - IDL
14 = FDA 175	30 = NTP Carcinogen	46 = Germany D TAL
15 = FDA 176	31 = OSHA Carcinogen	47 = Germany WKG
16 = FDA 177	32 = OSHA Highly Hazardous	48 = DEA List 1
		49 = DEA List 2

The following components of this material are found on the regulatory lists indicated.

Ferrous Sulfate	3, 4, 5, 6, 9, 45
Chromium Acetate	3, 4, 5, 6, 9, 34, 38, 45, 46
Crystalline Silica	1, 3, 4, 5, 6, 25, 30, 45

CERCLA REPORTABLE QUANTITIES(RQ)/SARA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

Component	Component RQ	Component TPQ	Product RQ
Chromium Acetate	1000 lbs	None	20000 lbs
Ferrous Sulfate	1000 lbs	None	16666

WHMIS CLASSIFICATION:

Class D, Division 1, Subdivision B: Toxic Material
 Acute Lethality
 Class D, Division 2, Subdivision A: Very Toxic Material
 Carcinogenicity
 Chronic Toxic Effects
 Class D, Division 2, Subdivision B: Toxic Material
 Chronic Toxic Effects
 Skin or Eye Irritation

CHEMICAL INVENTORY LISTINGS:

AUSTRALIA: This material contains components that require notification before sale or importation into Australia.
 CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL) or are exempt from notification.
 PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the Inventory of Existing Chemical Substances in China.
 EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.
 JAPAN: This material contains components that require notification before sale or importation into Japan.
 KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.
 PHILIPPINES: This material contains components that require notification before sale or importation into the Philippines.
 UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

EU RISK AND SAFETY PHRASES:

R22: Harmful if swallowed.
 R25: Toxic if swallowed.
 R45: May cause cancer.
 R36/38: Irritating to eyes and skin.

R48/23: Toxic: danger of serious damage to health by prolonged exposure through inhalation.
 S22: Do not breathe dust.
 S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
 S38: In case of insufficient ventilation, wear suitable respiratory equipment.
 S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
 S53: Avoid exposure - obtain special instructions before use.
 S24/25: Avoid contact with skin and eyes.
 S36/37: Wear suitable protective clothing and gloves.

EU Symbols: T - Toxic

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 2 Flammability: 0 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, * - Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

REVISION STATEMENT: The following sections have been updated: 1

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

- | | | | |
|--------|---|------|---|
| TLV | - Threshold Limit Value | TWA | - Time Weighted Average |
| STEL | - Short-term Exposure Limit | PEL | - Permissible Exposure Limit |
| ACGIH | - American Conference of Government Industrial Hygienists | OSHA | - Occupational Safety & Health Administration |
| NIOSH | - National Institute for Occupational Safety & Health | NFPA | - National Fire Protection Agency |
| WHMIS | - Workplace Hazardous Materials Information System | IARC | - Intl. Agency for Research on Cancer |
| EINECS | - European Inventory of existing Commercial Chemical Substances | RCRA | - Resource Conservation Recovery Act |
| SARA | - Superfund Amendments and Reauthorization Act. | TSCA | - Toxic Substance Control Act |
| EC50 | - Effective Concentration | LC50 | - Lethal Concentration |
| LD50 | - Lethal Dose | CAS | - Chemical Abstract Service |
| NDA | - No Data Available | NA | - Not Applicable |
| <= | - Less Than or Equal To | >= | - Greater Than or Equal To |
| CNS | - Central Nervous System | MAK | - Germany Maximum Concentration Values |

This data sheet is prepared according to the latest adaptation of the EEC Guideline 67/548.
 This data sheet is prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
 This data sheet is prepared according to the ANSI MSDS Standard (Z400.1).
 This data sheet was prepared by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof

may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

SDS no. 10031
Version 7
Revision date 30/Dec/2015
Supersedes date 08/Jun/2015

MISWACO

A Schlumberger Company

Safety Data Sheet GELEX†

1. Identification

1.1 Product identifier

Product name GELEX†
Product code 10031

This product may not be distributed or used in Canada.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Drilling fluid additive. Bentonite extender.
Uses advised against Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier
M-I L.L.C.

P.O.Box 42842
Houston, TX 77242
www.miswaco.slb.com
Telephone: 1 281-561-1511

Prepared by
Global Regulatory Compliance - Chemicals (GRC - Chemicals)

1.4 Emergency Telephone Number

Emergency telephone (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards Not classified
Environmental hazards Not classified

Physical Hazards

Combustible dust	-
------------------	---

2.2 Label elements

Eye contact Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician Treat symptomatically

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons

None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards

Suspended dust may present a dust explosion hazard.

Hazardous combustion products

Carbon oxides (CO_x).

5.3 Advice for firefighters

Special protective equipment for fire-fighters

As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures

Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls

Avoid release to the environment.

6.3 Methods and materials for containment and cleaning up

Methods for containment

Prevent further leakage or spillage if safe to do so.

Methods for cleaning up

Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections

See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

pH	No information available	
pH @ dilution	No information available	
Melting/freezing point	No information available	
Boiling point/range	No information available	
Flash point	Does not flash	PMCC
Evaporation rate (BuAc =1)	No information available	
Flammability (solid, gas)	Not Applicable	
Flammability Limits in Air		
Upper flammability limit	No information available	
Lower flammability limit	No information available	
Vapor pressure	0 mmHg	
Vapor density	Not applicable	
Specific gravity	1.3	
Bulk density	No information available	
Water solubility	Appreciable	
Solubility in other solvents	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	
Kinematic viscosity	No information available	
Dynamic viscosity	No information available	
Log Pow	No information available	
Explosive properties	Suspended dust may present a dust explosion hazard	
Oxidizing properties	None known.	

9.2 Other information

Pour point	No information available
Molecular weight	No information available
VOC content(%)	None
Density	No information available

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions

Hazardous polymerization

Hazardous polymerization does not occur.

10.4 Conditions to avoid

Heat, flames and sparks. Avoid dust formation.

10.5 Incompatible materials

Strong oxidizing agents. Acids. Bases.

10.6 Hazardous decomposition products

Carbon oxides (COx).

11. Toxicological information

11.1 Information on toxicological effects

12.2 Persistence and degradability

No product level data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)
This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

12.6 Other adverse effects.

None known.

13. Disposal considerations

13.1 Waste treatment methods

Disposal Method	Disposal should be made in accordance with federal, state and local regulations.
Contaminated packaging	Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport information

14.1 UN Number

Not regulated	
UN No. (DOT)	Not regulated
UN/ID No. (ADR/RID/ADN/ADG)	Not regulated
UN No. (IMDG)	Not regulated
UN No. (ICAO)	Not regulated

14.2 Proper shipping name

14.3 Hazard class(es)

DOT Hazard class	Not regulated
ADR/RID/ADN/ADG Hazard class	Not regulated
IMDG Hazard class	Not regulated
ICAO Hazard class/division	Not regulated

14.4 Packing group

DOT Packing group	Not regulated
ADR/RID/ADN/ADG Packing group	Not regulated
IMDG Packing group	Not regulated
ICAO Packing group	Not regulated

14.5 Environmental hazard

No

14.6 Special precautions

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

MATERIAL SAFETY DATA SHEET

GRAPHITE

Date: 07-20-04

1. Product and Company Identification

Product Name: GRAPHITE (All Grades)

Chemical Name: GRAPHITE

Chemical Family: CARBON

Chemical Formula: CARBON

CAS Reg. No. 7782-42-5

SUPPLIER: Grinding & Sizing Co.

515 Industrial Blvd.

Lufkin, Texas 75904

Emergency Phone Number: 936-634-7718

2. Composition:

Graphite, Natural

OSHA PEL: 2.5 mg/m³, ACGIH TLV 2.0mg/m³

May Contain:

Silica, Crystalline Quartz, 14808-60-7

Non-graphitic carbon

OSHA PEL: 0.1 mg/m³, ACGIH TLV 0.1mg/m³

Graphite is on both the DSL and NDSL

Graphite is on the US EPA TSCA Inventory

3. Hazards Identification:

- Acute Effects: Inhalation of dust may irritate mucous membranes.
- Ingestion: none
- Eyes: Dust abrasive to the eyes
- Skin: none
- Inhalation: long term inhalation may result in silicosis or pneumoconiosis.
- Route of entry: inhalation and eye contact

4. First Aid Measures

- Inhalation: Move exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention if breathing becomes difficult.
- Ingestion: Do not induce vomiting. Seek medical attention.
- Skin: Wash skin thoroughly with soap and water. Remove contaminated clothing
- Eyes: promptly wash eyes with lots of water. Continue to rinse for 30 minutes. Get medical attention.

5. Fire Fighting

- Extinguishing media: Water spray, CO2, dry chemical, foam
- Special fire fighting procedures: None, evacuate all unnecessary personnel. Wear appropriate safety equipment for fire conditions including SCBA.

6. Accidental Release Measures

- Highway or Rail Spill: Vacuum and sweep up.
- Contact local authorities for specific disposal site information.

7. Handling & Storage

- Handle only in well ventilated areas. Avoid breathing dust.
- Store in cool dry place, keep away from oxidizing agents, ignition sources.
- Exercise caution when handling in areas where contact with electrical circuits is possible as this material conducts electricity.

8. Exposure Controls, Personal Protection

- Ventilation-Local exhaust and ventilation system is recommended if handled in a confined area to control below recommended exposure levels.
- Respiratory Protection- Use NIOSH approved nuisance dust respirator.
- Eye Protection-Use safety glasses with side shields
- Skin Protection-Use long-sleeved clothing and gloves

9. Physical and Chemical Properties

- Appearance: gray/black powder
- Insoluble in water
- Boiling point n/a
- Melting point n/a
- Vapor Pressure n/a
- Specific gravity: 2.2
- Odor: none

10. Stability and Reactivity

- Stability: stable
- Reactivity: avoid excessive heat, ignition sources, acids, alkalis and strong oxidants
- Hazardous Decomposition: CO, CO₂
- Does not polymerize

11. Toxicological Information

- No toxicological information is available on this product

12. Ecological Information

- No ecological information is available

13. Transport Information

- Proper Shipping Name: Not regulated by DOT as a hazardous material
- Hazard class: none
- UN Number: none
- Packing Group: none

14. Regulatory Information

- OSHA (29 CFR 1910.1200) This product should be included in a hazard communication program.
- RCRA: none.
- CERCLA : Not subject to reporting
- NFPA Hazard Codes: Health:1, Flammability: 0, Reactivity: 0, Special hazards: 0

MATERIAL SAFETY DATA SHEET

GYPSUM

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: GYPSUM
CHEMICAL CLASS: Calcium sulfate dihydrate
APPLICATIONS: Oil well drilling fluid additive. Calcium source.
EMERGENCY TELEPHONE: 281-561-1600
SUPPLIER: Supplied by a Business Unit of
M-I L.L.C.
P.O. Box 42842, Houston, Texas 77242-2842
See cover sheet for local supplier.
TELEPHONE: 281-561-1509
FAX: 281-561-7240
CONTACT PERSON: Sam Hoskin - Manager, Occupational Health

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Gypsum	13397-24-5	100 %		

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a/an white powder. May form explosive dust-air mixtures. Slippery when wet. A nuisance dust.

ACUTE EFFECTS:

HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

INHALATION: May be irritating to the respiratory tract if inhaled.
INGESTION: May cause gastric distress, nausea and vomiting if ingested.
SKIN: May be irritating to the skin.
EYES: May be irritating to the eyes.

CHRONIC EFFECTS:

CARCINOGENICITY:

IARC: Not listed. OSHA: Not regulated. NTP: Not listed.

ROUTE OF ENTRY:

Inhalation. Skin and/or eye contact.

TARGET ORGANS:

Respiratory system, lungs. Skin. Eyes.

4. FIRST AID MEASURES

- GENERAL:** Persons seeking medical attention should carry a copy of this MSDS with them.
- INHALATION:** Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.
- INGESTION:** Drink a couple of glasses water or milk. Do NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. Get medical attention.
- SKIN:** Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
- EYES:** Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES

- AUTO IGNITION TEMP. (°F):** N/D
- FLAMMABILITY LIMIT - LOWER(%):** N/D
- FLAMMABILITY LIMIT - UPPER(%):** N/D
- EXTINGUISHING MEDIA:**
Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist.
- SPECIAL FIRE FIGHTING PROCEDURES:**
No specific fire fighting procedure given.
- UNUSUAL FIRE & EXPLOSION HAZARDS:**
Dust in high concentrations may form explosive mixtures with air.
- HAZARDOUS COMBUSTION PRODUCTS:**
Irritating gases/vapors/fumes. Oxides of: Carbon.

6. ACCIDENTAL RELEASE MEASURES

- PERSONAL PRECAUTIONS:**
Wear proper personal protective equipment (see MSDS Section 8).
- SPILL CLEAN-UP PROCEDURES:**
Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS:

Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

INGREDIENT NAME:	CAS No.:	OSHA PEL:	ACGIH TLV:	OTHER:	UNITS:
Gypsum	13397-24-5	TWA: 15	STEL: 15	TWA: STEL:	mg/m ³ total dust

PROTECTIVE EQUIPMENT:**ENGINEERING CONTROLS:**

Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

VENTILATION: Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

RESPIRATORS: Use at least a NIOSH-approved N95 half-mask disposable or reusable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator.

PROTECTIVE GLOVES:

Use suitable protective gloves if risk of skin contact.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

PROTECTIVE CLOTHING:

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES:

Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	Powder, dust.	
COLOR:	White.	
ODOR:	Odorless or no characteristic odor.	
DENSITY/SPECIFIC GRAVITY (g/ml):	2.32	TEMPERATURE (°F): 68
VAPOR DENSITY (air=1):	N/A	
VAPOR PRESSURE:	N/A	TEMPERATURE (°F):

10. STABILITY AND REACTIVITY

STABILITY: Normally stable.

CONDITIONS TO AVOID:

N/D.

HAZARDOUS POLYMERIZATION:

Will not polymerize.

POLYMERIZATION DESCRIPTION:

Not relevant.

MATERIALS TO AVOID:

N/D

HAZARDOUS DECOMPOSITION PRODUCTS:

No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:

No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:

Contact M-I Environmental Affairs for ecological information.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT:

This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting materials hazardous.

Empty containers retain residues. All labeled precautions must be observed.

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

PRODUCT RQ:

N/A

U.S. DOT:

U.S. DOT CLASS:

Not regulated.

CANADIAN TRANSPORT:

TDGR CLASS:

Not regulated.

SEA TRANSPORT:

IMDG CLASS:

Not regulated.

AIR TRANSPORT:

ICAO CLASS:

Not regulated.

15. REGULATORY INFORMATION

REGULATORY STATUS OF INGREDIENTS:

NAME:	CAS No:	TSCA:	CERCLA:	SARA 302:	SARA 313:	DSL(CAN):
Gypsum	13397-24-5	Yes	No	No	No	Yes

**US FEDERAL REGULATIONS:
WASTE CLASSIFICATION:**

Not a hazardous waste by U.S. RCRA criteria. See Section 13.

REGULATORY STATUS:

This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:

1: Immediate (Acute) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:
TSCA (U.S.)**STATE REGULATIONS:
STATE REGULATORY STATUS:**This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):
None.

PROPOSITION 65: This product does not contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required.

**CANADIAN REGULATIONS:
REGULATORY STATUS:**

This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations.

Canadian WHMIS Classification: Not a Controlled Product.

16. OTHER INFORMATION

NPCA HMIS HAZARD INDEX:

1 Slight Hazard

FLAMMABILITY:

0 Minimal Hazard

REACTIVITY:

0 Minimal Hazard

NPCA HMIS PERS. PROTECT. INDEX:

E - Safety Glasses, Gloves, Dust Respirator

USER NOTES:

N/A = Not applicable N/D = Not determined

INFORMATION SOURCES:

OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.
 ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).
 Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).
 Product information provided by the commercial vendor(s).

PREPARED BY: Sam Hoskin/bb
REVISION No./Repl. MSDS of: 2/April 15, 1999
MSDS STATUS: Approved.
DATE: February 5, 2002

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals an/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user, however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

MATERIAL SAFETY DATA SHEET

Q-Thin

1. Product and Company Identification

Product Name: Q-Thin

Chemical Name: Mixture

Chemical Family: Mixture

Chemical Formula: Mixture

CAS Reg. No. Mixture

Distributed By: Grinding & Sizing Co., Inc.

7707 Wallisville Rd.

Houston, TX 77020

(713) 673-5176

2. Composition:

		CAS	NO.
Chromium Compound*	5%		
12336-95-7			
Proprietary Ingredients	95%		

*chromium III (OSHA PEL 0.5mg/m3)

3. Hazards Identification:

- Acute Effects: irritating to the respiratory tract if inhaled.
- Ingestion: Toxic if swallowed; May cause gastric distress, nausea, vomiting, liver damage.
- Eyes: Irritating to the eyes
- Skin: Irritating to the skin upon prolonged contact.
- Chronic Effects: IARC not listed; OSHA not listed; NTP not listed.
- Route of Entry: inhalation, skin and eye contact.

4. First Aid Measures

- Inhalation: Move exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.
- Ingestion: Induce vomiting if person is conscious. Seek medical attention.
- Skin: Wash skin thoroughly with soap and water. Remove contaminated clothing.
- Eyes: Promptly wash eyes with lots of water. Continue to rinse for 30 minutes. Get medical attention.

4. Fire Fighting

- Material will burn releasing combustion products which may be toxic (SO₂, CO, CO₂).
- Extinguishing media: Water spray, CO₂, dry chemical, foam.
- Special fire fighting procedures: Evacuate all unnecessary personnel. Wear appropriate safety equipment for fire conditions including SCBA.

5. Accidental Release Measures

- Highway or Rail Spill: Contain spill, protect from ignition, keep out of water sources or sewers. Absorb in a dry, inert material like sand, clay. Contact local authorities for specific disposal site information.

6. Handling & Storage

- Handle only in well ventilated areas. Avoid breathing dust.
- Store in cool dry place, keep away from oxidizing agents, ignition sources.

7. Exposure Controls, Personal Protection

- Ingredient name: chrome compounds, OSHA PEL 0.5mg/m³
- Ventilation: Local exhaust and ventilation system is recommended if handled in a confined area to control below recommended exposure levels.
- Respiratory Protection: Use NIOSH approved air purifying respirator.
- Eye Protection: Use safety glasses with side shields.
- Skin Protection: Use long-sleeved clothing and gloves.

8. Physical and Chemical Properties

- Appearance: Reddish/tan powder
- Soluble in water
- Boiling Point: n/a
- Melting Point: n/a
- Vapor Pressure: n/a
- Specific Gravity: 1.25
- Odor: vanilla-like

10. Stability and Reactivity

- Stability: stable
- Reactivity: avoid excessive heat, ignition sources and strong oxidants.
- Hazardous Decomposition: SO₂
- Does not polymerize

11. Toxicological Information

- No toxicological information is available on this product
- Trivalent chrome has relatively low toxicity due to poor cell membrane permeability and noncorrosivity.

12. Ecological Information

- No ecological information is available

13. Disposal Considerations

- Recover and reuse if possible
- Dispose in permitted waste management facility

14. Transport Information

- Proper Shipping Name: Not regulated by DOT as a hazardous material.
- Hazard Class: none
- UN Number: none
- Packing Group: none

15. Regulatory Information

- OSHA (29 CFR 1910.1200) This product should be included in a hazard communication program.
- RCRA: If this product becomes a waste, it may be characterized as a hazardous waste as prescribed by RCRA.
- CERCLA: Not subject to reporting.
- SARA 313: This product contains the following chemical subject to the reporting requirements of Section 313: Chromium Compounds, Acute & Chronic
- NFPA Hazard Codes: Health: 1, Flammability: 0, Reactivity: 0, Special Hazards: 0



Issue Date: 12-Nov-03
IAW: ANSI Z400.1-1998
Supersedes: 09-Nov-00
Version: 02

Material Safety Data KWIK-SEAL®

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: KWIK-SEAL®

End Use: Oil Field Drilling Fluid Compound

Chemical Name(s): Blend of vegetable and polymer fibers

Chemical Family: mixture

Company: Kelco Oil Field Group, Division of CP KELCO ApS, 10920 W. Sam Houston Parkway North, Suite 800, Texas 77064 USA
(800) 331 3677 For additional non-emergency information
(713) 895 7575 8 a.m. - 5 p.m. (Central Time) weekdays

Emergency telephone number for chemical emergency, spill leak, fire, exposure, or accident:

CHEMTREC

1-800-424-9300 Day or Night -. Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands.

703-527-3887 For calls originating elsewhere, collect calls accepted.

2. COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT

Blend of vegetable and polymer fibers

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance And Odor: Various sized particles with slight odor

D.O.T. Hazard Classification: Non-hazardous material.

OSHA Hazard: Handle in a manner consistent with good industrial hygiene practices—avoid creating or inhaling aerosols of this or any other material.

Potential Health Effects:

Likely Routes Of Exposure: Skin contact and inhalation

Eye Contact: No more than slightly irritating. The dry particles may cause foreign body irritation in some individuals.

Skin Contact: No more than slightly toxic or slightly irritating. Prolonged contact with the dry powder may cause drying or chapping of the skin.

Inhalation: ~~Inhalation of the dust may cause coughing and sneezing.~~

Ingestion: Is not toxic if swallowed based on toxicity studies. No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed.

Refer to **Section 11** for toxicological information.

4. FIRST AID MEASURES

IF IN EYES OR ON SKIN, immediately flush the area with plenty of water. If easy to do, remove any contact lenses. Remove contaminated clothing. Get medical attention if irritation persists. Wash clothing before reuse.

IF INHALED, immediate first aid is not likely to be required. However, if symptoms occur, remove to fresh air. If discomfort persists, contact a physician. Remove material from eyes, skin and clothing.

IF SWALLOWED, immediate first aid is not likely to be required. A physician or Poison Control Center can be contacted for advice.

5. FIRE FIGHTING MEASURES

Flash point: Not applicable

Hazardous products of combustion: Carbon dioxide, carbon monoxide

Extinguishing media: In case of fire, use water, dry chemical, CO₂, or alcohol foam.

Unusual fire and explosion hazards: None

Fire fighting equipment: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

In case of spill, sweep, blow, or vacuum up spilled material and repackage.

Refer to **Section 13** for disposal information and **Section 15** for reportable quantity information.

7. HANDLING AND STORAGE

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. THESE PRACTICES INCLUDE AVOIDING UNNECESSARY EXPOSURE AND REMOVAL OF MATERIAL FROM EYES, SKIN, AND CLOTHING.

Keep away from heat, sparks and flame. Avoid creating dust cloud in handling transfer and clean up.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE PROTECTION: This product does not cause significant eye irritation or eye toxicity requiring special protection. Use good industrial practice to avoid eye contact.

SKIN PROTECTION: Although this product does not present a significant skin concern, minimize skin contamination by following good industrial practice. Wearing protective gloves is recommended. Wash hands and contaminated skin thoroughly after handling.

RESPIRATORY PROTECTION: Avoid breathing dust. Use NIOSH/MSHA approved respiratory protection equipment when airborne exposure limits are exceeded (see below). Consult the respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH/MSHA or the manufacturer. Respiratory protection programs must comply with 29 C.F.R. 1910.134.

VENTILATION: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult NFPA standard 91 for design of exhaust systems.

AIRBORNE EXPOSURE LIMITS:

AIRBORNE EXPOSURE LIMITS:

OSHA and ACGIH have not established specific exposure limits for this material. However, OSHA and ACGIH have established limits for particulates not otherwise regulated (PNOR) and particulates not otherwise classified (PNOC) respectively, which are the least stringent exposure limits applicable to dusts.

OSHA PEL
15 mg/m³ (total dust) 8-hr TWA
5 mg/m³ (respirable) 8-hr TWA

ACGIH TLV
10 mg/m³ (inhalable) 8-hr TWA
10 mg/m³ (inhalable) 8-hr TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Blend of various colored particles
pH: approximately neutral (as a 1% solution)
Solubility in Water: Not soluble.

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Stability: Product is stable under normal conditions of storage and handling. Store in a cool, dry place to maintain product performance.
Materials to avoid: Strong oxidizers
Hazardous decomposition products: Thermal decomposition products may include carbon dioxide and carbon monoxide.
Hazardous polymerization: Will not occur

11. TOXICOLOGICAL INFORMATION

The dry powder may cause foreign body irritation in some individuals. Prolonged contact with the dry powder may cause drying or chapping of the skin. Excessive inhalation of dust may be annoying and can mechanically impede respiration.

12. ECOLOGICAL INFORMATION

The following data have been classified using the criteria adopted by the European Economic Community (EEC) for aquatic organism toxicity. A legend summarizing the classification scheme appears below.

- 96-hr LC50; mysid shrimp, in standard drilling mud: >1,000,000 ppm suspended particulate phase
- Microtox Toxicity: Photobacterium phosphoreum - Non toxic

Legend for Aquatic Organism Toxicity (Journal of the European Communities, Annex VII A, Section 5.2.1)

Values	Classifications
LC50 or EC50 < or = 1.0 mg/L	Very Toxic
LC50 or EC50 > 1.0 mg/L and < or = 10 mg/L	Toxic
LC50 or EC50 > 10 mg/L < or = 100 mg/L	Harmful
LC50 or EC50 > 100 mg/L	Practically Nontoxic

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local, state, and federal regulations. Dry or wet solid material can be landfilled in accordance with local, state, and federal regulations. Liquids may be sewered in accordance with local, state, and federal regulations if care is taken to avoid pluggage or blockage of sewer systems recognizing that these materials are intended to increase viscosity and form gels. As a carbohydrate, this material is readily biodegradable, when at low concentrations, in a biological wastewater treatment plant.

14. TRANSPORT INFORMATION

The data provided in this section is for information only. Please apply the appropriate regulations to properly classify your shipment for transportation.

This product is not hazardous under the applicable DOT, ICAO/IATA, or IMDG regulations.

15. REGULATORY INFORMATION

Chemical Inventory Status

The ingredients of this product are on the TSCA Inventory, Canadian Domestic Substances List and the European Inventory.

SARA Hazard Notification

Hazard Categories Under Title III Rules (40 CFR 370): Fire
Section 302 Extremely Hazardous Substances: Not applicable
Section 313 Toxic Chemical(s): Not applicable

CERCLA Reportable Quantity: Not applicable

Refer to Section 11 for OSHA Hazardous Chemical(s) and Section 13 for RCRA classification.

16. OTHER INFORMATION

MSDS produced in accordance with: ANSI Z400.1-1998.

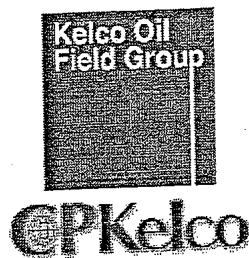
Reason for version: Revised D.O.T / OSHA statements; New format; Company address change

	Health	Fire	Reactivity
HMIS RATINGS:	0	1	0
NFPA RATINGS:	0	1	0

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kofg.help@cpkelco.com

www.kofg.com



MATERIAL SAFETY DATA SHEET

Q-PAC

Date: 11-09-01

1. Product and Company Identification

Product Name: PAC (Regular, Low, and Superlo)

Chemical Name: polyanionic cellulose

Chemical Family: cellulosic polymer

Chemical Formula: n/a

Supplier: Grinding & Sizing Company, Inc.

515 Industrial Boulevard

Lufkin, Texas 75904

Emergency Phone Number: 936-634-7718

2. Ingredient Identification:

polyanionic cellulose 100%

hazardous ingredients: none

3. Physical and Chemical Properties

- Appearance: off-white to light yellow powder
- Soluble in water
- Boiling point: n/a
- Melting point: n/a
- Vapor Pressure: n/a
- Specific gravity: 1.6
- Odor: none
- PH (1% solution): 6.5 – 9.0
- Bulk Density: 40 – 55 lb./cu.ft.

4. Fire and Explosion Data

- Autoignition temperature: 400°C (752 °F)
- Flashpoint: 430° F, 221°C
- Flammability: n/a
- Extinguishing media: Water spray, CO₂, dry chemical, foam
- Special fire fighting procedures: Evacuate all unnecessary personnel.
Wear appropriate safety equipment for fire conditions including SCBA.
- Dust may form explosive mixture with air at high concentrations

5. Stability and Reactivity

- Stability: stable
- Reactivity: avoid excessive heat, ignition sources and strong oxidizers
- Hazardous Decomposition: CO, CO₂
- Does not polymerize

6. Health Hazards Identification:

- Acute Effects: none
- Ingestion: none
- Eyes: Dust abrasive to the eyes
- Skin: may cause mild irritation
- Inhalation: may cause mild respiratory tract irritation
- Chronic Effects: IARC not listed; OSHA not listed; NTP not listed.
- Route of entry: inhalation and eye contact
- Medical conditions aggravated by exposure: none known
- First Aid Procedures:

Inhalation: Move exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

Ingestion: Under normal circumstances, first aid is not required.

Skin: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation persists.

Eyes: promptly wash eyes with lots of water. Continue to rinse for 15 minutes. Get medical attention if irritation persists.

7. Handling & Storage

- Handle only in well ventilated areas. Avoid breathing dust.
- Store in cool dry place.
- Material is slippery when wet.
- Dust may form explosive mixture with air at high concentrations.
- In case of accidental release or spillage, collect and contain material.
- Contact local authorities for proper disposal.

8. Exposure Controls, Personal Protection

- Ventilation-Local exhaust and ventilation system is recommended if handled in a confined area to control below recommended exposure levels.
- Respiratory Protection- Use NIOSH approved nuisance dust respirator.
- Eye Protection-Use safety glasses with side shields
- Skin Protection-Use long-sleeved clothing and gloves

9. Toxicological Information

- Oral toxicity: LD50: 1260 mg/kg (rat)

10. Ecological Information

- Readily biodegradable

11. Transport Information

- Proper Shipping Name: Not regulated by DOT as a hazardous material
- Hazard class: none
- UN Number: none
- Packing Group: none

12. Regulatory Information

- OSHA (29 CFR 1910.1200) This product should be included in a hazard communication program.
 - RCRA: none.
 - NFPA Hazard Codes: Health:0, Flammability: 0, Reactivity: 0, Special hazards: 0
-

PRODUCTION ENHANCEMENT SYSTEMS, LLC

P.O. Box 52872
Oil Center Station
Lafayette, LA 70505
(337) 849-6340

SAPP STICKS

(Sodium Acid Pyrophosphate)

PRODUCT DESCRIPTION

SAPP Sticks are condensate-dispersible, water soluble sticks containing a combination of surfactants, blended with sodium acid pyrophosphate. **SAPP Sticks** will perform in the presence of salt, or in fresh water systems.

USES & ADVANTAGES

SAPP Sticks are primarily designed as a *mud thinner/dispersant*. However, other advantages that have been realized from the use of **SAPP Sticks** include:

- Decreased wear on shaker screen due to thinner mud
- Friction Reducer
- Helps prevent the formation of "mud rings"
- Helps prevent bit balling
- Calcium Inhibitor
- pH reducer

TREATMENT PROCEDURE

The number of **SAPP Sticks** to be used varies from one drilling operation to the next. The weight of mud, drilling depth, and water can affect the number of sticks to be dropped. Field tests indicate the best results are achieved under normal drilling operations when 1 to 2 (1 1/4x15) sticks were dropped to each joint of drill stem added.

Note: The amount recommended is based on past field tests and operating under normal drilling operations and procedures. To determine the optimum amount of sticks required for periodic treatments, you may choose to gradually increase/decrease the number of sticks until the most economical treatment point is reached.

Caution: As with all industrial chemicals, contact with eyes or skin should be avoided. Wash thoroughly with water. Sticks should be stored in a cool, dry place. Always remove stick from plastic bag/cardboard tube before using. Bag or tube can be used as a glove to avoid contact with hands.

FAX: (337) 234-4195

EMAIL: eberbeadle4@msn.com

Material Safety Data Sheet

IDENTITY (As Used on Label and List)

Sapp Stick

Section I

Manufacturer's Name Production Enhancement Systems, LLC	Emergency Telephone Number 337-849-6340
Address (Number, Street, City, State, and ZIP Code) P.O. Box 52872 Lafayette, LA 70505	Telephone Number for Information 337-849-6340
	Date Prepared 03-07-2006

Section II - Hazard Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	%(optional)
Non-Phenol Ethoxyalates, Sodium Acid Pyrophosphate				

Section III - Physical/Chemical Characteristics

Boiling Point	N/A	Specific Gravity (H ₂ O = 1)	1.090
Vapor Pressure (mm Hg.)	N/A	Melting Point	128°F
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Buryl Acetate = 1)	N/A
Solubility in Water 100%			
Appearance and Odor White/off white, waxy solid at room temperature.			

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	N/A	Flammable Limits	LEL	UEL
		N/A		
Extinguishing Media Water spray, dry chemical, foam or Carbon Dioxide				
Special Fire Fighting Procedures N/A				
Unusual Fire and Explosion Hazards N/A				

Section V - Reactivity Data

Stability	Unstable		Conditions to Avoid None
	Stable	X	
Incompatibility (<i>Materials to Avoid</i>)		N/A	
Hazardous Decomposition or Byproducts		Carbon Monoxide, Carbon Dioxide or Oxides of Nitrogen	
Hazardous Polymerization	May Occur		Conditions to Avoid - None
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry:	Inhalation? No	Skin? No	Ingestion? No
Health Hazards (<i>Acute and Chronic</i>)	None Known		
Carcinogenicity:	NTP? ?	IARC Monographs? ?	OSHA Regulated? ?
Signs and Symptoms of Exposure	Affects of dermal contact, slight if any.		
Medical Conditions Generally Aggravated by Exposure	N/A		
Emergency and First Aid Procedures	Eye contact: Flush eyes with water for 15 minutes. Skin contact: Flush with water.		

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled	Contain spill if possible. If stick is melted, wipe up or absorb on suitable materials and shovel up.
Waste Disposal Method	According to Local, State or Federal Regulations - Landfill
Precautions to Be taken in Handling and Storing	Store in a cool, dry place. Keep container tightly closed when not in use.
Other Precautions	N/A

Section VIII - Control Measures

Respiratory Protection (<i>Specify Type</i>)	None considered necessary.		
Ventilation	Local Exhaust	Sufficient	Special N/A
	Mechanical (<i>General</i>)	N/A	Other N/A
Protective Gloves	Rubber Gloves	Eye Protection	Goggles
Other Protective Clothing or Equipment	N/A		
Work/Hygienic Practices	Wash thoroughly after handling.		

SAPP

SAPP

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 1 - Chemical Product and Company Identification ***

Chemical Name: Sodium Acid Pyrophosphate, technical, food grade
Product Use: For Commercial Use

Synonyms: SAPP; Pyrophosphoric acid, disodium salt; Disodium dihydrogen pyrophosphate; Diphosphoric acid, disodium salt
Supplier Information

Access Chemicals & Services LLC
One Area Place Suite 2000
7322 Southwest Freeway
Houston, Texas 77074

Phone: 713-270-7215
Fax: 713-988-5833
Emergency #: (800) 424-9300 or (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

*** Section 2 - Composition / Information on Ingredients ***

CAS#	Components	Percent
7758-16-9	Sodium Acid Pyrophosphate	> 99

Component Information - Information on Non-Hazardous Components

This product is not considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

*** Section 3 - Hazards Identification ***

Emergency Overview

Product is an odorless white powder. Dusts may cause irritation of the respiratory tract. May irritate skin and eyes. This material is not combustible; however, large amounts or airborne dusts can present an air/dust explosion hazard. Use appropriate extinguishing media for surrounding fire.

Hazard Statements

CAUTION: MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE EYE AND SKIN IRRITATION. Avoid contact with eyes and skin. Avoid breathing dusts. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation.

Potential Health Effects: Eyes

Dust and solution can cause mild irritation.

Potential Health Effects: Skin

This product may cause irritation to the skin.

Potential Health Effects: Ingestion

Ingestion of large doses may cause symptoms of irritation, nausea, vomiting, cramps and diarrhea.

Potential Health Effects: Inhalation

Dusts and mists from solutions may cause mild irritation of the upper respiratory tract.

HMS Ratings: Health Hazard: 1 Fire Hazard: 1 Physical Hazard: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes

Immediately flush eyes with plenty of water for 15 minutes. If irritation persists, seek medical attention immediately.

First Aid: Skin

If irritation occurs, wash gently and thoroughly with water and non-abrasive soap. If irritation persists, seek medical advice. Wash contaminated clothing before reuse.

First Aid: Ingestion

Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Immediately give large amounts of water. If vomiting occurs naturally, rinse mouth and repeat administration of water. Obtain medical advice immediately.

First Aid: Inhalation

Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Notes to Physician

Provide general supportive measures.

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 5 - Fire Fighting Measures ***

Flash Point: Not applicable	Method Used: Not applicable
Upper Flammable Limit (UFL): Not applicable	Lower Flammable Limit (LFL): Not applicable
Auto Ignition: Not available	Flammability Classification: Not applicable
Rate of Burning: Not applicable	

General Fire Hazards

Closed containers exposed to heat may explode. Can pose a serious dust explosion hazard.

Hazardous Combustion Products

Toxic phosphorus oxide gases.

Extinguishing Media

Use methods for the surrounding fire including water spray, dry chemical, carbon dioxide, or foam.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self contained breathing apparatus.

NFPA Rating: Health: 1 Fire: 0 Reactivity: 0 Other:

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information).

Clean-Up Procedures

Small releases can be cleaned up wearing gloves, goggles and suitable body protection. In case of a large spill (in which excessive dusts can be generated), clear the affected area, protect people, and respond with trained personnel. Place all spill residues in an appropriate container and seal. Thoroughly wash the area after a spill or leak clean-up. Prevent spill runoff from contamination of storm drains, sewers, soil or groundwater.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Avoid inhalation of dusts. Ventilate the area. Wear adequate personal protective equipment. Have emergency equipment readily available.

*** Section 7 - Handling and Storage ***

Handling Procedures

Do not breathe dust. Avoid all contact with skin and eyes. Wherever dust clouds may be generated, eliminate sparks, flames and other ignition sources. Use this product only with adequate ventilation. Wash thoroughly after handling. Care should be taken to avoid the accumulation of dusts, which can create a serious dust-explosion hazard. All equipment used in the handling of this material should be electrically grounded.

Storage Procedures

All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Empty containers may contain residual amounts of this product, therefore, empty containers should be handled with care. Keep this product in an air-tight container. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Keep container tightly closed when not in use. Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Limit quantity of material stored.

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

No exposure guidelines have been established.

B: Component Exposure Limits

The exposure limits given are for Particulates Not Otherwise Classified (PNOC).

OSHA: 15 mg/m³ TWA (Total dust)
5 mg/m³ TWA (Respirable fraction)

DFG MAKs 4 mg/m³ TWA (Inhalable fraction)
1.5 mg/m³ TWA (Respirable fraction)

Engineering Controls

Use general mechanical ventilation. Local exhaust is suggested for use, where possible, in enclosed or confined spaces.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Safety glasses recommended. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin

Wear appropriate work gloves for type of operation. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory

None required where adequate ventilation conditions exist. If airborne concentration is high, use an appropriate respirator or dust mask. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure-demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Personal Protective Equipment: General

Wash hands thoroughly after handling material. Do not eat, drink or smoke in work areas. Have a safety shower or eye-wash fountain available. Use good hygiene practices when handling this material including changing and laundering work clothing after use.

*** Section 9 - Physical & Chemical Properties ***

Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance:	White powder	Odor:	Odorless
Physical State:	Solid	pH:	3.5-4.5 (1% solution)
Vapor Pressure:	Not applicable	Vapor Density:	Not applicable
Boiling Point:	Not applicable	Melting Point:	428 deg F (220 deg C)
Solubility (H ₂ O):	13% @ 25 deg C	Specific Gravity:	1.86 (water=1)
Freezing Point:	Not applicable	Particle Size:	Not available
Softening Point:	Not applicable	Evaporation Rate:	Not applicable
Viscosity:	Not applicable	Bulk Density:	60 lbs/ft ³
Percent Volatile:	Not available	Molecular Weight:	221.96
		Chemical Formula:	Na ₂ H ₂ P ₂ O ₇

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable

Chemical Stability: Conditions to Avoid

Avoid conditions of heat and moisture.

Incompatibility

Strong acids and alkalis.

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 10 - Chemical Stability & Reactivity Information (Continued) ***

Hazardous Decomposition

Toxic phosphorus oxide gases.

Hazardous Polymerization

Will not occur.

*** Section 11 - Toxicological Information ***

Acute Toxicity

A: General Product Information

Information not available.

B: Component LD₅₀/LC₅₀

Sodium Acid Pyrophosphate (7758-16-9)

LD₅₀ (Oral-Mouse) 2650 mg/kg, LD₅₀ (Intraperitoneal-Mouse) 1 gm/kg, LD₅₀ (Subcutaneous-Mouse) 480 mg/kg, LD₅₀ (Intravenous-Mouse) 59 mg/kg, LD (Skin-Rabbit) > 300 mg/kg

Carcinogenicity

A: General Product Information

Information not available.

B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology

Information not available.

Neurotoxicity

Information not available.

Mutagenicity

In animal and yeast cell studies, no mutagenic effects were seen.

Teratogenicity

No birth defects were reported in mice, rabbits, or hamsters given this substance during gestation.

Other Toxicological Information

None

*** Section 12 - Ecological Information ***

Ecotoxicity

No information available.

Environmental Fate

No information available.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

As shipped, product is not considered a hazardous waste by the EPA.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Review federal, provincial, and local government requirements prior to disposal. Disposal by controlled incineration or secure landfill may be acceptable.

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 14 - Transportation Information ***

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under L.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information

Shipping Name: Not applicable.

Hazard Class: Not applicable

UNNA #: Not applicable

Packing Group: Not applicable

Required Label(s): Not applicable

EQ Quantity: Not applicable

International Air Transport Association (IATA)

For Shipments by Air transport We classify this product as hazardous (Class 9) when shipped by air because 49 CFR 173.140 (a). For the purposes of this subchapter, miscellaneous hazardous material (Class 9) means a material which presents a hazard during transportation, but which does not meet the definition of any other hazard class. This class includes: (a) Any material which has an anesthetic, noxious, or other similar property which could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties.

Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Sodium Acid Pyrophosphate)

Hazard Class: 9

UN: UN 3077

Packing Group: III

Passenger & Cargo Aircraft Packing Instruction: 911

Passenger & Cargo Aircraft Maximum Net Quantity: No Limit

Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y911

Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg

Special Provisions: A97

ERG Code: 9L

International Maritime Organization (I.M.O.) Classification

Sodium Acid Pyrophosphate is not regulated under I.M.O.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

No additional information.

B: Component Information

None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

Sodium Acid Pyrophosphate (7758-16-9)

CERCLA: Final RQ = Not Applicable

SARA 302 (EHS TPQ) There are no specific Threshold Planning Quantities for Sodium Acid Pyrophosphate. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

C: SARA 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Sodium Acid Pyrophosphate	7758-16-9	No	No	No	Yes	No

State Regulations

A: General Product Information

Other state regulations may apply.

B: Component Information

None of this product's components are listed on the state lists from CA, FL, MA, MN, NJ, or PA.

Component	CAS #	CA	FL	MA	MN	NJ	PA
Sodium Acid Pyrophosphate	7758-16-9	No	No	No	No	No	No

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

Other Regulations

A: General Product Information

Not determined.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EMRCS
Sodium Acid Pyrophosphate	7758-16-9	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

All identified ingredients are on the Canadian Domestic Substances List.

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Sodium Acid Pyrophosphate	7758-16-9	No disclosure limit.

ANSI LABELING (Z129.1): CAUTION! MAY CAUSE SKIN AND EYE IRRITATION. Avoid contact with skin, eyes, or clothing. Do not taste or swallow. Avoid breathing dusts and particulates. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, face shields, suitable body protection, and NIOSH-approved respiratory protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

*** Section 16 - Other Information ***

Other Information

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this information. By providing this information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com. Revision date: 05/31/01

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration

Contact: Sue Palmer-Koloman, PhD

Contact Phone: (713) 896-9966

Revision Log

08/28/00 3:54 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.
 05/31/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review; add SARA 311/312 Haz Ratings
 08/20/01 2:55 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemrec Num.
 2/18/02 10:52 AM HDF: Up-date of SARA Hazard Ratings.
 2/15/03 12:59 PM SEP: Added technical grade to section 1.
 09/16/03 7:32 AM HDF: General review of entire MSDS. Up-graded Section 3 Health Hazard information, HMIS categories. Added PNOC exposure limits to Section 8. Added currently available toxicity data to Section 11. Up-Dated Section 14 Transportation Information.

This is the end of MSDS #C1-138

Material Safety Data Sheet

Manufacture: Production Enhancement Systems, LLC P.O. Box 52872 Lafayette, LA 70505

Emergency Phone: (337) 849-6340

Date Prepared: 2-24-04

Production Enhancement Systems, LLC: SAME

I. Product Identification

Trade Name Synonyms:

Soap Stick Max (Red, White, Blue)

Common Name:

Soap Stick

CAS Regulatory Number:

25322-68-3

DOT Hazard Classification:

Not Regulated

Corrosive Per DOT:

Neither Skin or Steel

Chemical Formula:

Polyethylene Glycol

Chemical Family:

Organic Non-Ionic Surfactant Mixture

DOT Proper Shipping Name:

Not Regulated

UN Number:

NA

Guide Number:

NA

II. Hazardous Ingredients

CAS Number

25322-68-3

Components

Polyethylene glycol

%

50-100

ACGIH TLV

No Data

OSHA PEL

No Data

Carcinogen

Not Listed

III. Physical Data

Boiling Point:

>200°F

Specific Gravity:

1.056

Vapor Pressure:

N/A

pH:

6.0 - 8.0

Vapor Density:

NA

Dry Material Bulk Density:

ND

Percent Volatility:

ND

Solubility:

Soluble in water

Appearance and Odor:

Odorless white solid

IV. Fire and Explosion Hazard Data

Flash Point and Method Used:

NONE

Flammable Limits in Air:

NA

Auto Ignition Temperature:

NA

Extinguishing Media:

(x) Water Spray, (x) Dry Chemical, (x) Carbon dioxide, (x) Alcohol-resistant foam,
(x) foam, (x) Earth/Sand/Mud

Special Fire Fighting Procedures:

None Expected

Unusual Fire and Explosion Hazards:

None Expected

V. Health Hazard Data

Toxicity Data	No data exists for the surfactant used		
Carcinogen Listing	National Toxicology Report on Carcinogenic(NTP)	Not Listed	International Agency for Research on Cancer Not Listed
Primary Route(s) Of Entry	(x) Skin Contact (x) Inhalation	() Skin Absorption (x) Ingestion	(x) Eye Contact
Effects of Over Exposure	Skin Contact and Absorption: Skin Irritation may develop slowly with continued contact.		
	Eye Contact: Irritation develops immediately upon contact		
	Inhalation: Inhalation may cause headache, dizziness, and nausea		
	Ingestion: May cause diarrhea, and gastrointestinal upset		
Emergency And First Aid Procedures	Skin contact: (x) Immediately Wash Skin with soap and water () Get Medical Attention		
	Eye Contact: (x) Immediately Flush with water for 15 minutes		
	Inhalation: (x) Remove to Fresh Air (x) If Not Breathing Give Artificial Respiration (x) If Needed Give Oxygen () Get Medical Attention		
	Ingestion: () Do Not Induce Vomiting (x) Induce Vomiting (x) Give Plenty of Water (x) Get Medical Attention		

VI. Special Protection Information

Hand Protection: Glove Materials to Minimize Skin Contact

Acid Proof Clothing Acid Proof gloves Rubber boots

Eye Protection:

Chemical Splash Goggles Face Shield for Splash Hazards

Ventilation Requirements:

Adequate ventilation is required to minimize exposure or to maintain exposure levels below OSHA/ACGIH requirements. Local mechanical ventilation may be required

Respirator Type for Reducing Contaminant Concentration in Inhaled Air (exposure limits are exceeded):

NIOCH/MSHA approved positive pressure respirator

Special Protection

Safety shower, eye wash fountain, and washing facilities should be readily available

VII. Reactivity Data

Stability: <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable	Condition to Avoid: <input type="checkbox"/> Ignition Source with temperature Above: 100°F Other: Higher Temperatures melt product
Hazardous Polymerization: <input checked="" type="checkbox"/> Will Not Occur <input type="checkbox"/> May Occur	Incompatibility- Avoid Contact with: <input checked="" type="checkbox"/> Strong Oxidizers

Hazardous Decomposition- Thermal and other Methods:

Ammonia or amines oxides of nitrogen oxides of sulfur

VIII. Spill or Leak Procedures

Steps to be Taken if Material is Spilled or Released

Extinguish Ignition Sources Keep Upwind Avoid Skin Contact Flush with Water
 Sweep or Scoop Up and Remove Neutralize with lime, soda ash, sodium carbonate.
 Prevent Spread of Spill Wear protective Equipment
 Avoid Run-off

Waste Disposal- Consult Local, State, and Federal Regulations for Proper Disposal Procedures:

Material that cannot be used or chemically reprocessed should be disposed of at an approved facility in accordance with any applicable regulations under the Resource Conservation and Recovery Act. Dispose of material in accordance with all Federal, State, and local regulations.

IX. Special Precautions

Do Not Get in Eyes, on Skin or Clothing Do Not Breathe dust, Vapor, Mist or Gas
 Wash Thoroughly After Handling Keep Container Closed
 Keep From Freezing Empty container May Contain Hazardous residue
 Wear protective equipment when handling Keep Away from Heat, Sparks, & Open flames
 Use only with adequate ventilation

Storage:

Keep container closed Store in cool, dry place Follow NFPA requirements
 Keep out of reach of children

X. Additional Regulatory Concerns

Please Note

- 1) The data on these sheets relates only to the specific material designated herein.
- 2) This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Production Enhancement Systems, LLC
- 3) Production Enhancement Systems, LLC assumes no legal responsibility for use or reliance upon this data.

SAFETY DATA SHEET

ALUMINIUM STEARATE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: ALUMINIUM STEARATE
APPLICATIONS: Defoamer.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocta Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

GROSS FORMULA: Aluminium Stearate
CAS No.: 637-12-7

COMPOSITION COMMENTS:

This product is classified as containing no hazardous ingredients according to the EC Directives.

3. HAZARDS IDENTIFICATION:

Not regarded as a health hazard under current legislation.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water. Contact physician if larger quantity has been consumed. Try to induce vomiting.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Carbon dioxide (CO2), Dry chemicals, Foam, Water spray, fog or mist. This material is not combustible.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Can form dust clouds that may explode on contact with flames, heat and oxidizers.

HAZARDOUS COMBUSTION PRODUCTS:

Fire or high temperatures create: Asphyxiating gases/vapors/fumes. Carbon dioxide (CO₂). Carbon monoxide (CO).

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**

This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.

PROTECTIVE EQUIPMENT:

VENTILATION: Provide adequate general and local exhaust ventilation.

RESPIRATORS: Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P2 (for fine dust).

PROTECTIVE GLOVES:

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.
COLOUR:	White.
ODOUR/TASTE:	No characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.
DENSITY/SPECIFIC GRAVITY (g/ml):	1.07
BULK DENSITY:	258 - 330 kg/m ³
pH-VALUE, DILUTED SOLUTION:	7
AUTO IGNITION TEMP. (°C):	>150
	TEMPERATURE (°C): 25
	CONCENTRATION (%M):

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

MATERIALS TO AVOID:
Strong oxidizing agents.

HAZARDOUS DECOMP. PRODUCTS:
Fire or high temperatures create: Asphyxiating gases/vapours/flames of: Carbon dioxide (CO₂). Carbon monoxide (CO).

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Not regarded as dangerous for the environment.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: Not classified.

UK REGULATORY REFERENCES: Chemicals (Hazard Information & Packaging) Regulations 1993. The Control of Substances Hazardous to Health Regulations 1988.

16. OTHER INFORMATION:

USER NOTES:

Add Data HMIS Health - 1 HMIS Flammability - 1 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES:

Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY:

Dr. Kirsty Walker

REVISION DATE:

09-12-98

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

Material Safety Data Sheet
(DRILLING DETERGENT 4110)

JMN Specialties, Inc. 1100 Victory Drive Westwego, LA 70094 (504) 341-3749 ISO 9001 Registered	HMIS HEALTH:..... 1
	HMIS FLAMMABILITY:..... 0
	HMIS REACTIVITY:..... 0
	PERSONAL PROTECTION:..... B
	EMERGENCY NUMBER:..... 800-255-3924

SECTION 1 – IDENTIFICATION OF CHEMICAL PRODUCT

PRODUCT NAME:.....DRILLING DETERGENT 4110
EFFECTIVE DATE:.....November 13, 2002
CHEMICAL FAMILY:.....Drilling Additive
FORMULA:.....Proprietary
CAS NUMBER:.....Blend

SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENT	PERCENT	CAS NUMBER	PEL
This product is not considered hazardous as per 29CFR 1910:1200.	-	-	None Established

The criteria for listing components in the composition section are as follows: Carcinogens are listed when present at 0.1% or greater; components which are otherwise hazardous according to OSHA are listed when present at 1.0% or greater. Non-hazardous components may be listed at 3.0% or greater if not proprietary in nature. This is not intended to be complete compositional disclosure. Refer to section 14 for applicable states right to know and other regulatory information.

SECTION 3 – HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE / ODOR:.....Clear Viscous Blue-Green Liquid / Mild Odor
SHORT TERM EXPOSURE:.....**GENERAL:** No significant adverse health effects are expected to develop with normal use. **EYES:** Slight to moderate irritant. **SKIN:** Persons with pre-existing skin disorders may experience slight irritation. **INHALATION:** No adverse effects with normal use. **INGESTION:** No significant adverse health effects are expected to develop if only small amounts (less than a mouthful) are swallowed.
OSHA REGULATED:.....No
LISTED CARCINOGEN:.....NTA: No
IARC MONOGRAPHS: No

POTENTIAL HEALTH EFFECTS

INHALATION:.....Irritant
INGESTION:.....Irritant
SKIN (DERMAL):.....Irritant
OVER EXPOSURE EFFECTS:.....No evidence of adverse effects from available information.

**Material Safety Data Sheet
(DRILLING DETERGENT 4110)**

SECTION 4 – FIRST AID MEASURES

FIRST AID:.....In case of eye contact, flush immediately with plenty of water for at least 15 minutes and get medical attention; for skin, wash thoroughly with soap and water.
If affected by inhalation of vapor or spray mist, remove to fresh air.
If swallowed, do not induce vomiting, get immediate medical attention.

SECTION 5 - FIRE FIGHTING MEASURES

FLASHPOINT:.....Non Flammable Liquid
EXTINGUISHING MEDIA:.....Water fog or spray, Foam, Dry Powder, Carbon Dioxide (CO2).
DECOMPOSITION PRODUCTS:.....From fire; Smoke, Carbon dioxide, & Carbon Monoxide
LOWER FLAME LIMIT:.....NA
HIGHER FLAME LIMIT:.....NA
UNUSUAL FIRE AND EXPLOSION HAZARDS:.....None known
FIRE FIGHTING EQUIPMENT:.....Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

CHEMTEL EMERGENCY NUMBER (24 Hour):.....1-800-255-3924
SPILL:.....In case of spillage, dilute with water to sewer if allowed by local regulations, or, absorb with inert material and dispose of in accordance with applicable regulations.
RCRA STATUS:.....None

SECTION 7 – HANDLING AND STORAGE

HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES. THESE PRACTICES INCLUDE AVOIDING UNNECESSARY EXPOSURE AND PROMPT REMOVAL OF MATERIAL FROM EYES, SKIN, AND CLOTHING.

HANDLING AND STORAGE:.....No special storage requirements.

PRECAUTIONARY MEASURES:.....

Provide fresh air ventilation during and after application. Close container after each use. Avoid prolonged or repeated contact with skin. Avoid contact with skin, eyes, and clothing. After handling this product, wash hands before eating, drinking, or smoking. If needed, take first aid action shown in Section 4.

**Material Safety Data Sheet
(DRILLING DETERGENT 4110)**

SECTION 8 - EXPOSURE CONTROL / PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment.

EYE PROTECTION:.....Use goggles or face shield if spashing is likely.

RESPIRATORY

PROTECTION:.....Not normally needed. Use NIOSH approved vapor respirator if exposure is unknown or exceeds permissible limits.

Use NIOSH / MSHA approved respiratory protection equipment when airborne exposure limits are exceeded (see below). Consult the respirator manufacturer to determine appropriate type of equipment for a given application. Observe respirator use limitations specified by NIOSH / MSHA or the manufacturer. Respiratory protection programs must comply with 29 CFR 1910.134.

PROTECTIVE GLOVES:.....Wear impervious gloves

VENTILATION:.....Local exhaust

MECHANICAL EXHAUST:.....Desired in closed places

LOCAL EXHAUST:.....Recommended

VENTILATION NOTES: Provide natural or mechanical ventilation to control exposure levels below Airborne exposure limits (see below). The use of local mechanical exhaust ventilation is preferred at sources of air contamination such as open process equipment. Consult NFPA Standard 91 for design of exhaust systems.

THRESHOLD LIMIT VALUE: ..None Established for this Product

PROTECTIVE EQUIPMENT: ..HMIS PERSONAL PROTECTION: B: Safety Glasses, Gloves

The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE / ODOR:.....Clear Viscous Blue-Green Liquid / Mild Odor

BOILING POINT:.....~ 212°F

FREEZING POINT:.....32°F

VAPOR PRESSURE:.....ND

VAPOR DENSITY (AIR=1):.....> 1

SPECIFIC GRAVITY:.....1.0 - 1.05

pH:.....9 - 10

SOLUBILITY IN WATER:.....Complete

SECTION 10 - STABILITY AND REACTIVITY

STABILITY:.....Stable

HAZARDOUS

POLYMERIZATION:.....Will Not Occur

POLYMERIZATION AVOID:.....None

INCOMPATIBILITY:.....Avoid strong acids and bases.

CONDITIONS TO AVOID:.....None known

**Material Safety Data Sheet
(DRILLING DETERGENT 4110)**

SECTION 11 - TOXICOLOGICAL INFORMATION

EYE EFFECTS:

The eye irritation hazard is based on data from information supplied by raw material(s) supplier(s).

SKIN EFFECTS:

The skin irritation hazard is based on data from information supplied by raw material(s) supplier(s).

ACUTE ORAL EFFECTS:

The acute oral toxicity is based on data from information supplied by raw material(s) supplier(s).

ACUTE INHALATION EFFECTS:

The acute respiratory toxicity is based on data from information supplied by raw material(s) supplier(s).

SECTION 12 - ECOLOGICAL INFORMATION

Data from laboratory studies and from scientific literature is noted below if available.

SECTION 13 DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Follow State Regulations.

SECTION 14- TRANSPORTATION INFORMATION

The data provided in this section is for information only. The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate regulations to properly classify your shipment for transportation.

PROPER SHIPPING NAME:.....DOT NON-REGULATED - DRILLING DETERGENT 4110

REPORTABLE QUANTITY:.....None

HAZARD CLASS AND LABEL:.....NON-REGULATED

UN NUMBER:.....None

NA NUMBER:.....None

PACKAGING SIZE:.....Pail, Drum & Bulk

SECTION 15 - REGULATORY INFORMATION

SARA 311 CATEGORIES:

EPA ACUTE:.....Yes (Eyes)

EPA CHRONIC:.....No

EPA IGNITABILITY:.....No

EPA REACTIVITY:.....No

EPA SUDDEN RELEASE

OF PRESSURE:.....No

CERCLA RQ VALUE:.....None

SARA TPQ:.....None

**Material Safety Data Sheet
(DRILLING DETERGENT 4110)**

SARA RQ:.....None
EPA HAZARD WASTE #:.....None
CLEAN AIR:.....NA
CLEAN WATER:.....NA
SARA SECTION 313:.....No
NFPA HEALTH:.....1
NFPA FLAMMABILITY:.....0
NFPA REACTIVITY:.....0
DEA Chemical Trafficking Act:..
TSCA STATUS:.....All ingredients in this product are on the TSCA Inventory List.

SECTION 16 - ADDITIONAL INFORMATION

FOOT NOTES: NA - NOT APPLICABLE ND - NO DATA AVAILABLE >= GREATER THAN <= LESS THAN

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Company Health and Risk Assessment Unit, PO Box 1519, Gretna, LA 70054-1519.

REVISION STATEMENT: Changes have been made throughout this Material Safety Data Sheet. Please read the entire document.

DISCLAIMER:
Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, the Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving this MSDS will make their own determination as to its suitability for their intended purposes prior to use. Since the product is within the exclusive control of the user, it is the user's obligation to determine the conditions of safe use of this product. Such conditions should comply with all Federal Regulations concerning the Product. **NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.**

THIS IS THE LAST PAGE OF THIS MSDS

MATERIAL SAFETY DATA SHEET REGULATORY DATA

UPDATE: 1/7/98
 PRODUCT CODE: HLM100
 PRODUCT NAME: LIME, HYDRATED, DRAVO

CURRENT MSDS DATE: 1/1/95
 ORIGINAL ENTRY: 5/11/92
 109900

CAS Numbers and Names of the Primary Chemical and/or its Components

1305-62-0 CALCIUM HYDROXIDE MAXIMUM %
95.93

TITLE III, SECTION 313 REGULATED CAS REGISTRY NUMBERS AND NAMES

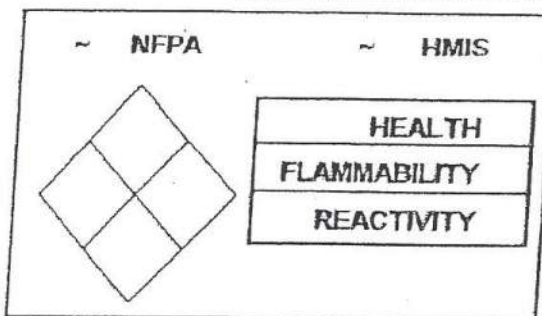
NONE LISTED BY REFERENCE

Extremely Hazardous Substance subject to section 302 emergency planning and notification requirements (EHS)	NO
Hazardous chemical and/or components subject to section 311 and 312 MSDS and inventory requirements (OSH)	NO
Toxic chemical and/or components subject to toxic chemical release reporting under Section 313 (TOXIC)	NO
Hazardous contents subject to section 304 spill reporting of Comprehensive Environmental Liability Act (CERCLA)	NO
Subject to the reporting requirements of the EPA Toxicity Characteristic Leaching Process (CFR40 261.24)	NO
This product, or its components, are listed on or are exempt from the Toxic Substance Control Act (TSCA)	YES
Contains a Toxic Air Pollutant listed under the 1990 Clean Air Act Amendments [42 USC sec 7412(b)(1)].	NO

SARA Title III Hazard Categories

- Fire Hazard
- Reactivity Hazard
- Sudden Release of Pressure
- Acute Health Hazard (Immediate)
- Chronic Health Hazard (Delayed)
- Extremely Hazardous Substance

* INFORMATION NOT AVAILABLE



Department of Transportation Data

D.O.T. Shipping Name (CFR49 172.101(2))
 LIME, HYDRATED, DRAVO

Hazard Class (CFR49 172.101(3))
 NOT REGULATED

ID Number (CFR49 172.101(4))
 NONE

ERG GUIDE: NA RQ #: 0

DISTRIBUTED BY: Industrial Chemicals Inc.
 PO Box 660688 2042 Montreat Drive
 Birmingham, AL 35266-0688 205-823-7330

FOR INTERNAL USE ONLY

NEW PRODUCT CODE ADDED (NEW FOLDER)

UPDATED COVER OR MSDS (NO FOLDER)

NEW CONTAINER TYPE ADDED (NO FOLDER)

No MSDS ON HOLD FOR THE FOLLOWING REASON:

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

MANUFACTURER'S NAME: DRAVO LIME COMPANY - LONGVIEW DIVISON	REGULAR TELEPHONE NO.: (205) 664-2456 EMERGENCY TELEPHONE NO.: (205) 663-0786
---	--

ADDRESS: **P.O. BOX 37, SAGINAW, ALABAMA 35137**

TRADE NAME: **LONGVIEW, PELICAN**

SYNONYMS: **CALCIUM HYDROXIDE, HYDRATED OR SLAKED LIME (Ca(OH)₂)**

SHIPPING NAME: **1 DOT: LONGVIEW OR PELICAN HIGH CALCIUM HYDRATED LIME DATA: NOT RESTRICTED**

II HAZARDOUS INGREDIENTS 2

MATERIAL OR COMPONENT	CAS NO.	%	HAZARD DATA
AVAILABLE CALCIUM HYDROXIDE		95.93	SEE SECTIONS III
AVAILABLE LIME INDEX		71.2	IV, V, VI, VII, VIII
SILICA		.62	IX
R2O3		.52	
LOI		24.44	
MgO		1.16	

III PHYSICAL DATA

BOILING POINT, 760 MM HG	N.A.	MELTING POINT N.A.
SPECIFIC GRAVITY (H ₂ O=1)	2.3 - 2.4	VAPOR PRESSURE N.A.
VAPOR DENSITY (AIR=1)	N.A.	SOLUBILITY IN H ₂ O% BY WT NEGLECTIBLE 0.185 - 0.07%
% VOLATILES BY VOLUME	25% MAX. AT 540 °C	EVAPORATION RATE (BUTYL ACETATE) N.A.
APPEARANCE AND ODOR	WHITE POWDER, FAINT MUSTY EARTHY ODOR	Ph (AS IS) Ph (1% SOLN)

IV FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)	N.A.	AUTOIGNITION TEMPERATURE	N.A.
FLAMMABLE LIMITS IN AIR, % BY VOLUME	LOWER	N.A.	UPPER N.A.
EXTINGUISHING MEDIA	N.A.		
SPECIAL FIRE FIGHTING PROCEDURES	N.A.		
UNUSUAL FIRE AND EXPLOSION HAZARD	N.A.		

V HEALTH HAZARD INFORMATION

HEALTH HAZARD DATA	HAZARD CLASSIFICATION	BASIS FOR CLASSIFICATION	SOURCE
ROUTE OF EXPOSURE INHALATION	STRONG SENSITIZER		
SKIN CONTACT	STRONG SENSITIZER		
SKIN ABSORPTION	N.A.		
EYE CONTACT	MILD IRRITANT		
INGESTION	NON-TOXIC, GRAS APPROVED FOOD ADDITIVE		
EFFECTS OF OVEREXPOSURE ACUTE OVEREXPOSURE	MILD IRRITANT		
CHRONIC OVEREXPOSURE	CAN CAUSE EXCESSIVE DRYING OF SKIN AND POSSIBLE IRRITATION		
EMERGENCY AND FIRST AID PROCEDURES			
EYES: FLUSH OUT IMMEDIATELY WITH WATER AND SEE A PHYSICIAN			
SKIN: WASH OFF LIME DUST WITH CLEAN WATER, RINSE SKIN WITH DILUTED VINEGAR, APPLY BURN OINTMENT TO AFFECTED AREAS.			
INHALATION:	N.A.		
INGESTION:	N.A.		
NOTES TO PHYSICIAN:			

VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY:
CONTACT WITH CARBON DIOXIDE IN MOIST AIR AND ACIDS

INCOMPATABILITY:
CONTACT WITH ACIDS, CORROSIVE TO ALUMINUM

HAZARDOUS DECOMPOSITION PRODUCTS:
N. A.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION:
N. A.

VII DISPOSAL, SPILL OR LEAK PROCEDURES

AQUATIC TOXICITY (E.G. 96HR TLM)
N. A.

WASTE DISPOSAL METHOD
CAN BE SALVAGED FOR USE OR EMPTIED IN SEWER OR REMOVED TO DUMP

STEPS TO BE TAKEN IF MATERIALS IS RELEASED OR SPILLED
NORMAL CLEANING

UTRALIZING CHEMICALS
ANY STRONG ACID: H₂, SO₄, HCl, ETC.

VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS
APPLY ADEQUATE VENTILATION TO KEEP DUST CONCENTRATION BELOW 15 MG/CU.M
VENT TO DUST COLLECTOR

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT:
LONG SLEEVE SHIRT WITH BUTTONED COLLAR, LONG PANTS EXTENDING OVER WORK SHOES
PROTECTIVE CREAM ON EXPOSED SKIN.

RESPIRATORY
PROTECTIVE FILTER MASK IN DUSTY ENVIRONMENT

EYE
TIGHT FITTING SAFETY GOGGLES

GLOVES
IN MANUAL HANDLING

OTHER CLOTHING AND EQUIPMENT

IX SPECIAL PRECAUTIONS

PRECAUTIONARY STATEMENTS

KEEP PRODUCT DRY AND AVOID DUSTING

OTHER HANDLING AND STORAGE REQUIREMENTS

HYDRATED LIME IS A SAFE MATERIAL TO USE IF WORKERS WILL ONLY FOLLOW A FEW PRECAUTIONS AND DRESS PROPERLY (AS DESCRIBED IN VII).

DON'T PERMIT DUST TO ACCUMULATE ON EXPOSED SKIN OR CLOTHING. BRUSH IT OFF

ADDITIONAL REGULATORY CONCERNS

FEDERAL:

- FDA GENERALLY REGARDED AS SAFE AS FOOD ADDITIVE
- USDA NO RESTRICTIONS
- CPSC USE CAUTIONARY LABELS FOR BAGGED MATERIAL SOLD FOR HOME USE
- TSCA
- OTHER NOT A SUSPECTED CARCINOGEN
- STATE N. A.

PREPARED BY: JIM BRYANT
 TITLE CHIEF CHEMIST
 COMPANY DRAVO LIME COMPANY - LONGVIEW DIVISION
 ADDRESS P.O. BOX 37
 SAGINAW, AL 35137
 PHONE: (205) 864-2456
 WATS NO.: (800) 633-4889

DATE PREPARED: January 1, 1995

PHPA

SODIUM POLYACRYLAMIDE

MSDS DESCRIPTION

Integrity PHPA is an anionic high molecular weight polyacrylamide/acrylate. Integrity PHPA is liquified in an emulsion form.

SPECIFICATIONS

Appearance:	White liquid emulsion
pH of 1% Solution:	6.0 - 7.5
Flash Point:	>200° F
Specific Gravity:	1.00 - 1.05

APPLICATION

Integrity PHPA is primarily designed as a drilling fluid additive to selectively flocculate, and provide shale stabilization. It also reduces total drilling cost by increasing penetration and decreasing bit wear. Integrity PHPA also provides lubricity and excellent hole cleaning and is extremely beneficial in directional and horizontal drilling.

RECOMMENDED TREATMENT

Integrity PHPA is compatible with other polymers including vinylamide copolymers, sulfonated styrene-based CMC, HEC, Xanthan Gum, Guar, modified starches, and other chemicals such as lignites and lignosulfonates. It can be used in fresh, KCL, and salt water based drilling fluids. Integrity PHPA is normally used at 0.75-1.5 lbs./bbl.

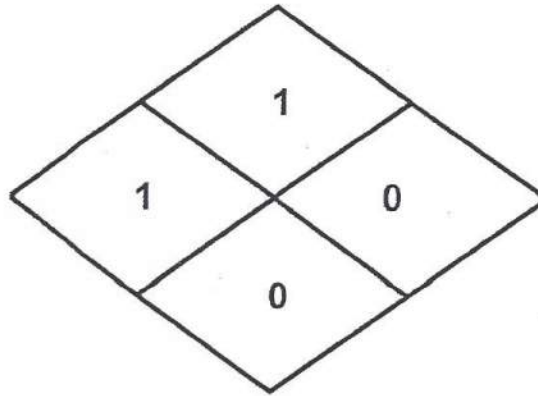
PACKAGING, HANDLING AND STORAGE

Integrity PHPA comes packaged in 5 gallon containers with wide mouth easy pour resealable lids. Do not store near open flames or near strong oxidizing agents.

agrity Industries, Inc.
P.O. Box 5342

Kingsville
361-595-5561
361-595-5588

TX 78363



3060 PHPA

Material Safety Data Sheet

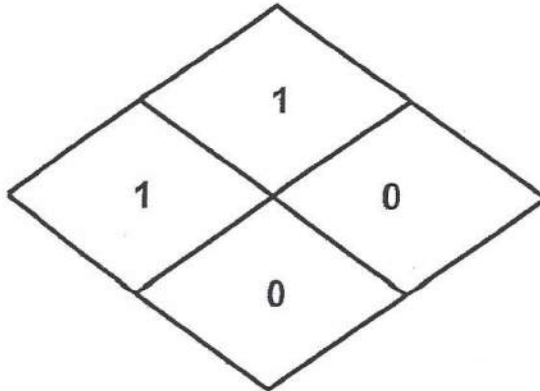
Page 7

	SECTION 3.0
Boiling Point	347 F
Freezing Point	N/A
Specific Gravity	1.0
Vapor Pressure (mm Hg)	N/A
Vapor Density	N/A
Solubility in H ₂ O	Appreciable
Appearance	White viscous liquid
Odor	Slight hydrocarbon
	SECTION 4.0
Stability	Stable under normal conditions.
Incompatibility	Strong oxidizers, slowly reacts with metals such as iron, copper, and aluminum.
Hazardous Decomposition Products	Combustion may produce oxides of carbon, nitrogen, and smoke
Hazardous Polymerizations	Will not occur
	SECTION 5.0
Flash Point	265 F
Extinguishing Media	Water, Dry Chemical, Foam, CO ₂
Special Fire Fighting Procedures	Normal firefighting procedures
Unusual Fire Hazards	None known
pH	N/A
	SECTION 6.0
Inhalation	Move to well ventilated area; if breathing difficulties persist after 15 minutes, seek medical help
Eye Contact	Wash eye thoroughly for 15 minutes; if irritation persists, seek medical help.
Skin Contact	Wash exposed area with soap & water
Ingestion	Ingesting large quantities can be slightly toxic, do not induce vomiting, drink water to dilute, seek medical assistance.
	SECTION 7.0
Acute	May irritate eyes, respiratory, digestive tracts, including nausea, vomiting, drowsiness, and headache.
Chronic	Prolong exposure may damage central nervous system, heart, liver, and create blood disorder.
	SECTION 8.0
Accidental Spill Procedures	Absorb with inert material and dispose of according to local, state, and federal regulations.
Handling & Storage	Store in well ventilated area.

Integrity Industries, Inc.
P. O. Box 5342

Kingsville
361-595-5561
361-595-5588

TX 78363



3060 PHPA

Material Safety Data Sheet

Respiratory Protection	SECTION 9.0
Ventilation	NIOSH approved organic respirator in mist conditions
Exhaust	Desired
Protective Gloves	Mechanical
Eye Protection	Rubber gloves
Other Protection	Safety Glasses, Goggles
	Eye wash/Safety shower

DOT Proper Shipping Name	SECTION. 10.0
DOT Hazard Class or Division	Not Regulated
DOT Identification Number	Not Hazardous
DOT Packaging Group	N/A
Type Label(s) Required or Exemption Nu	N/A
	None

DISCLAIMER	SECTION. 11.0
DISCLAIMER	SOME INFORMATION PROVIDED HEREIN WAS DRAWN FROM SOURCES OTHER THAN INTEGRITY INDUSTRIES.
DISCLAIMER	THE INFORMATION PROVIDED HEREIN IS BELIEVED BY INTEGRITY INDUSTRIES TO BE CORRECT AND RELIABLE; NO EXPRESSED OR IMPLIED WARRANTY IS PROVIDED HOWEVER.
DISCLAIMER	INTEGRITY INDUSTRIES ASSUMES NO RESPONSIBILITY AND DENIES ALL LIABILITY FOR ANY LOSS, DAMAGE, OR EXPENSE CONNECTED WITH CUSTOMERS' METHOD OF HANDLING, STORAGE, USE, AND DISPOSAL OF THIS PRODUCT.
DISCLAIMER	THE MSDS INFORMATION PROVIDED HEREIN IS APPLICABLE ONLY TO THIS PRODUCT.

Revised Date	SECTION 1.0
Supercedes	02/11/02
	06/15/98

Trade Name	SECTION 2.0
Synonyms/Other Designations	CAUSTIC SODA
Chemical Formula	ANHYDROUS SODIUM HYDROXIDE, SODIUM HYDROXIDE, CAUSTIC SODA
Hazard(s)	NaOH - CAS# 001310-73-2
	SODIUM HYDROXIDE, SOLID

Boiling Point	SECTION 3.0
	1390 C

ChemSol

MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTION

1.) CHEMICAL PRODUCT AND COMPANY INFORMATION

CHEMICAL NAME: SODIUM ACID PYROPHOSPHATE
SYNONYMS: SAPP

COMPANY NAME: CHEMSOL, LLC
601 CARLSON PARKWAY, SUITE 400
MINNETONKA, MN 55305

CONTACT: JAKE BOWLSBY
COMPANY PHONE: 952-807-7459
COMPANY FAX: 952-807-7479
COMPANY EMAIL: JAKE@CHEMSOLUSA.COM

2.) COMPOSITION, INFORMATION ON INGREDIENTS

PRODUCT: SAPP
CHEMICAL NAME: SODIUM ACID PYROPHOSPHATE
CAS NUMBER: 7758-16-9
CONTENTS: 100%

3.) HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. AVOID CONTACT WITH EYES, SKIN, AND CLOTHING. AVOID BREATHING AIRBORNE PRODUCT. KEEP CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.
THIS PRODUCT IS A/AN WHITE POWDER. A NUISANCE DUST. SLIPPERY WHEN WET. NO SIGNIFICANT IMMEDIATE HAZARDS FOR EMERGENCY RESPONSE PERSONNEL ARE KNOWN.

ACUTE EFFECTS OF OVEREXPOSURE:

SKIN CONTACT: MAY BE IRRITATING TO THE SKIN.
EYE CONTACT: MAY BE IRRITATING TO THE EYES.
INHALATION: MAY BE IRRITATING TO THE RESPIRATORY TRACT.
INGESTION: MAY CAUSE GASTRIC DISTRESS, NAUSEA AND VOMITING.

SUBCHRONIC AND CHRONIC EFFECT OF OVEREXPOSURE:

IARC: NOT LISTED. OSHA: NOT REGULATED. NTP: NOT LISTED.

-1-

CHEMSOL, LLC. • 601 CARLSON PARKWAY, SUITE 400
MINNETONKA, MN 55305 • PH: 952.807.7459 • FX: 952.807.7479

MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

OTHER HEALTH HAZARD CATEGORIES

KNOWN CARCINOGEN - NA

SUSPECT CARCINOGEN - NA

MUTAGEN - NA

TARGET ORGAN TOXIN: RESPIRATORY, LUNGS. SKIN. EYES.

CANADIAN WHMIS- DOES NOT MEET CRITERIA FOR ANY OF THE ABOVE CATEGORIES.

4.) FIRST AID MEASURES

SKIN CONTACT:

WASH WITH PLENTY OF WATER AND SOAP WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE USE. IF IRRITATION PERSISTS SEEK MEDICAL ATTENTION.

EYE CONTACT:

IN CASE OF CONTACT, IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER AND LOWER EYELIDS. IF IRRITATION PERSISTS SEEK MEDICAL ATTENTION.

INGESTION:

DO NOT INDUCE VOMITING. IF CONSCIOUS AND ALERT, RINSE MOUTH AND DRINK 2-4 CUPS OF MILK OR WATER. WASH MOUTH WITH WATER. SEEK MEDICAL ATTENTION IF IRRITATION OCCURS.

INHALATION:

MOVE TO FRESH AIR IMMEDIATELY. IF COUGH OR OTHER SYMPTOMS APPEAR SEEK MEDICAL ATTENTION.

5.) FIRE FIGHTING MEASURES

AUTO IGNITION TEMP (F): N/D

FLAMIBILITY LIMIT – LOWER (%): N/D

FLAMIBILITY LIMIT – UPPER (%): N/D

EXTINGUISH MEDIA:

CARBON DIOXIDE (CO2). DRY CHEMICALS. FOAM. WATER SPRAY, FOG OR MIST.

SPECIAL FIRE FIGHTING PROCEDURES:

NO UNUSUAL FIRE OR EXPLOSION HAZARDS NOTED.

HAZARDOUS COMBUSITON PRODUCTS:

THIS MATERIAL IS NOT COMBUSTIBLE. FIRE OR HIGH TEMPERATURES CREATE:
OXIDES OF: SODIUM. PHOSPHORUS.

-2-

Chemical
Solutions
Economic
Answers

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MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

6.) ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

WEAR PROPER PERSONAL PROTECTIVE EQUIPMENT (SEE MSDS SEC.8)

SPILL CLEAN-UP PROCEDURES:

AVOID GENERATING AND SPREADING DUST. SHOVEL INTO DRY CONTAINERS. COVER AND MOVE THE CONTAINERS. FLUSH THE AREA WITH WATER. DO NOT CONTAMINATE DRAINAGE OR WATERWAYS. REPACKAGE OR RECYCLE IF POSSIBLE.

7.) HANDLING AND STORAGE

HANDLING PRECAUTIONS:

AVOID HANDLING CAUSING GENERATION OF DUST. WEAR FULL PROTECTIVE CLOTHING FOR PROLONGED EXPOSURE AND OR/HIGH CONCENTRATIONS. EYE WASH AND EMERGENCY SHOWER MUST BE AVAILABLE AT THE WORK PLACE. WASH HANDS OFTEN AND CHANGE CLOTHING WHEN NEEDED. PROVIDE GOOD VENTILATION. MECHANICAL OR LOCAL EXHAUST VENTILATION IS REQUIRED.

STORAGE PRECAUTIONS:

STORE AT MODERATE TEMPERATURES IN DRY, WELL VENTILATED AREA. KEEP IN ORIGINAL CONTAINER.

8.) EXPOSURE CONTROLS, PERSONAL PROTECTION

INGREDIENT NAME:

SODIUM ACID PYROPHOSPHATE

INGREDIENT COMMENTS:

EXPOSURE LIMITS FOR PARTICULATES NOT OTHERWISE CLASSIFIED (PNO) APPLY TO DUST/MIST/AEROSOL/ OF THE PROPRIETARY INGREDIENTS THIS PRODUCT. TLV: 3 MG/M3 RESP DUST; PEL: 5 MG/M3 RESP. DUST.

PROTECTIVE EQUIPMENT

GLOVES, EYE SHEILD

-3-

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MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

ENGINEERING CONTROLS:

USE APPROPRIATE ENGINEERING CONTROLS SUCH AS, EXHAUST VENTILATION AND PROCESS ENCLOSURE, TO REDUCE AIR CONTAMINATION AND KEEP WORKER EXPOSURE BELOW THE APPLICABLE LIMITS.

VENTILATION:

SUPPLY NATURAL OR MECHANICAL VENTILATION ADEQUATE TO EXHAUST AIRBORNE PRODUCT AND KEEP EXPOSURE BELOW THE APPLICABLE LIMITS.

RESPIRATORS:

USE AT LEAST A NIOSH-APPROVED N95 HALF-MASK DISPOSABLE OR REUSABLE PARTICULATE RESPIRATOR. IN WORK ENVIRONMENTS CONTAINING OIL MIST/AEROSOL USE AT LEAST A NIOSH-APPROVED P95 HALF-MASK DISPOSABLE OR REUSABLE PARTICULATE RESPIRATOR.

EYE PROTECTION:

WEAR DUST RESISTANT SAFETY GOGGLES WHERE THERE IS DANGER OF EYE CONTACT.

PROTECTIVE CLOTHING:

WEAR APPROPRIATE CLOTHING TO PREVENT REPEATED OR PROLONGED SKIN CONTACT.

HYGENIC WORK PRACTICES:

WASH PROMPTLY WITH SOAP AND WATER IF SKIN BECOMES CONTAMINATED. CHANGE WORK CLOTHING DAILY IF THERE IS ANY POSSIBILITY OF CONTAMINATION.

9.) PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	POWDER, DUST.
COLOR:	WHITE
ODOR:	ODORLESS OR NO COLOR
SOLUBILITY DESCRIPTION:	SOLUBLE IN WATER
SOLUBILITY VALUE (G/100G H ₂ O 68 F):	13
MELT./FREEZE. POINT (F, INTERVAL):	428
DENSITY/SPECIFIC GRAVITY (G/ML)	1.862
BULK DENSITY:	1095 KG/M ³
VAPOR DENSITY (AIR=1)	N/A
VAPOR PRESSURE:	N/A
PH VALUE, DILUTED SOLUTION:	4.3 CONCENTRATION: 1%

MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

10.) STABILITY AND REACTIVITY

CONDITIONS TO AVOID: NA

DECOMPOSITION PRODUCTS: NO SPECIFIC PRODUCTS NOTED.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CHEMICAL STABILITY: STABLE UNDER NORMAL TEMPERATURE AND PRESSURE.

MATERIALS TO AVOID: BASES, ALKALIS (INORGANIC).

11.) TOXICOLOGICAL INFORMATION

COMPONENT: SODIUM ACID PYROPHOSPHATE

TOXIC DOSE – LD 50: 2650

TOXIC DOSE – LD 50: >300 MG/KG (SKN-RBT)

12.) ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:

NO ECOLOGICAL INFORMATION IS AVAILABLE FOR THIS PRODUCT.

13.) DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT

MUST CONSULT STATE AND LOCAL HAZARDOUS WASTE REGULATIONS TO ENSURE COMPLETE AND ACCURATE CLASSIFICATION. DISPOSE OF IN ACCORDANCE WITH ANY LOCAL, STATE, AND FEDERAL REGULATIONS. PREVENT RUN-OFF TO SEWERS.

RCRA P-SERIES: NONE LISTED

RCRA U-SERIES: NONE LISTED

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MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

DISPOSAL METHODS

RECOVER AND RECLAIM OR RECYCLE, IF PRACTICAL. SHOULD THIS PRODUCT BECOME A WASTE, DISPOSE OF IN A PERMITTED INDUSTRIAL LANDFILL. ENSURE THAT CONTAINERS ARE EMPTY BY RCRA CRITERIA PRIOR TO DISPOSAL IN A PERMITTED INDUSTRIAL LANDFILL.

14.) TRANSPORTATION INFORMATION

PRODUCT RQ:	N/A
U.S. DOT:	
U.S. DOT CLASS:	NOT REGULATED
CANADIAN TRANSPORTATION	
TDGR:	NOT REGULATED
SEA TRANSPORT:	NOT REGULATED
AIR TRANSPORT	
ICAO CLASS:	NOT REGULATED

15.) REGULATORY INFORMATION

REGULATORY STATUS OF INGREDIENTS:

NAME:	CAS No:
SODIUM ACID PYROPHOSPHATE	7758-16-9

TSCA:
YES

SARA 302/313:
No

DSL (CAN):
YES

US FEDERAL REGULATION:

WASTE CLASSIFICATION:

NOT A HAZARDOUS WASTE BY US RCRA CRITERIA. SEE SECTION 13

ChemSol

MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

REGULATORY STATUS:

THIS PRODUCT OR ITS COMPONENTS, IF A MIXTURE E, IS SUBJECT TO FOLLOWING REGULATIONS (NOT MEANT TO BE ALL INCLUSIVE – SELECTED REGULATIONS REPRESENTED):

SECTION 313: THIS PRODUCT DOES NOT CONTAIN TOXIC CHEMICAL SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

SARA 311 CATEGORIES:

1: IMMEDIATE (ACUTE) HEALTH EFFECTS.

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON OR ARE EXEMPT FROM THE FOLLOWING INTERNATIONAL CHEMICAL REGISTRIES:
TSCA (U.S.), DSL (CAN.), EINECS (S. KOREA), AICS (AUSTRALIA).

STATE REGULATIONS:

STATE REGULATORY STATUS:

THIS PRODUCT OR ITS COMPONENTS, IF A MIXTURE E, IS SUBJECT TO FOLLOWING REGULATIONS (NOT MEANT TO BE ALL INCLUSIVE – SELECTED REGULATIONS REPRESENTED): NONE

16.) OTHER INFORMATION

NPCA HMIS HAZARD INDEX: 1 SLIGHT HAZARD
FLAMMABILITY: 0 MINIMAL HAZARD
REACTIVITY: 0 MINIMAL HAZARD
NPCA: E- GLASSES, GLOVES, RESPIRATOR

THIS INFORMATION WAS PREPARED BY THE CHEMSOL, LLC TECHNICAL SERVICES DEPARTMENT. ALL INFORMATION HEREIN IS CONSIDERED TO BE ACCURATE AND PRESENTED IN IT ENTIRETY. ADDITIONAL INFORMATION WILL BE FURNISHED UPON REQUEST TO ASSIST THE USER; HOWEVER, NEITHER WARRANTY, EITHER EXPRESSED OR IMPLIED, NOR LIABILITY OF ANY NATURE WITH RESPECT TO THIS PRODUCT OR TO THE DATA HEREIN IS MADE OR INCURRED HEREUNDER.

-7-

CHEMSOL, LLC. • 601 CARLSON PARKWAY, SUITE 400
MINNETONKA, MN 55305 • PH: 952.807.7459 • FX: 952.807.7479

SAFETY DATA SHEET

BENTONITE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: BENTONITE

APPLICATIONS: Viscosifier.

EMERGENCY TELEPHONES: 001 281 561 1600 (USA)

SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ

TELEPHONE: 44 (0)1224 - 584336

FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH: RISK:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	0-15 %	
BENTONITE	1302-78-9	85-100 %	

COMPOSITION COMMENTS:

This product contains a small quantity of quartz, crystalline silica.

3. HAZARDS IDENTIFICATION:

This product contains a small quantity of quartz. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

This material is not combustible. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Not relevant.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. May be slippery when wet. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT NAME:**QUARTZ, CRYSTALLINE SILICA
BENTONITE**CAS No.:**14808-60-7
1302-78-9**STD:**MEL
NUI**LT EXP. 8 HRS:**0.3 mg/m³**ST EXP. 15 MIN:****INGREDIENT COMMENTS:**MEL = Maximum Exposure Limit. * OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. OES TWA 4mg/m³ respirable dust, 10mg/m³ total dust.**PROTECTIVE EQUIPMENT:****VENTILATION:** Provide adequate general and local exhaust ventilation.**RESPIRATORS:** Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).**PROTECTIVE GLOVES:**

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:**APPEARANCE:**

Powder, dust.

COLOUR:

Cream. to Grey.

ODOUR/TASTE:

Odourless or no characteristic odour.

SOLUBILITY DESCRIPTION:

Insoluble in water.

ChemSol

Chemical Solutions/Economic Answers

601 Carlson Parkway, Suite 400 • Minnetonka, MN 55305
Phone (952) 807-7446 • Fax (952) 807-7479
www.chemsolusa.com

Material Safety Data Sheet
Caustic Soda (99% Beads)
BP/US/FCC/USP24/EU/EU330

Synonyms: Soda lye, lye, white caustic, aetznatron, ascarite, Collo-Grillrein, Sodium Hydroxide Pellets, NaOH

Molecular Formula: NaOH

CAS No: 1310-73-2

EC No: 215-185-5

Manufactured in Tianjin, China by Wanjie International Co., Limited

Supplied by: ChemSol LLC

601 Carlson Parkway, Suite 400

Minnetonka, MN 55305

24 Emergency Contact Information: CHEMTREC 1-800-424-9300

1. Physical Data:

Appearance: Odorless white beads (often sold as pearls/beads)

Melting Point: 318 C

Vapor Pressure: 1390 C

Specific Gravity: 2.12

Water Solubility: High (Note: Dissolution in water is highly exothermic)

2. Stability

Stable. Incompatible with a wide variety of materials including many metals, ammonium compounds, cyanides, acids, nitro compounds, phenols, combustible organics. Hygroscopic. Heat of solution is very high and may lead to a dangerously hot solution if small amounts of water are used. Absorbs carbon dioxide from the air.

3. Toxicology

Very corrosive. Causes severe burns. May cause serious permanent eye damage. Very harmful by ingestion. Harmful by skin contact or by irritation of dust. Typical TLV 2 mg m-1.

Toxicology Data

IPR-MUS LD50 40 mg kg-1

Irritation Data

EYE-MKY 1%/24h sev

SKN-RBT 500mg/24h sev

EYE-RBT 1% sev

Risk Phrases

R35.

4. Ecological Information

Ecotoxicity Information

LC₁₀₀ Cyprinus Carpio 180ppm/24hr @ 25C TLm, mosquito fish 125ppm/96hr (fresh water); TLm Bluegill 99 mg/L/48 hr (tap water)

Carcinogenicity

Sodium hydroxide is not classified as a carcinogen by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as a carcinogen by OSHA (Occupational Safety and Health Administration), and not listed as a carcinogen by NTP (National Toxicology Program).

Persistence & Degradation

Aquatic: In the case of solid, anhydrous NaOH spill on soil, ground water pollution will occur if precipitation occurs prior to clean up. Precipitation will dissolve some of the solid and create an aqueous solution of NaOH, which then would be able to infiltrate the soil. Degrades readily by reacting with natural carbon dioxide in the air. Does not bioaccumulate.

5. Fire and Explosion Hazard Data

General

Sodium Hydroxide will not burn or support combustion. The reaction of sodium hydroxide with water and a number of commonly encountered materials can generate sufficient heat to ignite nearby combustible materials. Sodium Hydroxide can react with metals, such as aluminum tin and zinc, to form flammable hydrogen gas.

Flashpoint

None

Extinguishing Media

Use extinguishing media suitable for the surrounding fire. If water is used, care should be taken, since it can generate heat and cause and cause spattering if applied directly to Sodium Hydroxide.

Firefighting Equipment

Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. Chemical resistance clothing (e.g. chemical splash suit) and positive pressure self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) may be necessary.

Firefighting Procedures

Evacuate area and fight fire from a safe distance or a protected location. Approach fire from area if it can be done without risk. Water can be used with extreme caution to extinguish fire in an area where Sodium Hydroxide is stored. The water must not come into contact with the Sodium Hydroxide. Water can be used in flooding quantities as a spray of fog to keep fire-exposed containers cool and absorb heat. At high temperatures, fuming may occur, giving off a strong, corrosive gas. Do not enter without wearing specialized protective equipment suitable for the situation.

Evacuation

If tank truck involved in a fire, ISOLATE and consider evacuation of one-half mile radius.

Effects of Overexposure**Acute Eye Contact**

Extremely corrosive. The severity of injury increases with the concentration (for solutions), the duration of exposure, and the speed of penetration into the eye. The solid will absorb moisture from the eye, or water being used for removal, forming a highly concentrated solution. Damage can range from severe irritation and mild scarring to blistering, disintegration, ulceration, severe scarring and clouding.

Skin Contact

Sodium Hydroxide is extremely corrosive and is capable of scarring. It can penetrate to deeper layers of the skin and corrosion will continue until removed. The severity of injury depends on duration of exposure. The solid will also cause severe burns as it can absorb moisture from the skin, air and rinse water used for removal. Burns may not be immediately painful; onset of pain may be delayed minutes to hours. Several human studies and case reports describe the corrosive effects of Sodium Hydroxide.

Ingestion

Severe pain; burning of the mouth, throat and esophagus; vomiting; diarrhea; collapse and possible death may result.

Inhalation

Sodium Hydroxide does not readily form a vapor and inhalation exposure is only likely to occur to aerosols since the solid absorbs moisture from the air and will only form a dust under severe agitation. Due to its corrosive nature, Sodium Hydroxide aerosols could cause pulmonary edema (life threatening lung injury).

Chronic Effects

SKIN: Repeated or prolonged skin contact would be expected to cause drying, cracking, and inflammation of the skin. There was no trend of increased mortality in relation to duration (up to 30 years) or intensity of exposure to (0.5 mg/m³ to 1.5 mg/m³) among 291 workers exposed to Sodium Hydroxide dust during the production of flakes or beads of concentrated Sodium Hydroxide from chlorine cell effluent.

Existing Medical Conditions Possibly Aggravated by Exposure

Asthma, bronchitis, emphysema and other lung diseases and chronic nose, sinus or throat conditions. Skin irritation may be aggravated in individual's with existing skin disorders.

6. Recommended First Aid Measures

Eye Exposure

Immediately flush eyes with running water for a minimum of 20 minutes and upward to 60 minutes is recommended. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention immediately. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Skin Exposure

Immediately flush skin with running water for at least 20 minutes and upward to 60 minutes is recommended. Under running water remove contaminated clothing, jewelry, and shoes. If irritation persists obtain medical attention. Discard contaminated clothing and shoes in a manner, which limits further exposure.

Inhalation Exposure

Move victim to fresh air. Give artificial respiration only if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance: induce artificial respiration with the aid of a pocket mask equipped with a one way valve or other proper respiratory medical device. Give Cardiopulmonary Resuscitation (CPR) only if there is no pulse and no breathing. Obtain medical attention immediately. Symptoms can be delayed up to 48 hours after exposure.

Ingestion Exposure

Do not induce vomiting. If victim is alert and not convulsing, rinse mouth and give as much water as possible to dilute material (8 to 10 oz.). If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Immediately transport victim to an emergency facility.

Notes to Physician

Treat symptomatically

7. Accidental Release Measures

Evacuation Procedure & Safety

Restrict access to area until completion of clean up. Ensure trained personnel conduct clean up.

Containment of Spills

Remove all ignition sources (no smoking, flares, sparks or flames). All equipment should be grounded and non-sparking. Ventilate area. Prevent entry into sewers or waterways. Shovel or sweep up dry Sodium Hydroxide for recycling or disposal. Neutralize the final traces and flush with water.

Land Spill: Cover solids with a plastic sheet to prevent dissolving in rain or fire fighting water. Solutions should be contained by diking with inert material, such as sand or earth.

Water Spill: Neutralize with dilute acid.

Deactivating Chemicals:

Waste Disposal:

Weak acid solutions (vinegar, hydrochloric or sulfuric acid). Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste water with normal garbage or to sewer systems. Clean up material may be a RCRA Hazardous Waste or disposal. Spills are subject to CERCLA reporting requirements: RQ=1000lbs. (454 kgs).

8. Handling and Storage

Handling

Use smallest possible amounts in designated area with adequate ventilation. Keep containers closed when not in use. Empty containers may contain hazardous residues. Transfer solids using tools or equipment, which are corrosion-resistant. Cautiously, transfer which are corrosion-resistant. Cautiously, transfer into sturdy containers made of compatible materials. Never return contaminated material to its original container. Considerable heat is generated when diluted with water. Proper handling procedures must be followed to prevent vigorous boiling, splattering or violent eruption of the diluted solution. Never add water to caustic. Always add caustic to water and provide agitation. When mixing with water, stir small amounts in slowly. Use cold water to prevent excessive heat generation. In general, keep solid Sodium Hydroxide away from water. Post "DO NOT USE WATER" in area of use to prevent accidental contact.

Storage

Store in a cool, dry, well-ventilated area. This material absorbs water. Keep containers tightly closed when not in use and when empty. Protect from damage. Store away from incompatible materials such as strong acids, nitroaromatic, nitroparaffinic or organohalogen compounds. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. Containers made of nickel alloys are preferred. Steel containers are acceptable if temperatures are not elevated. Nickel is the preferred metal for handling this product. Plastics or plastic-lined steel, or FRP tanks of derakane vinyl ester resin may be suitable. If indoor storage of pearl caustic is unavailable, the pallets should be protected against the extremes of weather. Do not expose containers to temperature above 40 C (104 F).

9. Transportation Information

UN Major Hazard class 8.0. Packing Group II. UN No. 1823. EMS No 8.0-06.

10. Personal Protection

Safety glasses, adequate ventilation, Neoprene or PVC Gloves.

Safety Phrases

S26, S37, S39, S45.

MSDS Status: Revised December 3, 2006 by Technical Services Department of ChemSol LLC.

Information contained herein is believed to be accurate. However, it is provided solely for the customer's consideration, investigation and verification. ChemSol LLC hereby specifically disclaims any and all warranties expressed or implied, regarding the accuracy and completeness of such information, and makes no representation with respect to thereto.

SAFETY DATA SHEET

BARITE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: BARITE
APPLICATIONS: Weighting agent.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
BARITE	7727-43-7	89-95 %		
QUARTZ, CRYSTALLINE SILICA	14808-60-7	1-5 %		

COMPOSITION COMMENTS:

This product contains a small quantity of quartz, crystalline silica.

3. HAZARDS IDENTIFICATION:

This product contains a small quantity of quartz. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

This material is not combustible. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Not relevant.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. May be slippery when wet. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT NAME:	CAS No.:	STD:	LT EXP. 8 HRS:	ST EXP. 15 MIN:
BARITE	7727-43-7	NUI		
QUARTZ, CRYSTALLINE SILICA	14808-60-7	MEL.	0.3 mg/m ³	

INGREDIENT COMMENTS:

MEL = Maximum Exposure Limit. * OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. OES = Occupational Exposure Standard.

PROTECTIVE EQUIPMENT:**VENTILATION:** Provide adequate general and local exhaust ventilation.**RESPIRATORS:** Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).**PROTECTIVE GLOVES:**

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.
COLOUR:	Tan. to Grey.
ODOUR/TASTE:	Odourless or no characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.

MELT/FREEZ. POINT (°C, interval): 1580
DENSITY/SPECIFIC GRAVITY (g/ml): 4.2 - 4.25 TEMPERATURE (°C): 20
BULK DENSITY: 1714 - 2163 kg/m³

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid wet and humid conditions.

MATERIALS TO AVOID:
No incompatible groups noted.

HAZARDOUS DECOMP. PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION:

TOXICOLOGICAL DATA:

Acute toxicity. LD50. Oral. Rat. > 20000 mg/kg

INHALATION: Dust may irritate respiratory system or lungs. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

HEALTH WARNINGS:

This product contains small quantities of quartz. Prolonged inhalation of high concentrations may damage respiratory system. Because of quantity and composition, the health hazard is small.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:

Not regarded as dangerous for the environment. This material is a naturally occurring mineral.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:

ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:

RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:

SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: S-22 Do not breathe dust.
S-38 In case of insufficient ventilation, wear suitable respiratory equipment.

UK REGULATORY REFERENCES: The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations 1993. IARC Monographs, Vol.68, 1997.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 0 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 28-1-99

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness, therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

SAFETY DATA SHEET

LIGNITE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: LIGNITE
APPLICATIONS: Thinner.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	0-5 %		
LIGNITE	1415-93-6	95-100 %		

COMPOSITION COMMENTS:

This product contains a small quantity of quartz, crystalline silica.

3. HAZARDS IDENTIFICATION:

This product contains a small quantity of quartz. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water. Get medical attention if any discomfort continues.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Fire can be extinguished using: Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

Use supplied air respirator if substance is involved in a fire. Water spray may be used to flush spills away from exposures and dilute spills to non-flammable mixtures.

UNUSUAL FIRE & EXPLOSION HAZARDS:

High concentrations of dust may form explosive mixture with air.

HAZARDOUS COMBUSTION PRODUCTS:

Asphyxiating gases/vapors/fumes.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Avoid generation and spreading of dust. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT NAME:	CAS No.:	STD:	LT EXP. 8 HRS:	ST EXP. 15 MIN:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	MEL.	0.3 mg/m ³	
LIGNITE	1415-93-6	NUI.		

INGREDIENT COMMENTS:

MEL = Maximum Exposure Limit. * OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. OES TWA 4mg/m³ respirable dust, 10mg/m³ total dust.

PROTECTIVE EQUIPMENT:

VENTILATION: Provide adequate general and local exhaust ventilation.

RESPIRATORS: Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).

PROTECTIVE GLOVES:

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE: Powder, dust.
COLOUR: Dark brown. to Black.
ODOUR/TASTE: Slight.
SOLUBILITY DESCRIPTION: Soluble in water.
SOLUBILITY VALUE (g/100g H₂O 20°C): 46
DENSITY/SPECIFIC GRAVITY (g/ml): 1.8 **TEMPERATURE (°C):** 25
pH-VALUE, DILUTED SOLUTION: 5 **CONCENTRATION (%M):**
FLAMMABILITY LIMIT - LOWER(%): May form explosive dust clouds in air.

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid heat, flames and other sources of ignition.

MATERIALS TO AVOID:
Strong oxidizing agents.

HAZARDOUS DECOMP. PRODUCTS:
Asphyxiating gases/vapours/fumes of: Oxides of: Carbon.

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

HEALTH WARNINGS:
This product contains small quantities of quartz. Prolonged inhalation of high concentrations may damage respiratory system. Because of quantity and composition, the health hazard is small.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Not regarded as dangerous for the environment.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: S-22 Do not breathe dust.
S-38 In case of insufficient ventilation, wear suitable respiratory equipment.

UK REGULATORY REFERENCES: The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations 1993. IARC Monographs, Vol.68, 1997.

16. OTHER INFORMATION:

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 15-02-99

DISCLAIMER:

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MATERIAL SAFETY DATA SHEET

SAFE-CARB (all grades)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: SAFE-CARB (all grades)
CHEMICAL CLASS: Naturally occurring mineral.
APPLICATIONS: Oil well drilling fluid additive. Bridging and weighting agent.
EMERGENCY TELEPHONE: 281-561-1600
SUPPLIER: Supplied by a Business Unit of
 M-I L.L.C.
 P.O. Box 42842, Houston, Texas 77242-2842
 See cover sheet for local supplier.
TELEPHONE: 281-561-1509
FAX: 281-561-7240
CONTACT PERSON: Sam Hoskin

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Silica, crystalline, quartz	14808-60-7	0-2 %		
Calcium carbonate	1317-65-3	60-100		

COMPOSITION COMMENTS:
 Ground marble.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a/an white powder. Dike and contain spills. Keep out of sewers and waterways. No significant immediate hazards for emergency response personnel are known.

ACUTE EFFECTS:

HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

~~INHALATION: May be irritating to the respiratory tract if inhaled.~~

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: May be irritating to the skin.

~~EYES: May be irritating to the eyes.~~

CHRONIC EFFECTS:

CARCINOGENICITY:

IARC: Not listed. OSHA: Not regulated. NTP: Not listed.

ATTENTION! CANCER HAZARD. CONTAINS CRYSTALLINE SILICA WHICH CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

IARC Monographs, Vol. 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

ROUTE OF ENTRY:

Inhalation. Skin and/or eye contact.

TARGET ORGANS:

Respiratory system, lungs. Skin. Eyes.

4. FIRST AID MEASURES

GENERAL: Persons seeking medical attention should carry a copy of this MSDS with them.

INHALATION: Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

INGESTION: Drink a couple of glasses water or milk. Do NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person. Get medical attention.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES

AUTO IGNITION TEMP. (*F): N/D
FLAMMABILITY LIMIT - LOWER(%): N/D
FLAMMABILITY LIMIT - UPPER(%): N/D

EXTINGUISHING MEDIA:

Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

No specific hazardous combustion products noted.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Wear proper personal protective equipment (see MSDS Section 8).

SPILL CLEAN-UP PROCEDURES:

Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS:

Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

INGREDIENT NAME:	CAS No.:	OSHA PEL:		ACGIH TLV:		OTHER:		UNITS:
		TWA:	STEL:	TWA:	STEL:	TWA:	STEL:	
Silica, crystalline, quartz	14808-60-7	*		0.1				mg/m ³ resp.dust
Calcium carbonate	1317-65-3	15		10				mg/m ³ total dust

INGREDIENT COMMENTS:

* OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite.

PROTECTIVE EQUIPMENT:



ENGINEERING CONTROLS:

Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

VENTILATION: Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

RESPIRATORS: Use at least a NIOSH-approved N95 half-mask disposable or reusable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator. For exposures exceeding 10 x PEL use a NIOSH-approved N100 Particulate Respirator.

PROTECTIVE GLOVES:

Use suitable protective gloves if risk of skin contact.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

PROTECTIVE CLOTHING:

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES:

Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE: Powder, dust.
COLOR: White.
ODOR: Odorless or no characteristic odor.
SOLUBILITY DESCRIPTION: Slightly soluble in water. Soluble in: Hydrochloric acid (HCl).
DENSITY/SPECIFIC GRAVITY (g/ml): 2.7 - 2.8 TEMPERATURE (°F): 68
VAPOR DENSITY (air=1): N/A
VAPOR PRESSURE: N/A TEMPERATURE (°F):

10. STABILITY AND REACTIVITY

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Not relevant.

HAZARDOUS POLYMERIZATION:
Will not polymerize.

POLYMERIZATION DESCRIPTION:
Not relevant.

MATERIALS TO AVOID:
Strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:
No toxicological data is available for this product.

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:
No ecological information is available for this product.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT:

This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Empty containers retain residues. All labeled precautions must be observed.

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

PRODUCT RQ: N/A

U.S. DOT:
U.S. DOT CLASS: Not regulated.

CANADIAN TRANSPORT:
TDGR CLASS: Not regulated.

SEA TRANSPORT:
IMDG CLASS: Not regulated.

AIR TRANSPORT:
ICAO CLASS: Not regulated.

15. REGULATORY INFORMATION

REGULATORY STATUS OF INGREDIENTS:

NAME:	CAS No:	TSCA:	CERCLA:	SARA 302:	SARA 313:	DSL(CAN):
Silica, crystalline, quartz	14808-60-7	Yes	No	No	No	Yes
Calcium carbonate	1317-65-3	Yes	No	No	No	NDSL

US FEDERAL REGULATIONS:
WASTE CLASSIFICATION:

Not a hazardous waste by U.S. RCRA criteria. See Section 13.

REGULATORY STATUS:

This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:

1. Immediate (Acute) Health Effects.
2. Delayed (Chronic) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:

TSCA (U.S.)

STATE REGULATIONS:
STATE REGULATORY STATUS:

This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

Pennsylvania Right-to-Know.

Illinois Right-to-Know.

New Jersey Right-to-Know.

PROPOSITION 65: This product contains the following chemical(s) considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer or reproductive toxicity, and for which warnings are now required:

Silica, crystalline. Arsenic (7440-38-2) <1 ppm; Lead (7439-92-1) <1 ppm.

CANADIAN REGULATIONS:

10337 - SAFE-CARB (all grades)

LABELS FOR SUPPLY:



REGULATORY STATUS:

This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations.

Canadian WHMIS Classification: D2A - Other Toxic Effects: Very Toxic Material

16. OTHER INFORMATION

NPCA HMIS HAZARD INDEX:

* 1 Slight Hazard

FLAMMABILITY:

0 Minimal Hazard

REACTIVITY:

0 Minimal Hazard

NPCA HMIS PERS. PROTECT. INDEX:

E - Safety Glasses, Gloves, Dust Respirator

USER NOTES:

N/A = Not applicable N/D = Not determined

INFORMATION SOURCES:

OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.

ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).

Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, Silica, Some Silicates, Coal Dust, and para-Aramid Fibrils, Vol. 68, World Health Organization, Lyon, France, 1997.

Product information provided by the commercial vendor(s).

PREPARED BY:

Sam Hoskin

REVISION No./Repl. MSDS of:

1 / February 14, 1997

MSDS STATUS:

Approved.

DATE: July 28, 1998

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SAFETY DATA SHEET

MICA

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: MICA
APPLICATIONS: Lost circulation material
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	0-5 %		
MICA	12001-26-2	95-100 %		

COMPOSITION COMMENTS:

This product contains a small quantity of quartz, crystalline silica.

3. HAZARDS IDENTIFICATION:

This product contains a small quantity of quartz. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

This material is not flammable. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Not relevant.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Avoid generation and spreading of dust. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT NAME:	CAS No.:	STD:	LT EXP. 8 HRS:	ST EXP. 15 MIN:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	MEL	0.3 mg/m ³	
MICA	12001-26-2	NUI		

INGREDIENT COMMENTS:

MEL = Maximum Exposure Limit * OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. OES TWA 4mg/m³ respirable dust, 10mg/m³ total dust.

PROTECTIVE EQUIPMENT:**VENTILATION:** Provide adequate general and local exhaust ventilation.**RESPIRATORS:** Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).**PROTECTIVE GLOVES:**

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:**APPEARANCE:**

Powder, dust.

COLOUR:

Varying. Grey to Silver.

ODOUR/TASTE:

Odourless or no characteristic odour.

SOLUBILITY DESCRIPTION:

Insoluble in water.

DENSITY/SPECIFIC GRAVITY (g/ml):	2.6 - 2.9	TEMPERATURE (°C): 20
pH-VALUE, DILUTED SOLUTION:	9.0	CONCENTRATION (%M): 10%

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Not known.

MATERIALS TO AVOID:
No incompatible groups noted.

HAZARDOUS DECOMP. PRODUCTS:
Not relevant.

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

HEALTH WARNINGS:
This product contains small quantities of quartz. Prolonged inhalation of high concentrations may damage respiratory system. Because of quantity and composition, the health hazard is small.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Not regarded as dangerous for the environment. This material is a naturally occurring mineral.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: S-22 Do not breathe dust.
S-38 In case of insufficient ventilation, wear suitable respiratory equipment.

UK REGULATORY REFERENCES: The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations 1993. IARC Monographs, Vol.68, 1997.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 0 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 15-2-99

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SAFETY DATA SHEET

SODIUM BICARBONATE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: SODIUM BICARBONATE
APPLICATIONS: Oil well drilling fluid additive.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

GROSS FORMULA: Sodium Hydrogen Carbonate
CAS No.: 144-55-8

COMPOSITION COMMENTS:

This product formulation is not classified as hazardous in accordance with the EU Directives.

3. HAZARDS IDENTIFICATION:

Not regarded as a health hazard under current legislation.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Carbon dioxide (CO₂). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

Use special protective clothing. Regular protection may not be safe. Use pressurized air mask if substance is involved in a fire.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Fire or high temperatures create: Oxides of: Carbon.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate water sources or sewer. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**

This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.

PROTECTIVE EQUIPMENT:

VENTILATION: Provide adequate general and local exhaust ventilation.

RESPIRATORS: If ventilation is insufficient, suitable respiratory protection must be provided. Dust filter P2 (for fine dust).

PROTECTIVE GLOVES:

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.	
COLOUR:	White.	
ODOUR/TASTE:	Odourless or no characteristic odour.	
SOLUBILITY DESCRIPTION:	Soluble in water.	
SOLUBILITY VALUE (g/100g H₂O 20°C):	7	
MELT/FREEZ. POINT (°C, interval):	270	
DENSITY/SPECIFIC GRAVITY (g/ml):	2.16	TEMPERATURE (°C): 20
BULK DENSITY:	801-1089 kg/m ³	
pH-VALUE, DILUTED SOLUTION:	8.3	CONCENTRATION (%M): 1%

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid wet and humid conditions.

MATERIALS TO AVOID:
Strong acids.

HAZARDOUS DECOMP. PRODUCTS:
Fire or high temperatures create: Oxides of Carbon.

11. TOXICOLOGICAL INFORMATION:

TOXIC DOSE - LD 50: 4220 mg/kg (oral rat)

INHALATION: Dust may irritate respiratory system or lungs.

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Contact M-F's Environmental Affairs Department for ecological information.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not Classified

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not Classified.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not Classified.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not Classified.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: Not classified.

STATUTORY INSTRUMENTS: Chemicals (Hazard Information and Packaging) Regulations. Control of Substances Hazardous to Health.

GUIDANCE NOTES: Occupational Exposure Limits EH40.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 0 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997). The Merck Index, 11. edition, 1989. Sigma-Aldrich Material Safety Data Sheets on CD-ROM.

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 22-7-99

REV. No./REPL. SDS GENERATED: 1

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SAFETY DATA SHEET

NUTPLUG (All Grades)

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: NUTPLUG (All Grades)
APPLICATIONS: Lost circulation material
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

GROSS FORMULA: Cellulose - Nutshells
CAS No.: 9004-34-6

COMPOSITION COMMENTS:

This product is classified as containing no hazardous ingredients according to the EC Directives.

3. HAZARDS IDENTIFICATION:

Not regarded as a health hazard under current legislation.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

Use pressurized air mask if substance is involved in a fire.

UNUSUAL FIRE & EXPLOSION HAZARDS:

High concentrations of dust may form explosive mixture with air.

HAZARDOUS COMBUSTION PRODUCTS:Asphyxiating gases/vapors/fumes. Carbon dioxide (CO₂). Carbon monoxide (CO).**6. ACCIDENTAL RELEASE MEASURES:****SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.**PROTECTIVE EQUIPMENT:****VENTILATION:** Provide adequate general and local exhaust ventilation.**RESPIRATORS:** Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P2 (for fine dust).**PROTECTIVE GLOVES:**

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.
COLOUR:	Brown.
ODOUR/TASTE:	Odourless or no characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.
DENSITY/SPECIFIC GRAVITY (g/ml):	1.35 TEMPERATURE (°C): 20
BULK DENSITY:	577 - 641 kg/m ³
FLAMMABILITY LIMIT - LOWER(%):	May form explosive dust clouds in air.

10. STABILITY AND REACTIVITY:**STABILITY:** Normally stable.

CONDITIONS TO AVOID:

Avoid heat, flames and other sources of ignition.

MATERIALS TO AVOID:

Strong oxidizing agents.

HAZARDOUS DECOMP. PRODUCTS:Fire or high temperatures create: Asphyxiating gases/vapours/fumes of: Carbon dioxide (CO₂). Carbon monoxide (CO).

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs. Inhalation may cause bronchial asthma in some personnel.**INGESTION:** May cause discomfort if swallowed.**SKIN:** Powder may irritate skin.**EYES:** Particles in the eyes may cause irritation and smarting.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:

Not regarded as dangerous for the environment.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:**ROAD TRANSPORT NOTES:** Not classified for road transport.**RAIL TRANSPORT:****RAIL TRANSPORT NOTES:** Not classified for rail transport.**SEA TRANSPORT:****SEA TRANSPORT NOTES:** Not classified for sea transport.**AIR TRANSPORT:****AIR TRANSPORT NOTES:** Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.**SAFETY PHRASES:** Not classified.

UK REGULATORY REFERENCES:

Chemicals (Hazard Information & Packaging) Regulations 1993. The Control of Substances Hazardous to Health Regulations 1988.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 1 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 10-12-98

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

PHPA

SODIUM POLYACRYLAMIDE

MSDS DESCRIPTION

Integrity **PHPA** is an anionic high molecular weight polyacrylamide/acrylate. Integrity **PHPA** is liquified in an emulsion form.

SPECIFICATIONS

Appearance:	White liquid emulsion
pH of 1% Solution:	6.0 - 7.5
Flash Point:	>200° F
Specific Gravity:	1.00 - 1.05

APPLICATION

Integrity **PHPA** is primarily designed as a drilling fluid additive to selectively flocculate, and provide shale stabilization. It also reduces total drilling cost by increasing penetration and decreasing bit wear. Integrity **PHPA** also provides lubricity and excellent hole cleaning and is extremely beneficial in directional and horizontal drilling.

RECOMMENDED TREATMENT

Integrity **PHPA** is compatible with other polymers including vinylamide copolymers, sulfonated styrene-based CMC, HEC, Xanthan Gum, Guar, modified starches, and other chemicals such as lignites and lignosulfonates. It can be used in fresh, KCL, and salt water based drilling fluids. Integrity **PHPA** is normally used at 0.75-1.5 lbs./bbl.

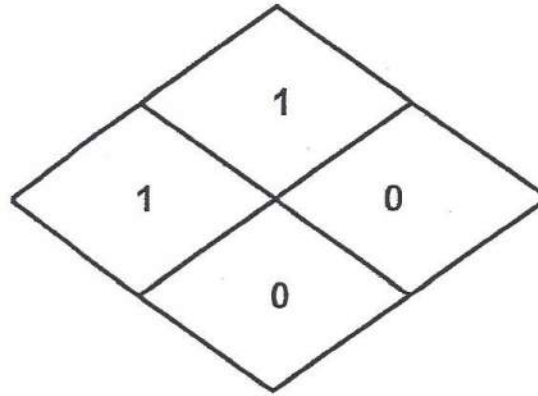
PACKAGING, HANDLING AND STORAGE

Integrity **PHPA** comes packaged in 5 gallon containers with wide mouth easy pour resealable lids. Do not store near open flames or near strong oxidizing agents.

agrity Industries, Inc.
O. Box 5342

Kingsville
361-595-5561
361-595-5588

TX 78363



3060 PHPA

Material Safety Data Sheet

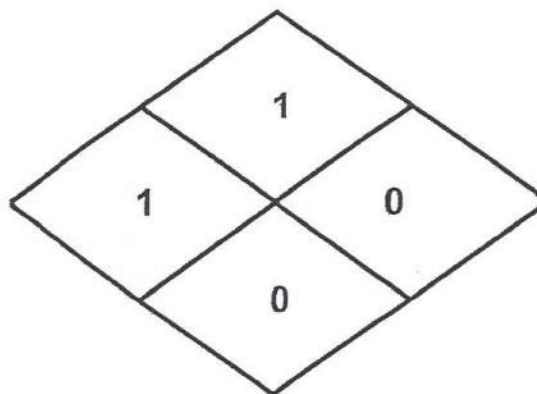
Page 7

Boiling Point	SECTION 3.0 347 F
Freezing Point	N/A
Specific Gravity	1.0
Vapor Pressure (mm Hg)	N/A
Vapor Density	N/A
Solubility in H ₂ O	Appreciable
Appearance	White viscous liquid
Odor	Slight hydrocarbon
Stability	SECTION 4.0 Stable under normal conditions.
Incompatibility	Strong oxidizers, slowly reacts with metals such as iron, copper, and aluminum.
Hazardous Decomposition Products	Combustion may produce oxides of carbon, nitrogen, and smoke
Hazardous Polymerizations	Will not occur
Flash Point	SECTION 5.0 265 F
Extinguishing Media	Water, Dry Chemical, Foam, CO ₂
Special Fire Fighting Procedures	Normal firefighting procedures
Unusual Fire Hazards	None known
pH	N/A
Inhalation	SECTION 6.0 Move to well ventilated area; if breathing difficulties persist after 15 minutes, seek medical help
Eye Contact	Wash eye thoroughly for 15 minutes; if irritation persists, seek medical help.
Skin Contact	Wash exposed area with soap & water
Ingestion	Ingesting large quantities can be slightly toxic, do not induce vomiting, drink water to dilute, seek medical assistance.
Acute	SECTION 7.0 May irritate eyes, respiratory, digestive tracts, including nausea, vomiting, drowsiness, and headache.
Chronic	Prolong exposure may damage central nervous system, heart, liver, and create blood disorder.
Accidental Spill Procedures	SECTION 8.0 Absorb with inert material and dispose of according to local, state, and federal regulations.
Handling & Storage	Store in well ventilated area.

Integrity Industries, Inc.
P. O. Box 5342

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TX 78363



3060 PHPA

Material Safety Data Sheet

Page 8

Respiratory Protection	SECTION 9.0
Ventilation	NIOSH approved organic respirator in mist conditions
Exhaust	Desired
Protective Gloves	Mechanical
Eye Protection	Rubber gloves
Other Protection	Safety Glasses, Goggles
	Eye wash/Safety shower

DOT Proper Shipping Name	SECTION 10.0
DOT Hazard Class or Division	Not Regulated
DOT Identification Number	Not Hazardous
DOT Packaging Group	N/A
Type Label(s) Required or Exemption Nu	N/A
	None

DISCLAIMER	SECTION 11.0
DISCLAIMER	SOME INFORMATION PROVIDED HEREIN WAS DRAWN FROM SOURCES OTHER THAN INTEGRITY INDUSTRIES.
DISCLAIMER	THE INFORMATION PROVIDED HEREIN IS BELIEVED BY INTEGRITY INDUSTRIES TO BE CORRECT AND RELIABLE; NO EXPRESSED OR IMPLIED WARRANTY IS PROVIDED HOWEVER.
DISCLAIMER	INTEGRITY INDUSTRIES ASSUMES NO RESPONSIBILITY AND DENIES ALL LIABILITY FOR ANY LOSS, DAMAGE, OR EXPENSE CONNECTED WITH CUSTOMERS' METHOD OF HANDLING, STORAGE, USE, AND DISPOSAL OF THIS PRODUCT.
DISCLAIMER	THE MSDS INFORMATION PROVIDED HEREIN IS APPLICABLE ONLY TO THIS PRODUCT.

Revised Date	SECTION 1.0
Supersedes	02/11/02
	06/15/98

Trade Name	SECTION 2.0
Synonyms/Other Designations	CAUSTIC SODA
Chemical Formula	ANHYDROUS SODIUM HYDROXIDE, SODIUM HYDROXIDE, CAUSTIC SODA
Hazard(s)	NaOH - CAS# 001310-73-2
	SODIUM HYDROXIDE, SOLID

Boiling Point	SECTION 3.0
	1390 C



Material Safety Data Sheet



Toxic

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Soltex® Additive

Product Use: Drilling Mud Additive
Product Number(s): 0001016807, 0001033053, 0001079530
Synonyms: DRILLING MUD ADDITIVE
Product Cas No.: MIXTURE

Company Identification:
 Chevron Phillips Chemical Company LP
 Drilling Specialties Company
 10001Six Pines Drive
 The Woodlands, TX 77380

Product Information:
 MSDS Requests: (800) 852-5530
 Technical Information: (800) 221-1956

24-Hour Emergency Telephone Numbers

HEALTH: Chevron Phillips Emergency Information Center 866.442.9628 (North America) and 1.832.813.4984 (International)

TRANSPORTATION: North America: CHEMTREC 800.424.9300 or 703.527.3887
 ASIA: +1.703.527.3887
 EUROPE: BIG .32.14.584545 (phone) or .32.14.583516 (telefax)
 SOUTH AMERICA SOS-Cotec Inside Brazil: 0800.111.767
 Outside Brazil: 55.19.3467.1600

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	AMOUNT	EINECS	SYM	R-PHRASES
Proprietary Materials	Various	100 % weight	NA	NA	NA
Crystalline Silica	14808-60-7	< 1.0 % weight	238-878-4	NA	NA
n-Heptane	142-82-5	0.001 % weight	205-563-8	F, Xn, N	R65, R50/53, R38, R11, R67

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Crystalline Silica	ACGIH	.05 mg/m3	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m3	NA	NA	Respirable Dust
Crystalline Silica	German MAK	.15 mg/m3	NA	NA	NA

Revision Number: 5
 Revision Date: 02/24/2005

1 of 9

Soltex® Additive
 MSDS : 59370

Proprietary Materials	CPCHEM	Not Established	NA	NA	NA
n-Heptane	ACGIH	400 ppm	500 ppm	NA	NA
n-Heptane	German MAK	500 ppm	NA	4	NA
n-Heptane	OSHA PEL	500 ppm	NA	NA	NA

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Solid black powder with no odor.

- MAY CAUSE SKIN IRRITATION
- DUST MAY PRODUCE MECHANICAL IRRITATION TO THE MUCOUS MEMBRANES OF THE EYES, NOSE, THROAT AND UPPER RESPIRATORY TRACT
- MAY CAUSE EYE IRRITATION
- CANCER HAZARD - CONTAINS MATERIAL THAT CAN CAUSE CANCER
- MAY CAUSE DAMAGE TO:
----- LUNGS

IMMEDIATE HEALTH EFFECTS:

Eye: This material may be irritating to the eyes and could cause prolonged (days) impairment of your vision. The degree of the injury will depend on the amount of material that gets into the eye and the speed and thoroughness of the first aid treatment. Not expected to cause prolonged or significant eye irritation. Material is dusty and may scratch the surface of the eye.

Skin: This material may be irritating to the skin. The degree of the injury will depend on the amount of material that gets onto the skin and the speed and thoroughness of the first aid treatment. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: May be irritating to mouth, throat, and stomach. Symptoms may include nausea, vomiting, and diarrhea.

Inhalation: The dust from this material may cause respiratory irritation.

DELAYED OR OTHER HEALTH EFFECTS:

Cancer: Prolonged or repeated exposure to this material can cause cancer.

Target Organs: Repeated inhalation of this material at elevated concentrations may cause damage to the following organ(s) based on animal data: - Lung

See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with running water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get

immediate medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

SECTION 5 FIRE FIGHTING MEASURES

NFPA RATINGS: Health: 1 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: NA

Autoignition: NDA

Flammability (Explosive) Limits (% by volume in air): Lower: NA Upper: NA

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: Evacuate area of all unnecessary personnel. Wear appropriate safety equipment for fire conditions including NIOSH self-contained breathing apparatus (SCBA) and other protective equipment as described in Section 8 if exposure conditions warrant.

Combustion Products: Combustion may form: Sulfur Oxides, Carbon Oxides

SECTION 6 ACCIDENTAL RELEASE MEASURES

Spill Management: Reduce airborne dust and prevent scattering by moistening with water. Avoid creating dust clouds. Shovel, sweep up or use industrial vacuum cleaner to pick up. Place in container for proper disposal.

SECTION 7 HANDLING AND STORAGE

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL . REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL .

Precautionary Measures: Use caution to avoid creation of dusts and to prevent inhalation of product dust (fines). Avoid contact with product dust. Airborne dust concentrations above 20 mg/l may create a dust explosion hazard. Do not breathe dust at levels above the recommended exposure limits. Avoid breathing material. Keep container closed. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids, National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).

General Storage Information: Treat as a solid that can burn. Store away from oxidizing materials, in a cool, dry place with adequate ventilation. Bond and ground transfer equipment. DO NOT USE OR

STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA.
Keep container closed when not in use.

Container Warnings: Containers, even those that have been emptied, can contain residues of dusts or solid particulates which may create both health and fire/explosion hazards.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3) applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

If heated material generates vapor or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.

Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: Neoprene

Respiratory Protection: If user operations generate harmful levels of airborne material that is not adequately controlled by ventilation, wear a NIOSH approved respirator that provides adequate protection. Use the following elements for air-purifying respirators: Air-Purifying Respirator for Dusts and Mists

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Crystalline Silica	ACGIH	.05 mg/m ³	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m ³	NA	NA	Respirable Dust
Crystalline Silica	German MAK	.15 mg/m ³	NA	NA	NA
Proprietary Materials	CPCHEM	Not Established	NA	NA	NA
n-Heptane	ACGIH	400 ppm	500 ppm	NA	NA
n-Heptane	German MAK	500 ppm	NA	4	NA
n-Heptane	OSHA PEL	500 ppm	NA	NA	NA

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Solid black powder with no odor.

pH: NA

VAPOR PRESSURE: NA

VAPOR DENSITY (AIR=1): NA

BOILING POINT: NA

SOLUBILITY (in water): Appreciable
SPECIFIC GRAVITY: 1.2 - 1.5

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: Not Applicable

Incompatibility With Other Materials: No data available

Hazardous Decomposition Products: Sulfur Oxides. Carbon Oxides.

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: LD50 / rat / > 5 g/kg

Acute Dermal Toxicity: LD50 / not known

Acute Inhalation Toxicity: LC50 / not known

Eye Irritation: May cause eye irritation.

Skin Irritation: May cause skin irritation.

ADDITIONAL TOXICOLOGY INFORMATION:

The toxicological properties of this product have not been tested or have not been tested completely and its handling or use may be hazardous. EXERCISE DUE CARE.

Long-term exposure to high dust concentrations may cause non-debilitating lung changes.

This product contains CRYSTALLINE SILICA:

Repeated Dose Toxicity: Up to 420 days / inhalation / rat / Doses: 30,000 particles/ml 18 hrs/day 5days/wk / Silicotic nodules

Genetic Toxicity: AMES test = Negative / Recombination Assay = Negative

Carcinogenicity: 2 yrs / inhalation / rat / Dose: 1 mg/m³ / primary lung tumors in control (3) and treated (18); 150, 300 or 570 days / inhalation / mouse / Doses: 1475 ug/m³ for 150 days, 1800 ug/m³ for 300 days or 1950 ug/m³ for 570 days 8 hrs/day 5days/wk / pulmonary adenomas found in both control (7) and treated (9)

Other: International Agency for Research on Cancer (IARC) classifies crystalline silica as a human carcinogen

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:

This material is not expected to be toxic to aquatic organisms.

- 96 hour(s) / LC50 / Flatfish, Flounder (*Scophthalmus maximus*) / 1672 mg/l
- 95 hour(s) / EC50 / Diatom (*Skeletonema costatum*) / 4.0 g/l
- 96 hour(s) / LC50 / mysid shrimp (*Mysidopsis bahia*) / 420,000 ppm

ENVIRONMENTAL FATE:

This material is not expected to be readily biodegradable.
28 days / 3 - 6 %

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

Shipping Descriptions per regulatory authority.**US DOT**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

ICAO / IATA

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

IMO / IMDG

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

RID / ADR

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

SECTION 15 REGULATORY INFORMATION**SARA 311/312 CATEGORIES:**

1. Immediate (Acute) Health Effects:	YES
2. Delayed (Chronic) Health Effects:	YES
3. Fire Hazard:	NO
4. Sudden Release of Pressure Hazard:	NO
5. Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

Revision Number: 5
Revision Date: 02/24/2005

6 of 9

Soltex® Additive
MSDS : 59370

01 = CA Prop 65	17 = FDA 178	33 = RCRA Waste Appendix VIII
02 = LA RTK	18 = FDA 179	34 = RCRA Waste D-List
03 = MA RTK	19 = FDA 180	35 = RCRA Waste P-List
04 = MN Hazardous Substance	20 = FDA 181	36 = RCRA Waste U-List
05 = NJ RTK	21 = FDA 182	37 = SARA Section 311/312
06 = PA RTK	22 = FDA 184	38 = SARA Section 313
07 = CAA Section 112 HAPs	23 = FDA 186	39 = TSCA 12 (b)
08 = CWA Section 307	24 = FDA 189	40 = TSCA Section 4
09 = CWA Section 311	25 = IARC Group 1	41 = TSCA Section 5(a)
10 = DOT Marine Pollutant	26 = IARC Group 2A	42 = TSCA Section 8(a) CAIR
11 = FDA 172	27 = IARC Group 2B	43 = TSCA Section 8(a) PAIR
12 = FDA 173	28 = IARC Group 3	44 = TSCA Section 8(d)
13 = FDA 174	29 = IARC Group 4	45 = WHIMS - IDL
14 = FDA 175	30 = NTP Carcinogen	46 = Germany D TAL
15 = FDA 176	31 = OSHA Carcinogen	47 = Germany WKG
16 = FDA 177	32 = OSHA Highly Hazardous	48 = DEA List 1
		49 = DEA List 2

The following components of this material are found on the regulatory lists indicated.

Crystalline Silica	1, 3, 4, 5, 6, 25, 30, 45
n-Heptane	39, 40

WHMIS CLASSIFICATION:

Class D, Division 2, Subdivision A: Very Toxic Material
 Carcinogenicity
 Chronic Toxic Effects

CHEMICAL INVENTORY LISTINGS:

AUSTRALIA: This material contains components that require notification before sale or importation into Australia.

CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL).

PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the draft Inventory of Existing Chemical Substances in China.

EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.

KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.

PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).

UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

EU RISK AND SAFETY PHRASES:

R40: Possible risks of irreversible effects.

R45: May cause cancer.

S22: Do not breathe dust.

S38: In case of insufficient ventilation, wear suitable respiratory equipment.

S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S53: Avoid exposure - obtain special instructions before use.

EU Symbols: T

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 1 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

REVISION STATEMENT: This revision updates all sections of the MSDS please review.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	Threshold Limit Value	TWA	- Time Weighted Average
STEL	Short-term Exposure Limit	PEL	- Permissible Exposure Limit
ACGIH	American Conference of - Government Industrial Hygienists	OSHA	- Occupational Safety & Health
NIOSH	National Institute of Safety & Health	NFPA	- National Fire Protection Agency
WHMIS	Workplace Hazardous Materials - Information System	IARC	- Intl. Agency for Research on Cancer
EINECS	European Inventory of existing - Commercial Chemical Sales	RCRA	- Resource Conservation Recovery Act
SARA	Superfund Amendments and - Reauthorization Act.	TSCA	- Toxic Substance Control Act
EC50	Effective Dose	LC50	- Lethal Concentration
LD50	Lethal Dose	CAS	- Chemical Abstract Service Number
NDA	No Data Available	NA	- Not Applicable
<=	Less Than or Equal To	>=	- Greater Than or Equal To
CNS	Central Nervous System	MAK	- Germany Maximum Concentration Values

This data sheet is prepared according to the latest adaptation of the EEC Guideline 67/548.
This data sheet is prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).

This data sheet is prepared according to the ANSI MSDS Standard (Z400.1).

This data sheet was prepared by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

MATERIAL SAFETY DATA SHEET

GRAPHITE

Date: 07-20-04

1. Product and Company Identification

Product Name: GRAPHITE (All Grades)

Chemical Name: GRAPHITE

Chemical Family: CARBON

Chemical Formula: CARBON

CAS Reg. No. 7782-42-5

SUPPLIER: Grinding & Sizing Co.

515 Industrial Blvd.

Lufkin, Texas 75904

Emergency Phone Number: 936-634-7718

2. Composition:

Graphite, Natural

OSHA PEL: 2.5 mg/m³, ACGIH TLV 2.0mg/m³

May Contain:

Silica, Crystalline Quartz, 14808-60-7

Non-graphitic carbon

OSHA PEL: 0.1 mg/m³, ACGIH TLV 0.1mg/m³

Graphite is on both the DSL and NDSL

Graphite is on the US EPA TSCA Inventory

3. Hazards Identification:

- Acute Effects: Inhalation of dust may irritate mucous membranes.
- Ingestion: none
- Eyes: Dust abrasive to the eyes
- Skin: none
- Inhalation: long term inhalation may result in silicosis or pneumoconiosis.
- Route of entry: inhalation and eye contact

4. First Aid Measures

- Inhalation: Move exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention if breathing becomes difficult.
- Ingestion: Do not induce vomiting. Seek medical attention.
- Skin: Wash skin thoroughly with soap and water. Remove contaminated clothing
- Eyes: promptly wash eyes with lots of water. Continue to rinse for 30 minutes. Get medical attention.

5. Fire Fighting

- Extinguishing media: Water spray, CO2, dry chemical, foam
- Special fire fighting procedures: None, evacuate all unnecessary personnel. Wear appropriate safety equipment for fire conditions including SCBA.

6. Accidental Release Measures

- Hiway or Rail Spill: Vacuum and sweep up.
- Contact local authorities for specific disposal site information.

7. Handling & Storage

- Handle only in well ventilated areas. Avoid breathing dust.
- Store in cool dry place, keep away from oxidizing agents, ignition sources.
- Exercise caution when handling in areas where contact with electrical circuits is possible as this material conducts electricity.

8. Exposure Controls, Personal Protection

- Ventilation-Local exhaust and ventilation system is recommended if handled in a confined area to control below recommended exposure levels.
- Respiratory Protection- Use NIOSH approved nuisance dust respirator.
- Eye Protection-Use safety glasses with side shields
- Skin Protection-Use long-sleeved clothing and gloves

9. Physical and Chemical Properties

- Appearance: gray/black powder
- Insoluble in water
- Boiling point n/a
- Melting point n/a
- Vapor Pressure n/a
- Specific gravity: 2.2
- Odor: none

10. Stability and Reactivity

- Stability: stable
- Reactivity: avoid excessive heat, ignition sources, acids, alkalis and strong oxidants
- Hazardous Decomposition: CO, CO₂
- Does not polymerize

11. Toxicological Information

- No toxicological information is available on this product

12. Ecological Information

- No ecological information is available

13. Transport Information

- Proper Shipping Name: Not regulated by DOT as a hazardous material
- Hazard class: none
- UN Number: none
- Packing Group: none

14. Regulatory Information

- OSHA (29 CFR 1910.1200) This product should be included in a hazard communication program.
- RCRA: none.
- CERCLA : Not subject to reporting
- NFPA Hazard Codes: Health: 1, Flammability: 0, Reactivity: 0, Special hazards: 0

SAFETY DATA SHEET

NUTPLUG (All Grades)

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: NUTPLUG (All Grades)
APPLICATIONS: Lost circulation material
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
 Poczta Quay,
 Footdee,
 Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

GROSS FORMULA: Cellulose - Nutshells
CAS No.: 9004-34-6

COMPOSITION COMMENTS:

This product is classified as containing no hazardous ingredients according to the EC Directives.

3. HAZARDS IDENTIFICATION:

Not regarded as a health hazard under current legislation.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:
 Carbon dioxide (CO₂). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

Use pressurized air mask if substance is involved in a fire.

UNUSUAL FIRE & EXPLOSION HAZARDS:

High concentrations of dust may form explosive mixture with air.

HAZARDOUS COMBUSTION PRODUCTS:Asphyxiating gases/vapors/fumes. Carbon dioxide (CO₂). Carbon monoxide (CO).**6. ACCIDENTAL RELEASE MEASURES:****SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.**PROTECTIVE EQUIPMENT:****VENTILATION:** Provide adequate general and local exhaust ventilation.**RESPIRATORS:** Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P2 (for fine dust).**PROTECTIVE GLOVES:**

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.
COLOUR:	Brown.
ODOUR/TASTE:	Odourless or no characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.
DENSITY/SPECIFIC GRAVITY (g/ml):	1.35
BULK DENSITY:	577 - 641 kg/m ³
FLAMMABILITY LIMIT - LOWER(%):	May form explosive dust clouds in air.

10. STABILITY AND REACTIVITY:**STABILITY:** Normally stable.

CONDITIONS TO AVOID:

Avoid heat, flames and other sources of ignition.

MATERIALS TO AVOID:

Strong oxidizing agents.

HAZARDOUS DECOMP. PRODUCTS:

Fire or high temperatures create: Asphyxiating gases/vapours/fumes of: Carbon dioxide (CO₂). Carbon monoxide (CO).

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs. Inhalation may cause bronchial asthma in some personnel.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:

Not regarded as dangerous for the environment.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:

ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:

RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:

SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:

AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: Not classified.

UK REGULATORY REFERENCES:

Chemicals (Hazard Information & Packaging) Regulations 1993. The Control of Substances Hazardous to Health Regulations 1988.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 1 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 10-12-98

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

Zub - K - slide



Reliant

Technologies, Inc.

2933 Highway, 1, North
Port Allen, LA 70767

225-383-7923 Information Phone - www.r-techusa.com

225-383-7923 Emergency Phone

Product Name

**RTC "Plus" Extreme Pressure Drilling
Mud Lubricant**

Health: 1
Flammability: 1
Reactivity: 0
Personal Protection: B
Date Revised: 1/2/2001
Prepared By:
Hailey Plaisance

Material Safety Data Sheet

Product Code: MA-1003

Page 1

**SECTION 1 - HAZARDOUS INGREDIENTS AND
SARA III INFORMATION**

Reportable Components:

***NO REPORTABLE QUANTITIES OF HAZARDOUS
INGREDIENTS ARE PRESENT***

***No toxic chemical(s) subject to the reporting requirements of
section 313 of Title III and of 40 CFR 372 are present. ***

DOT Shipping: Non-Regulated

Notes: N/A=NOT APPLICABLE

**SECTION 2 - PHYSICAL AND CHEMICAL
CHARACTERISTICS**

Boiling Point: 335 to 390 C
Vapor Density: Heavier than Air
Evaporation Rate: Slower than Water
Solubility in Water: Complete
Appearance And Odor: Dark amber liquid with mild odor
Specific Gravity: .88
pH: N/A

SECTION 3 - FIRE AND EXPLOSION DATA

Flash Point: >200 F **Method Used:** COC
Flammable Limits in Air By Volume:
Lower: N/A **Upper:** N/A
Extinguishing Media: Water spray, foam, dry chemical, carbon dioxide or
any class B extinguishing agent
Special Firefighting Procedures: Not Combustible
Unusual Fire and Explosion Hazards: Hazardous product of decomposition include
carbon monoxide, hydrocarbon, sulfur compounds,
and oxygenated derivatives

**SECTION 4 - PHYSICAL HAZARDS
(REACTIVITY DATA)**

Stability: STABLE

Conditions and Materials to Avoid: Oxidizers

Hazardous Decomposition: This product will generate carbon monoxide
(CO), carbon dioxide, hydrocarbons and
oxygenated derivatives, sulfur compounds,
smoke, and soot when burned.

Hazardous Polymerization: WILL NOT OCCUR

SECTION 5 - HEALTH HAZARDS DATA

Signs and Symptoms of Exposure:

Eye And Skin Contact And Absorption: Possible: Eye irritation or damage from contact with
liquid. May cause dryness of skin with risk of
dermatitis.

Ingestion: Not likely: May cause gastrointestinal distress,
irritation and possible nausea.

Inhalation: Possible: Vapors and liquid may be irritating to skin,
eyes, or mucous membranes

Medical Conditions Generally Aggravated by Exposure:

Acute: Vapors or liquid may be irritating to skin, eyes, or mucous
membranes. Acute: Inhalation of vapors may be narcotic or
anesthetic. May cause dermatitis and eye irritation.

Carcinogen: NO
IARC Monographs? NO **NPT List?** NO **OSHA?** NO

EMERGENCY AND FIRST AID PROCEDURES:

Eyes: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT
LEAST 15 MINUTES AND GET MEDICAL ATTENTION.

Skin: WASH AFFECTED AREA WITH LARGE AMOUNTS OF
WATER AND REMOVE SOAKED CLOTHING.

Ingestion: Consult a physician and treat symptomatically.

Inhalation: REMOVE TO FRESH AIR, AND GIVE ARTIFICIAL
REUSCITATION IF NOT BREATHING. CALL A
PHYSICIAN IMMEDIATELY.

**SECTION 6 - PRECAUTIONS AND SPILL
PROCEDURES**

Handling and Storage Precautions:

Emptied container retains vapors and product residue. Do not cut or
weld on or near this container. Keep out of reach of children. Store in
a secure area.

Steps to be Taken if Material is Released or Spilled:

Contain spill and leaks to prevent discharge to the environment.
Absorb spillage with sawdust or other absorbent and incinerate in an

Product Code: MA-1003

Page 2

approved incinerator. This material should not be dumped, spilled, or rinsed into sewers or public waterways.

Waste Disposal Method:

Always dispose in accordance with applicable Federal, State and Local regulations.

**SECTION 7 - SPECIAL PROTECTION
INFORMATION AND CONTROL MEASURES**

Respiratory Protection:

NIOSH approved organic vapor mask in enclosed area

Ventilation:

Wither local exhaust or general room ventilation is usually required.

Eye Protection: Chemical Goggles are recommended.

Protective Gloves: RUBBER OR NEOPRENE

Work and Hygienic Practices:

WASH HANDS BEFORE EATING OR USING THE WASHROOM

Other Protective Equipment:

RUBBER BOOTS AND SPLASH APRON WHEN DEEMED NECESSARY

Disclaimer:

This safety information is provided to assist customers in assessing compliance with health, safety, and environmental regulations. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. Information contained herein is based on data available and is believed to be accurate. No guarantee or warranty is provided since the use of this product is within the exclusive control of the user and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. Customers are responsible for compliance with local, state, and federal regulations that may be pertinent in the storage, application, and disposal of this product.



Material Safety Data Sheet



Toxic

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Soltex® Additive

Product Use: Drilling Mud Additive
Product Number(s): 0001016807, 0001033053, 0001079530
Synonyms: DRILLING MUD ADDITIVE
Product Cas No.: MIXTURE

Company Identification:
 Chevron Phillips Chemical Company LP
 Drilling Specialties Company
 10001 Six Pines Drive
 The Woodlands, TX 77380

Product Information:
 MSDS Requests: (800) 852-5530
 Technical Information: (800) 221-1956

24-Hour Emergency Telephone Numbers

HEALTH: Chevron Phillips Emergency Information Center 866.442.9628 (North America) and 1.832.813.4984 (International)

TRANSPORTATION: North America: CHEMTREC 800.424.9300 or 703.527.3887
 ASIA: +1.703.527.3887
 EUROPE: BIG .32.14.584545 (phone) or .32.14.583516 (telefax)
 SOUTH AMERICA SOS-Cotec Inside Brazil: 0800.111.767
 Outside Brazil: 55.19.3467.1600

SECTION 2. COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	AMOUNT	EINECS	SYM	R-PHRASES
Proprietary Materials	Various	100 % weight	NA	NA	NA
Crystalline Silica	14808-60-7	< 1.0 % weight	238-878-4	NA	NA
n-Heptane	142-82-5	0.001 % weight	205-563-8	F, Xn, N	R65, R50/53, R38, R11, R67

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Crystalline Silica	ACGIH	.05 mg/m ³	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m ³	NA	NA	Respirable Dust
Crystalline Silica	German MAK	.15 mg/m ³	NA	NA	NA

Proprietary Materials	CPCHEM	Not Established	NA	NA	NA
n-Heptane	ACGIH	400 ppm	500 ppm	NA	NA
n-Heptane	German MAK	500 ppm	NA	4	NA
n-Heptane	OSHA PEL	500 ppm	NA	NA	NA

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Solid black powder with no odor.

- MAY CAUSE SKIN IRRITATION
- DUST MAY PRODUCE MECHANICAL IRRITATION TO THE MUCOUS MEMBRANES OF THE EYES, NOSE, THROAT AND UPPER RESPIRATORY TRACT
- MAY CAUSE EYE IRRITATION
- CANCER HAZARD - CONTAINS MATERIAL THAT CAN CAUSE CANCER
- MAY CAUSE DAMAGE TO:
----- LUNGS

IMMEDIATE HEALTH EFFECTS:

Eye: This material may be irritating to the eyes and could cause prolonged (days) impairment of your vision. The degree of the injury will depend on the amount of material that gets into the eye and the speed and thoroughness of the first aid treatment. Not expected to cause prolonged or significant eye irritation. Material is dusty and may scratch the surface of the eye.

Skin: This material may be irritating to the skin. The degree of the injury will depend on the amount of material that gets onto the skin and the speed and thoroughness of the first aid treatment. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: May be irritating to mouth, throat, and stomach. Symptoms may include nausea, vomiting, and diarrhea.

Inhalation: The dust from this material may cause respiratory irritation.

DELAYED OR OTHER HEALTH EFFECTS:

Cancer: Prolonged or repeated exposure to this material can cause cancer.

Target Organs: Repeated inhalation of this material at elevated concentrations may cause damage to the following organ(s) based on animal data: - Lung

See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with running water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get

immediate medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

SECTION 5: FIRE FIGHTING MEASURES

NFPA RATINGS: Health: 1 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: NA

Autoignition: NDA

Flammability (Explosive) Limits (% by volume in air): Lower: NA Upper: NA

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: Evacuate area of all unnecessary personnel. Wear appropriate safety equipment for fire conditions including NIOSH self-contained breathing apparatus (SCBA) and other protective equipment as described in Section 8 if exposure conditions warrant.

Combustion Products: Combustion may form: Sulfur Oxides, Carbon Oxides

SECTION 6: ACCIDENTAL RELEASE MEASURES

Spill Management: Reduce airborne dust and prevent scattering by moistening with water.

Avoid creating dust clouds. Shovel, sweep up or use industrial vacuum cleaner to pick up. Place in container for proper disposal.

SECTION 7: HANDLING AND STORAGE

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL . REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL .

Precautionary Measures: Use caution to avoid creation of dusts and to prevent inhalation of product dust (fines). Avoid contact with product dust. Airborne dust concentrations above 20 mg/l may create a dust explosion hazard. Do not breathe dust at levels above the recommended exposure limits. Avoid breathing material. Keep container closed. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids, National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).

General Storage Information: Treat as a solid that can burn. Store away from oxidizing materials, in a cool, dry place with adequate ventilation. Bond and ground transfer equipment. **DO NOT USE OR**

STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA.
Keep container closed when not in use.

Container Warnings: Containers, even those that have been emptied, can contain residues of dusts or solid particulates which may create both health and fire/explosion hazards.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3) applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

If heated material generates vapor or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.

Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: Neoprene

Respiratory Protection: If user operations generate harmful levels of airborne material that is not adequately controlled by ventilation, wear a NIOSH approved respirator that provides adequate protection. Use the following elements for air-purifying respirators: Air-Purifying Respirator for Dusts and Mists

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Crystalline Silica	ACGIH	.05 mg/m ³	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m ³	NA	NA	Respirable Dust
Crystalline Silica	German MAK	.15 mg/m ³	NA	NA	NA
Proprietary Materials	CPCHEM	Not Established	NA	NA	NA
n-Heptane	ACGIH	400 ppm	500 ppm	NA	NA
n-Heptane	German MAK	500 ppm	NA	4	NA
n-Heptane	OSHA PEL	500 ppm	NA	NA	NA

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Solid black powder with no odor.

pH: NA

VAPOR PRESSURE: NA

VAPOR DENSITY (AIR=1): NA

BOILING POINT: NA

SOLUBILITY (in water): Appreciable
SPECIFIC GRAVITY: 1.2 - 1.5

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: Not Applicable

Incompatibility With Other Materials: No data available

Hazardous Decomposition Products: Sulfur Oxides. Carbon Oxides.

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: LD50 / rat / > 5 g/kg

Acute Dermal Toxicity: LD50 / not known

Acute Inhalation Toxicity: LC50 / not known

Eye Irritation: May cause eye irritation.

Skin Irritation: May cause skin irritation.

ADDITIONAL TOXICOLOGY INFORMATION:

The toxicological properties of this product have not been tested or have not been tested completely and its handling or use may be hazardous. EXERCISE DUE CARE.

Long-term exposure to high dust concentrations may cause non-debilitating lung changes.

This product contains CRYSTALLINE SILICA:

Repeated Dose Toxicity: Up to 420 days / inhalation / rat / Doses: 30,000 particles/ml 18 hrs/day 5days/wk / Silicotic nodules

Genetic Toxicity: AMES test = Negative / Recombination Assay = Negative

Carcinogenicity: 2 yrs / inhalation / rat / Dose: 1 mg/m³ / primary lung tumors in control (3) and treated (18); 150, 300 or 570 days / inhalation / mouse / Doses: 1475 ug/m³ for 150 days, 1800 ug/m³ for 300 days or 1950 ug/m³ for 570 days 8 hrs/day 5days/wk / pulmonary adenomas found in both control (7) and treated (9)

Other: International Agency for Research on Cancer (IARC) classifies crystalline silica as a human carcinogen

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:

This material is not expected to be toxic to aquatic organisms.

- 96 hour(s) / LC50 / Flatfish, Flounder (*Scophthalmus maximus*) / 1672 mg/l
- 95 hour(s) / EC50 / Diatom (*Skeletonema costatum*) / 4.0 g/l
- 96 hour(s) / LC50 / mysid shrimp (*Mysidopsis bahia*) / 420,000 ppm

ENVIRONMENTAL FATE:

This material is not expected to be readily biodegradable.
28 days / 3 - 6 %

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

Shipping Descriptions per regulatory authority.**US DOT**

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

ICAO / IATA

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

IMO / IMDG

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

RID / ADR

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

SECTION 15 REGULATORY INFORMATION**SARA 311/312 CATEGORIES:**

1. Immediate (Acute) Health Effects:	YES
2. Delayed (Chronic) Health Effects:	YES
3. Fire Hazard:	NO
4. Sudden Release of Pressure Hazard:	NO
5. Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01 = CA Prop 65
02 = LA RTK
03 = MA RTK
04 = MN Hazardous Substance
05 = NJ RTK
06 = PA RTK
07 = CAA Section 112 HAPs
08 = CWA Section 307
09 = CWA Section 311
10 = DOT Marine Pollutant
11 = FDA 172
12 = FDA 173
13 = FDA 174
14 = FDA 175
15 = FDA 176
16 = FDA 177

17 = FDA 178
18 = FDA 179
19 = FDA 180
20 = FDA 181
21 = FDA 182
22 = FDA 184
23 = FDA 186
24 = FDA 189
25 = IARC Group 1
26 = IARC Group 2A
27 = IARC Group 2B
28 = IARC Group 3
29 = IARC Group 4
30 = NTP Carcinogen
31 = OSHA Carcinogen
32 = OSHA Highly Hazardous

33 = RCRA Waste Appendix VIII
34 = RCRA Waste D-List
35 = RCRA Waste P-List
36 = RCRA Waste U-List
37 = SARA Section 311/312
38 = SARA Section 313
39 = TSCA 12 (b)
40 = TSCA Section 4
41 = TSCA Section 5(a)
42 = TSCA Section 8(a) CAIR
43 = TSCA Section 8(a) PAIR
44 = TSCA Section 8(d)
45 = WHIMS - IDL
46 = Germany D TAL
47 = Germany WKG
48 = DEA List 1
49 = DEA List 2

The following components of this material are found on the regulatory lists indicated.

Crystalline Silica

1, 3, 4, 5, 6, 25, 30, 45

n-Heptane

39, 40

WHMIS CLASSIFICATION:

Class D, Division 2, Subdivision A: Very Toxic Material

Carcinogenicity

Chronic Toxic Effects

CHEMICAL INVENTORY LISTINGS:

AUSTRALIA: This material contains components that require notification before sale or importation into Australia.

CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL).

PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the draft Inventory of Existing Chemical Substances in China.

EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.

KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.

PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).

UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

EU RISK AND SAFETY PHRASES:

R40: Possible risks of irreversible effects.

R45: May cause cancer.

S22: Do not breathe dust.

S38: In case of insufficient ventilation, wear suitable respiratory equipment.

S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

553: Avoid exposure - obtain special instructions before use.

EU Symbols: T

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 1 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

REVISION STATEMENT: This revision updates all sections of the MSDS please review.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	Threshold Limit Value	TWA	- Time Weighted Average
STEL	Short-term Exposure Limit	PEL	- Permissible Exposure Limit
ACGIH	American Conference of - Government Industrial Hygienists	OSHA	- Occupational Safety & Health
NIOSH	National Institute of Safety & Health	NFPA	- National Fire Protection Agency
WHMIS	Workplace Hazardous Materials - Information System	IARC	- Intl. Agency for Research on Cancer
EINECS	European Inventory of existing - Commercial Chemical Sales	RCRA	- Resource Conservation Recovery Act
SARA	Superfund Amendments and - Reauthorization Act.	TSCA	- Toxic Substance Control Act
EC50	Effective Dose	LC50	- Lethal Concentration
LD50	Lethal Dose	CAS	- Chemical Abstract Service Number
NDA	No Data Available	NA	- Not Applicable
<=	Less Than or Equal To	>=	- Greater Than or Equal To
CNS	Central Nervous System	MAK	- Germany Maximum Concentration Values

This data sheet is prepared according to the latest adaptation of the EEC Guideline 67/548.
This data sheet is prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
This data sheet is prepared according to the ANSI MSDS Standard (Z400.1).
This data sheet was prepared by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

SAFETY DATA SHEET

SODA ASH

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: SODA ASH
APPLICATIONS: pH modifier.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
SODA ASH	497-19-8	60-100 %	Xi	36

COMPOSITION COMMENTS:

This product is classified as an irritant according to the EU Directives.

3. HAZARDS IDENTIFICATION:

Irritating to eyes.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.

INGESTION: Rinse mouth thoroughly with water and give large amounts of milk or water to people not unconscious. DO NOT induce vomiting. Get medical attention immediately.

SKIN: Immediately remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

NOTE! Use air-supplied respirators to protect against gases/fumes.

HAZARDOUS COMBUSTION PRODUCTS:

Fire or high temperatures create: Carbon dioxide (CO₂).

6. ACCIDENTAL RELEASE MEASURES:**PERSONAL PRECAUTION IN SPILL:**

Wear proper personal protective equipment (see MSDS Section 8).

SPILL CLEANUP METHODS:

Shovel into dry containers. Cover and move the containers. Flush the area with water. Small quantities can be dissolved/diluted in water and flushed to drain. Flush with plenty of water to clean spillage area. Inform Authorities if large amounts are involved.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid spilling, skin and eye contact. Avoid handling which leads to dust formation. Use mechanical ventilation in case of handling which causes formation of dust.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**

This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.

PROTECTIVE EQUIPMENT:

RESPIRATORS: No specific recommendation made, but protection against nuisance dust must be used when the general level exceeds 10 mg/m³. D, Dust mask/respirator. Dust filter P2 (for fine dust).

PROTECTIVE GLOVES:

Chemical resistant gloves required for prolonged or repeated contact. Use protective gloves made of: Neoprene, nitrile, polyethylene or PVC.

EYE PROTECTION:

Wear approved chemical safety goggles where eye exposure is reasonably probable. Use tight fitting goggles if dust is generated.

OTHER PROTECTION:

Provide eyewash station. Wear appropriate clothing to prevent repeated or prolonged skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Crystals. Granular. Powder, dust.
COLOUR:	White.
ODOUR/TASTE:	No characteristic odour.
SOLUBILITY DESCRIPTION:	Very soluble in water.
SOLUBILITY VALUE (g/100g H₂O 20°C):	22 g/100 ml
MELT./FREEZ. POINT (°C, interval):	851
DENSITY/SPECIFIC GRAVITY (g/ml):	2.53 TEMPERATURE (°C): 20

pH-VALUE, CONC. SOLUTION: 11.6

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable. Avoid: Moisture. Contact with acids.

MATERIALS TO AVOID:
Strong acids. Strong oxidizing agents.

HAZARDOUS DECOMP. PRODUCTS:
Fire or high temperatures create: Carbon dioxide (CO₂).

11. TOXICOLOGICAL INFORMATION:

TOXIC DOSE - LD 50: 4090 mg/kg (oral rat)
INHALATION: Gas or vapour in high concentrations may irritate respiratory system.

INGESTION: Gastrointestinal symptoms, including upset stomach.

SKIN: Prolonged or repeated exposure may cause severe irritation.

EYES: Irritating to eyes. Repeated exposure may cause chronic eye irritation.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Contact M-I's Environmental Affairs Department for ecological information.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

LABEL FOR SUPPLY:**RISK PHRASES:**

R-36 Irritating to eyes.

SAFETY PHRASES:

S-22 Do not breathe dust.

S-26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S-36 Wear suitable protective clothing.

16. OTHER INFORMATION:**USER NOTES:**

HMIS Health - 1 HMIS Flammability - 1 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

REVISION COMMENTS:

Revised by Sarah Glover

ISSUED BY:

Dr. Kirsty Walker

REVISION DATE:

14-06-00

THIS SDS IS PRODUCED WITH SAFECHEM for WINDOWS

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

SAFETY DATA SHEET

MICA

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: MICA
APPLICATIONS: Lost circulation material.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	0-5 %		
MICA	12001-26-2	95-100 %		

COMPOSITION COMMENTS:
 This product contains a small quantity of quartz, crystalline silica.

3. HAZARDS IDENTIFICATION:

This product contains a small quantity of quartz. IARC Monographs, Vol 68, 1997, concludes that there is sufficient evidence that inhaled crystalline silica in the form of quartz or cristobalite from occupational sources causes cancer in humans. IARC classification Group 1.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:
 This material is not flammable. Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:
 No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:
 No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:
 Not relevant.

6. ACCIDENTAL RELEASE MEASURES:

SPILL CLEANUP METHODS:
 Shovel into dry containers. Cover and move the containers. Flush the area with water. Avoid generation and spreading of dust. Wear necessary protective equipment.

7. HANDLING AND STORAGE:

USAGE PRECAUTIONS:
 Avoid handling which leads to dust formation. Provide good ventilation. Mechanical ventilation or local exhaust ventilation may be required.

STORAGE PRECAUTIONS:
 Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:

INGREDIENT NAME:	CAS No.:	STD:	LT EXP. 8 HRS:	ST EXP. 15 MIN:
QUARTZ, CRYSTALLINE SILICA	14808-60-7	MEL.	0.3 mg/m ³	
MICA	12001-26-2	NUI		

INGREDIENT COMMENTS:
 MEL = Maximum Exposure Limit. * OSHA PELs for Mineral Dusts containing crystalline silica are 10 mg/m³ / (%SiO₂+2) for quartz and 1/2 the calculated quartz value for cristobalite and tridymite. NUI = Nuisance Dust. OES TWA 4mg/m³ respirable dust, 10mg/m³ total dust.

PROTECTIVE EQUIPMENT:



VENTILATION: Provide adequate general and local exhaust ventilation.

RESPIRATORS: Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P3 (for especially fine dust/powder).

PROTECTIVE GLOVES:
 No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:
 Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:
 Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust
COLOUR:	Varying. Grey. to Silver.
ODOUR/TASTE:	Odourless or no characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.

10417 - MICA

DENSITY/SPECIFIC GRAVITY (g/ml): 2.6 - 2.9
 pH-VALUE, DILUTED SOLUTION: 9.0

TEMPERATURE (°C): 20
 CONCENTRATION (%M): 10%

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
 Not known.

MATERIALS TO AVOID:
 No incompatible groups noted.

HAZARDOUS DECOMP. PRODUCTS:
 Not relevant.

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs. Harmful: danger of serious damage to health by prolonged exposure through inhalation.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

HEALTH WARNINGS:
 This product contains small quantities of quartz. Prolonged inhalation of high concentrations may damage respiratory system. Because of quantity and composition, the health hazard is small.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
 Not regarded as dangerous for the environment. This material is a naturally occurring mineral.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
 Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: S-22 Do not breathe dust.
S-38 In case of insufficient ventilation, wear suitable respiratory equipment.

UK REGULATORY REFERENCES: The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations 1993. IARC Monographs, Vol.68, 1997.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 0 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 15-2-99

DISCLAIMER:

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SAFETY DATA SHEET

SODIUM BICARBONATE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: SODIUM BICARBONATE

APPLICATIONS: Oil well drilling fluid additive.

EMERGENCY TELEPHONES: 001 281 561 1600 (USA)

SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ

TELEPHONE: 44 (0)1224 - 584336

FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

GROSS FORMULA: Sodium Hydrogen Carbonate

CAS No.: 144-55-8

COMPOSITION COMMENTS:

This product formulation is not classified as hazardous in accordance with the EU Directives.

3. HAZARDS IDENTIFICATION:

Not regarded as a health hazard under current legislation.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Carbon dioxide (CO₂). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

Use special protective clothing. Regular protection may not be safe. Use pressurized air mask if substance is involved in a fire.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Fire or high temperatures create: Oxides of: Carbon.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate water sources or sewer. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**

This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.

PROTECTIVE EQUIPMENT:

VENTILATION: Provide adequate general and local exhaust ventilation.

RESPIRATORS: If ventilation is insufficient, suitable respiratory protection must be provided. Dust filter P2 (for fine dust).

PROTECTIVE GLOVES:

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.
COLOUR:	White.
ODOUR/TASTE:	Odourless or no characteristic odour.
SOLUBILITY DESCRIPTION:	Soluble in water.
SOLUBILITY VALUE (g/100g H₂O 20°C):	7
MELT/FREEZ. POINT (°C, interval):	270
DENSITY/SPECIFIC GRAVITY (g/ml):	2.16
BULK DENSITY:	801-1089 kg/m ³
pH-VALUE, DILUTED SOLUTION:	8.3
	TEMPERATURE (°C): 20
	CONCENTRATION (%M): 1%

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid wet and humid conditions.

MATERIALS TO AVOID:
Strong acids.

HAZARDOUS DECOMP. PRODUCTS:
Fire or high temperatures create: Oxides of: Carbon.

11. TOXICOLOGICAL INFORMATION:

TOXIC DOSE - LD 50: 4220 mg/kg (oral rat)
INHALATION: Dust may irritate respiratory system or lungs.

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Contact M-T's Environmental Affairs Department for ecological information.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not Classified

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not Classified.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not Classified.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not Classified.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: Not classified.

STATUTORY INSTRUMENTS: Chemicals (Hazard Information and Packaging) Regulations. Control of Substances Hazardous to Health.

GUIDANCE NOTES: Occupational Exposure Limits EH40.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 0 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997). The Merck Index, 11. edition, 1989. Sigma-Aldrich Material Safety Data Sheets on CD-ROM.

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 22-7-99

REV. No./REPL. SDS GENERATED: 1

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SAPP

SAP

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 1 - Chemical Product and Company Identification ***

Chemical Name: Sodium Acid Pyrophosphate, technical, food grade
Product Use: For Commercial Use
Synonyms: SAPP; Pyrophosphoric acid, disodium salt; Disodium dihydrogen pyrophosphate; Diphosphoric acid, disodium salt
Supplier Information

Access Chemicals & Services LLC
One Area Place Suite 2000
7322 Southwest Freeway
Houston, Texas 77074

Phone: 713-270-7215
Fax: 713-988-5833
Emergency #: (800) 424-9300 or (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.
NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

*** Section 2 - Composition / Information on Ingredients ***

Table with 3 columns: CAS#, Components, Percent. Row 1: 7758-16-9, Sodium Acid Pyrophosphate, > 93

Component Information/Information on Non-Hazardous Components
This product is not considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

*** Section 3 - Hazards Identification ***

Emergency Overview
Product is an odorless white powder. Dusts may cause irritation of the respiratory tract. May irritate skin and eyes. This material is not combustible; however, large amounts or airborne dusts can present an air/dust explosion hazard. Use appropriate extinguishing media for surrounding fire.

Hazard Statements
CAUTION: MAY CAUSE RESPIRATORY TRACT IRRITATION. MAY CAUSE EYE AND SKIN IRRITATION. Avoid contact with eyes and skin. Avoid breathing dusts. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation.

Potential Health Effects: Eyes
Dust and solution can cause mild irritation.
Potential Health Effects: Skin
This product may cause irritation to the skin.
Potential Health Effects: Ingestion
Ingestion of large doses may cause symptoms of irritation, nausea, vomiting, cramps and diarrhea.
Potential Health Effects: Inhalation
Dusts and mists from solutions may cause mild irritation of the upper respiratory tract.
HMS Ratings: Health Hazard: 1 Fire Hazard: 1 Physical Hazard: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes
Immediately flush eyes with plenty of water for 15 minutes. If irritation persists, seek medical attention immediately.
First Aid: Skin
If irritation occurs, wash gently and thoroughly with water and non-abrasive soap. If irritation persists, seek medical advice. Wash contaminated clothing before reuse.
First Aid: Ingestion
Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Immediately give large amounts of water. If vomiting occurs naturally, rinse mouth and repeat administration of water. Obtain medical advice immediately.
First Aid: Inhalation
Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.
First Aid: Notes to Physician
Provide general supportive measures.

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 5 - Fire Fighting Measures ***

Flash Point: Not applicable

Upper Flammable Limit (UFL): Not applicable

Auto Ignition: Not available

Rate of Burning: Not applicable

General Fire Hazards

Closed containers exposed to heat may explode. Can pose a serious dust explosion hazard.

Hazardous Combustion Products

Toxic phosphorus oxide gases.

Extinguishing Media

Use methods for the surrounding fire including water spray, dry chemical, carbon dioxide, or foam.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self contained breathing apparatus.

MFPA Ratings: Health: 1 Fire: 0 Reactivity: 0 Other:

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information).

Clean-Up Procedures

Small releases can be cleaned-up wearing gloves, goggles and suitable body protection. In case of a large spill (in which excessive dusts can be generated), clear the affected area, protect people, and respond with trained personnel. Place all spill residues in an appropriate container and seal. Thoroughly wash the area after a spill or leak clean-up. Prevent spill runoff from contamination of storm drains, sewers, soil or groundwater.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Avoid inhalation of dusts. Ventilate the area. Wear adequate personal protective equipment. Have emergency equipment readily available.

*** Section 7 - Handling and Storage ***

Handling Procedures

Do not breathe dust. Avoid all contact with skin and eyes. Wherever dust clouds may be generated, eliminate sparks, flames and other ignition sources. Use this product only with adequate ventilation. Wash thoroughly after handling. Care should be taken to avoid the accumulation of dusts, which can create a serious dust-explosion hazard. All equipment used in the handling of this material should be electrically grounded.

Storage Procedures

All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Empty containers may contain residual amounts of this product; therefore, empty containers should be handled with care. Keep this product in an air-tight container. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Keep container tightly closed when not in use. Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Limit quantity of material stored.

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

No exposure guidelines have been established.

B: Component Exposure Limits

The exposure limits given are for Particulates Not Otherwise Classified (PNOC).

OSHA: 15 mg/m³ TWA (Total dust)
 5 mg/m³ TWA (Respirable fraction)
 DFG MAKs 4 mg/m³ TWA (Inhalable fraction)
 1.5 mg/m³ TWA (Respirable fraction)

Engineering Controls

Use general mechanical ventilation. Local exhaust is suggested for use, where possible, in enclosed or confined spaces.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Safety glasses recommended. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin

Wear appropriate work gloves for type of operation. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory

None required where adequate ventilation conditions exist. If airborne concentration is high, use an appropriate respirator or dust mask. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Personal Protective Equipment: General

Wash hands thoroughly after handling material. Do not eat, drink or smoke in work areas. Have a safety shower or eye-wash fountain available. Use good hygiene practices when handling this material including changing and laundering work clothing after use.

*** Section 9 - Physical & Chemical Properties ***

Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance:	White powder	Odor:	Odorless
Physical State:	Solid	pH:	3.5-4.5 (1% solution)
Vapor Pressure:	Not applicable	Vapor Density:	Not applicable
Boiling Point:	Not applicable	Melting Point:	428 deg F (220 deg C)
Solubility (H ₂ O):	13% @ 25 deg C	Specific Gravity:	1.86 (water=1)
Freezing Point:	Not applicable	Particle Size:	Not available
Softening Point:	Not applicable	Evaporation Rate:	Not applicable
Viscosity:	Not applicable	Bulk Density:	60 lbs/ft ³
Percent Volatile:	Not available	Molecular Weight:	221.96
		Chemical Formula:	Na ₂ H ₂ P ₂ O ₇

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable

Chemical Stability: Conditions to Avoid

Avoid conditions of heat and moisture.

Incompatibility

Strong acids and alkalis.

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 10 - Chemical Stability & Reactivity Information (Continued) ***

Hazardous Decomposition

Toxic phosphorus oxide gases.

Hazardous Polymerization

Will not occur.

*** Section 11 - Toxicological Information ***

Acute Toxicity

A: General Product Information

Information not available.

B: Component LD50/LCS0

Sodium Acid Pyrophosphate (7758-16-9)

LD₅₀ (Oral-Mouse) 2650 mg/kg; LD₅₀ (Intraperitoneal-Mouse) 1 gm/kg; LD₅₀ (Subcutaneous-Mouse) 480 mg/kg; LD₅₀ (Intravenous-Mouse) 59 mg/kg; LD (Skin-Rabbit) > 300 mg/kg

Carcinogenicity

A: General Product Information

Information not available.

B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology

Information not available.

Neurotoxicity

Information not available.

Mutagenicity

In animal and yeast cell studies, no mutagenic effects were seen.

Teratogenicity

No birth defects were reported in mice, rabbits, or hamsters given this substance during gestation.

Other Toxicological Information

None

*** Section 12 - Ecological Information ***

Ecotoxicity

No information available.

Environmental Fate

No information available.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

As shipped, product is not considered a hazardous waste by the EPA.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Review federal, provincial, and local government requirements prior to disposal. Disposal by controlled incineration or secure landfill may be acceptable.

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

*** Section 14 - Transportation Information ***

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information

- Shipping Name: Not applicable.
- Hazard Class: Not applicable
- DN/NA #: Not applicable
- Packing Group: Not applicable
- Required Label(s): Not applicable
- RQ Quantity: Not applicable

International Air Transport Association (IATA)

For Shipments by Air transport: We classify this product as hazardous (Class 9) when shipped by air because 49 CFR 173.140 (a). For the purposes of this subchapter, miscellaneous hazardous material (Class 9) means a material which presents a hazard during transportation, but which does not meet the definition of any other hazard class. This class includes: (a) Any material which has an anesthetic, noxious, or other similar property which could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties.

Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s. (Sodium Acid Pyrophosphate)

Hazard Class: 9

UN: UN 3077

Packing Group: III

Passenger & Cargo Aircraft Packing Instruction: 911

Passenger & Cargo Aircraft Maximum Net Quantity: No Limit

Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y911

Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg

Special Provisions: A97

ERG Code: 9L

International Maritime Organization (I.M.O.) Classification

Sodium Acid Pyrophosphate is not regulated under I.M.O.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

No additional information.

B: Component Information

None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

Sodium Acid Pyrophosphate (7758-16-9)

CERCLA: Final RQ = Not Applicable

SARA 302 (EHS TPO): There are no specific Threshold Planning Quantities for Sodium Acid Pyrophosphate. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

C: SARA 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Sodium Acid Pyrophosphate	7758-16-9	No	No	No	Yes	No

State Regulations

A: General Product Information

Other state regulations may apply.

B: Component Information

None of this product's components are listed on the state lists from CA, FL, MA, MN, NJ, or PA.

Component	CAS #	CA	FL	MA	MN	NJ	PA
Sodium Acid Pyrophosphate	7758-16-9	No	No	No	No	No	No

Material Safety Data Sheet

Material Name: Sodium Acid Pyrophosphate

ID: C1-138

Other Regulations

A: General Product Information

Not determined.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Sodium Acid Pyrophosphate	7758-16-9	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

All identified ingredients are on the Canadian Domestic Substances List.

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Sodium Acid Pyrophosphate	7758-16-9	No disclosure limit.

ANSI LABELING (Z129.1): CAUTION! MAY CAUSE SKIN AND EYE IRRITATION. Avoid contact with skin, eyes, or clothing. Do not taste or swallow. Avoid breathing dusts and particulates. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH-approved respiratory protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

*** Section 16 - Other Information ***

Other Information

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com. Revision date: 05/31/01

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration.

Contact: Sue Palmer-Kolman, PhD

Contact Phone: (713) 896-9966

Revision Log

08/28/00 3:54 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.
 05/31/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Ratings
 08/20/01 2:55 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.
 2/18/02 10:52 AM HDF: Up-date of SARA Hazard Ratings.
 2/15/03 12:59 PM SEP: Added technical grade to section 1.
 09/16/03 7:32 AM HDF: General review of entire MSDS. Up-graded Section 3 Health Hazard information, HMIS categories. Added PNOC exposure limits to Section 8. Added currently available toxicity data to Section 11. Up-Dated Section 14 Transportation Information.

This is the end of MSDS #C1-138

MATERIAL SAFETY DATA SHEET

XCD POLYMER

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: XCD POLYMER
CHEMICAL CLASS: Biopolymer.
APPLICATIONS: Oil well drilling fluid additive. Viscosifier
EMERGENCY TELEPHONE: 281-561-1600
SUPPLIER: Supplied by a Business Unit of
M-I L.L.C.
P.O. Box 42842, Houston, Texas 77242-2842
See cover sheet for local supplier.
TELEPHONE: 281-561-1509
FAX: 281-561-7240
CONTACT PERSON: Sam Hoskin

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Xanthan gum	11138-66-2	100 %		

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a powder. May form explosive dust-air mixtures. Slippery when wet. white to tan No significant immediate hazards for emergency response personnel are known.

ACUTE EFFECTS:

HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

INHALATION: May be irritating to the respiratory tract if inhaled.
INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: May be irritating to the skin.

EYES: May be irritating to the eyes.

CHRONIC EFFECTS:

CARCINOGENICITY:

IARC: Not listed. OSHA: Not regulated. NTP: Not listed.

ROUTE OF ENTRY:

Inhalation. Skin and/or eye contact.

TARGET ORGANS:

Respiratory system, lungs. Skin. Eyes.

4. FIRST AID MEASURES

- GENERAL:** Persons seeking medical attention should carry a copy of this MSDS with them.
- INHALATION:** Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.
- INGESTION:** Drink a couple of glasses water or milk. Do not give victim anything to drink of he is unconscious. Get medical attention.
- SKIN:** Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
- EYES:** Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.
-

5. FIRE FIGHTING MEASURES

- AUTO IGNITION TEMP. (°F):** >392
- FLAMMABILITY LIMIT - LOWER(%):** N/D
- FLAMMABILITY LIMIT - UPPER(%):** N/D
- EXTINGUISHING MEDIA:**
Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist.
- SPECIAL FIRE FIGHTING PROCEDURES:**
No specific fire fighting procedure given.
- UNUSUAL FIRE & EXPLOSION HAZARDS:**
Dust in high concentrations may form explosive mixtures with air.
- HAZARDOUS COMBUSTION PRODUCTS:**
Irritating gases/vapors/fumes. Oxides of: Carbon.
-

6. ACCIDENTAL RELEASE MEASURES

- PERSONAL PRECAUTIONS:**
Wear proper personal protective equipment (see MSDS Section 8).
- SPILL CLEAN-UP PROCEDURES:**
Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.
-

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS:

Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

INGREDIENT NAME:	CAS No.:	OSHA PEL: TWA: STEL:	ACGIH TLV: TWA: STEL:	OTHER: TWA: STEL:	UNITS:
Xanthan gum	11138-66-2	5	3		mg/m3 resp.dust

INGREDIENT COMMENTS:

Exposure limits are for Particulates Not Otherwise Classified (PNOC).

PROTECTIVE EQUIPMENT:**ENGINEERING CONTROLS:**

Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

VENTILATION: Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

RESPIRATORS: Use at least a NIOSH-approved N95 half-mask disposable or reusable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator.

PROTECTIVE GLOVES:

Use suitable protective gloves if risk of skin contact.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

PROTECTIVE CLOTHING:

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES:

Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	Powder, dust.
COLOR:	White to Tan.
ODOR:	Slight.
SOLUBILITY DESCRIPTION:	Soluble in water.
DENSITY/SPECIFIC GRAVITY (g/ml):	N/D
BULK DENSITY:	50 lb/cu ft; 805 kg/m3
VAPOR DENSITY (air=1):	N/A
VAPOR PRESSURE:	N/A
pH-VALUE, DILUTED SOLUTION:	5.4-8.6

TEMPERATURE (°F):
TEMPERATURE (°F):
CONCENTRATION (%M): 1%

10. STABILITY AND REACTIVITY

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid heat.

HAZARDOUS POLYMERIZATION:
Will not polymerize.

POLYMERIZATION DESCRIPTION:
Not relevant.

MATERIALS TO AVOID:
Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION

Component: Xanthan gum

TOXIC DOSE - LD 50: >5000 mg/kg (oral rat)

12. ECOLOGICAL INFORMATION

ACUTE AQUATIC TOXICITY:

This product is approved for use under the U.S. Environmental Protection Agency (EPA) Region IX (California) General NPDES Permit which regulates offshore discharges of drilling fluids. Contact M-I's Environmental Affairs Department for more information.

This product passes the mysid shrimp toxicity test required by the U.S. Environmental Protection Agency (EPA) Region VI (Gulf of Mexico) NPDES Permit, which regulates offshore discharge of drilling fluids, when tested in a standard drilling fluid. Contact M-I's Environmental Affairs Department for more information.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT:

This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc, may render the resulting materials hazardous.

Empty containers retain residues. All labeled precautions must be observed.

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

GENERAL:

RQ = N/A

U.S. DOT:
U.S. DOT CLASS: Not regulated.

CANADIAN TRANSPORT:
TDGR CLASS: Not regulated.

SEA TRANSPORT:
IMDG CLASS: Not regulated.

AIR TRANSPORT:
ICAO CLASS: Not regulated.

15. REGULATORY INFORMATION

REGULATORY STATUS OF INGREDIENTS:

NAME:	CAS No:	TSCA:	CERCLA:	SARA 302:	SARA 313:	DSL(CAN):
Xanthan gum	11138-66-2	Yes	No	No	No	Yes

US FEDERAL REGULATIONS:

WASTE CLASSIFICATION: Not a hazardous waste by U.S. RCRA criteria. See Section 13.

REGULATORY STATUS:

This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:

1: Immediate (Acute) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:

TSCA (U.S.)
DSL (Canada)
EINECS (Europe)

STATE REGULATIONS:

STATE REGULATORY STATUS:

This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

None.

CANADIAN REGULATIONS:

REGULATORY STATUS:

This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations.

Canadian WHMIS Classification: Not a Controlled Product.

16. OTHER INFORMATION

NPCA HMIS HAZARD INDEX:	1 Slight Hazard
FLAMMABILITY:	1 Slight Hazard
REACTIVITY:	0 Minimal Hazard
NPCA HMIS PERS. PROTECT. INDEX:	E - Safety Glasses, Gloves, Dust Respirator

USER NOTES: N/A = Not applicable N/D = Not determined

INFORMATION SOURCES: OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.

ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).

Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

Product information provided by the commercial vendor(s).

PREPARED BY: Sam Hoskin

REVISION No./Repl. MSDS of: 1/September 9, 1994

MSDS STATUS: Approved.

DATE: June 3, 1998

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

SAFETY DATA SHEET NUTPLUG (All Grades)

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: NUTPLUG (All Grades)
APPLICATIONS: Lost circulation material
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

GROSS FORMULA: Cellulose - Nutshells
CAS No.: 9004-34-6

COMPOSITION COMMENTS:

This product is classified as containing no hazardous ingredients according to the EC Directives.

3. HAZARDS IDENTIFICATION:

Not regarded as a health hazard under current legislation.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA: Carbon dioxide (CO₂). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

Use pressurized air mask if substance is involved in a fire.

UNUSUAL FIRE & EXPLOSION HAZARDS:

High concentrations of dust may form explosive mixture with air.

HAZARDOUS COMBUSTION PRODUCTS:Asphyxiating gases/vapors/fumes. Carbon dioxide (CO₂). Carbon monoxide (CO).**6. ACCIDENTAL RELEASE MEASURES:****SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

B. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.**PROTECTIVE EQUIPMENT:****VENTILATION:** Provide adequate general and local exhaust ventilation.**RESPIRATORS:** Respiratory protection must be used if air concentration exceeds acceptable level. Dust filter P2 (for fine dust).**PROTECTIVE GLOVES:**

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.
COLOUR:	Brown.
ODOUR/TASTE:	Odourless or no characteristic odour.
SOLUBILITY DESCRIPTION:	Insoluble in water.
DENSITY/SPECIFIC GRAVITY (g/ml):	1.35
BULK DENSITY:	577 - 641 kg/m ³
FLAMMABILITY LIMIT - LOWER(%):	May form explosive dust clouds in air.

10. STABILITY AND REACTIVITY:**STABILITY:** Normally stable.

CONDITIONS TO AVOID:

Avoid heat, flames and other sources of ignition.

MATERIALS TO AVOID:

Strong oxidizing agents.

HAZARDOUS DECOMP. PRODUCTS:

Fire or high temperatures create: Asphyxiating gases/vapours/fumes of: Carbon dioxide (CO₂). Carbon monoxide (CO).

11. TOXICOLOGICAL INFORMATION:

INHALATION: Dust may irritate respiratory system or lungs. Inhalation may cause bronchial asthma in some personnel.

INGESTION: May cause discomfort if swallowed.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:

Not regarded as dangerous for the environment.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:

ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:

RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:

SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:

AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: Not classified.

UK REGULATORY REFERENCES:

Chemicals (Hazard Information & Packaging) Regulations 1993. The Control of Substances Hazardous to Health Regulations 1988.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 1 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 10-12-98

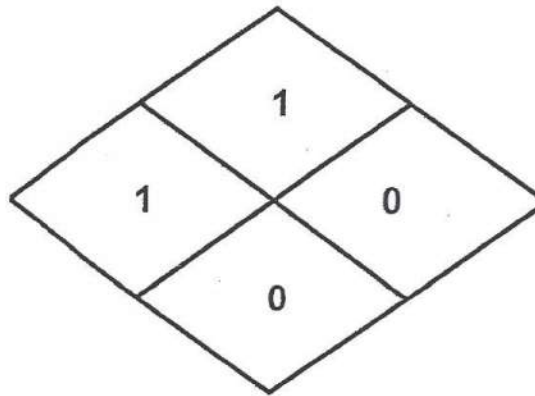
DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

Agriity Industries, Inc.
P.O. Box 5342

Kingsville
361-595-5561
361-595-5588

TX 78363



3060 PHPA

Material Safety Data Sheet

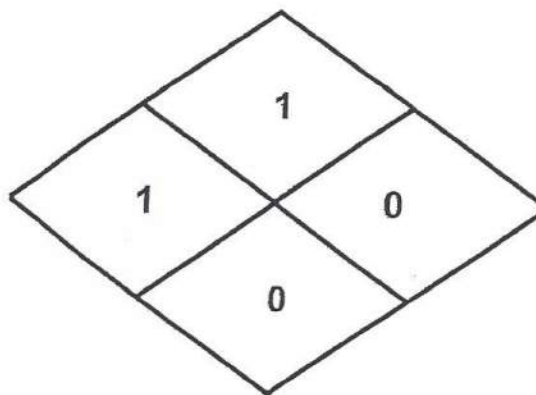
Page 7

	SECTION 3.0
Boiling Point	347 F
Freezing Point	N/A
Specific Gravity	1.0
Vapor Pressure (mm Hg)	N/A
Vapor Density	N/A
Solubility in H ₂ O	Appreciable
Appearance	White viscous liquid
Odor	Slight hydrocarbon
	SECTION 4.0
Stability	Stable under normal conditions.
Incompatibility	Strong oxidizers, slowly reacts with metals such as iron, copper, and aluminum.
Hazardous Decomposition Products	Combustion may produce oxides of carbon, nitrogen, and smoke
Hazardous Polymerizations	Will not occur
	SECTION 5.0
Flash Point	265 F
Extinguishing Media	Water, Dry Chemical, Foam, CO ₂
Special Fire Fighting Procedures	Normal firefighting procedures
Unusual Fire Hazards	None known
pH	N/A
	SECTION 6.0
Inhalation	Move to well ventilated area; if breathing difficulties persist after 15 minutes, seek medical help
Eye Contact	Wash eye thoroughly for 15 minutes; if irritation persists, seek medical help.
Skin Contact	Wash exposed area with soap & water
Ingestion	Ingesting large quantities can be slightly toxic, do not induce vomiting, drink water to dilute, seek medical assistance.
	SECTION 7.0
Acute	May irritate eyes, respiratory, digestive tracts, including nausea, vomiting, drowsiness, and headache.
Chronic	Prolong exposure may damage central nervous system, heart, liver, and create blood disorder.
	SECTION 8.0
Accidental Spill Procedures	Absorb with inert material and dispose of according to local, state, and federal regulations.
Handling & Storage	Store in well ventilated area.

Integrity Industries, Inc.
P. O. Box 5342

Kingsville
361-595-5561
361-595-5588

TX 78363



3060 PHPA

Material Safety Data Sheet

Page 8

Respiratory Protection	SECTION 9.0
Ventilation	NIOSH approved organic respirator in mist conditions
Exhaust	Desired
Protective Gloves	Mechanical
Eye Protection	Rubber gloves
Other Protection	Safety Glasses, Goggles
	Eye wash/Safety shower

DOT Proper Shipping Name	SECTION. 10.0
DOT Hazard Class or Division	Not Regulated
DOT Identification Number	Not Hazardous
DOT Packaging Group	N/A
Type Label(s) Required or Exemption Nu	N/A
	None

DISCLAIMER	SECTION. 11.0
DISCLAIMER	SOME INFORMATION PROVIDED HEREIN WAS DRAWN FROM SOURCES OTHER THAN INTEGRITY INDUSTRIES.
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DISCLAIMER	INTEGRITY INDUSTRIES ASSUMES NO RESPONSIBILITY AND DENIES ALL LIABILITY FOR ANY LOSS, DAMAGE, OR EXPENSE CONNECTED WITH CUSTOMERS' METHOD OF HANDLING, STORAGE, USE, AND DISPOSAL OF THIS PRODUCT.
DISCLAIMER	THE MSDS INFORMATION PROVIDED HEREIN IS APPLICABLE ONLY TO THIS PRODUCT.

Revised Date	SECTION 1.0
Supersedes	02/11/02
	06/15/98

Trade Name	SECTION 2.0
Synonyms/Other Designations	CAUSTIC SODA
Chemical Formula	ANHYDROUS SODIUM HYDROXIDE, SODIUM HYDROXIDE, CAUSTIC SODA
Hazard(s)	NaOH CAS# 001310-73-2
	SODIUM HYDROXIDE, SOLID

Boiling Point	SECTION 3.0
	1390 C

MATERIAL SAFETY DATA SHEET

Q-PAC

Date: 11-09-01

1. Product and Company Identification

Product Name: PAC (Regular, Low, and Superlo)

Chemical Name: polyanionic cellulose

Chemical Family: cellulosic polymer

Chemical Formula: n/a

Supplier: Grinding & Sizing Company, Inc.

515 Industrial Boulevard

Lufkin, Texas 75904

Emergency Phone Number: 936-634-7718

2. Ingredient Identification:

polyanionic cellulose 100%

hazardous ingredients: none

3. Physical and Chemical Properties

- Appearance: off-white to light yellow powder
 - Soluble in water
 - Boiling point: n/a
 - Melting point: n/a
 - Vapor Pressure: n/a
 - Specific gravity: 1.6
 - Odor: none
 - PH (1% solution): 6.5 – 9.0
 - Bulk Density: 40 – 55 lb./cu.ft.
-

4. Fire and Explosion Data

- Autoignition temperature: 400°C (752°F)
- Flashpoint: 430°F, 221°C
- Flammability: n/a
- Extinguishing media: Water spray, CO₂, dry chemical, foam
- Special fire fighting procedures: Evacuate all unnecessary personnel. Wear appropriate safety equipment for fire conditions including SCBA.
- Dust may form explosive mixture with air at high concentrations

5. Stability and Reactivity

- Stability: stable
- Reactivity: avoid excessive heat, ignition sources and strong oxidizers
- Hazardous Decomposition: CO, CO₂
- Does not polymerize

6. Health Hazards Identification:

- Acute Effects: none
 - Ingestion: none
 - Eyes: Dust abrasive to the eyes
 - Skin: may cause mild irritation
 - Inhalation: may cause mild respiratory tract irritation
 - Chronic Effects: IARC not listed; OSHA not listed; NTP not listed.
 - Route of entry: inhalation and eye contact
 - Medical conditions aggravated by exposure: none known
 - First Aid Procedures:
 - Inhalation: Move exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.
 - Ingestion: Under normal circumstances, first aid is not required.
 - Skin: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation persists.
 - Eyes: promptly wash eyes with lots of water. Continue to rinse for 15 minutes. Get medical attention if irritation persists.
-

7. Handling & Storage

- Handle only in well ventilated areas. Avoid breathing dust.
- Store in cool dry place.
- Material is slippery when wet.
- Dust may form explosive mixture with air at high concentrations.
- In case of accidental release or spillage, collect and contain material.
- Contact local authorities for proper disposal.

8. Exposure Controls, Personal Protection

- Ventilation-Local exhaust and ventilation system is recommended if handled in a confined area to control below recommended exposure levels.
- Respiratory Protection- Use NIOSH approved nuisance dust respirator.
- Eye Protection-Use safety glasses with side shields
- Skin Protection-Use long-sleeved clothing and gloves

9. Toxicological Information

- Oral toxicity: LD50: 1260 mg/kg (rat)

10. Ecological Information

- Readily biodegradable

11. Transport Information

- Proper Shipping Name: Not regulated by DOT as a hazardous material
- Hazard class: none
- UN Number: none
- Packing Group: none

12. Regulatory Information

- OSHA (29 CFR 1910.1200) This product should be included in a hazard communication program.
- RCRA:none.
- NFPA Hazard Codes: Health:0, Flammability: 0, Reactivity: 0, Special hazards: 0

MATERIAL SAFETY DATA SHEET

Q-Thin

1. Product and Company Identification

Product Name: Q-Thin

Chemical Name: Mixture

Chemical Family: Mixture

Chemical Formula: Mixture

CAS Reg. No. Mixture

Distributed By: Grinding & Sizing Co., Inc.

7707 Wallisville Rd.

Houston, TX 77020

(713) 673-5176

2. Composition:

		CAS	NO.
Chromium Compound*	5%		
12336-95-7			
Proprietary Ingredients	95%		

*chromium III (OSHA PEL 0.5mg/m³)

3. Hazards Identification:

- Acute Effects: irritating to the respiratory tract if inhaled.
- Ingestion: Toxic if swallowed; May cause gastric distress, nausea, vomiting, liver damage.
- Eyes: Irritating to the eyes
- Skin: Irritating to the skin upon prolonged contact.
- Chronic Effects: IARC not listed; OSHA not listed; NTP not listed.
- Route of Entry: inhalation, skin and eye contact.

4. First Aid Measures

- Inhalation: Move exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.
- Ingestion: Induce vomiting if person is conscious. Seek medical attention.
- Skin: Wash skin thoroughly with soap and water. Remove contaminated clothing.
- Eyes: Promptly wash eyes with lots of water. Continue to rinse for 30 minutes. Get medical attention.

4. Fire Fighting

- Material will burn releasing combustion products which may be toxic (SO₂, CO, CO₂).
- Extinguishing media: Water spray, CO₂, dry chemical, foam.
- Special fire fighting procedures: Evacuate all unnecessary personnel. Wear appropriate safety equipment for fire conditions including SCBA.

5. Accidental Release Measures

- Highway or Rail Spill: Contain spill, protect from ignition, keep out of water sources or sewers. Absorb in a dry, inert material like sand, clay. Contact local authorities for specific disposal site information.

6. Handling & Storage

- Handle only in well ventilated areas. Avoid breathing dust.
- Store in cool dry place, keep away from oxidizing agents, ignition sources.

7. Exposure Controls, Personal Protection

- Ingredient name: chrome compounds, OSHA PEL 0.5mg/m³
- Ventilation: Local exhaust and ventilation system is recommended if handled in a confined area to control below recommended exposure levels.
- Respiratory Protection: Use NIOSH approved air purifying respirator.
- Eye Protection: Use safety glasses with side shields.
- Skin Protection: Use long-sleeved clothing and gloves.

8. Physical and Chemical Properties

- Appearance: Reddish/tan powder
- Soluble in water
- Boiling Point: n/a
- Melting Point: n/a
- Vapor Pressure: n/a
- Specific Gravity: 1.25
- Odor: vanilla-like

10. Stability and Reactivity

- Stability: stable
- Reactivity: avoid excessive heat, ignition sources and strong oxidants.
- Hazardous Decomposition: SO₂
- Does not polymerize

11. Toxicological Information

- No toxicological information is available on this product
- Trivalent chrome has relatively low toxicity due to poor cell membrane permeability and noncorrosivity.

12. Ecological Information

- No ecological information is available

13. Disposal Considerations

- Recover and reuse if possible
- Dispose in permitted waste management facility

14. Transport Information

- Proper Shipping Name: Not regulated by DOT as a hazardous material.
- Hazard Class: none
- UN Number: none
- Packing Group: none

15. Regulatory Information

- OSHA (29 CFR 1910.1200) This product should be included in a hazard communication program.
- RCRA: If this product becomes a waste, it may be characterized as a hazardous waste as prescribed by RCRA.
- CERCLA: Not subject to reporting.
- SARA 313: This product contains the following chemical subject to the reporting requirements of Section 313: Chromium Compounds, Acute & Chronic
- NFPA Hazard Codes: Health: 1, Flammability: 0, Reactivity: 0, Special Hazards: 0

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MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTION

1.) CHEMICAL PRODUCT AND COMPANY INFORMATION

CHEMICAL NAME: SODIUM ACID PYROPHOSPHATE
SYNONYMS: SAPP

COMPANY NAME:	CHEMSOL, LLC 601 CARLSON PARKWAY, SUITE 400 MINNETONKA, MN 55305
CONTACT:	JAKE BOWLSBY
COMPANY PHONE:	952-807-7459
COMPANY FAX:	952-807-7479
COMPANY EMAIL:	JAKE@CHEMSOLUSA.COM

2.) COMPOSITION, INFORMATION ON INGREDIENTS

PRODUCT:	SAPP
CHEMICAL NAME:	SODIUM ACID PYROPHOSPHATE
CAS NUMBER:	7758-16-9
CONTENTS:	100%

3.) HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. AVOID CONTACT WITH EYES, SKIN, AND CLOTHING. AVOID BREATHING AIRBORNE PRODUCT. KEEP CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

THIS PRODUCT IS A/AN WHITE POWDER. A NUISANCE DUST. SLIPPERY WHEN WET. NO SIGNIFICANT IMMEDIATE HAZARDS FOR EMERGENCY RESPONSE PERSONNEL ARE KNOWN.

ACUTE EFFECTS OF OVEREXPOSURE:

SKIN CONTACT:	MAY BE IRRITATING TO THE SKIN.
EYE CONTACT:	MAY BE IRRITATING TO THE EYES.
INHALATION:	MAY BE IRRITATING TO THE RESPIRATORY TRACT.
INGESTION:	MAY CAUSE GASTRIC DISTRESS, NAUSEA AND VOMITING.

SUBCHRONIC AND CHRONIC EFFECT OF OVEREXPOSURE:

IARC: NOT LISTED. OSHA: NOT REGULATED. NTP: NOT LISTED.

-1-

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MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

OTHER HEALTH HAZARD CATEGORIES

KNOWN CARCINOGEN - NA

SUSPECT CARCINOGEN - NA

MUTAGEN - NA

TARGET ORGAN TOXIN: RESPIRATORY, LUNGS. SKIN. EYES.

CANADIAN WHMIS- DOES NOT MEET CRITERIA FOR ANY OF THE ABOVE CATEGORIES.

4.) FIRST AID MEASURES

SKIN CONTACT:

WASH WITH PLENTY OF WATER AND SOAP WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE USE. IF IRRITATION PERSISTS SEEK MEDICAL ATTENTION.

EYE CONTACT:

IN CASE OF CONTACT, IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER AND LOWER EYELIDS. IF IRRITATION PERSISTS SEEK MEDICAL ATTENTION.

INGESTION:

DO NOT INDUCE VOMITING. IF CONSCIOUS AND ALERT, RINSE MOUTH AND DRINK 2-4 CUPS OF MILK OR WATER. WASH MOUTH WITH WATER. SEEK MEDICAL ATTENTION IF IRRITATION OCCURS.

INHALATION:

MOVE TO FRESH AIR IMMEDIATELY. IF COUGH OR OTHER SYMPTOMS APPEAR SEEK MEDICAL ATTENTION.

5.) FIRE FIGHTING MEASURES

AUTO IGNITION TEMP (F): N/D

FLAMIBILITY LIMIT – LOWER (%): N/D

FLAMIBILITY LIMIT – UPPER (%): N/D

EXTINGUISH MEDIA:

CARBON DIOXIDE (CO₂). DRY CHEMICALS. FOAM. WATER SPRAY, FOG OR MIST.

SPECIAL FIRE FIGHTING PROCEDURES:

NO UNUSUAL FIRE OR EXPLOSION HAZARDS NOTED.

HAZARDOUS COMBUSITON PRODUCTS:

THIS MATERIAL IS NOT COMBUSTIBLE. FIRE OR HIGH TEMPERATURES CREATE:

OXIDES OF: SODIUM. PHOSPHORUS.

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MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

6.) ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

WEAR PROPER PERSONAL PROTECTIVE EQUIPMENT (SEE MSDS SEC.8)

SPILL CLEAN-UP PROCEDURES:

AVOID GENERATING AND SPREADING DUST. SHOVEL INTO DRY CONTAINERS. COVER AND MOVE THE CONTAINERS. FLUSH THE AREA WITH WATER. DO NOT CONTAMINATE DRAINAGE OR WATERWAYS. REPACKAGE OR RECYCLE IF POSSIBLE.

7.) HANDLING AND STORAGE

HANDLING PRECAUTIONS:

AVOID HANDLING CAUSING GENERATION OF DUST. WEAR FULL PROTECTIVE CLOTHING FOR PROLONGED EXPOSURE AND OR/HIGH CONCENTRATIONS. EYE WASH AND EMERGENCY SHOWER MUST BE AVAILABLE AT THE WORK PLACE. WASH HANDS OFTEN AND CHANGE CLOTHING WHEN NEEDED. PROVIDE GOOD VENTILATION. MECHANICAL OR LOCAL EXHAUST VENTILATION IS REQUIRED.

STORAGE PRECAUTIONS:

STORE AT MODERATE TEMPERATURES IN DRY, WELL VENTILATED AREA. KEEP IN ORIGINAL CONTAINER.

8.) EXPOSURE CONTROLS, PERSONAL PROTECTION

INGREDIENT NAME:

SODIUM ACID PYROPHOSPHATE

INGREDIENT COMMENTS:

EXPOSURE LIMITS FOR PARTICULATES NOT OTHERWISE CLASSIFIED (PNOC) APPLY TO DUST/MIST/AEROSOL/ OF THE PROPRIETARY INGREDIENTS THIS PRODUCT. TLV: 3 MG/M³ RESP DUST; PEL: 5 MG/M³ RESP. DUST.

PROTECTIVE EQUIPMENT

GLOVES, EYE SHEILD

-3-

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MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

ENGINEERING CONTROLS:

USE APPROPRIATE ENGINEERING CONTROLS SUCH AS, EXHAUST VENTILATION AND PROCESS ENCLOSURE, TO REDUCE AIR CONTAMINATION AND KEEP WORKER EXPOSURE BELOW THE APPLICABLE LIMITS.

VENTILATION:

SUPPLY NATURAL OR MECHANICAL VENTILATION ADEQUATE TO EXHAUST AIRBORNE PRODUCT AND KEEP EXPOSURE BELOW THE APPLICABLE LIMITS.

RESPIRATORS:

USE AT LEAST A NIOSH-APPROVED N95 HALF-MASK DISPOSABLE OR REUSABLE PARTICULATE RESPIRATOR. IN WORK ENVIRONMENTS CONTAINING OIL MIST/AEROSOL USE AT LEAST A NIOSH-APPROVED P95 HALF-MASK DISPOSABLE OR REUSABLE PARTICULATE RESPIRATOR.

EYE PROTECTION:

WEAR DUST RESISTANT SAFETY GOGGLES WHERE THERE IS DANGER OF EYE CONTACT.

PROTECTIVE CLOTHING:

WEAR APPROPRIATE CLOTHING TO PREVENT REPEATED OR PROLONGED SKIN CONTACT.

HYGENIC WORK PRACTICES:

WASH PROMPTLY WITH SOAP AND WATER IF SKIN BECOMES CONTAMINATED. CHANGE WORK CLOTHING DAILY IF THERE IS ANY POSSIBILITY OF CONTAMINATION.

9.) PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	POWDER, DUST.
COLOR:	WHITE
ODOR:	ODORLESS OR NO COLOR
SOLUBILITY DESCRIPTION:	SOLUBLE IN WATER
SOLUBILITY VALUE (G/100G H ₂ O 68 F):	13
MELT./FREEZE. POINT (F, INTERVAL):	428
DENSITY/SPECIFIC GRAVITY (G/ML)	1.862
BULK DENSITY:	1095 KG/M ³
VAPOR DENSITY (AIR=1)	N/A
VAPOR PRESSURE:	N/A
PH VALUE, DILUTED SOLUTION:	4.3 CONCENTRATION: 1%

MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

10.) STABILITY AND REACTIVITY

CONDITIONS TO AVOID: NA

DECOMPOSITION PRODUCTS: NO SPECIFIC PRODUCTS NOTED.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CHEMICAL STABILITY: STABLE UNDER NORMAL TEMPERATURE AND PRESSURE.

MATERIALS TO AVOID: BASES, ALKALIS (INORGANIC).

11.) TOXICOLOGICAL INFORMATION

COMPONENT: SODIUM ACID PYROPHOSPHATE

TOXIC DOSE – LD 50: 2650

TOXIC DOSE – LD 50: >300 MG/KG (SKN-RBT)

12.) ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:

NO ECOLOGICAL INFORMATION IS AVAILABLE FOR THIS PRODUCT.

13.) DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT

MUST CONSULT STATE AND LOCAL HAZARDOUS WASTE REGULATIONS TO ENSURE COMPLETE AND ACCURATE CLASSIFICATION. DISPOSE OF IN ACCORDANCE WITH ANY LOCAL, STATE, AND FEDERAL REGULATIONS. PREVENT RUN-OFF TO SEWERS.

RCRA P-SERIES: NONE LISTED

RCRA U-SERIES: NONE LISTED

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MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

DISPOSAL METHODS

RECOVER AND RECLAIM OR RECYCLE, IF PRACTICAL. SHOULD THIS PRODUCT BECOME A WASTE, DISPOSE OF IN A PERMITTED INDUSTRIAL LANDFILL. ENSURE THAT CONTAINERS ARE EMPTY BY RCRA CRITERIA PRIOR TO DISPOSAL IN A PERMITTED INDUSTRIAL LANDFILL.

14.) TRANSPORTATION INFORMATION

PRODUCT RQ:	N/A
U.S. DOT:	
U.S. DOT CLASS:	NOT REGULATED
CANADIAN TRANSPORTATION	
TDGR:	NOT REGULATED
SEA TRANSPORT:	NOT REGULATED
AIR TRANSPORT	
ICAO CLASS:	NOT REGULATED

15.) REGULATORY INFORMATION

REGULATORY STATUS OF INGREDIENTS:

NAME:	CAS No:
SODIUM ACID PYROPHOSPHATE	7758-16-9

TSCA:
YES

SARA 302/313:
No

DSL (CAN):
YES

US FEDERAL REGULATION:

WASTE CLASSIFICATION:

NOT A HAZARDOUS WASTE BY US RCRA CRITERIA. SEE SECTION 13

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MATERIAL SAFETY DATA INFORMATION SODIUM ACID PYROPHOSPHATE (SAPP)

CHEMSOL DRILLING FLUID SOLUTIONS

REGULATORY STATUS:

THIS PRODUCT OR ITS COMPONENTS, IF A MIXTURE E, IS SUBJECT TO FOLLOWING REGULATIONS (NOT MEANT TO BE ALL INCLUSIVE – SELECTED REGULATIONS REPRESENTED):

SECTION 313: THIS PRODUCT DOES NOT CONTAIN TOXIC CHEMICAL SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

SARA 311 CATEGORIES:

1: IMMEDIATE (ACUTE) HEALTH EFFECTS.

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON OR ARE EXEMPT FROM THE FOLLOWING INTERNATIONAL CHEMICAL REGISTRIES:
TSCA (U.S.), DSL (CAN.), EINECS (S. KOREA), AICS (AUSTRALIA).

STATE REGULATIONS:

STATE REGULATORY STATUS:

THIS PRODUCT OR ITS COMPONENTS, IF A MIXTURE E, IS SUBJECT TO FOLLOWING REGULATIONS (NOT MEANT TO BE ALL INCLUSIVE – SELECTED REGULATIONS REPRESENTED): NONE

16.) OTHER INFORMATION

NPCA HMIS HAZARD INDEX: 1 SLIGHT HAZARD
FLAMMABILITY: 0 MINIMAL HAZARD
REACTIVITY: 0 MINIMAL HAZARD
NPCA: E- GLASSES, GLOVES, RESPIRATOR

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-7-

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SAFETY DATA SHEET

SODA ASH

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: SODA ASH
APPLICATIONS: pH modifier.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
 Pocra Quay,
 Footdee,
 Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

INGREDIENT NAME:	CAS No.:	CONTENT	HEALTH:	RISK:
SODA ASH	497-19-8	60-100 %	Xi	36

COMPOSITION COMMENTS:

This product is classified as an irritant according to the EU Directives.

3. HAZARDS IDENTIFICATION:

Irritating to eyes.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. If respiratory problems, artificial respiration/oxygen. Get medical attention if any discomfort continues.
INGESTION: Rinse mouth thoroughly with water and give large amounts of milk or water to people not unconscious. DO NOT induce vomiting. Get medical attention immediately.
SKIN: Immediately remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES:

NOTE! Use air-supplied respirators to protect against gases/fumes.

HAZARDOUS COMBUSTION PRODUCTS:

Fire or high temperatures create: Carbon dioxide (CO₂).

6. ACCIDENTAL RELEASE MEASURES:**PERSONAL PRECAUTION IN SPILL:**

Wear proper personal protective equipment (see MSDS Section 8).

SPILL CLEANUP METHODS:

Shovel into dry containers. Cover and move the containers. Flush the area with water. Small quantities can be dissolved/diluted in water and flushed to drain. Flush with plenty of water to clean spillage area. Inform Authorities if large amounts are involved.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid spilling, skin and eye contact. Avoid handling which leads to dust formation. Use mechanical ventilation in case of handling which causes formation of dust.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**

This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.

PROTECTIVE EQUIPMENT:

RESPIRATORS: No specific recommendation made, but protection against nuisance dust must be used when the general level exceeds 10 mg/m³. D, Dust mask/respirator. Dust filter P2 (for fine dust).

PROTECTIVE GLOVES:

Chemical resistant gloves required for prolonged or repeated contact. Use protective gloves made of: Neoprene, nitrile, polyethylene or PVC.

EYE PROTECTION:

Wear approved chemical safety goggles where eye exposure is reasonably probable. Use tight fitting goggles if dust is generated.

OTHER PROTECTION:

Provide eyewash station. Wear appropriate clothing to prevent repeated or prolonged skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Crystals. Granular. Powder, dust.
COLOUR:	White.
ODOUR/TASTE:	No characteristic odour.
SOLUBILITY DESCRIPTION:	Very soluble in water.
SOLUBILITY VALUE (g/100g H₂O 20°C):	22 g/100 ml
MELT/FREEZ. POINT (°C, interval):	851
DENSITY/SPECIFIC GRAVITY (g/ml):	2.53 TEMPERATURE (°C): 20

pH-VALUE, CONC. SOLUTION: 11.6

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable. Avoid: Moisture. Contact with acids.

MATERIALS TO AVOID:
Strong acids. Strong oxidizing agents.

HAZARDOUS DECOMP. PRODUCTS:
Fire or high temperatures create: Carbon dioxide (CO₂).

11. TOXICOLOGICAL INFORMATION:

TOXIC DOSE - LD 50: 4090 mg/kg (oral rat)

INHALATION: Gas or vapour in high concentrations may irritate respiratory system.

INGESTION: Gastrointestinal symptoms, including upset stomach.

SKIN: Prolonged or repeated exposure may cause severe irritation.

EYES: Irritating to eyes. Repeated exposure may cause chronic eye irritation.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Contact M-T's Environmental Affairs Department for ecological information.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not classified for road transport.

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not classified for rail transport.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not classified for sea transport.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not classified for air transport.

15. REGULATORY INFORMATION:

LABEL FOR SUPPLY:



RISK PHRASES:

R-36 Irritating to eyes.

SAFETY PHRASES:

S-22 Do not breathe dust.

S-26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S-36 Wear suitable protective clothing.

16. OTHER INFORMATION:

USER NOTES:

HMIS Health - 1 HMIS Flammability - 1 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

REVISION COMMENTS:

Revised by Sarah Glover

ISSUED BY:

Dr. Kirsty Walker

REVISION DATE:

14-06-00

THIS SDS IS PRODUCED WITH SAFECHEM for WINDOWS**DISCLAIMER:**

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

SAFETY DATA SHEET

SODIUM BICARBONATE

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY:

PRODUCT NAME: SODIUM BICARBONATE
APPLICATIONS: Oil well drilling fluid additive.
EMERGENCY TELEPHONES: 001 281 561 1600 (USA)
SUPPLIER: M-I Drilling Fluids UK Ltd,
Pocra Quay,
Footdee,
Aberdeen. AB11 5DQ
TELEPHONE: 44 (0)1224 - 584336
FAX: 44 (0)1224 - 576119

2. COMPOSITION/INFORMATION ON INGREDIENTS:

GROSS FORMULA: Sodium Hydrogen Carbonate
CAS No.: 144-55-8

COMPOSITION COMMENTS:

This product formulation is not classified as hazardous in accordance with the EU Directives.

3. HAZARDS IDENTIFICATION:

Not regarded as a health hazard under current legislation.

4. FIRST AID MEASURES:

INHALATION: Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
INGESTION: First aid is not normally required. Rinse mouth thoroughly. Drink plenty of water.
SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.
EYES: Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES:

EXTINGUISHING MEDIA:

Carbon dioxide (CO₂). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

Use special protective clothing. Regular protection may not be safe. Use pressurized air mask if substance is involved in a fire.

UNUSUAL FIRE & EXPLOSION HAZARDS:

No unusual fire or explosion hazards noted.

HAZARDOUS COMBUSTION PRODUCTS:

Fire or high temperatures create: Oxides of: Carbon.

6. ACCIDENTAL RELEASE MEASURES:**SPILL CLEANUP METHODS:**

Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate water sources or sewer. Wear necessary protective equipment.

7. HANDLING AND STORAGE:**USAGE PRECAUTIONS:**

Avoid handling which leads to dust formation. Provide good ventilation.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION:**INGREDIENT COMMENTS:**

This material is considered a nuisance dust, OES TWA 4mg/m³ Respirable Dust, 10 mg/m³ Total Dust.

PROTECTIVE EQUIPMENT:

VENTILATION: Provide adequate general and local exhaust ventilation.

RESPIRATORS: If ventilation is insufficient, suitable respiratory protection must be provided. Dust filter P2 (for fine dust).

PROTECTIVE GLOVES:

No specific hand protection noted, but gloves may still be advisable. For prolonged or repeated skin contact use suitable protective gloves. Rubber or plastic.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

OTHER PROTECTION:

Wear appropriate clothing to prevent repeated or prolonged skin contact. Provide eyewash station.

9. PHYSICAL AND CHEMICAL PROPERTIES:

APPEARANCE:	Powder, dust.	
COLOUR:	White.	
ODOUR/TASTE:	Odourless or no characteristic odour.	
SOLUBILITY DESCRIPTION:	Soluble in water.	
SOLUBILITY VALUE (g/100g H₂O 20°C):	7	
MELT/FREEZ. POINT (°C, interval):	270	
DENSITY/SPECIFIC GRAVITY (g/ml):	2.16	TEMPERATURE (°C): 20
BULK DENSITY:	801-1089 kg/m ³	
pH-VALUE, DILUTED SOLUTION:	8.3	CONCENTRATION (%M): 1%

10. STABILITY AND REACTIVITY:

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid wet and humid conditions.

MATERIALS TO AVOID:
Strong acids.

HAZARDOUS DECOMP. PRODUCTS:
Fire or high temperatures create: Oxides of Carbon.

11. TOXICOLOGICAL INFORMATION:

TOXIC DOSE - LD 50: 4220 mg/kg (oral rat)

INHALATION: Dust may irritate respiratory system or lungs.

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: Powder may irritate skin.

EYES: Particles in the eyes may cause irritation and smarting.

12. ECOLOGICAL INFORMATION:

ECOLOGICAL INFORMATION:
Contact M-T's Environmental Affairs Department for ecological information.

13. DISPOSAL CONSIDERATIONS:

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Dispose of on site landfill area. Dispose of in accordance with Local Authority requirements.

14. TRANSPORT INFORMATION:

ROAD TRANSPORT:
ROAD TRANSPORT NOTES: Not Classified

RAIL TRANSPORT:
RAIL TRANSPORT NOTES: Not Classified.

SEA TRANSPORT:
SEA TRANSPORT NOTES: Not Classified.

AIR TRANSPORT:
AIR TRANSPORT NOTES: Not Classified.

15. REGULATORY INFORMATION:

RISK PHRASES: Not classified.

SAFETY PHRASES: Not classified.

STATUTORY INSTRUMENTS: Chemicals (Hazard Information and Packaging) Regulations. Control of Substances Hazardous to Health.

GUIDANCE NOTES: Occupational Exposure Limits EH40.

16. OTHER INFORMATION:

USER NOTES: HMIS Health - 1 HMIS Flammability - 0 HMIS Reactivity - 0 E - Safety glasses, Gloves, Dust Respirator

INFORMATION SOURCES: Material Safety Data Sheet, Misc. manufacturers. Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997). The Merck Index, 11. edition, 1989. Sigma-Aldrich Material Safety Data Sheets on CD-ROM.

ISSUED BY: Dr. Kirsty Walker

REVISION DATE: 22-7-99

REV. No./REPL. SDS GENERATED: 1

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.



Material Safety Data Sheet



Toxic

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Soltex® Additive

Product Use: Drilling Mud Additive
Product Number(s): 0001016807, 0001033053, 0001079530
Synonyms: DRILLING MUD ADDITIVE
Product Cas No.: MIXTURE

Company Identification:
 Chevron Phillips Chemical Company LP
 Drilling Specialties Company
 10001 Six Pines Drive
 The Woodlands, TX 77380

Product Information:
 MSDS Requests: (800) 852-5530
 Technical Information: (800) 221-1956

24-Hour Emergency Telephone Numbers

HEALTH: Chevron Phillips Emergency Information Center 866.442.9628 (North America) and 1.832.813.4984 (International)

TRANSPORTATION: North America: CHEMTREC 800.424.9300 or 703.527.3887
 ASIA: +1.703.527.3887
 EUROPE: BIG .32.14.584545 (phone) or .32.14.583516 (telefax)
 SOUTH AMERICA SOS-Cotec Inside Brazil: 0800.111.767
 Outside Brazil: 55.19.3467.1600

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	AMOUNT	EINECS	SYM	R-PHRASES
Proprietary Materials	Various	100 % weight	NA	NA	NA
Crystalline Silica	14808-60-7	< 1.0 % weight	238-878-4	NA	NA
n-Heptane	142-82-5	0.001 % weight	205-563-8	F, Xn, N	R65, R50/53, R38, R11, R67

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Crystalline Silica	ACGIH	.05 mg/m ³	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m ³	NA	NA	Respirable Dust
Crystalline Silica	German MAK	.15 mg/m ³	NA	NA	NA

Proprietary Materials	CPCHEM	Not Established	NA	NA	NA
n-Heptane	ACGIH	400 ppm	500 ppm	NA	NA
n-Heptane	German MAK	500 ppm	NA	4	NA
n-Heptane	OSHA PEL	500 ppm	NA	NA	NA

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Solid black powder with no odor.

- MAY CAUSE SKIN IRRITATION
- DUST MAY PRODUCE MECHANICAL IRRITATION TO THE MUCOUS MEMBRANES OF THE EYES, NOSE, THROAT AND UPPER RESPIRATORY TRACT
- MAY CAUSE EYE IRRITATION
- CANCER HAZARD - CONTAINS MATERIAL THAT CAN CAUSE CANCER
- MAY CAUSE DAMAGE TO:
 - - - - - LUNGS

IMMEDIATE HEALTH EFFECTS:

Eye: This material may be irritating to the eyes and could cause prolonged (days) impairment of your vision. The degree of the injury will depend on the amount of material that gets into the eye and the speed and thoroughness of the first aid treatment. Not expected to cause prolonged or significant eye irritation. Material is dusty and may scratch the surface of the eye.

Skin: This material may be irritating to the skin. The degree of the injury will depend on the amount of material that gets onto the skin and the speed and thoroughness of the first aid treatment. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: May be irritating to mouth, throat, and stomach. Symptoms may include nausea, vomiting, and diarrhea.

Inhalation: The dust from this material may cause respiratory irritation.

DELAYED OR OTHER HEALTH EFFECTS:

Cancer: Prolonged or repeated exposure to this material can cause cancer.

Target Organs: Repeated inhalation of this material at elevated concentrations may cause damage to the following organ(s) based on animal data: - Lung

See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: Flush eyes with running water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get medical attention if irritation persists.

Skin: To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

Ingestion: If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get

immediate medical attention. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

SECTION 5 FIRE FIGHTING MEASURES

NFPA RATINGS: Health: 1 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:

Flashpoint: NA

Autoignition: NDA

Flammability (Explosive) Limits (% by volume in air): Lower: NA Upper: NA

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: Evacuate area of all unnecessary personnel. Wear appropriate safety equipment for fire conditions including NIOSH self-contained breathing apparatus (SCBA) and other protective equipment as described in Section 8 if exposure conditions warrant.

Combustion Products: Combustion may form: Sulfur Oxides, Carbon Oxides

SECTION 6 ACCIDENTAL RELEASE MEASURES

Spill Management: Reduce airborne dust and prevent scattering by moistening with water.

Avoid creating dust clouds. Shovel, sweep up or use industrial vacuum cleaner to pick up. Place in container for proper disposal.

SECTION 7 HANDLING AND STORAGE

READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL . REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL .

Precautionary Measures: Use caution to avoid creation of dusts and to prevent inhalation of product dust (fines). Avoid contact with product dust. Airborne dust concentrations above 20 mg/l may create a dust explosion hazard. Do not breathe dust at levels above the recommended exposure limits. Avoid breathing material. Keep container closed. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids, National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).

General Storage Information: Treat as a solid that can burn. Store away from oxidizing materials, in a cool, dry place with adequate ventilation. Bond and ground transfer equipment. **DO NOT USE OR**

STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

Container Warnings: Containers, even those that have been emptied, can contain residues of dusts or solid particulates which may create both health and fire/explosion hazards.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3) applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

If heated material generates vapor or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure.

PERSONAL PROTECTIVE EQUIPMENT:

Eye/Face Protection: Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.

Skin Protection: Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: Neoprene

Respiratory Protection: If user operations generate harmful levels of airborne material that is not adequately controlled by ventilation, wear a NIOSH approved respirator that provides adequate protection. Use the following elements for air-purifying respirators: Air-Purifying Respirator for Dusts and Mists

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
Crystalline Silica	ACGIH	.05 mg/m ³	NA	NA	NA
Crystalline Silica	CPCHEM	.05 mg/m ³	NA	NA	Respirable Dust
Crystalline Silica	German MAK	.15 mg/m ³	NA	NA	NA
Proprietary Materials	CPCHEM	Not Established	NA	NA	NA
n-Heptane	ACGIH	400 ppm	500 ppm	NA	NA
n-Heptane	German MAK	500 ppm	NA	4	NA
n-Heptane	OSHA PEL	500 ppm	NA	NA	NA

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Solid black powder with no odor.

pH: NA

VAPOR PRESSURE: NA

VAPOR DENSITY (AIR=1): NA

BOILING POINT: NA

SOLUBILITY (in water): Appreciable

SPECIFIC GRAVITY: 1.2 - 1.5

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Conditions to Avoid: Not Applicable

Incompatibility With Other Materials: No data available

Hazardous Decomposition Products: Sulfur Oxides. Carbon Oxides.

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS:

Acute Oral Toxicity: LD50 / rat / > 5 g/kg

Acute Dermal Toxicity: LD50 / not known

Acute Inhalation Toxicity: LC50 / not known

Eye Irritation: May cause eye irritation.

Skin Irritation: May cause skin irritation.

ADDITIONAL TOXICOLOGY INFORMATION:

The toxicological properties of this product have not been tested or have not been tested completely and its handling or use may be hazardous. EXERCISE DUE CARE.

Long-term exposure to high dust concentrations may cause non-debilitating lung changes.

This product contains CRYSTALLINE SILICA:

Repeated Dose Toxicity: Up to 420 days / inhalation / rat / Doses: 30,000 particles/ml 18 hrs/day 5days/wk / Silicotic nodules

Genetic Toxicity: AMES test = Negative / Recombination Assay = Negative

Carcinogenicity: 2 yrs / inhalation / rat / Dose: 1 mg/m³ / primary lung tumors in control (3) and treated (18); 150, 300 or 570 days / inhalation / mouse / Doses: 1475 ug/m³ for 150 days, 1800 ug/m³ for 300 days or 1950 ug/m³ for 570 days 8 hrs/day 5days/wk / pulmonary adenomas found in both control (7) and treated (9)

Other: International Agency for Research on Cancer (IARC) classifies crystalline silica as a human carcinogen

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY:

This material is not expected to be toxic to aquatic organisms.

- 96 hour(s) / LC50 / Flatfish, Flounder (*Scophthalmus maximus*) / 1672 mg/l
- 95 hour(s) / EC50 / Diatom (*Skeletonema costatum*) / 4.0 g/l
- 96 hour(s) / LC50 / mysid shrimp (*Mysidopsis bahia*) / 420,000 ppm

ENVIRONMENTAL FATE:

This material is not expected to be readily biodegradable.
28 days / 3 - 6 %

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

Shipping Descriptions per regulatory authority.

US DOT

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

ICAO / IATA

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

IMO / IMDG

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

RID / ADR

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION

SECTION 15 REGULATORY INFORMATION

SARA 311/312 CATEGORIES:	1. Immediate (Acute) Health Effects:	YES
	2. Delayed (Chronic) Health Effects:	YES
	3. Fire Hazard:	NO
	4. Sudden Release of Pressure Hazard:	NO
	5. Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01 = CA Prop 65	17 = FDA 178	33 = RCRA Waste Appendix VIII
02 = LA RTK	18 = FDA 179	34 = RCRA Waste D-List
03 = MA RTK	19 = FDA 180	35 = RCRA Waste P-List
04 = MN Hazardous Substance	20 = FDA 181	36 = RCRA Waste U-List
05 = NJ RTK	21 = FDA 182	37 = SARA Section 311/312
06 = PA RTK	22 = FDA 184	38 = SARA Section 313
07 = CAA Section 112 HAPs	23 = FDA 186	39 = TSCA 12 (b)
08 = CWA Section 307	24 = FDA 189	40 = TSCA Section 4
09 = CWA Section 311	25 = IARC Group 1	41 = TSCA Section 5(a)
10 = DOT Marine Pollutant	26 = IARC Group 2A	42 = TSCA Section 8(a) CAIR
11 = FDA 172	27 = IARC Group 2B	43 = TSCA Section 8(a) PAIR
12 = FDA 173	28 = IARC Group 3	44 = TSCA Section 8(d)
13 = FDA 174	29 = IARC Group 4	45 = WHIMS - IDL
14 = FDA 175	30 = NTP Carcinogen	46 = Germany D TAL
15 = FDA 176	31 = OSHA Carcinogen	47 = Germany WKG
16 = FDA 177	32 = OSHA Highly Hazardous	48 = DEA List 1
		49 = DEA List 2

The following components of this material are found on the regulatory lists indicated.

Crystalline Silica	1, 3, 4, 5, 6, 25, 30, 45
n-Heptane	39, 40

WHMIS CLASSIFICATION:

Class D, Division 2, Subdivision A: Very Toxic Material
Carcinogenicity
Chronic Toxic Effects

CHEMICAL INVENTORY LISTINGS:

AUSTRALIA: This material contains components that require notification before sale or importation into Australia.

CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL).

PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the draft Inventory of Existing Chemical Substances in China.

EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.

KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.

PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).

UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

EU RISK AND SAFETY PHRASES:

R40: Possible risks of irreversible effects.

R45: May cause cancer.

S22: Do not breathe dust.

S38: In case of insufficient ventilation, wear suitable respiratory equipment.

S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S53: Avoid exposure - obtain special instructions before use.

EU Symbols: T

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 1 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

REVISION STATEMENT: This revision updates all sections of the MSDS please review.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	Threshold Limit Value	TWA	- Time Weighted Average
STEL	Short-term Exposure Limit	PEL	- Permissible Exposure Limit
ACGIH	American Conference of - Government Industrial Hygienists	OSHA	- Occupational Safety & Health
NIOSH	National Institute of Safety & Health	NFPA	- National Fire Protection Agency
WHMIS	Workplace Hazardous Materials - Information System	IARC	- Intl. Agency for Research on Cancer
EINECS	European Inventory of existing - Commercial Chemical Sales	RCRA	- Resource Conservation Recovery Act
SARA	Superfund Amendments and - Reauthorization Act.	TSCA	- Toxic Substance Control Act
EC50	Effective Dose	LC50	- Lethal Concentration
LD50	Lethal Dose	CAS	- Chemical Abstract Service Number
NDA	No Data Available	NA	- Not Applicable
<=	Less Than or Equal To	>=	- Greater Than or Equal To
CNS	Central Nervous System	MAK	- Germany Maximum Concentration Values

This data sheet is prepared according to the latest adaptation of the EEC Guideline 67/548.
This data sheet is prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).
This data sheet is prepared according to the ANSI MSDS Standard (Z400.1).
This data sheet was prepared by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380.

MATERIAL SAFETY DATA SHEET

XCD POLYMER

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: XCD POLYMER
CHEMICAL CLASS: Biopolymer.
APPLICATIONS: Oil well drilling fluid additive. Viscosifier
EMERGENCY TELEPHONE: 281-561-1600
SUPPLIER: Supplied by a Business Unit of
M-I L.L.C.
P.O. Box 42842, Houston, Texas 77242-2842
See cover sheet for local supplier.
TELEPHONE: 281-561-1509
FAX: 281-561-7240
CONTACT PERSON: Sam Hoskin

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Xanthan gum	11138-66-2	100 %		

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

This product is a powder. May form explosive dust-air mixtures. Slippery when wet. white to tan No significant immediate hazards for emergency response personnel are known.

ACUTE EFFECTS:

HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

INHALATION: May be irritating to the respiratory tract if inhaled.

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: May be irritating to the skin.

EYES: May be irritating to the eyes.

CHRONIC EFFECTS:

CARCINOGENICITY:

IARC: Not listed. OSHA: Not regulated. NTP: Not listed.

ROUTE OF ENTRY:

Inhalation. Skin and/or eye contact.

TARGET ORGANS:

Respiratory system, lungs. Skin. Eyes.

4. FIRST AID MEASURES

GENERAL:

Persons seeking medical attention should carry a copy of this MSDS with them.

INHALATION:

Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

INGESTION:

Drink a couple of glasses water or milk. Do not give victim anything to drink of he is unconscious. Get medical attention.

SKIN:

Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES:

Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES

AUTO IGNITION TEMP. (°F):

>392

FLAMMABILITY LIMIT - LOWER(%):

N/D

FLAMMABILITY LIMIT - UPPER(%):

N/D

EXTINGUISHING MEDIA:

Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Dust in high concentrations may form explosive mixtures with air.

HAZARDOUS COMBUSTION PRODUCTS:

Irritating gases/vapors/fumes. Oxides of: Carbon.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:

Wear proper personal protective equipment (see MSDS Section 8).

SPILL CLEAN-UP PROCEDURES:

Avoid generating and spreading of dust. Shovel into dry containers. Cover and move the containers. Flush the area with water. Do not contaminate drainage or waterways. Repackage or recycle if possible.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS:

Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

STORAGE PRECAUTIONS:

Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

INGREDIENT NAME:	CAS No.:	OSHA PEL: TWA: STEL:	ACGIH TLV: TWA: STEL:	OTHER: TWA: STEL:	UNITS:
Xanthan gum	11138-66-2	5	3		mg/m ³ resp.dust

INGREDIENT COMMENTS:

Exposure limits are for Particulates Not Otherwise Classified (PNOC).

PROTECTIVE EQUIPMENT:**ENGINEERING CONTROLS:**

Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

VENTILATION: Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

RESPIRATORS: Use at least a NIOSH-approved N95 half-mask disposable or reusable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reusable particulate respirator.

PROTECTIVE GLOVES:

Use suitable protective gloves if risk of skin contact.

EYE PROTECTION:

Wear dust resistant safety goggles where there is danger of eye contact.

PROTECTIVE CLOTHING:

Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES:

Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	Powder, dust.	
COLOR:	White, to Tan.	
ODOR:	Slight.	
SOLUBILITY DESCRIPTION:	Soluble in water.	
DENSITY/SPECIFIC GRAVITY (g/ml):	N/D	TEMPERATURE (°F):
BULK DENSITY:	50 lb/cu ft; 805 kg/m ³	
VAPOR DENSITY (air=1):	N/A	
VAPOR PRESSURE:	N/A	TEMPERATURE (°F):
pH-VALUE, DILUTED SOLUTION:	5.4-8.6	CONCENTRATION (%M): 1%

10. STABILITY AND REACTIVITY

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid heat.

HAZARDOUS POLYMERIZATION:
Will not polymerize.

POLYMERIZATION DESCRIPTION:
Not relevant.

MATERIALS TO AVOID:
Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION

Component: Xanthan gum

TOXIC DOSE - LD 50: >5000 mg/kg (oral rat)

12. ECOLOGICAL INFORMATION

ACUTE AQUATIC TOXICITY:

This product is approved for use under the U.S. Environmental Protection Agency (EPA) Region IX (California) General NPDES Permit which regulates offshore discharges of drilling fluids. Contact M-I's Environmental Affairs Department for more information.

This product passes the mysid shrimp toxicity test required by the U.S. Environmental Protection Agency (EPA) Region VI (Gulf of Mexico) NPDES Permit, which regulates offshore discharge of drilling fluids, when tested in a standard drilling fluid. Contact M-I's Environmental Affairs Department for more information.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT:

This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc, may render the resulting materials hazardous.

Empty containers retain residues. All labeled precautions must be observed.

DISPOSAL METHODS:

Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

GENERAL: RQ = N/A

U.S. DOT:
 U.S. DOT CLASS: Not regulated.

CANADIAN TRANSPORT:
 TDGR CLASS: Not regulated.

SEA TRANSPORT:
 IMDG CLASS: Not regulated.

AIR TRANSPORT:
 ICAO CLASS: Not regulated.

15. REGULATORY INFORMATION

REGULATORY STATUS OF INGREDIENTS:

NAME:	CAS No:	TSCA:	CERCLA:	SARA 302:	SARA 313:	DSL(CAN):
Xanthan gum	11138-66-2	Yes	No	No	No	Yes

US FEDERAL REGULATIONS:

WASTE CLASSIFICATION: Not a hazardous waste by U.S. RCRA criteria. See Section 13.

REGULATORY STATUS:

This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:

1: Immediate (Acute) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:

TSCA (U.S.)
 DSL (Canada)
 EINECS (Europe)

STATE REGULATIONS:

STATE REGULATORY STATUS:

This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

None.

CANADIAN REGULATIONS:

REGULATORY STATUS:

This Material Safety Data Sheet has been prepared in compliance with the Controlled Product Regulations.

Canadian WHMIS Classification: Not a Controlled Product.

16. OTHER INFORMATION

NPCA HMIS HAZARD INDEX:	1 Slight Hazard
FLAMMABILITY:	1 Slight Hazard
REACTIVITY:	0 Minimal Hazard
NPCA HMIS PERS. PROTECT. INDEX:	E - Safety Glasses, Gloves, Dust Respirator

USER NOTES: N/A = Not applicable N/D = Not determined

INFORMATION SOURCES: OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants.

ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition).

Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997).

Product information provided by the commercial vendor(s).

PREPARED BY: Sam Hoskin

REVISION No./Repl. MSDS of: 1/September 9, 1994

MSDS STATUS: Approved.

DATE: June 3, 1998

DISCLAIMER:

MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

ATTACHMENT 17
PRELIMINARY CEMENTING PROPOSAL FOR THE 9 5/8-INCH SURFACE CASING

Primary Cementing Proposal

Brammer Engineering

NLT Royalty Partners 10-4 #1

9 5/8 IN SURFACE CASING

Well Location

County: *County*
State: *Florida*

Well Information

Casing Size: 9 5/8 [in] 40 lb./ft.
Casing Depth: 3,500 [ft]
TVD: 3,500 [ft]
O.H. Size: 12 1/4 [in]
O.H. Depth: 3,500 [ft]

Water Estimates

Spacer: 40.0 [bbls]
Total Mix Water: 301.2 [bbls]
Displacement: 262.1 [bbls]
Wash up: 30.0 [bbls]

Total Water Estimate: 633.3 [bbls]

BHST: 126.6 [°F]
BHCT: 98 [°F]

Prepared For: *Andy Smith*

Date Prepared: 10/5/23

Prepared By: *Heath Speights*

Phone: (601) 444 - 0220

Fax: (601) 444 - 0226

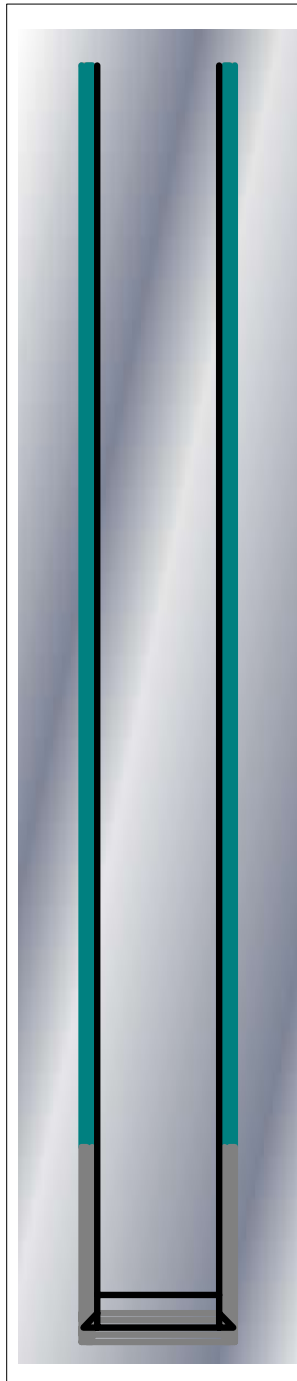
Email: HSpeights@docenergyservices.com

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Well Bore Information

Drilling Fluid 9.0 ppg Water Based Drilling Fluid

Spacers



Differential Pressure
906 [psi]
[assumes vertical hole]

Total Annular Excess
110 %

Casing in OH1 Factor:
0.3132 [cuft/ft]
(Without Excess)

Casing Capacity Factor:
0.4259 [cuft/ft]

Lead Cement

Top: Cement to Surface
Fill: 3,000 [ft]
Excess: 110 %
Vol: 1,976 [cuft]

Tail Cement

Top: 3,000 [ft]
Fill: 500 [ft]
Excess: 110 %
Vol: 353 [cuft]

Shoe Track Length
45 [ft]

Measured Depth
3,500 [ft]

Note: Drawing may not be 100% Accurate with different situations.

Displacement Volume: 262 [bbls]

Mud / Cement Spacer System:

40 bbls FRESH WATER @ 8.34 [lb/gal]

Lead Cement Slurry

DOC LITE II MS PREM + 3% Salt (NaCl) (BWOW) + 2 LB/SK PHENO SEAL BLEND + 0.2% DOC - 35 + 0.5% DOC - 41P

	1060	sks
Mix Weight:		12.80 [lb/gal]
Yield:		1.86 [cuft/sk]
Mix Water:		9.97 [gal/sk]

Tail Cement Slurry

TYPE I/II CEMENT

	300	sks
Mix Weight:		15.60 [lb/gal]
Yield:		1.18 [cuft/sk]
Mix Water:		5.21 [gal/sk]

Top Out System

100 sks TYPE I/II CEMENT + 2% Calcium Chloride

Mixed @ 16.2 ppg

Displacement Fluid

262 bbls of Fresh Water

Always refigure on location!!!!



Price Code	Description	Units	Amount	Units of Sale	Book Price	Disc. Unit Price	Disc. Price
SERVICES							
99101	MILEAGE, PUMP TRUCK		700	Mile	\$ 6.75	\$ 6.75	\$ 4,725.00
99105	MILEAGE, BULK TRUCK	3	700	Mile	\$ 6.75	\$ 6.75	\$ 14,175.00
99108	MILEAGE, PICKUP		700	Mile	\$ 3.90	\$ 3.90	\$ 2,730.00
99190	DOT VEHICLE CHARGE		4	Each	\$ 225.00	\$ 225.00	\$ 900.00
99202	PUMP, DOUBLE RCM (1,000 HP)		6	hr	\$ 500.00	\$ 500.00	\$ 3,000.00
99220	PLUG CONTAINER		1	job	\$ 625.00	\$ 625.00	\$ 625.00
99228	DATALINK		1	job	\$ 500.00	\$ 500.00	\$ 500.00
99340	HS&E FEE		1	ea	\$ 220.00	\$ 220.00	\$ 220.00
99331	SUPERVISOR LABOR		6	hr	\$ 150.00	\$ 150.00	\$ 900.00
99332	OPERATOR LABOR	3	6	hr	\$ 75.00	\$ 75.00	\$ 1,350.00
99302	PUMP CHARGE, (1,500' - 3,000')		1460	sk	\$ 1.95	\$ 1.95	\$ 2,847.00
99310	MATERIAL HANDLING CHARGES		1460	sk	\$ 2.85	\$ 2.85	\$ 4,161.00
99221	CIRCULATING IRON PACKAGE		1	job	\$ 2,450.00	\$ 2,450.00	\$ 2,450.00
99210	BULK TRAILER		6	hr	\$ 100.00	\$ 100.00	\$ 600.00
99106	MILEAGE, FIELD BIN		700	Mile	\$ 6.75	\$ 6.75	\$ 4,725.00
99212	FIELD STORAGE BIN		1	day	\$ 1,250.00	\$ 1,250.00	\$ 1,250.00
99333	SUPERVISOR LABOR (BINS)		4	hr	\$ 150.00	\$ 150.00	\$ 600.00
99334	OPERATOR LABOR (BINS)	5	4	hr	\$ 75.00	\$ 75.00	\$ 1,500.00
#N/A	FUEL SURCHARGE 2.5%			ea			
MATERIALS							
99401	TYPE I/II CEMENT		400	sk	\$ 20.91	\$ 20.91	\$ 8,364.00
99533	DOC LITE II MS PREM		1060	sk	\$ 23.90	\$ 23.90	\$ 25,334.00
99482	SODIUM CHLORIDE		2638	lb	\$ 0.45	\$ 0.45	\$ 1,187.10
99443	DOC - 41P		480	lb	\$ 3.12	\$ 3.12	\$ 1,497.60
99462	PHENO SEAL BLEND		2120	lb	\$ 1.59	\$ 1.59	\$ 3,370.80
99536	DOC - 35		192	lb	\$ 8.45	\$ 8.45	\$ 1,622.40
99480	Calcium Chloride		188	lb	\$ 0.81	\$ 0.81	\$ 152.28
Discounted Price \$							88,786.18



Additional Non-Discounted Items (If Utilized)

Price Code	Description	Amount	Units	Unit Cost	Disc. Unit Price
99390	ADD HOURS ON LOCATION (PER PUMP)	1	hr	600.00	\$ 600.00
99221	CIRCULATING IRON PACKAGE	1	job	2450.00	\$ 2,450.00
99321	100 SK TOP OUT CHARGE	1	job	2275.00	\$ 2,275.00
99242	STANDBY PUMP TRUCK	1	job	2800.00	\$ 2,800.00
TOTAL					\$ 8,125.00

Non Discounted Floating Equipment (If Utilized)

Description	Amount	Units	Unit Cost	Total Price
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
TOTAL				\$ -

The services and materials quoted are based on the best information available at the time that this quotation was prepared. When the actual work is performed the amounts and types of services and materials may require adjustments from this quotation. Actual amounts and types of services and materials will be charged at the time the work is performed. Unit prices from DOCES' current price list and discounts quoted are applied as per this quotation, unless otherwise noted.

This quotation is for the materials and services presented under this cover letter. The prices and discounts are based on DOCES being awarded the work on a first call basis. Prices maybe adjusted if the work is not on a first call basis. Prices are valid for a period of 30 days following this quotation. Taxes, if any, will be applied to the actual invoice.

Sincerely

Heath Speights

ATTACHMENT 18
PRELIMINARY CEMENTING PROPOSAL FOR THE 5 1/2-INCH PRODUCTION CASING

Primary Cementing Proposal

Brammer Engineering

NLT Royalty Partners 10-4 #1

5 1/2 IN PRODUCTION CASING

Well Location

Field: *Calhoun Florida*
County: *Calhoun Florida*
State: *Florida*

Well Information

Casing Size: 5 1/2 [in] 17 lb./ft.
Casing Depth: 14,070 [ft]
TVD: 14,070 [ft]
O.H. Size: 8 3/4 [in]
O.H. Depth: 14,070 [ft]

Water Estimates

Spacer: 40.0 [bbls]
Total Mix Water: 116.9 [bbls]
Displacement: 327.9 [bbls]
Wash up: 30.0 [bbls]

Pvs.Casing Size: 9 5/8 [in]
Pvs. Casing Depth: 3500 [ft]
BHST: 315.0 [°F]
BHCT: 248 [°F]

Total Water Estimate: 514.8 [bbls]

Prepared For: *Andy Smith*

Date Prepared: 10/5/23

Prepared By: *Heath Speights*

Phone: (601) 444 - 0220

Fax: (601) 444 - 0226

Email: HSpeights@docenergyservices.com

DISCLAIMER OF LIABILITY: With respect to this report, neither DOC Energy Services nor any of their employees, makes any warranty, express or implied, including the warranties of merchantability and fitness for a particular purpose, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.

Well Bore Information

Drilling Fluid 9.0 ppg Water Based Drilling Fluid

Spacers

Previous Casing Depth:
3500 [ft]

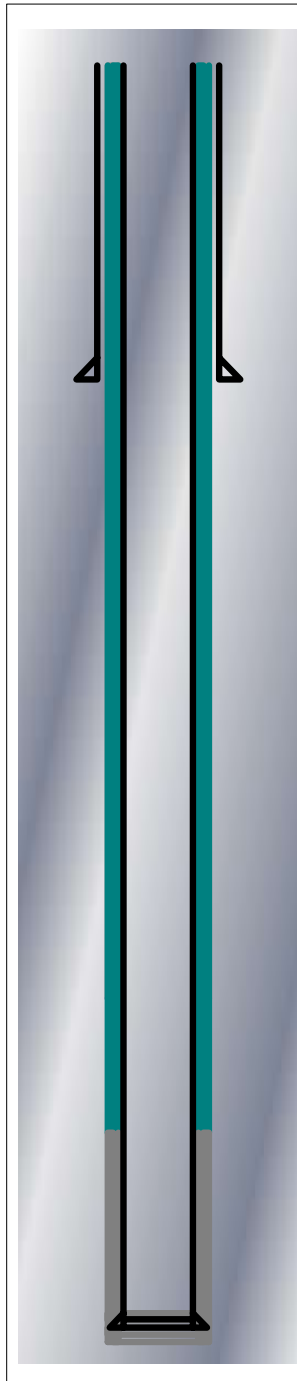
Casing in Casing Factor:
0.2609 [cuft/ft]

Differential Pressure
1630 [psi]
[assumes vertical hole]

Total Annular Excess
35 %

Casing in OH1 Factor:
0.2526 [cuft/ft]
(Without Excess)

Casing Capacity Factor:
0.1313 [cuft/ft]



Lead Cement

Top:	10,400 [ft]
Fill:	1,500 [ft]
Excess:	0 %
Vol:	381 [cuft]

Tail Cement

Top:	11,900 [ft]
Fill:	2170 [ft]
Excess:	35 %
Vol:	752 [cuft]

Shoe Track Length

45 [ft]

Measured Depth

14,070 [ft]

Note: Drawing may not be 100% Accurate with different situations.

Displacement Volume: 328 [bbls]

Mud / Cement Spacer System:

40 bbls DOC MUD FLUSH @ 8.34 [lb/gal]

Lead Cement Slurry

DOC LITE II MS PREM + 0.3% DOC - 17C + 0.1% DOC - 35 + 0.5% DOC - 41P + 0.35% DOC - 24R + 22% SILICA FLOUR 200 MESH

175 sks

Mix Weight:	12.80 [lb/gal]
Yield:	2.18 [cuft/sk]
Mix Water:	11.64 [gal/sk]

Tail Cement Slurry

CLASS H CEMENT + 5% KCl (BWOW) + 35% SILICA FLOUR 200 MESH + 0.35% DOC - 24R + 0.2% DOC - 35 + 0.7% DOC - 17C + 0.05% DOC - 34

520 sks

Mix Weight:	16.30 [lb/gal]
Yield:	1.45 [cuft/sk]
Mix Water:	5.53 [gal/sk]

Displacement Fluid

328 bbls of Fresh Water

Always refigure on location!!!!



Price Code	Description	Units	Amount	Units of Sale	Book Price	Disc. Unit Price	Disc. Price
SERVICES							
99101	MILEAGE, PUMP TRUCK		700	Mile	\$ 6.75	\$ 6.75	\$ 4,725.00
99105	MILEAGE, BULK TRUCK	4	700	Mile	\$ 6.75	\$ 6.75	\$ 18,900.00
99108	MILEAGE, PICKUP		700	Mile	\$ 3.90	\$ 3.90	\$ 2,730.00
99190	DOT VEHICLE CHARGE		4	Each	\$ 225.00	\$ 225.00	\$ 900.00
99202	PUMP, DOUBLE RCM (1,000 HP)		6	hr	\$ 500.00	\$ 500.00	\$ 3,000.00
99220	PLUG CONTAINER		1	job	\$ 625.00	\$ 625.00	\$ 625.00
99228	DATALINK		1	job	\$ 500.00	\$ 500.00	\$ 500.00
99340	HS&E FEE		1	ea	\$ 220.00	\$ 220.00	\$ 220.00
99331	SUPERVISOR LABOR		6	hr	\$ 150.00	\$ 150.00	\$ 900.00
99332	OPERATOR LABOR	3	6	hr	\$ 75.00	\$ 75.00	\$ 1,350.00
99302	PUMP CHARGE, (1,500' - 3,000')		695	sk	\$ 1.95	\$ 1.95	\$ 1,355.25
99310	MATERIAL HANDLING CHARGES		695	sk	\$ 2.85	\$ 2.85	\$ 1,980.75
99221	CIRCULATING IRON PACKAGE		1	job	\$ 2,450.00	\$ 2,450.00	\$ 2,450.00
99210	BULK TRAILER	4	6	hr	\$ 100.00	\$ 100.00	\$ 2,400.00
99242	STANDBY PUMP TRUCK		1	job	\$ 2,800.00	\$ 2,800.00	\$ 2,800.00
99391	LAB ANALYSIS CHARGE		2	ea	\$ 750.00	\$ 750.00	\$ 1,500.00
99106	MILEAGE, FIELD BIN		700	Mile	\$ 6.75	\$ 6.75	\$ 4,725.00
99212	FIELD STORAGE BIN		1	day	\$ 1,250.00	\$ 1,250.00	\$ 1,250.00
99331	SUPERVISOR LABOR		4	hr	\$ 150.00	\$ 150.00	\$ 600.00
99332	OPERATOR LABOR	4	4	hr	\$ 75.00	\$ 75.00	\$ 1,200.00
#N/A	FUEL SURCHARGE 2.5%		1	ea	\$ 2,670.42	\$ 2,670.42	\$ 2,670.42
MATERIALS							
99402	CLASS H CEMENT		520	sk	\$ 32.52	\$ 32.52	\$ 16,910.40
99533	DOC LITE II MS PREM		175	sk	\$ 23.90	\$ 23.90	\$ 4,182.50
99481	KCL - POTASSIUM CHLORIDE (DRY)		1196	lb	\$ 1.70	\$ 1.70	\$ 2,033.20
99475	DOC - 34		24	lb	\$ 27.87	\$ 27.87	\$ 668.88
99443	DOC - 41P		79	lb	\$ 3.12	\$ 3.12	\$ 246.48
99485	SILICA FLOUR 200 MESH		20591	lb	\$ 0.48	\$ 0.48	\$ 9,883.68
99542	DOC - 17C		390	lb	\$ 21.25	\$ 21.25	\$ 8,287.50
99527	DOC - 24R		226	lb	\$ 35.00	\$ 35.00	\$ 7,910.00
99536	DOC - 35		114	lb	\$ 8.45	\$ 8.45	\$ 963.30
99411	DOC MUD FLUSH		40	bbi	\$ 40.50	\$ 40.50	\$ 1,620.00
Discounted Price \$							109,487.36



Additional Non-Discounted Items (If Utilized)

Price Code	Description	Amount	Units	Unit Cost	Disc. Unit Price
99390	ADD HOURS ON LOCATION (PER PUMP)	1	hr	600.00	\$ 600.00
99221	CIRCULATING IRON PACKAGE	1	job	2450.00	\$ 2,450.00
99321	100 SK TOP OUT CHARGE	1	job	2275.00	\$ 2,275.00
99242	STANDBY PUMP TRUCK	1	job	2800.00	\$ 2,800.00
TOTAL					\$ 8,125.00

Non Discounted Floating Equipment (If Utilized)

Description	Amount	Units	Unit Cost	Total Price
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
TOTAL				\$ -

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Sincerely

Heath Speights

ATTACHMENT 19
SAFETY DATA SHEETS FOR CEMENT



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

Safety Data Sheet

Section 1 Identification of the Substance and of the Supplier

1.1 Product Identifier

Product Name/Identification:	ASTM Class F Fly Ash
Synonyms:	Coal Fly Ash, Pozzolan
Product Code:	N/A
Formula:	UVCB Substance

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Relevant Identified Uses:	Cement Replacement, Concrete Additive, Inert Filler
Uses Advised Against:	Any uses not meeting appropriate engineering specifications

1.3 Details of the Supplier of the SDS

Manufacturer/Supplier:	Headwaters Resources, Inc.
Street Address:	10701 South Riverfront Parkway
City, State and Zip Code:	South Jordan, UT 84095
Customer Service Telephone:	801.984.9400
Website Address:	flyash.com

1.4 Emergency Telephone Number

Emergency Phone Number:	877.347.8096
Hours Available:	24 hours/7 days a week

Section 2 Hazards Identification

2.1 Classification of the Substance

GHS Classification(s) according to OSHA Hazard Communication Standard (29 CFR 1910.1200):

- STOT-SE Category 3 (Respiratory Irritation)
- STOT-RE Category 2



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

2.2 Label Elements

Labeling according to 29 CFR 1910.1200 Appendices A, B and C*	
Hazard Pictogram(s)	
Signal Word	Danger
Hazard Statement(s)	May cause respiratory irritation. May cause damage to lungs after repeated/prolonged exposure via inhalation.
Precautionary Statement(s)	Do not breathe dust. Use outdoors or in a well ventilated area. If inhaled: Remove to fresh air and keep comfortable for breathing. Get medical advice/attention if you feel unwell. Store in a secure area. Dispose of product in accordance with local/national regulations.

* Fly ash and other coal combustion products (CCPs) are UVCB substances (substance of unknown or variable composition or biological). Various CCPs, noted as Ashes; Ash; Ash residues; Ashes, residues, bottom, bottom ash; bottom ash residues; waste solids, ashes under TSCA are defined by the US EPA as: "The residuum from the burning of a combination of carbonaceous materials. The following elements may be present as oxides: aluminum, calcium, iron, magnesium, nickel, phosphorus, potassium, silicon, sulfur, titanium, and vanadium." Ashes, including fly ash and fluidized bed combustion ash, are identified by CAS number 68131-74-8. The exact composition of the ash is dependent on the fuel source and flue additives composed of a large number of constituents. The classification of the final substance is dependent on the presence of specific identified oxides as well as other trace elements.

2.3 Other Hazards

Listed Carcinogens: Respirable Crystalline Silica

IARC: Yes NTP: Yes OSHA: No Other: No

**Section 3
Composition/Information on Ingredients**

Substance	CAS No.	Percentage (%)	GHS Classification
Aluminosilicates	Various: See note 1	70-95	Single Exposure STOT, Category 3
Crystalline Silica	14808-60-7	<10	Repeat Dose STOT, Category 2
Silica, crystalline respirable (RCS)	14808-60-7	See note 2	Repeat Dose STOT, Category 2
Calcium oxide (CaO)	1305-78-8	<2%	Skin Irritant Category 2 Eye irritant Category 2B



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

Substance	CAS No.	Percentage (%)	GHS Classification
Manganese dioxide (MnO ₂)	1313-13-9	<2%	Skin Irritant Category 2 Eye irritant Category 2B
Phosphorus pentoxide (P ₂ O ₅)	1314-56-3	<2%	Skin Irritant Category 2 Eye Irritant Category 2B
Potassium oxide (K ₂ O)	12136-45-7	<2%	Skin Irritant Category 2 Eye irritant Category 2B
Magnesium sulfate	7487-88-9	<2%	Skin Irritant Category 2 Eye irritant Category 2B

1. Aluminosilicates may be in the form of mullite (CAS#1302-93-8); aluminosilicate glass, or pozzolans (CAS#71243-67-9). The form is dependent on the source of the coal and on the process used to create the CCP. Pulverized coal combustion would be more likely to create high levels of pozzolans. Aluminosilicates may have inclusions of calcium, titanium, iron, potassium, phosphorus, magnesium and other metal oxides.
2. RSC in the CCP has not been determined.

Section 4 First Aid Measures

4.1 Description of First Aid Measures

Inhalation	If product is inhaled and irritation of the nose or coughing occurs, remove person to fresh air. Get medical advice/attention if respiratory symptoms persist.
Skin Contact	If skin exposure occurs, wash with soap and water.
Eye Contact	If product gets into the eye, rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Seek medical attention/advice if irritation occurs or persists.
Ingestion	No specific first aid measures are required.

4.2 Most Important Health Effects, Both Acute and Delayed

Acute Effects	Direct exposure may cause respiratory irritation, eye irritation and skin irritation. The product dust can dry and irritate the skin and cause dermatitis and can irritate eyes and skin through mechanical abrasion.
Chronic Effects	Chronic exposure may cause lung damage from repeated exposure. Chronic inhalation of dusts containing respirable crystalline silica may result in silicosis.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Seek first aid or call a doctor or Poison Control Center if contact with eyes occurs and irritation remains after rinsing.



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

**Section 5
Firefighting Measures**

5.1 Extinguishing Media

Suitable Extinguishing Media	Product is not flammable. Use extinguishing media appropriate for surrounding fire.
Unsuitable Extinguishing Media	Not applicable; the product is not flammable.

5.2 Special Hazards Arising From the Substance or Mixture

Hazardous Combustion Products	None known.
--------------------------------------	-------------

5.3 Advice for Firefighters

Special Protective Equipment and Precautions for Firefighters	As with any fire, wear self-contained breathing apparatus (NIOSH-approved or equivalent) and full protective gear.
--	--

**Section 6
Accidental Release Measures**

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

6.1.1 Personal Precautions/Protective Equipment

See Section 8.2.2 "Personal Protective Equipment". For concentrations exceeding Occupational Exposure Levels (OELs), use a self-contained breathing apparatus (SCBA).

6.1.2 Emergency Procedures

Use scooping, water spraying/flushing/misting or ventilated vacuum cleaning systems to clean up spills. Do not use pressurized air.

6.2 Environmental Precautions

Prevent contamination of drains or waterways and dispose according to local and national regulations.

6.3 Methods and Material for Containment and Cleaning Up

Do not use brooms or compressed air to clean surfaces. Use dust collection vacuum and extraction systems.

Large spills of dry product should be removed by a vacuum system. Dampened material should be removed by mechanical means and recycled or disposed of according to local and national regulations.

See Sections 8 and 13 for additional information on exposure controls and disposal.



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

Section 7 Handling and Storage

7.1 Precautions for Safe Handling

Practice good housekeeping. Use adequate exhaust ventilation, dust collection and/or water mist to maintain airborne dust concentrations below permissible exposure limits. (Note: respirable crystalline silica dust may be in the air without a visible dust cloud).

Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Maintain and test ventilation and dust collection equipment. In cases of insufficient ventilation, wear a NIOSH-approved respirator for silica dust when handling or disposing dust from this product. Avoid contact with skin and eyes. Wash or vacuum clothing that has become dusty. Avoid eating, smoking, or drinking while handling the material.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

Minimize dust produced during loading and unloading.

Section 8 Exposure Controls/Personal Protection

8.1 Control Parameters

OCCUPATIONAL EXPOSURE LIMITS					
SUBSTANCE		OSHA PEL TWA (mg/m ³)	NIOSH REL TWA (mg/m ³)	ACGIH TLV TWA (mg/m ³)	CA - OSHA PEL (mg/m ³)
Calcium oxide		5	2	2	2
Particulates Not Otherwise Regulated	Total	15	15	-	10
	Respirable	5	5	-	5
Crystalline Silica	Total Quartz	$30 \div (\%SiO_2 + 2)$ (Total Quartz)	-	-	0.3
	Respirable Crystalline Silica	$10 \div (\%SiO_2 + 2)$	0.05	0.025 (α -quartz & cristobalite)	0.1
	Cristobalite	-	0.05	0.025 (α -quartz & cristobalite)	0.05 (respirable)
Manganese dioxide (as manganese compounds)	Total	5 (Ceiling)	1 3 (STEL)	0.1	0.2
	Respirable	-	-	0.02	-



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

8.2 Exposure Controls

8.2.1 Engineering Controls

Provide ventilation to maintain the ambient workplace atmosphere below the occupational exposure limit(s). Use general and local exhaust ventilation and dust collection systems as necessary to minimize exposure.

8.2.2 Personal Protective Equipment (PPE)

Respiratory protection	Wear a NIOSH-approved particulate respirator if exposure to airborne particulates is unavoidable and where occupational exposure limits may be exceeded. If airborne exposures are anticipated to exceed applicable PELs or TLVs, a self-contained breathing apparatus or airline respirator is recommended.
Eye and face protection	If eye contact is possible, wear protective glasses with side shields or dust goggles, as appropriate. Avoid contact lenses.
Hand and skin protection	Wear gloves and protective clothing. Wash hands with soap and water after contact with material.

**Section 9
Physical and Chemical Properties**

9.1 Information on Basic Physical and Chemical Properties

Property: Value	Property: Value
Appearance (physical state, color, etc.): Fine tan/ gray particulate	Upper/Lower Flammability or Explosive Limits: Not applicable
Odor: Odorless ¹	Vapor Pressure (Pa): Not applicable
Odor Threshold: Not applicable	Vapor Density: Not applicable
pH in Water (25°C): 7-12 ²	Specific Gravity: 2.2 - 2.8
Melting Point/Freezing Point (°C): Not applicable	Water Solubility: Slight
Initial Boiling Point and Boiling Range (°C): Not applicable	Partition Coefficient: n-octane/water: Not determined
Flash Point (°C): Not determined	Auto Ignition Temperature (°C): Not applicable
Evaporation Rate: Not applicable	Decomposition Temperature (°C): Not determined
Flammability (solid, gas): Not combustible	Viscosity: Not applicable

¹ The use of urea or aqueous ammonio injected into the flue gas to reduce nitrogen oxides (NOx) emissions may result in the presence of ammonium sulfate or ammonium bisulfate in the ash at less than 0.1%. When ash containing these substances becomes wet under high pH (>9), free ammonio gas may be released, resulting in objectionable/nuisance ammonio odor and potential exposure to ammonio gas, especially in confined spaces.

² This is a typical range. There are rare cases where Class F fly ash has pH in water of less than 7.

**Class F Fly Ash**

SDS Number: 002

Revision Date: 5/18/15

9.2 Other Information

None.

**Section 10
Stability and Reactivity**

10.1 Reactivity

The material is an inert, inorganic material primarily composed of elemental oxides.

10.2 Chemical Stability

The material is stable under normal use conditions.

10.3 Possibility of Hazardous Reactions

The material is a relatively stable, inert material. Polymerization will not occur. However, when ash containing added ammonia becomes wet under high pH (>9), free ammonia gas may be released, resulting in an objectionable/nuisance ammonia odor and potential exposure to ammonia gas, especially in confined spaces.

10.4 Conditions to Avoid

Product can become airborne in moderate winds. Dry material should be stored in silos. Materials stored out of doors should be covered or maintained in a damp condition.

10.5 Incompatible Materials

None known.

10.6 Hazardous Decomposition Products

None known.

**Section 11
Toxicological Information**

11.1 Information on Toxicological Effects

Endpoint	Data
Acute oral toxicity	LD50 > 2000 mg/kg
Acute dermal toxicity	LD50 > 2000 mg/kg
Acute inhalation toxicity	LC50 > 5.0 mg/L
Skin corrosion/irritation	Not irritating to skin.
Eye damage/irritation	Slight but reversible eye irritation.



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

Endpoint	Data
Respiratory/skin sensitization	Not a respiratory or dermal sensitizer.
Germ cell mutagenicity	Not mutagenic in <i>in vitro</i> and <i>in vivo</i> assays with or without metabolic activation.
Carcinogenicity	Not available. Respirable crystalline silica has been identified as a carcinogen by NTP and IARC.
Reproductive toxicity	An animal study with a CCP has indicated some effects on male and female reproductive organs and parameters without a clear dose response, while studies with other CCPs have not shown reproductive effects. Therefore, there is not enough evidence available to classify according to reproductive toxicity. No developmental toxicity has been observed in available animal studies.
STOT-SE	No specific target organ toxicity after a single exposure to the substance is expected; however, presence as a nuisance dust may result in respiratory irritation.
STOT-RE	NOAEC = 4.2 mg/m ³ fly ash dust; as no effects were observed at the highest dose tested during the 180-day inhalation study, it is not possible to assess the level at which toxicologically significant effects may occur. Repeated inhalation exposures to high levels of respirable crystalline silica may result in lung damage (i.e., silicosis).
Aspiration Hazard	Not applicable based on product form.

Section 12 Ecological Information

12.1 Toxicity

Coal Ash CAS# 68131-74-8	
Toxicity to fish	LC50 >100 mg/L
Toxicity to invertebrates	Data indicates that the test substance is not toxic to <i>Daphnia magna</i> (EC50 undetermined).
Toxicity to algae and plants	EC50 = 10 mg/L

Calcium oxide CAS# 1305-78-8	
Toxicity to fish	LC50 = 50.6 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

<p>Toxicity to invertebrates</p>	<p>EC50 = 49.1 mg/L The findings were closely related to the pH of the test solutions; therefore, pH is considered to be the main reason for the effects.</p>
<p>Toxicity to algae and plants</p>	<p>NOEC =48 mg/L @ 72 hours based on Ca(OH)₂ The initial pH of the test medium was not directly related to the biologically relevant effects. The formation of precipitates is likely the result of the reaction between CO₂ dissolved in the medium.</p>

12.2 Persistence and Degradability

Not relevant for inorganic materials.

12.3 Bioaccumulative Potential

No data available.

12.4 Mobility in Soil

No data available.

12.5 Results of PBT and vPvB Assessment

No data available.

12.6 Other Adverse Effects

None known.

**Section 13
Disposal Considerations**

See Sections 7 and 8 above for safe handling and use, including appropriate hygienic practices.

Dispose of all waste product and containers in accordance with federal, state and local regulations.

**Section 14
Transport Information**

<p>Regulatory entity: U.S. DOT</p>	<p>Shipping Name:</p>	<p>Not Regulated</p>
	<p>Hazard Class:</p>	<p>Not Regulated</p>
	<p>ID Number:</p>	<p>Not Regulated</p>
	<p>Packing Group:</p>	<p>Not Regulated</p>



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

Section 15 Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Mixture

- **TSCA Inventory Status**

All components are listed on the TSCA Inventory.

- **California Proposition 65**

The following substances are known to the State of California to be carcinogens and/or reproductive toxicants:

- Respirable crystalline silica
- Titanium dioxide (airborne particles)

- **State Right-to-Know (RTK)**

Component	CAS	MA ^{1,2}	NJ ^{3,4}	PA ⁵	RI ⁶
Ammonium bisulfate	7803-63-6	No	Yes	No	No
Ammonium sulfate	7783-20-2	Yes	No	Yes	No
Calcium oxide	1305-78-8	Yes	Yes	Yes	No
Iron oxide	1309-37-1	Yes	Yes	Yes	No
Magnesium oxide	1309-48-4	No	Yes	No	No
Phosphorus pentoxide (or phosphorus oxide)	1314-56-3	Yes	Yes	Yes	No
Potassium oxide	12136-45-7	No	Yes	No	No
Silica-crystalline (SiO ₂), quartz	14808-60-7	Yes	Yes	Yes	No
Titanium dioxide	13463-67-7	Yes	Yes	Yes	No

¹ Massachusetts Department of Public Health, no date

² 189th General Court of The Commonwealth of Massachusetts, no date

³ New Jersey Department of Health and Senior Services, 2010a

⁴ New Jersey Department of Health, 2010b

⁵ Pennsylvania Code, 1986

⁶ Rhode Island Department of Labor and Training, no date

- **Coal ash is not a SARA 313 substance.**

Coal ash is required for SARA Tier II (311/312) reporting when in sufficient quantities. Trace elements in coal ash should be considered in TRI reporting.



Class F Fly Ash

SDS Number: 002

Revision Date: 5/18/15

**Section 16
Other Information, Including Date of Preparation or Last Revision**

16.1 Indication of Changes

Date of preparation or last revision: May 18, 2015

16.2 Abbreviations and Acronyms

ACGIH:	American Conference of Industrial Hygienists	PA:	Pennsylvania
ANSI:	American National Standards Institute	Pa:	Paschal
CA:	California	PBT:	Persistent, Toxic and Bioaccumulative
CAA:	Clean Air Act	PEL:	Permissible exposure limit
CAS:	Chemical Abstract Services	PPE:	Personal Protective Equipment
CCP:	Coal Combustion Product	REL:	Recommended exposure limit
CFR:	Code of Federal Regulations	RI:	Rhode Island
EPA:	Environmental Protection Agency	RCS:	Respirable Crystalline Silica
GHS:	Globally Harmonized System of Classification and Labeling	RTK:	Right-to-Know
HMIS:	Hazardous Materials Identification System	SARA:	Superfund Amendments and Reauthorization Act
IARC:	International Agency for Research on Cancer	SCBA:	Self-contained breathing apparatus
LC50:	Concentration resulting in the mortality of 50% of an animal population	SDS:	Safety Data Sheet
LD50:	Dose resulting in the mortality of 50% of an animal population	STEL:	Short-term exposure limit
LEL:	Lower explosive limit	STOT-RE:	Specific target organ toxicity-repeated exposure
MA:	Massachusetts	STOT-SE:	Specific target organ toxicity-single exposure
NA:	Not Applicable	TLV:	Threshold limit value
NJ:	New Jersey	TSCA:	Toxic Substances Control Act
NOEC:	No observed effect concentration	TWA:	Time-weighted average
NIOSH:	National Institute of Occupational Safety and Health	UEL:	Upper explosive limit
NOx:	Nitrogen oxides	UVCB:	Unknown or Variable Composition/Biological
NTP:	US National Toxicology Program	U.S.:	United States
OEL:	Occupational Exposure Limit	U.S. DOT:	United States of Department of Transportation
OSHA:	Occupational Safety and Health Administration	vPvB:	Very Persistent and Very Bioaccumulative

16.3 Other Hazards

Table 1: Class F Fly Ash

Hazardous Materials Identification System (HMIS)			Degree of hazard (0 = Low; 4= Extreme)
Health: 1*	Flammability: 0	Reactivity: 1	Personal Protection: -

* Chronic Health Effects

**Class F Fly Ash**

SDS Number: 002

Revision Date: 5/18/15

DISCLAIMER:

This SDS has been prepared in accordance with the Hazard Communication Rule 29 CFR 1910.1200. Information herein is based on data considered to be accurate as of date prepared. No warranty or representation, express or implied, is made as to the accuracy or completeness of this data and safety information. No responsibility can be assumed for any damage or injury resulting from abnormal use, failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.



AGRI-EMPRESA, LLC

Manufacturer • Packager • Distributer

SAFETY DATA SHEET

BENTONITE DRILLING GEL

REV. DATE: 07-01-2014 REV 1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Company Identification:

Agri Empresa LLC
6001 W. Industrial Ave
Midland, TX 79706

24 Hour Emergency Telephone: Call Chemtrec 1-703-527-3887

To Request and SDS: 1-432-694-1994

Customer Service: 1-432-694-1994

Trade Name(s): HydroGel

Generic Name(s): Wyoming (Western) Bentonite; Bentonite Clay (CAS no. 1302-78-9)

Chemical Name(s): Sodium Montmorillonite (CAS No. 1318-93-0)

2. HAZARD IDENTIFICATION

Physical State: Solid

Color: Blue-Gray to Green as moist solid; Light Tan to Gray as dry powder.

Odor: Odorless

Primary Entry Routes: Skin, Eyes, Inhalation, and Ingestion..

Health Effects-Eyes: Mechanical irritant.

Health Effects-Skin: Possibly drying resulting in dermatitis.

2. HAZARD IDENTIFICATION (cont.)

Health Effects-

Inhalation:

Acute (short term) exposure to dust levels exceeding the PEL may cause irritation of respiratory tract resulting in a dry cough. *Chronic* (long term) exposure to airborne Bentonite dust containing respirable size quartz particles, where respirable quartz particle levels are higher than TLV's, may lead to development of silicosis or other respiratory problems. Persistent dry cough and labored breathing upon exertion may be symptomatic.

Health Effects-

Ingestion:

No adverse effects

Permissible Exposure

Limits:

Bentonite as "Particles not otherwise regulated" (formally nuisance dust)

Total dust

Respirable dust

OSHA PEL
(8 hour TWA)

15 mg/m³

5 mg/m³

ACGIH TLV

ND

ND

Crystalline Silica: Quartz (respirable)

10 mg/m³
% Silica +2

0.025 mg/m³

Carcinogenicity:

Bentonite is not listed by ACGIH, IARC, NTP, or OSHA. IARC, 1997, concludes that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica from occupational sources (IARC Class 1), that carcinogenicity was not detected in all industrial circumstances studied and that carcinogenicity may depend on characteristics of the crystalline silica or on external factors affecting its biological activity. NTP classifies respirable crystalline silica as "known to be a human carcinogen" (NTP 9th Report on Carcinogens - 2000). ACGIH classifies crystalline silica, quartz, as a suspected human carcinogen (A2).



Warning

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS Number</u>	<u>%</u>
Crystalline Silica (SiO ₂) as Quartz	14808-60-7	See Note

Hazard: Low concentrations of crystalline silica (SiO₂) in the form of quartz may be present in airborne Bentonite dust.

Note: Although the typical quartz content of western Bentonite is in the range of 2 to 6% most of the quartz particles are larger than the respirable threshold size. The actual respirable quartz concentration in airborne Bentonite dust will depend upon Bentonite source, fineness of product, moisture content of product, local humidity and wind condition at point of use and other specific factors.

4. FIRST AID MEASURES

Inhalation: Move to area free from dust. If symptoms of irritation persists contact physician. Inhalation may aggravate existing respiratory illness.

Skin Contact: Wash with soap and water until clean.

Eye Contact: Flush with until irritation ceases.

5. FIRE FIGHTING MEASURES

Flash Point: NA

Flammable Limits: LEL: NA UEL: NA

Unusual Fire and Explosion Hazards: None. Product will not support combustion.

Fire Extinguishing Media: None for product. Any media can be used for packaging. Product becomes slippery when wet.

6. ACCIDENTAL RELEASE MEASURES

Spill/Leak Procedure: Avoid breathing dust; wear respirator approved for silica bearing dust. Vacuum up to avoid generating airborne dust. Avoid using water, product slippery when wet.

Waste Management and Disposal Procedures: Waste should be disposed of in accordance with applicable local, state, and federal regulations.

7. HANDLING AND STORAGE

Use NIOSH/MSHA respirators approved for silica bearing dust when free silica containing airborne Bentonite dust levels exceed PEL/TLV's. Clean up spills promptly to avoid making dust. Storage area floors may become slippery if wet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation:	Mechanical, general room ventilation. Use local ventilation to maintain PEL's/TLV's
Respirator:	Use respirators approved by NIOSH/MSHA respirators approved for silica bearing dust.
Eye Protection:	Generally not necessary. Personal preference.
Gloves:	Generally not necessary. Personal preference.

Permissible Exposure Limits:	OSHA PEL (8 hour TWA)	ACGIH TLV
Bentonite as "Particles not otherwise regulated" (formally nuisance dust)		
Total dust	15 mg/m3	ND
Respirable dust	5 mg/m3	ND
Crystalline Silica: Quartz (respirable)	<u>10 mg/m3</u> % Silica +2	0.025 mg/m3

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Blue-Gray to Green as moist solid; Light Tan to Gray as dry powder.
Odor:	Odorless.
pH:	8-10 (5% aqueous solution)
Specific Gravity:	2.45-2.55
Density:	55-68 lbs/cu.ft.
Boiling Point(F):	Not determined
Boiling Point(C):	Not determined
Freezing Point(F):	2642.0
Freezing Point(C):	1450.0
Vapor Pressure(mmHg)	
Vapor Density(Air-1):	

9. PHYSICAL AND CHEMICAL PROPERTIES (cont.)

Percent Volatiles:

Evaporation Rate(Butyl Acetate=1):

Solubility in Water (g/100ml):

Insoluble, forms colloidal suspension.

Solubility in Solvents:

Not Determined

VOCs(lbs/gallon);

Not Determined

Viscosity,Dynamic(centipoise):

Not Determined

Viscosity, Kinematic(centistokes):

Not Determined

Partition Coefficientn-Octanol/Water: Not Determined

Molecular Weight(g/mole);

10. STABILITY AND REACTIVITY

Stability Data:

Stable.

Polymerization:

None.

Chemical Incompatibilities:

None.

Hazardous Decomposition Products:

None Known.

11. TOXICOLOGICAL INFORMATION

Toxicity Data:

Acute Oral LD50

Not determined

Acute Dermal LD50

Not determined

Aquatic Toxicology LC50

Not determined.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

No data available.

Environmental Fate:

No data available.

Environmental Degradation:

No data available.

Soil Absorption/Mobility:

No data available.

13. DISPOSAL CONSIDERATIONS

Disposal:

Product should be disposed of in accordance with applicable local, state, and federal regulations.

14. TRANSPORT INFORMATION

Shipping Name:	Not Regulated
Hazardous Substance:	Not Regulated
Hazard Class:	Not Regulated
Caution Labeling:	Not Regulated

15. REGULATORY INFORMATION

Shipping Name:	Not Regulated
Hazardous Substance:	Not Regulated
Hazard Class:	Not Regulated
Caution Labeling:	Not Regulated

16. OTHER INFORMATION

DISCLAIMER STATEMENT:

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if the material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

****END****

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Trade name C 17

1.2 Relevant identified uses of the substance or mixture and uses advised against

- no data available

1.3 Details of the supplier of the safety data sheet

Company

Chemplex
Solvay USA Inc.
NOVECARE
506 CR 137
P.O. Box 1071
Snyder, TX 79550
Phone (325) 573-7298

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture

HCS 2012 (29 CFR 1910.1200)

Combustible dust

May form combustible dust concentrations in air.

2.2 Label elements

HCS 2012 (29 CFR 1910.1200)

Signal Word

- Warning

Hazard Statements

- May form combustible dust concentrations in air.

2.3 Other hazards which do not result in classification

- Slightly irritating to eyes and skin.
- No specific risk when handled in accordance with good occupational hygiene and safety practice.
- Divided solid.
- May form explosive dust-air mixture.
- Electrostatic charges may be generated as a result of flow, stirring etc.
- Electrostatic charges may build up by swirling, pneumatic transport, pouring etc.
- Hazardous reactions may occur on contact with certain chemicals. (Refer to the list of incompatible materials section 10: "Stability-Reactivity").

SECTION 3: Composition/information on ingredients
3.1 Substance

- Not applicable, this product is a mixture.

3.2 Mixture
Hazardous Ingredients and Impurities

Chemical Name	Identification number CAS-No.	Concentration [%]
diatomaceous earth	61790-53-2	20 - 40

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

Non Hazardous Ingredients and Impurities

Chemical Name	Identification number CAS-No.	Concentration [%]
Polymeric Resin	*****	60- 80

SECTION 4: First aid measures
4.1 Description of first-aid measures
General advice

- Show this material safety data sheet to the doctor in attendance.
- First responder needs to protect himself.
- Place affected apparel in a sealed bag for subsequent decontamination.

In case of inhalation

- If inhaled, remove to fresh air.
- Keep at rest.
- Consult a physician if necessary.

In case of skin contact

- In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Seek medical advice.
- Wash contaminated clothing before re-use.

In case of eye contact

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- If eye irritation persists, consult a physician.

In case of ingestion

- Do not induce vomiting without medical advice.
- If victim is conscious:
- Rinse mouth with water.
- Keep at rest.
- Do not give anything to drink.
- Do not leave the victim unattended.
- Vomiting may occur spontaneously
- Risk of product entering the lungs on vomiting after ingestion.
- Lay victim on side.

- Seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Effects

- Skin contact may aggravate existing skin disease
- Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
- Treat symptomatically.
- There is no specific antidote available.

SECTION 5: Firefighting measures

Flash point

Not applicable, solid for which the melting point is > 100 °C / 212°F

Flammability class: Will burn

Autoignition temperature

no data available

Flammability / Explosive limit

no data available

5.1 Extinguishing media

Suitable extinguishing media

- Water spray
- Foam
- Multipurpose powders
- Carbon dioxide (CO₂)

Unsuitable extinguishing media

- High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting

- Under fire conditions:
- Will burn
- Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Hazardous combustion products:

- On combustion or on thermal decomposition (pyrolysis), releases:
- Sulfur oxides
- Carbon oxides
- Silicon oxides
- Nitrogen oxides (NO_x)

5.3 Advice for firefighters

Special protective equipment for fire-fighters

- Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.

Specific fire fighting methods

- Do not use a solid water stream as it may scatter and spread fire.
- Cool closed containers exposed to fire with water spray.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

- Wear suitable protective equipment.
- For further information refer to section 8 "Exposure controls / personal protection."

6.2 Environmental precautions

- Do not flush into surface water or sanitary sewer system.
- Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.
- Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies

6.3 Methods and materials for containment and cleaning up***Prohibition***

- Use only non-sparking tools.
- Avoid dust formation.

Recovery

- Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).
- Keep in suitable, closed containers for disposal.
- Keep in properly labeled containers.
- Never return spills in original containers for re-use.

Decontamination / cleaning

- Wash off with plenty of water.
- Recover the cleaning water for subsequent disposal.
- Decontaminate tools, equipment and personal protective equipment in a segregated area.

Disposal

- Dispose of in accordance with local regulations.

Additional advice

- Forms slippery/greasy layers with water.

6.4 Reference to other sections

- 7. HANDLING AND STORAGE
- 8. EXPOSURE CONTROLS/PERSONAL PROTECTION
- 13. DISPOSAL CONSIDERATIONS

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

PRCO90070616

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- Potential dust explosion hazard.
- Take measures to prevent the build up of electrostatic charge.
- Ensure all equipment is electrically grounded before beginning transfer operations.
- This powder should not be flowed through non-conductive ducts or pipes
- Use only appropriately classed electrical equipment.
- Handle in accordance with good industrial hygiene and safety practice.
- Do not breathe vapors/dust.
- Avoid contact with skin and eyes.
- Do not use sparking tools.

Hygiene measures

- Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this materials:
- 1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes or contact with material.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions

- Stable under normal conditions.
- Keep container tightly closed.
- Keep in a cool, well-ventilated place.
- Protect from moisture.
- Keep away from open flames, hot surfaces and sources of ignition.
- Keep away from incompatible materials to be indicated by the manufacturer
- Keep away from: Strong oxidizing agents, Strong acids, Strong bases

7.3 Specific end use(s)

- no data available

SECTION 8: Exposure controls/personal protection

Introductory Remarks: These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

8.1 Control parameters

Components with workplace occupational exposure limits

Ingredients	Value type	Value	Basis
diatomaceous earth			Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
	See table Z-3		
diatomaceous earth	TWA	20Million particles per cubic foot	Occupational Safety and Health Administration - Table Z-3 Mineral Dusts
	Form of exposure : Dust Based on impinger samples counted by light-field techniques., mppcf X 35.3 = million particles per cubic meter = particles per c.c.Expressed as :Silica		

diatomaceous earth	TWA	80mg/m3 / %SiO ₂	Occupational Safety and Health Administration - Table Z-3 Mineral Dusts
	Form of exposure : Dust Expressed as :Silica		
diatomaceous earth	TWA	6 mg/m3	National Institute for Occupational Safety and Health
	Expressed as :Silica		
Particulates not otherwise regulated	PEL	15 mg/m3	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
	Form of exposure : Total dust		
Particulates not otherwise regulated	PEL	5 mg/m3	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
	Form of exposure : Respirable fraction		

8.2 Exposure controls

Control measures

Engineering measures

- Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures :
- Effective exhaust ventilation system

Individual protection measures

Respiratory protection

- Use a respirator with an approved filter if a risk assessment indicates this is necessary.
- When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.
- Under normal conditions, in the absence of other airborne contaminants, the following devices should provide protection from this material up to the conditions specified by the appropriate local standard(s):
- Respirator with a dust filter

Hand protection

- Where there is a risk of contact with hands, use appropriate gloves
- Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
- Gloves must be inspected prior to use.
- Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection

- Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.
- Eye contact should be prevented through the use of:
- Safety glasses with side-shields

Skin and body protection

- Protective suit
- Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures

- Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this materials:
- 1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.

- 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes or contact with material.

Protective measures

- Ensure that eyewash stations and safety showers are close to the workstation location.
- Emergency equipment immediately accessible, with instructions for use.
- The protective equipment must be selected in accordance with current local standards and in cooperation with the supplier of the protective equipment.
- Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the potential hazards, and/or risks that may occur during use.

SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

9.1 Information on basic physical and chemical properties

<u>Appearance</u>	<u>Form:</u> powder
	<u>Physical state:</u> solid
	<u>Color:</u> beige to white
<u>Odor</u>	odorless
<u>Odor Threshold</u>	no data available
<u>pH</u>	no data available
<u>Boiling point/boiling range</u>	no data available
<u>Flash point</u>	Not applicable, solid for which the melting point is > 100 °C / 212°F
<u>Evaporation rate (Butylacetate = 1)</u>	Flammability class: Will burn no data available
<u>Flammability (solid, gas)</u>	May form combustible dust concentrations in air.
<u>Flammability / Explosive limit</u>	no data available
<u>Autoignition temperature</u>	no data available
<u>Vapor pressure</u>	no data available
<u>Vapor density</u>	no data available
<u>Density</u>	1.34 g/cm ³ (68 °F (20 °C))
<u>Solubility</u>	no data available
<u>Partition coefficient: n-octanol/water</u>	no data available
<u>Thermal decomposition</u>	no data available
<u>Viscosity</u>	no data available
<u>Explosive properties</u>	no data available
<u>Oxidizing properties</u>	no data available

9.2 Other information

no data available

SECTION 10: Stability and reactivity**10.1 Reactivity**

- no data available

10.2 Chemical stability

- Stable under normal conditions.

10.3 Possibility of hazardous reactions**Polymerization**

- Hazardous polymerization does not occur.

10.4 Conditions to avoid

- Keep away from heat and sources of ignition.
- Electric arcs
- Static electricity
- Exposure to moisture.
- Avoid high temperatures.

10.5 Incompatible materials

- Strong oxidizing agents
- Strong acids and strong bases

10.6 Hazardous decomposition products

- On combustion or on thermal decomposition (pyrolysis), releases:
- Sulfur oxides
- Carbon oxides
- Nitrogen oxides (NO_x)
- Silicon oxides

SECTION 11: Toxicological information**11.1 Information on toxicological effects****Acute toxicity****Acute oral toxicity**

Not classified as harmful if swallowed
According to the data on the components

Acute inhalation toxicity

Not classified as harmful by inhalation

Acute dermal toxicity

According to the data on the components
Not classified as harmful by contact with skin

Acute toxicity (other routes of administration)

According to the data on the components
no data available

Skin corrosion/irritation

Mild skin irritation

Serious eye damage/eye irritation

May cause slight temporary irritation to ocular mucous membranes

Respiratory or skin sensitization Does not cause skin sensitization.
Does not cause respiratory sensitization.

Mutagenicity

Genotoxicity in vitro no data available
Genotoxicity in vivo no data available

Carcinogenicity no data available

This product does not contain any ingredient designated as probable or suspected human carcinogens by:

NTP
IARC
OSHA
ACGIH

Toxicity for reproduction and development

Toxicity to reproduction / fertility no data available
Developmental Toxicity/Teratogenicity no data available

STOT

STOT-single exposure no data available
STOT-repeated exposure no data available

Aspiration toxicity no data available

SECTION 12: Ecological information

12.1 Toxicity no data available

12.2 Persistence and degradability**Biodegradation**

Biodegradability no data available

12.3 Bioaccumulative potential no data available

12.4 Mobility in soil no data available

12.5 Results of PBT and vPvB assessment no data available

12.6 Other adverse effects no data available

Ecotoxicity assessment

Acute aquatic toxicity Not classified due to lack of data.

Chronic aquatic toxicity Not classified due to lack of data.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal

- Chemical additions, processing or otherwise altering this material may make the waste management information presented in this SDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.
- Dispose of in accordance with local regulations.

Waste Code

- Environmental Protection Agency
- Hazardous Waste – NO

Advice on cleaning and disposal of packaging

- Empty the packaging completely prior to disposal.
- Dispose of contents/ container to an approved waste disposal plant.
- Dispose of in accordance with local regulations.

SECTION 14: Transport information

DOT

not regulated

TDG

not regulated

NOM

not regulated

IMDG

not regulated

IATA

not regulated

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information
15.1 Notification status

Inventory Information	Status
United States TSCA Inventory	- Contains component(s) that meet the TSCA polymer exemption criteria of 40 CFR 723.250.
Canadian Domestic Substances List (DSL)	- One or more components not listed on inventory
Australia Inventory of Chemical Substances (AICS)	- One or more components not listed on inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- One or more components not listed on inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- One or more components not listed on inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	- Listed on Inventory
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	- One or more components not listed on inventory

15.2 Federal Regulations
US. EPA EPCRA SARA Title III
SARA HAZARD DESIGNATION SECTIONS 311/312 (40 CFR 370)

Fire Hazard	no
Reactivity Hazard	no
Sudden Release of Pressure Hazard	no
Acute Health Hazard	no
Chronic Health Hazard	no

Section 313 Toxic Chemicals (40 CFR 372.65)

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)

This material does not contain any components with a SARA 302 RQ.

Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)

This material does not contain any components with a section 304 EHS RQ.

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

This material does not contain any components with a CERCLA RQ.

15.3 State Regulations**US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)**

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

SECTION 16: Other information**NFPA (National Fire Protection Association) - Classification**

Health	1 slight
Flammability	1 slight
Instability or Reactivity	0 minimal

HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification

Health	1 slight
Flammability	1 slight
Reactivity	0 minimal
PPE	Determined by User; dependent on local conditions

Date Prepared: 11/03/2015

Key or legend to abbreviations and acronyms used in the safety data sheet

- PEL	Permissible exposure limit (PEL)
- TWA	Time weighted average
- ACGIH	American Conference of Governmental Industrial Hygienists
- OSHA	Occupational Safety and Health Administration
- NTP	National Toxicology Program
- IARC	International Agency for Research on Cancer
- NIOSH	National Institute for Occupational Safety and Health

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

- Trade name CHEMPLEX C 35

1.2 Relevant identified uses of the substance or mixture and uses advised against**Uses of the Substance / Mixture**

- Oil & gas industry

1.3 Details of the supplier of the safety data sheet**Company**

Chemplex
Solvay USA Inc.
NOVECARE
506 CR 137
P.O. Box 1071
Snyder, TX 79550
Phone (325) 573-7298

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CONTACT CHEMTREC (24-Hour Number): 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture**HCS 2012 (29 CFR 1910.1200)**

Combustible dust

May form combustible dust concentrations in air.

2.2 Label elements**HCS 2012 (29 CFR 1910.1200)****Signal Word**

- Warning

Hazard Statements

- May form combustible dust concentrations in air.

2.3 Other hazards which do not result in classification

None identified

SECTION 3: Composition/information on ingredients**3.1 Substance**

- Not applicable, this product is a mixture.

3.2 Mixture

Hazardous Ingredients and Impurities

- No ingredients are hazardous.

Non Hazardous Ingredients and Impurities

Chemical name	Identification number CAS-No.	Concentration [%]
NJTSRN 489909-5570-PC	*****	80- 100

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice

- First responder needs to protect himself.
- Place affected apparel in a sealed bag for subsequent decontamination.

In case of inhalation

- If breathed in, move person into fresh air.
- Consult a physician if necessary.

In case of skin contact

- In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Seek medical advice.
- Wash contaminated clothing before reuse.

In case of eye contact

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- Seek medical advice.

In case of ingestion

- Do not induce vomiting without medical advice.
- If victim is conscious:
- Rinse mouth with water.
- Keep at rest.
- Do not give anything to drink.
- Do not leave the victim unattended.
- Vomiting may occur spontaneously
- Risk of product entering the lungs on vomiting after ingestion.
- Lay victim on side.
- Seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Effects

- Skin contact may aggravate existing skin disease
- Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
- Treat symptomatically.
- There is no specific antidote available.

SECTION 5: Firefighting measures

Flash point > 200 °F (> 93 °C)

Autoignition temperature No data available

Flammability / Explosive limit No data available

5.1 Extinguishing media**Suitable extinguishing media**

- Extinguishing media - small fires
- Dry chemical

- Extinguishing media - large fires
- Foam
- Water spray

Unsuitable extinguishing media

- High volume water jet

5.2 Special hazards arising from the substance or mixture**Specific hazards during fire fighting**

- Under fire conditions:
- Will burn
- Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
- Hazardous decomposition products formed under fire conditions.

Hazardous combustion products:

- On combustion or on thermal decomposition (pyrolysis), releases:
- Carbon oxides
- Sulfur oxides

5.3 Advice for firefighters**Special protective equipment for fire-fighters**

- Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.
- Wear full protective clothing and self-contained breathing apparatus.
- Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing

Further information

- Standard procedure for chemical fires.
- Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
- Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

- Wear suitable protective equipment.
- For further information refer to section 8 "Exposure controls / personal protection."

6.2 Environmental precautions

- Do not flush into surface water or sanitary sewer system.
- Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.
- Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies

6.3 Methods and materials for containment and cleaning up**Prohibition**

- Use only non-sparking tools.
- Avoid dust formation.

Recovery

- Soak up with inert absorbent material.
- Shovel or sweep up.
- Keep in suitable, closed containers for disposal.
- Never return spills in original containers for re-use.

Decontamination / cleaning

- Wash nonrecoverable remainder with large amounts of water.
- Clean contaminated surface thoroughly.
- Recover the cleaning water for subsequent disposal.
- Decontaminate tools, equipment and personal protective equipment in a segregated area.

Disposal

- Dispose of in accordance with local regulations.

6.4 Reference to other sections

- 7. HANDLING AND STORAGE
- 8. EXPOSURE CONTROLS/PERSONAL PROTECTION
- 13. DISPOSAL CONSIDERATIONS

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

- Potential dust explosion hazard.
- Use explosion-proof equipment.
- This powder should not be flowed through non-conductive ducts or pipes
- Use only appropriately classed electrical equipment.
- Take measures to prevent the build up of electrostatic charge.
- Mixture may charge electrostatically: always use grounding leads when transferring from one container to another.
- Handle in accordance with good industrial hygiene and safety practice.
- Avoid inhalation of vapor or mist.

- Avoid contact with skin and eyes.
- Do not ingest.
- Do not use sparking tools.
- Ensure all equipment is electrically grounded before beginning transfer operations.

Hygiene measures

- Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this materials:
- 1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes or contact with material.

7.2 Conditions for safe storage, including any incompatibilities**Technical measures/Storage conditions**

- Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.
- Stable under normal conditions.
- Keep container tightly closed in a dry and well-ventilated place.
- Keep away from open flames, hot surfaces and sources of ignition.
- Keep away from incompatible materials to be indicated by the manufacturer
- Keep away from: Strong oxidizing agents

7.3 Specific end use(s)

- no data available

SECTION 8: Exposure controls/personal protection

Introductory Remarks: These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

8.1 Control parameters**Components with workplace occupational exposure limits**

Components	Value type	Value	Basis
Particulates not otherwise regulated	PEL	15 mg/m ³	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
		Form of exposure : Total dust	
Particulates not otherwise regulated	PEL	5 mg/m ³	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
		Form of exposure : Respirable fraction	

8.2 Exposure controls

Control measures

Engineering measures

- Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures :
- Effective exhaust ventilation system

Individual protection measures

Respiratory protection

- When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Hand protection

- Recommended preventive skin protection
- Gloves
- Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye protection

- Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.
- Eye contact should be prevented through the use of:
- Safety glasses with side-shields

Skin and body protection

- Recommended preventive skin protection
- Footwear protecting against chemicals
- Impervious clothing
- Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures

- Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this materials:
- 1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes or contact with material.

Protective measures

- Ensure that eyewash stations and safety showers are close to the workstation location.
- Emergency equipment immediately accessible, with instructions for use.
- The protective equipment must be selected in accordance with current local standards and in cooperation with the supplier of the protective equipment.
- Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the potential hazards, and/or risks that may occur during use.

SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

9.1 Information on basic physical and chemical properties

<u>Appearance</u>	Form: powder Physical state: solid Color: red brown
<u>Odor</u>	characteristic
<u>Odor Threshold</u>	No data available
<u>pH</u>	8.0 - 10.0
<u>Melting point/freezing point</u>	<u>Melting point/range:</u> > 698 °F (> 370 °C)
<u>Initial boiling point and boiling range</u>	No data available
<u>Flash point</u>	> 200 °F (> 93 °C)
<u>Evaporation rate (Butylacetate = 1)</u>	No data available
<u>Flammability (solid, gas)</u>	May form combustible dust concentrations in air.
<u>Flammability / Explosive limit</u>	No data available
<u>Autoignition temperature</u>	No data available
<u>Vapor pressure</u>	No data available
<u>Vapor density</u>	No data available
<u>Density</u>	1.2 g/cm ³ (68 °F (20 °C)) <u>Bulk density:</u> 600 kg/m ³
<u>Relative density</u>	No data available
<u>Solubility</u>	<u>Water solubility:</u> soluble
<u>Partition coefficient: n-octanol/water</u>	No data available
<u>Decomposition temperature</u>	No data available
<u>Viscosity</u>	No data available
<u>Explosive properties</u>	No data available
<u>Oxidizing properties</u>	No data available

9.2 Other information

No data available

SECTION 10: Stability and reactivity**10.1 Reactivity**

- no data available

10.2 Chemical stability

- Stable under normal conditions.

10.3 Possibility of hazardous reactions

- **polymerization**
Hazardous polymerization does not occur.

10.4 Conditions to avoid

- Keep away from heat and sources of ignition.
- Avoid dust formation.

10.5 Incompatible materials

- Strong acids and oxidizing agents
- Strong bases
- Strong acids

10.6 Hazardous decomposition products

- On combustion or on thermal decomposition (following the evaporation of water) releases:
- Carbon oxides
- Sulfur oxides

SECTION 11: Toxicological information**11.1 Information on toxicological effects****Acute toxicity****Acute oral toxicity**

Not classified as hazardous for acute oral toxicity according to GHS.
According to the available data on the components
According to the classification criteria for mixtures.

Acute inhalation toxicity

Not classified as hazardous for acute inhalation toxicity according to GHS.
According to the available data on the components
According to the classification criteria for mixtures.

Acute dermal toxicity

According to the available data on the components
Not classified as harmful by contact with skin
According to the classification criteria for mixtures.

Acute toxicity (other routes of administration)

No data available

<u>Skin corrosion/irritation</u>	Not classified as irritating to skin According to the available data on the components According to the classification criteria for mixtures.
<u>Serious eye damage/eye irritation</u>	According to the available data on the components Not classified as irritating to eyes According to the classification criteria for mixtures.
<u>Respiratory or skin sensitization</u>	Does not cause skin sensitization. According to the available data on the components According to the classification criteria for mixtures.
<u>Mutagenicity</u>	
Genotoxicity in vitro	According to the available data on the components Product is not considered to be genotoxic According to the classification criteria for mixtures.
Genotoxicity in vivo	According to the available data on the components Product is not considered to be genotoxic According to the classification criteria for mixtures.
<u>Carcinogenicity</u>	No data available

This product does not contain any ingredient designated as probable or suspected human carcinogens by:

NTP
IARC
OSHA
ACGIH
NTP
IARC
OSHA

Toxicity for reproduction and development

Toxicity to reproduction / fertility	According to the available data on the components, The product is not considered to affect fertility., According to the classification criteria for mixtures.
Developmental Toxicity/Teratogenicity	According to the available data on the components, The product is not considered to be toxic for development., The product is not considered to be teratogenic., According to the classification criteria for mixtures.

STOT

STOT-single exposure	The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria. According to the classification criteria for mixtures.
STOT-repeated exposure	The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria. According to the classification criteria for mixtures.

Experience with human exposure No data available

Aspiration toxicity No data available

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish The product itself has not been tested.

Acute toxicity to daphnia and other aquatic invertebrates The product itself has not been tested.

Toxicity to aquatic plants The product itself has not been tested.

Toxicity to microorganisms The product itself has not been tested.

Chronic toxicity to fish The product itself has not been tested.

Chronic toxicity to daphnia and other aquatic invertebrates The product itself has not been tested.

Terrestrial Compartment

Toxicity to soil dwelling organisms The product itself has not been tested.

12.2 Persistence and degradability

Abiotic degradation No data available

Physical- and photo-chemical elimination No data available

Biodegradation No data available

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water No data available

Bioconcentration factor (BCF) No data available

12.4 Mobility in soil

Adsorption potential (Koc) Conclusion is not possible due to incomplete or heterogeneous data on the components

Known distribution to environmental compartments No data available

12.5 Results of PBT and vPvB assessment This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects**Ecotoxicity assessment**

Short-term (acute) aquatic hazard According to the available data on the components
The product does not have any known adverse effects on the aquatic organisms tested
According to the classification criteria for mixtures.

Long-term (chronic) aquatic hazard According to the available data on the components
Does not have any known long term adverse effects on the aquatic organisms tested
According to the classification criteria for mixtures.

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product Disposal**

- Chemical additions, processing or otherwise altering this material may make the waste management information presented in this SDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

Waste Code

- Environmental Protection Agency
- Hazardous Waste – NO

Advice on cleaning and disposal of packaging

- Rinse with an appropriate solvent.
- Dispose of contents/container in accordance with local regulation.

SECTION 14: Transport information**DOT**

not regulated

TDG

not regulated

NOM

PRCO90068232

Version : 2.00 / US (Z8)

www.solvay.com



CHEMPLEX C 35

Revision Date 07/15/2019

not regulated

IMDG

not regulated

IATA

not regulated

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information**15.1 Notification status**

Inventory Information	Status
United States TSCA Inventory	- One or more components not listed on inventory
United States TSCA Inventory	- On or in compliance with the active portion of the TSCA inventory
Canadian Domestic Substances List (DSL)	- One or more components not listed on inventory
Australia Inventory of Chemical Substances (AICS)	- One or more components not listed on inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- One or more components not listed on inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- One or more components not listed on inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	- One or more components not listed on inventory
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	- Not in compliance with the inventory
Taiwan Chemical Substance Inventory (TCSI)	- One or more components not listed on inventory
New Zealand. Inventory of Chemical Substances	- One or more components is not listed on the NZIOC inventory. The HSNO status of the product has not been assessed.
EU. European Registration, Evaluation, Authorisation and Restriction of Chemical (REACH)	- When purchased from a Solvay legal entity based in the EEA ("European Economic Area"), this product is compliant with the registration provisions of the REACH Regulation (EC) No. 1907/2006 as all its components are either excluded, exempt, and/or registered. When purchased from a legal entity outside of the EEA, please contact your local representative for additional information.

15.2 Federal Regulations**US. EPA EPCRA SARA Title III****Section 313 Toxic Chemicals (40 CFR 372.65)**

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)

PRCO90068232

Version : 2.00 / US (Z8)

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This material does not contain any components with a SARA 302 RQ.

Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)

This material does not contain any components with a section 304 EHS RQ.

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

This material does not contain any components with a CERCLA RQ.

15.3 State Regulations

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.
This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

SECTION 16: Other information

NFPA (National Fire Protection Association) - Classification

Health	1 slight
Flammability	1 slight
Instability or Reactivity	0 minimal

HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification

Health	1 slight
Flammability	1 slight
Reactivity	0 minimal
PPE	Determined by User; dependent on local conditions

Date Prepared: 07/15/2019

Key or legend to abbreviations and acronyms used in the safety data sheet

- PEL	Permissible exposure limit (PEL)
- TWA	Time weighted average
- ACGIH	American Conference of Governmental Industrial Hygienists
- OSHA	Occupational Safety and Health Administration
- NTP	National Toxicology Program
- IARC	International Agency for Research on Cancer
- NIOSH	National Institute for Occupational Safety and Health

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

- Trade name CHEMPLEX C 24

1.2 Relevant identified uses of the substance or mixture and uses advised against**Uses of the Substance / Mixture**

- Oil & gas industry

1.3 Details of the supplier of the safety data sheet**Company**

Chemplex
Solvay USA Inc.
NOVECARE
506 CR 137
P.O. Box 1071
Snyder, TX 79550
Phone (325) 573-7298

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CONTACT CHEMTREC (24-Hour Number): 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture**HCS 2012 (29 CFR 1910.1200)**

Combustible dust

May form combustible dust concentrations in air.

2.2 Label elements**HCS 2012 (29 CFR 1910.1200)****Signal Word**

- Warning

Hazard Statements

- May form combustible dust concentrations in air.

2.3 Other hazards which do not result in classification

None identified

SECTION 3: Composition/information on ingredients**3.1 Substance**

- Not applicable, this product is a mixture.

3.2 Mixture

Hazardous Ingredients and Impurities

- No ingredients are hazardous.

Non Hazardous Ingredients and Impurities

Chemical name	Identification number CAS-No.	Concentration [%]
Lignosulfonic acid, sodium salt	8061-51-6	90- 100

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice

- First responder needs to protect himself.
- Place affected apparel in a sealed bag for subsequent decontamination.

In case of inhalation

- If breathed in, move person into fresh air.
- Consult a physician if necessary.

In case of skin contact

- In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Seek medical advice.
- Wash contaminated clothing before reuse.

In case of eye contact

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- Seek medical advice.

In case of ingestion

- Do not induce vomiting without medical advice.
- If victim is conscious:
- Rinse mouth with water.
- Keep at rest.
- Do not give anything to drink.
- Do not leave the victim unattended.
- Vomiting may occur spontaneously
- Risk of product entering the lungs on vomiting after ingestion.
- Lay victim on side.
- Seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Effects

- Skin contact may aggravate existing skin disease
- Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
- Treat symptomatically.
- There is no specific antidote available.

SECTION 5: Firefighting measures

Flash point	> 200 °F (> 93 °C)
Autoignition temperature	752 °F (400 °C)
Flammability / Explosive limit	Lower flammability/explosion limit : 0.01 Lb/Ft ³ Upper flammability/explosion limit :

5.1 Extinguishing media**Suitable extinguishing media**

- Extinguishing media - small fires
- Dry chemical
- Carbon dioxide (CO₂)

- Extinguishing media - large fires
- Foam
- Water spray

Unsuitable extinguishing media

- High volume water jet
- (frothing possible)

5.2 Special hazards arising from the substance or mixture**Specific hazards during fire fighting**

- Under fire conditions:
- Will burn
- Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
- Hazardous decomposition products formed under fire conditions.

Hazardous combustion products:

- On combustion or on thermal decomposition (pyrolysis), releases:
- Carbon oxides
- Sulfur oxides

5.3 Advice for firefighters**Special protective equipment for fire-fighters**

- Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.
- Wear full protective clothing and self-contained breathing apparatus.
- Personal protective equipment comprising: suitable protective gloves, safety goggles and protective clothing

Further information

- Standard procedure for chemical fires.
- Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
- Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

- Wear suitable protective equipment.
- For further information refer to section 8 "Exposure controls / personal protection."

6.2 Environmental precautions

- Do not flush into surface water or sanitary sewer system.
- Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.
- Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies

6.3 Methods and materials for containment and cleaning up**Prohibition**

- Use only non-sparking tools.
- Avoid dust formation.

Recovery

- Soak up with inert absorbent material.
- Shovel or sweep up.
- Keep in suitable, closed containers for disposal.
- Never return spills in original containers for re-use.

Decontamination / cleaning

- Wash nonrecoverable remainder with large amounts of water.
- Clean contaminated surface thoroughly.
- Recover the cleaning water for subsequent disposal.
- Decontaminate tools, equipment and personal protective equipment in a segregated area.

Disposal

- Dispose of in accordance with local regulations.

6.4 Reference to other sections

- 7. HANDLING AND STORAGE
- 8. EXPOSURE CONTROLS/PERSONAL PROTECTION
- 13. DISPOSAL CONSIDERATIONS

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

- Potential dust explosion hazard.
- Use explosion-proof equipment.
- This powder should not be flowed through non-conductive ducts or pipes
- Use only appropriately classed electrical equipment.
- Take measures to prevent the build up of electrostatic charge.

- Mixture may charge electrostatically: always use grounding leads when transferring from one container to another.
- Handle in accordance with good industrial hygiene and safety practice.
- Avoid inhalation of vapor or mist.
- Avoid contact with skin and eyes.
- Do not ingest.
- Do not use sparking tools.
- Ensure all equipment is electrically grounded before beginning transfer operations.

Hygiene measures

- Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this materials:
- 1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes or contact with material.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions

- Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.
- Stable under normal conditions.
- Keep container tightly closed in a dry and well-ventilated place.
- Keep away from open flames, hot surfaces and sources of ignition.
- Keep away from incompatible materials to be indicated by the manufacturer
- Keep away from: Strong oxidizing agents

7.3 Specific end use(s)

- no data available

SECTION 8: Exposure controls/personal protection

Introductory Remarks: These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

8.1 Control parameters

Components with workplace occupational exposure limits

Components	Value type	Value	Basis
Particulates not otherwise regulated	PEL	15 mg/m ³	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
		Form of exposure : Total dust	
Particulates not otherwise regulated	PEL	5 mg/m ³	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
		Form of exposure : Respirable fraction	

8.2 Exposure controls

Control measures

Engineering measures

- Where engineering controls are indicated by use conditions or a potential for excessive exposure exists, the following traditional exposure control techniques may be used to effectively minimize employee exposures :
- Effective exhaust ventilation system

Individual protection measures

Respiratory protection

- When respirators are required, select NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Hand protection

- Recommended preventive skin protection
- Gloves
- Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

Eye protection

- Eye and face protection requirements will vary dependent upon work environment conditions and material handling practices. Appropriate ANSI Z87 approved equipment should be selected for the particular use intended for this material.
- Eye contact should be prevented through the use of:
- Safety glasses with side-shields

Skin and body protection

- Recommended preventive skin protection
- Footwear protecting against chemicals
- Impervious clothing
- Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures

- Personal hygiene is an important work practice exposure control measure and the following general measures should be taken when working with or handling this materials:
- 1) Do not store, use, and/or consume foods, beverages, tobacco products, or cosmetics in areas where this material is stored.
- 2) Wash hands and face carefully before eating, drinking, using tobacco, applying cosmetics, or using the toilet.
- 3) Wash exposed skin promptly to remove accidental splashes or contact with material.

Protective measures

- Ensure that eyewash stations and safety showers are close to the workstation location.
- Emergency equipment immediately accessible, with instructions for use.
- The protective equipment must be selected in accordance with current local standards and in cooperation with the supplier of the protective equipment.
- Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the potential hazards, and/or risks that may occur during use.

SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

9.1 Information on basic physical and chemical properties

<u>Appearance</u>	<u>Form:</u> powder <u>Physical state:</u> solid <u>Color:</u> beige to brown.
<u>Odor</u>	slight characteristic
<u>Odor Threshold</u>	No data available
<u>pH</u>	8.0 - 9.0 (3 % (m/v))
<u>Melting point/freezing point</u>	<u>Melting point/range:</u> > 266 °F (> 130 °C)
<u>Initial boiling point and boiling range</u>	No data available
<u>Flash point</u>	> 200 °F (> 93 °C)
<u>Evaporation rate (Butylacetate = 1)</u>	No data available
<u>Flammability (solid, gas)</u>	May form combustible dust concentrations in air.
<u>Flammability / Explosive limit</u>	<u>Lower flammability/explosion limit:</u> Type: Lower flammability limit 0.01 Lb/Ft3 <u>Upper flammability/explosion limit:</u> Type: Upper flammability limit 0.21 Lb/Ft3
<u>Autoignition temperature</u>	752 °F (400 °C)
<u>Vapor pressure</u>	No data available
<u>Vapor density</u>	No data available
<u>Density</u>	0.465 g/cm3 (68 °F (20 °C))
<u>Relative density</u>	0.37 - 0.56
<u>Solubility</u>	<u>Water solubility:</u> completely soluble
<u>Partition coefficient: n-octanol/water</u>	No data available
<u>Decomposition temperature</u>	No data available

<u>Viscosity</u>	No data available
<u>Explosive properties</u>	No data available
<u>Oxidizing properties</u>	No data available

9.2 Other information

No data available

SECTION 10: Stability and reactivity**10.1 Reactivity**

- no data available

10.2 Chemical stability

- Stable under normal conditions.

10.3 Possibility of hazardous reactions

- polymerization**
- Hazardous polymerization does not occur.

10.4 Conditions to avoid

- Keep away from heat and sources of ignition.
- Avoid dust formation.

10.5 Incompatible materials

- Strong acids and oxidizing agents

10.6 Hazardous decomposition products

- On combustion or on thermal decomposition (following the evaporation of water) releases:
- Carbon oxides
- Sulfur oxides

SECTION 11: Toxicological information**11.1 Information on toxicological effects****Acute toxicity****Acute oral toxicity**

Not classified as hazardous for acute oral toxicity according to GHS.
According to the available data on the components
According to the classification criteria for mixtures.

Acute inhalation toxicity

Not classified as hazardous for acute inhalation toxicity according to GHS.
According to the available data on the components
According to the classification criteria for mixtures.

Acute dermal toxicity

According to the available data on the components
Not classified as harmful by contact with skin
According to the classification criteria for mixtures.

Acute toxicity (other routes of administration)

No data available

Skin corrosion/irritation

Not classified as irritating to skin
According to the available data on the components
According to the classification criteria for mixtures.

Serious eye damage/eye irritation

According to the available data on the components
Not classified as irritating to eyes
According to the classification criteria for mixtures.

Respiratory or skin sensitization

Does not cause skin sensitization.
According to the available data on the components
According to the classification criteria for mixtures.

Mutagenicity**Genotoxicity in vitro**

According to the available data on the components
Product is not considered to be genotoxic
According to the classification criteria for mixtures.

Genotoxicity in vivo

According to the available data on the components
Product is not considered to be genotoxic
According to the classification criteria for mixtures.

Carcinogenicity

No data available

This product does not contain any ingredient designated as probable or suspected human carcinogens by:

NTP
IARC
OSHA
ACGIH
NTP
IARC
OSHA

Toxicity for reproduction and development**Toxicity to reproduction / fertility**

According to the available data on the components, The product is not considered to affect fertility., According to the classification criteria for mixtures.

Developmental Toxicity/Teratogenicity

According to the available data on the components, The product is not considered to be toxic for development., The product is not considered to be teratogenic., According to the classification criteria for mixtures.

STOT**STOT-single exposure**

The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.
According to the classification criteria for mixtures.

STOT-repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.
According to the classification criteria for mixtures.

Experience with human exposure No data available

Aspiration toxicity No data available

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish The product itself has not been tested.

Acute toxicity to daphnia and other aquatic invertebrates The product itself has not been tested.

Toxicity to aquatic plants The product itself has not been tested.

Toxicity to microorganisms The product itself has not been tested.

Chronic toxicity to fish The product itself has not been tested.

Chronic toxicity to daphnia and other aquatic invertebrates The product itself has not been tested.

Terrestrial Compartment

Toxicity to soil dwelling organisms The product itself has not been tested.

12.2 Persistence and degradability

Abiotic degradation No data available

Physical- and photo-chemical elimination No data available

Biodegradation No data available

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water No data available

Bioconcentration factor (BCF) No data available

12.4 Mobility in soil

Adsorption potential (Koc) Conclusion is not possible due to incomplete or heterogeneous data on the components

Known distribution to environmental compartments No data available

12.5 Results of PBT and vPvB assessment This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects**Ecotoxicity assessment**

Short-term (acute) aquatic hazard According to the available data on the components
The product does not have any known adverse effects on the aquatic organisms tested
According to the classification criteria for mixtures.

Long-term (chronic) aquatic hazard According to the available data on the components
Does not have any known long term adverse effects on the aquatic organisms tested
According to the classification criteria for mixtures.

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product Disposal**

- Chemical additions, processing or otherwise altering this material may make the waste management information presented in this SDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material.

Waste Code

- Environmental Protection Agency
- Hazardous Waste – NO

Advice on cleaning and disposal of packaging

- Rinse with an appropriate solvent.
- Dispose of contents/container in accordance with local regulation.

SECTION 14: Transport information**DOT**

not regulated

TDG

not regulated

NOM

PRCO90070753

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not regulated

IMDG

not regulated

IATA

not regulated

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information**15.1 Notification status**

Inventory Information	Status
United States TSCA Inventory	- All substances listed as active on the TSCA inventory
Canadian Domestic Substances List (DSL)	- Listed on Inventory
Australia Inventory of Chemical Substances (AICS)	- Listed on Inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- Listed on Inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- Listed on Inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	- Listed on Inventory
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	- Listed on Inventory
Taiwan Chemical Substance Inventory (TCSI)	- Listed on Inventory
New Zealand. Inventory of Chemical Substances	- All components are listed on the NZIOC inventory. The HSNO status of the product has not been assessed.
EU. European Registration, Evaluation, Authorisation and Restriction of Chemical (REACH)	- When purchased from a Solvay legal entity based in the EEA ("European Economic Area"), this product is compliant with the registration provisions of the REACH Regulation (EC) No. 1907/2006 as all its components are either excluded, exempt, and/or registered. When purchased from a legal entity outside of the EEA, please contact your local representative for additional information.

15.2 Federal Regulations**US. EPA EPCRA SARA Title III****Section 313 Toxic Chemicals (40 CFR 372.65)**

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)

This material does not contain any components with a SARA 302 RQ.

Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)

This material does not contain any components with a section 304 EHS RQ.

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

This material does not contain any components with a CERCLA RQ.

15.3 State Regulations**US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)**

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects. This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

SECTION 16: Other information**NFPA (National Fire Protection Association) - Classification**

Health	1 slight
Flammability	1 slight
Instability or Reactivity	0 minimal

HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification

Health	1 slight
Flammability	1 slight
Reactivity	0 minimal
PPE	Determined by User; dependent on local conditions

Date Prepared: 07/15/2019

Key or legend to abbreviations and acronyms used in the safety data sheet

- PEL	Permissible exposure limit (PEL)
- TWA	Time weighted average
- ACGIH	American Conference of Governmental Industrial Hygienists
- OSHA	Occupational Safety and Health Administration
- NTP	National Toxicology Program
- IARC	International Agency for Research on Cancer
- NIOSH	National Institute for Occupational Safety and Health

CHEMPLEX C 24

Revision Date 07/15/2019

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.



Safety Data Sheet

Section 1: Identification

Product identifier

Product Name • **Chemplex C-51**

Product Code • 01723

Relevant identified uses of the substance or mixture and uses advised against

Recommended use • Petrochemical industry: Cement Additive

Details of the supplier of the safety data sheet

Manufacturer • Chemplex | Solvay USA Inc. | Novecare Division
 506 CF 137
 P.O. Box 1071 Snyder, TX 79550
 United States
 www.chemplex.net
 SDS@chemplex.net

Telephone (General) • 325.573.7298

Emergency telephone number

Manufacturer • 800.424.9300 - CHEMTREC

Section 2: Hazard Identification

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012 • Combustible Dust

Label elements

OSHA HCS 2012

WARNING

Hazard statements • May form combustible dust concentrations in air.

Precautionary statements

Prevention • Avoid breathing dust, fume, gas, mist, vapours and/or spray.

Other hazards

OSHA HCS 2012 • No data available

Canada

According to: WHMIS

Classification of the substance or mixture

WHMIS

- Under Canadian regulations (Workplace Hazardous Materials Information System (WHMIS) - Hazardous Products Act (HPA), this material is hazardous due to combustible dust-air mixture potential.

Label elements

WHMIS

- No label element(s) required

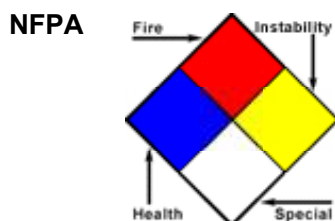
Other hazards

WHMIS

- Combustible Dust.

Other information

- One should be specifically trained before communicating or using the following National Fire Protection Association (NFPA) and or Hazardous Materials Identification System (HMIS) categories since the definition and scales applied do not match US OSHA GHS and HAZCOM 2012 definitions and rules.



- Health Hazard: 1 - Caution: May be irritating
Flammability: 1 - Combustible if heated
Reactivity: 0 - Stable: Not reactive under normal conditions

- HMIS**
- HMIS Health - 1: Slight Hazard
HMIS Flammability - 1: Slight Hazard
HMIS Physical Hazard - 0: Minimal Hazard

Section 3 - Composition/Information on Ingredients

Substances

- Not applicable. This material is a mixture.

Mixtures

Blend of non-hazardous organic gelling agents and inert minerals. The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

Composition		
Chemical Name	Identifiers	%
Cellulose, 2-hydroxyethyl ether	CAS:9004-62-0	> 95%
Water	CAS:7732-18-5	< 5%

- This product is considered hazardous according to the OSHA Hazard Communication Standard 29 CFR 1910.1200 due to the combustible dust-air mixture potential. Under Canadian regulations (Workplace Hazardous Materials Information System (WHMIS) - Hazardous Products Act (HPA), this material is hazardous due to combustible dust-air mixture potential.

Section 4: First-Aid Measures

Description of first aid measures

- Inhalation**
- Remove to fresh air. Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes. Get medical attention if symptoms occur.
- Skin**
- Exposure to dust may cause mechanical irritation. Wash skin with soap and water. Get medical attention if symptoms occur.
- Eye**
- Exposure to dust may cause mechanical irritation. If contact with material occurs flush eyes with water. Remove contact lenses if worn. Get medical attention if symptoms occur.
- Ingestion**
- Do NOT induce vomiting. Get medical attention immediately.

Most important symptoms and effects, both acute and delayed

- Exposure to dust may cause mechanical irritation.

Indication of any immediate medical attention and special treatment needed

- Notes to Physician**
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. Treat symptomatically. There is no specific antidote available.

Section 5: Fire-Fighting Measures

Extinguishing media

- Suitable Extinguishing Media**
- LARGE FIRES: Dry chemical, CO₂, alcohol-resistant foam or water spray.
SMALL FIRES: Dry chemical, CO₂, water spray or regular foam.

- Unsuitable Extinguishing Media**
- DO NOT use high volume water jet.
LARGE FIRES: Do not scatter spilled material with high pressure water streams.

Special hazards arising from the substance or mixture

- Unusual Fire and Explosion Hazards**
- Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
Under fire conditions:
Will burn.

- Hazardous Combustion Products**
- Oxides of carbon.
Hazardous combustion products may include a complex mixture of airborne solid and liquid particulates and gases (acrid smoke and irritating fumes)

Advice for firefighters

- Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing.
Standard procedures for chemical fires.
Collect contaminated fire extinguishing materials separately. This must be not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

- Personal Precautions**
- Avoid breathing dust. Wear suitable protective clothing. Refer to Section 8 - Exposure Controls/Personal Protection.

- Emergency Procedures**
- Eliminate all ignition sources.

Environmental precautions

- Do not flush to sewer or allow to enter waterways. Spills may be reportable to the National Response Center (800-424-8802) and to state and or local agencies. Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.

Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Carefully shovel or sweep up spilled material and place in suitable container. Avoid generating dust. Wash remainder with plenty of water. Water will make area slippery. Repeat cleaning process until the contaminated surface is no longer slippery. Refer to Section 13 - Disposal Considerations.

Prohibited Materials

- Use non-sparking tools and grounded/bonded equipment and containers when transferring.

Section 7 - Handling and Storage

Precautions for safe handling

Handling

- Minimize dust generation and accumulation. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Take precautionary measures against static charges. Do not use sparking tools. Use explosion-proof electrical/ventilating/lighting/equipment. Do not breathe dust.

Conditions for safe storage, including any incompatibilities

Storage

- Keep only in the original container/package in a cool well-ventilated place. Store away from strong oxidizing agents and acids. Keep away from heat, ignition sources and strong oxidizing agents.

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines

- Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

Exposure Limits/Guidelines			
	Result	ACGIH	OSHA
Cellulose, 2-hydroxyethyl ether as Particulates not otherwise classified (PNOC)	TWAs	10 mg/m ³ TWA (inhalable particles, recommended); 3 mg/m ³ TWA (respirable particles, recommended) <i>as Particulates not otherwise classified (PNOC)</i>	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction) <i>as Particulates not otherwise classified (PNOC)</i>

Exposure controls

Engineering Measures/Controls

- Use non-sparking tools and grounded/bonded equipment and containers when transferring. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory

- When respirators are required, use NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Eye/Face

- Wear protective eyewear (goggles, face shield, or safety glasses).

Skin/Body

- Wear protective clothing and gloves.

General Industrial Hygiene

- Avoid all contact. Strict hygiene. Handle in accordance with good industrial hygiene

Considerations

and safety practice. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Keep away from food, drink and animal feeding stuffs.

Environmental Exposure Controls

- No data available

Additional Protection Measures

- The protective equipment must be selected in accordance with local standards and in cooperation with the supplier of the protective equipment. Selection of the appropriate personal protective equipment should be based upon an evaluation of the performance characteristics of the protective equipment relative to the tasks to be performed, conditions present, duration of use, and the potential hazards, and/or risks that may occur during use. Emergency equipment should be immediately accessible, with instructions for use. Facilities using or storing this material should be equipped with an eyewash and safety shower in close proximity to areas of storage and use.

Section 9 - Physical and Chemical Properties

Information on Physical and Chemical Properties

Material Description			
Physical Form	Solid	Appearance/Description	Cream, off white powder.
Color	Cream, off-white.	Odor	Mild Slight Odor.
Taste	No data available	Particulate Type	Dust
Odor Threshold	No data available		
General Properties			
Boiling Point	No data available	Melting Point	No data available
Decomposition Temperature	No data available	Heat of Decomposition	No data available
pH	6 to 8.5 @ 20 C(68 F) at 10 g/l	Specific Gravity/Relative Density	1.1 to 1.5 @ 20 C(68 F) Water=1
Water Solubility	> 10 g/L	Viscosity	No data available
Explosive Properties	No data available		
Volatility			
Vapor Pressure	No data available	Vapor Density	No data available
Evaporation Rate	No data available		
Flammability			
Flash Point	No data available	UEL	No data available
Autoignition	120 C(248 F)	Flammability (solid, gas)	No data available
Environmental			
Octanol/Water Partition coefficient	No data available		

Section 10: Stability and Reactivity

Reactivity

- Reactive with oxidizing agents.

Chemical stability

- This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

- Hazardous polymerization will not occur.

Conditions to avoid

- Dust generation. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as

electrical grounding and bonding, or inert atmospheres. Take precautionary measures against static charges.

Incompatible materials

- Strong oxidizing agents.

Hazardous decomposition products

- Hazardous combustion products may include a complex mixture of airborne solid and liquid particulates and gases (acid smoke and irritating fumes) Carbon monoxide (CO), and Carbon dioxide (CO₂)

Section 11 - Toxicological Information

Information on toxicological effects

	CAS	
Chemplex C-51	NDA	Acute Toxicity: Ingestion/Oral-Rat LD50 • >5000 mg/kg

GHS Properties	Classification
Acute toxicity	OSHA HCS 2012 • Acute Toxicity - Classification criteria not met; Acute Toxicity - Dermal - Classification criteria not met; Acute Toxicity - Inhalation - Classification criteria not met; Acute Toxicity - Oral - Classification criteria not met
Aspiration Hazard	OSHA HCS 2012 • Classification criteria not met
Carcinogenicity	OSHA HCS 2012 • Classification criteria not met
Germ Cell Mutagenicity	OSHA HCS 2012 • Classification criteria not met
Skin corrosion/Irritation	OSHA HCS 2012 • Classification criteria not met
Skin sensitization	OSHA HCS 2012 • Classification criteria not met
STOT-RE	OSHA HCS 2012 • Classification criteria not met
STOT-SE	OSHA HCS 2012 • Classification criteria not met
Toxicity for Reproduction	OSHA HCS 2012 • Classification criteria not met
Respiratory sensitization	OSHA HCS 2012 • Classification criteria not met
Serious eye damage/Irritation	OSHA HCS 2012 • Classification criteria not met

Potential Health Effects

Inhalation

Acute (Immediate)

- Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

Chronic (Delayed)

- Long term inhalation can cause irritation, inflammation, and/or permanent injury to the lungs. Illness such as pneumoconiosis (dusty lung), pulmonary fibrosis, chronic bronchitis, emphysema, and bronchial asthma may develop.

Skin

Acute (Immediate)

- Exposure to dust may cause mechanical irritation.

Chronic (Delayed)

- No data available

Eye

Acute (Immediate)

- Exposure to dust may cause mechanical irritation.

Chronic (Delayed)

- No data available

Ingestion

Acute (Immediate)

- Under normal conditions of use, ingestion is not expected. Not an ingestion hazard

- Chronic (Delayed)** based upon LD50.
- No data available

Section 12 - Ecological Information

Toxicity

- This material is not expected to be acutely toxic to aquatic organisms.

Persistence and degradability

- This material is not expected to be readily biodegradable.

Bioaccumulative potential

- Bioconcentration potential is low (BCF less than 100 or log Pow greater than 7).

Mobility in Soil

- Expected to be relatively immobile in soil (Koc > 5000).

Other adverse effects

- According to test data on the components and the classification criteria for mixtures, this product has no known adverse effects on aquatic organisms.

Section 13 - Disposal Considerations

Waste treatment methods

Product waste

- Chemical additions, processing or otherwise altering this material may make the waste management information presented in this SDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations.

Packaging waste

- Rinse with an appropriate solvent. Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	UN number	UN proper shipping name	Transport hazard class (es)	Packing group	Environmental hazards
DOT	NDA	Not regulated	NDA	NDA	NDA
TDG	NDA	Not regulated	NDA	NDA	NDA
IMO/IMDG	NDA	Not regulated	NDA	NDA	NDA
IATA/ICAO	NDA	Not regulated	NDA	NDA	NDA

Special precautions for user ● No data available

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code ● No data available

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications ● None

United States

Environment

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

Not Listed

Other Information

- All components of this product are listed on the following:

US TSCA Inventory

Canada Domestic Substance List (DSL)

Australia Inventory of Chemical Substances (AICS)

China Inventory of Existing chemical Substances in China (IECSC)

Japan Inventory of Existing and New Chemicals (ENCS)

Korea Existing Chemical Inventory (KECI)

Section 16 - Other Information

Last Revision Date

- 21/January/2015

Preparation Date

- 12/January/2015

Disclaimer/Statement of Liability

- The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but does not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in another manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

IARC = International Agency for Research on Cancer

MSHA = Mine Safety and Health Administration

NDA = No Data Available

NIOSH = National Institute of Occupational Safety and Health

NTP = National Toxicology Program

OSHA = Occupational Safety and Health Administration

STEL = Short Term Exposure Limits are based on 15-minute exposures

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures



Safety Data Sheet

Section 1: Identification

Product identifier

Product Name • **Chemplex C-41P**

Product Code • 01716

Relevant identified uses of the substance or mixture and uses advised against

Recommended use • Cement defoamer

Details of the supplier of the safety data sheet

Manufacturer • Chemplex | Solvay USA Inc. | Novecare Division

506 CF 137
P.O. Box 1071 Snyder, TX 79550
United States
www.chemplex.net
SDS@chemplex.net

Telephone (General) • 325.573.7298

Emergency telephone number

Manufacturer • 800.424.9300 - CHEMTREC

Section 2: Hazard Identification

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012 • Classification criteria not met

Label elements

OSHA HCS 2012

Hazard statements • No label element(s) required

Precautionary statements

Prevention • Do not breathe dusts or mists.

Other hazards

OSHA HCS 2012 • Dusts in high concentrations may cause skin, eye, and respiratory tract irritation.

Canada

According to: WHMIS

Classification of the substance or mixture

WHMIS

- Under Canadian regulations (Workplace Hazardous Materials Information System (WHMIS) - Hazardous Products Act (HPA), this material is not hazardous.

Label elements

WHMIS

- No label element(s) required

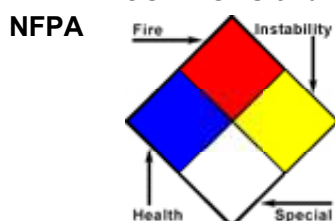
Other hazards

WHMIS

- Dusts in high concentrations may cause skin, eye, and respiratory tract irritation.

Other information

- One should be specifically trained before communicating or using the following National Fire Protection Association (NFPA) and or Hazardous Materials Identification System (HMIS) categories since the definition and scales applied do not match US OSHA GHS and HAZCOM 2012 definitions and rules.



- Health Hazard: 1 - Caution: May be irritating
Flammability: 0 - Not combustible
Reactivity: 0 - Stable: Not reactive under normal conditions

HMIS

- HMIS Health - 1: Slight Hazard
HMIS Physical Hazard - 0: Minimal Hazard
HMIS Flammability - 0: Minimal Hazard

Section 3 - Composition/Information on Ingredients

Substances

- Not applicable. This material is a mixture.

Mixtures

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

Composition		
Chemical Name	Identifiers	%
Calcium Carbonate	CAS:1317-65-3	> 90%
Polydimethyl Siloxane	CAS:63148-62-9	< 5%

- This product is not considered hazardous under the U.S. OSHA 29 CFR 1910.1200 Hazard Communication Standard. Under Canadian regulations (Workplace Hazardous Materials Information System (WHMIS) - Hazardous Products Act (HPA), this material is not hazardous.

Section 4: First-Aid Measures

Description of first aid measures

- Inhalation**
- Remove to fresh air. Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes. Get medical attention if symptoms occur.
- Skin**
- Exposure to dust may cause mechanical irritation. Wash skin with soap and water. Get medical attention if symptoms occur.
- Eye**
- Exposure to dust may cause mechanical irritation. If contact with material occurs flush eyes with water. Remove contact lenses if worn. Get medical attention if symptoms occur.
- Ingestion**
- If conscious, rinse mouth with water. Do NOT induce vomiting. If symptoms persist, call a physician or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

- Exposure to dust may cause mechanical irritation. Repeated or long exposure to excessive quantities of dust may aggravate existing asthmatic or respiratory conditions.

Indication of any immediate medical attention and special treatment needed

- Notes to Physician**
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred. Treat symptomatically. There is no specific antidote available.

Section 5: Fire-Fighting Measures

Extinguishing media

- Suitable Extinguishing Media**
- Use extinguishing agents appropriate for surrounding fire.

- Unsuitable Extinguishing Media**
- None known.

Special hazards arising from the substance or mixture

- Unusual Fire and Explosion Hazards**
- No unusual fire and explosion hazards known.

- Hazardous Combustion Products**
- Hazardous combustion products may include a complex mixture of airborne solid and liquid particulates and gases (acid smoke and irritating fumes) Carbon monoxide (CO), and Carbon dioxide (CO₂)

Advice for firefighters

- Firefighters should wear NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing. Standard procedures for chemical fires. Collect contaminated fire extinguishing materials separately. This must be not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Other information

- This product reacts readily with acid to generate carbon dioxide (CO₂); which is an asphyxiant (reduces or displaces the normal oxygen concentration in breathing air).

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

- Personal Precautions**
- Avoid breathing dust. Wear suitable protective clothing. Refer to Section 8 - Exposure Controls/Personal Protection.

- Emergency Procedures**
- Prevent further leakage or spillage. Keep unauthorized personnel away. Avoid dust formation. Sweep up to prevent slipping hazard.

Environmental precautions

- Do not flush to sewer or allow to enter waterways. Spills may be reportable to the National Response Center (800-424-8802) and to state and or local agencies. Take all necessary measures to avoid accidental discharge of products into drains and waterways due to the rupture of containers or transfer systems.

Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Carefully shovel or sweep up spilled material and place in suitable container. Avoid generating dust. Wash remainder with plenty of water. Water will make area slippery. Repeat cleaning process until the contaminated surface is no longer slippery. Refer to Section 13 - Disposal Considerations.

Prohibited Materials

- This product reacts readily with acid to generate carbon dioxide (CO₂); which is an asphyxiant (reduces or displaces the normal oxygen concentration in breathing air).

Section 7 - Handling and Storage

Precautions for safe handling

Handling

- Do not use in areas without adequate ventilation. Minimize dust generation and accumulation. Do not breathe dust. Avoid contact with skin and eyes.

Conditions for safe storage, including any incompatibilities

Storage

- Keep only in the original container/package in a cool well-ventilated place. Store away from strong oxidizing agents and acids.

Incompatible Materials or Ignition Sources

- Store away from acids. This product reacts readily with acid to generate carbon dioxide (CO₂); which is an asphyxiant (reduces or displaces the normal oxygen concentration in breathing air).

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines

- Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

Exposure Limits/Guidelines				
	Result	ACGIH	NIOSH	OSHA
Chemplex C-41P as Particulates not otherwise classified (PNOC)	TWAs	10 mg/m ³ TWA (inhalable particles, recommended); 3 mg/m ³ TWA (respirable particles, recommended) <i>as Particulates not otherwise classified (PNOC)</i>	Not established	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction) <i>as Particulates not otherwise classified (PNOC)</i>
Calcium Carbonate (1317-65-3)	TWAs	Not established	10 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable dust)	15 mg/m ³ TWA (total dust); 5 mg/m ³ TWA (respirable fraction)

Exposure controls

Engineering Measures/Controls

- Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory

- When respirators are required, use NIOSH/MSHA approved equipment based on actual or potential airborne concentrations and in accordance with the appropriate regulatory standards and/or industrial recommendations.

Eye/Face

- Wear protective eyewear (goggles, face shield, or safety glasses).

Skin/Body

- Wear protective clothing and gloves.

General Industrial Hygiene Considerations

- Avoid all contact. Strict hygiene. Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Keep away from food, drink and animal feeding stuffs.

Environmental Exposure Controls

- Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Additional Protection Measures

- The protective equipment must be selected in accordance with local standards and in cooperation with the supplier of the protective equipment. Selection of the appropriate personal protective equipment should be based upon an evaluation of the performance characteristics of the protective equipment relative to the tasks to be performed, conditions present, duration of use, and the potential hazards, and/or risks that may occur during use. Emergency equipment should be immediately accessible, with instructions for use. Facilities using or storing this material should be equipped with an eyewash and safety shower in close proximity to areas of storage and use.

Section 9 - Physical and Chemical Properties**Information on Physical and Chemical Properties**

Material Description			
Physical Form	Solid	Color	White
Odor	Odorless	Particulate Type	Dust
Odor Threshold	No data available		
General Properties			
Boiling Point	No data available	Melting Point	No data available
Decomposition Temperature	150 C(302 F) Based upon polydimethylsiloxane which can generate formaldehyde above decomposition temperature.	pH	Near neutral
Specific Gravity/Relative Density	= 2.7	Bulk Density	300 to 600 kg/m ³ Based upon Calcium carbonate
Water Solubility	Soluble	Viscosity	No data available
Volatility			
Vapor Pressure	No data available	Vapor Density	No data available
Evaporation Rate	No data available		
Flammability			
Flash Point	No data available	UEL	No data available
LEL		Autoignition	No data available
Flammability (solid, gas)	No data available		
Environmental			
Octanol/Water Partition coefficient	No data available		

Section 10: Stability and Reactivity**Reactivity**

- No dangerous reaction known under conditions of normal use.

Chemical stability

- This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

- Hazardous polymerization will not occur.

Conditions to avoid

- Dust generation.

Incompatible materials

- Store away from acids. This product reacts readily with acid to generate carbon dioxide (CO₂); which is an asphyxiant (reduces or displaces the normal oxygen concentration in breathing air).

Hazardous decomposition products

- This product contains polydimethylsiloxane which can generate formaldehyde at approximately 300 F (150 C) and above in atmospheres containing oxygen. Hazardous combustion products may include a complex mixture of airborne solid and liquid particulates and gases (acrid smoke and irritating fumes) Carbon monoxide (CO), and Carbon dioxide (CO₂)

Section 11 - Toxicological Information**Information on toxicological effects**

GHS Properties	Classification
Acute toxicity	OSHA HCS 2012 • Acute Toxicity - Classification criteria not met; Acute Toxicity - Dermal - Classification criteria not met; Acute Toxicity - Inhalation - Classification criteria not met; Acute Toxicity - Oral - Classification criteria not met
Aspiration Hazard	OSHA HCS 2012 • Classification criteria not met
Carcinogenicity	OSHA HCS 2012 • Classification criteria not met
Germ Cell Mutagenicity	OSHA HCS 2012 • Classification criteria not met
Skin corrosion/Irritation	OSHA HCS 2012 • Classification criteria not met
Skin sensitization	OSHA HCS 2012 • Classification criteria not met
STOT-RE	OSHA HCS 2012 • Classification criteria not met
STOT-SE	OSHA HCS 2012 • Classification criteria not met
Toxicity for Reproduction	OSHA HCS 2012 • Classification criteria not met
Respiratory sensitization	OSHA HCS 2012 • Classification criteria not met
Serious eye damage/Irritation	OSHA HCS 2012 • Classification criteria not met

Potential Health Effects**Inhalation****Acute (Immediate)**

- Excessive concentrations of nuisance dust in the workplace may cause mechanical irritation to mucous membranes.

Chronic (Delayed)

- Long term inhalation can cause irritation, inflammation, and/or permanent injury to the lungs. Illness such as pneumoconiosis (dusty lung), pulmonary fibrosis, chronic bronchitis, emphysema, and bronchial asthma may develop.

Skin**Acute (Immediate)**

- Exposure to dust may cause mechanical irritation.

Chronic (Delayed)

- No data available

Eye**Acute (Immediate)**

- Exposure to dust may cause mechanical irritation.

Chronic (Delayed)

- No data available

Ingestion

- Acute (Immediate)** • Under normal conditions of use, ingestion is not expected. Not an ingestion hazard based upon LD50.
- Chronic (Delayed)** • No data available

Section 12 - Ecological Information

Toxicity

- No data available

Persistence and degradability

- No data available

Bioaccumulative potential

- No data available

Mobility in Soil

- No data available

Other adverse effects

- According to test data on the components and the classification criteria for mixtures, this product has no known adverse effects on aquatic organisms.

Section 13 - Disposal Considerations

Waste treatment methods

Product waste

- Chemical additions, processing or otherwise altering this material may make the waste management information presented in this SDS incomplete, inaccurate or otherwise inappropriate. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations.

Packaging waste

- Rinse with an appropriate solvent. Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	UN number	UN proper shipping name	Transport hazard class (es)	Packing group	Environmental hazards
DOT	Not regulated	NDA	NDA	NDA	NDA
TDG	Not regulated	NDA	NDA	NDA	NDA
IMO/IMDG	Not regulated	NDA	NDA	NDA	NDA
IATA/ICAO	Not regulated	NDA	NDA	NDA	NDA

Special precautions for user • No data available

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code • No data available

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications • Acute**United States****Environment****U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities**

• Calcium Carbonate	1317-65-3	Not Listed
• Polydimethyl Siloxane	63148-62-9	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Calcium Carbonate	1317-65-3	Not Listed
• Polydimethyl Siloxane	63148-62-9	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Calcium Carbonate	1317-65-3	Not Listed
• Polydimethyl Siloxane	63148-62-9	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Calcium Carbonate	1317-65-3	Not Listed
• Polydimethyl Siloxane	63148-62-9	Not Listed

United States - California**Environment****U.S. - California - Proposition 65 - Carcinogens List**

• Calcium Carbonate	1317-65-3	Not Listed
• Polydimethyl Siloxane	63148-62-9	Not Listed

Other Information

- All components of this product are listed on the following:

 US TSCA Inventory

 Canada Domestic Substance List (DSL)

 Australia Inventory of Chemical Substances (AICS)

 China Inventory of Existing chemical Substances in China (IECSC)

 Japan Inventory of Existing and New Chemicals (ENCS)

 Korea Existing Chemical Inventory (KECI)
Section 16 - Other Information**Last Revision Date**

- 02/February/2015

Preparation Date

- 02/February/2015

Disclaimer/Statement of Liability

- The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but does not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in another manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

IARC = International Agency for Research on Cancer

MSHA = Mine Safety and Health Administration

NDA = No Data Available

NIOSH = National Institute of Occupational Safety and Health

NTP = National Toxicology Program

OSHA = Occupational Safety and Health Administration

STEL = Short Term Exposure Limits are based on 15-minute exposures

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product information

Trade name : KCl
Synonyms : Potassium Chloride : Muriate of potash
Product Number : 01803
Use : Petrochemical Industry

Manufacturer : Chemplex | Solvay USA Inc. | Novecare Division
 506 CR 137
 P.O. Box 1071 Snyder, TX 79550
 United States
 www.chemplex.net
 SDS@chemplex.net

Telephone (General)- 325.573.7298

Emergency telephone number

Manufacturer- 800.424.9300 - CHEMTREC

2. HAZARDS

IDENTIFICATION

Emergency Overview

OSHA Hazards

Target Organ

Effect Target

Organs

HeartHeart

GHS Classification

Acute toxicity, Oral (Category

5) Eye irritation (Category 2B)

Acute aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Pictogram none

Signal word Warning

Hazard statement(s)

H303 May be harmful if
 swallowed. H320 Causes eye irritation.
 H402 Harmful to aquatic life.

Precautionary statement(s)

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

HMIS Classification

Health hazard: 1

Chronic Health Hazard: *

Flammability: 0

Physical hazards: 0

NFPA Rating

Health hazard:	0
Fire:	0
Reactivity Hazard:	0

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula	: KCl
Molecular Weight	: 74.55 g/mol

Component	Concentration
Potassium chloride	
CAS-No.	7447-40-7
EC-No.	231-211-8

4. FIRST AID MEASURES

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products

Hazardous decomposition products formed under fire conditions. - Hydrogen chloride gas, Potassium oxides

Further information

The product itself does not burn.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Avoid breathing dust.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place.

hygroscopic Keep in a dry place.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Immersion protection

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: > 480 min

Splash protection

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: > 30 min

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection

impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form crystalline, powder

Colour white

Safety data

pH 7

Melting point/freezing point 770 °C (1,418 °F)

Boiling point	1,500 °C (2,732 °F)
Flash point	no data available
Ignition temperature	no data available
Autoignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	no data available
Density	1.984 g/cm ³
Water solubility	soluble
Partition coefficient: n-octanol/water	no data available
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

10. STABILITY AND REACTIVITY

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

no data available

Conditions to avoid

Exposure to moisture.

Materials to avoid

Strong acids, Strong oxidizing agents

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Hydrogen chloride gas, Potassium oxides

Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50 no data available

Inhalation LC50 no data available

Dermal LD50 no data available

Other information no data available

Skin corrosion/irritation no data available

Serious eye damage/eye irritation

Eyes - rabbit - Mild eye irritation - 24 h

Respiratory or skin sensitization no data available

Germ cell mutagenicity no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity no data available

Teratogenicity no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard no data available

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Signs and Symptoms of Exposure

hyperkalemia, Nausea, Vomiting, Abdominal pain, Diarrhoea, Constipation., Paresthesia., Thirst, Dizziness, Rash, pruritus, Weakness, muscle cramps, minor psychiatric changes, minor visual changes

Synergistic effects

no data available

Additional Information

RTECS: TS8050000

12. ECOLOGICAL INFORMATION

Toxicity

Fish	LC50 - Pimephales promelas (fathead minnow) - 880 mg/l - 96 h mortality NOEC - Pimephales promelas (fathead minnow) - 500 mg/l - 7 d mortality LOEC - Pimephales promelas (fathead minnow) - 1,000 mg/l - 7 d
Daphnia	EC50 - Daphnia magna (Water flea) - 83 mg/l - 48 h

Persistence and degradability no data available

Bioaccumulative potential no data available

Mobility in soil no data available

PBT and vPvB assessment no data available

Other adverse effects environmental hazard cannot be excluded in the event of unprofessional handling and disposal; Harmful to aquatic life

13. DISPOSAL CONSIDERATIONS

Product : Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging : Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US) Not dangerous goods

IMDG Not dangerous goods

IATA Not dangerous goods

15. REGULATORY INFORMATION

OSHA Hazards
Target Organ Effect

SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Potassium chloride

CAS-No.
7447-40-7

Revision Date

New Jersey Right To Know Components

Potassium chloride

CAS-No.
7447-40-7

Revision Date

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION**Last Revision Date**

- 05/June/2015

Preparation Date

- 05/June/2015

Disclaimer/Statement of Liability

- The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but does not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in another manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.

U.S. SILICA COMPANY SAFETY DATA SHEET

SSA-1

1. IDENTIFICATION

Product identifier: Silica Sand or Ground Silica; crystalline silica (quartz)

Product Name/Trade Names:

Sand and Ground Silica Sand (sold under various names: ASTM TESTING SANDS • GLASS SAND • FILPRO® • FLINT SILICA • DM-SERIES • F-SERIES • FOUNDRY SANDS • FJ-SERIES H-SERIES • L-SERIES • N-SERIES • NJ SERIES • OK-SERIES • P-SERIES • T-SERIES • hydraulic fracturing sand, all sizes • frac sand, all sizes • MIN-U-SIL® Fine Ground Silica • MYSTIC WHITE® • #1 DRY • #1 SPECIAL • PENN SAND® • PRO WHITE® • SILURIAN® • Q-ROK® • SIL-CO-SIL® Ground Silica • MICROSIL® • SUPERSIL® • MASON SAND • GS SERIES • PERSPEC • proppant, all sizes • SHALE FRAC® - SERIES • KOSSE WHITE® • OTTAWA WHITE® • OPTIJUMP® • LIGHTHOUSE™

Chemical Name or Synonym:

Crystalline Silica (Quartz), Sand, Silica Sand, Flint, Ground Silica, Fine Ground Silica, Silica Flour.

Recommended use of the chemical and restrictions on use: (non-exhaustive list): brick, ceramics, foundry castings, glass, grout, hydraulic fracturing sand, frac sand, proppant, mortar, paint and coatings, silicate chemistry, silicone rubber, thermoset plastics.

DO NOT USE U.S. SILICA COMPANY SAND OR GROUND SILICA FOR SAND BLASTING

Manufacturer:

U.S. Silica Company
8490 Progress Drive, Suite 300
Frederick, MD 21701
U.S.A.

Phone: 800-243-7500
Emergency Phone: 301-682-0600
Fax: 301-682-0690

2. HAZARD(S) IDENTIFICATION

Classification:

Physical	Health
Not Hazardous	Carcinogen Category 1A Specific Target Organ Toxicity – Repeated Exposure Category 1



DANGER

May cause cancer by inhalation.
Causes damage to lungs through prolonged or repeated exposure by inhalation.

Response:

If exposed or concerned: Get medical advice.

Disposal:

Dispose of contents/containers in accordance with local regulation

Prevention

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust.
Do not eat, drink or smoke when using this product.
Wear protective gloves and safety glasses or goggles.
In case of inadequate ventilation wear respiratory protection.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS No.	Percent
Crystalline Silica (quartz)	14808-60-7	95-99.9

4. FIRST-AID MEASURES

Inhalation: First aid is not generally required. If irritation develops from breathing dust, move the person from the overexposure and seek medical attention if needed.

Skin contact: First aid is not required.

Eye contact: Wash immediately with plenty of water. Do not rub eyes. If irritation persists, seek medical attention.

Ingestion: First aid is not required.

Most important symptoms/effects, acute and delayed: Particulates may cause abrasive eye injury. Inhalation of dust may cause respiratory tract irritation. Symptoms of exposure may include cough, sore throat, nasal congestion, sneezing, wheezing and shortness of breath. Prolonged inhalation of respirable crystalline silica above certain concentrations may cause lung diseases, including silicosis and lung cancer.

Indication of immediate medical attention and special treatment, if necessary: Immediate medical attention is not required.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media: Use extinguishing media appropriate for surrounding fire.

Specific hazards arising from the chemical: Product is not flammable, combustible or explosive.

Special protective equipment and precautions for fire-fighters: None required.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures: Wear appropriate protective clothing and respiratory protection (see Section 8). Avoid generating airborne dust during clean-up.

Environmental precautions: No specific precautions. Report releases to regulatory authorities if required by local, state and federal regulations.

Methods and materials for containment and cleaning up: Avoid dry sweeping. Do not use compressed air to clean spilled sand or ground silica. Use water spraying/flushing or ventilated or HEPA filtered vacuum cleaning system, or wet before sweeping. Dispose of in closed containers.

7. HANDLING AND STORAGE

Precautions for safe handling:

Avoid generating dust. Do not breathe dust. Do not rely on your sight to determine if dust is in the air. Respirable crystalline silica dust may be in the air without a visible dust cloud. Use adequate exhaust

ventilation and dust collection to reduce respirable crystalline silica dust levels to below the permissible exposure limit ("PEL"). Maintain and test ventilation and dust collection equipment. Use all available work practices to control dust exposures, such as water sprays. Practice good housekeeping. Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Keep airborne dust concentrations below permissible exposure limits.

Where necessary to reduce exposures below the PEL or other applicable limit (if lower than the PEL), wear a respirator approved for silica containing dust when using, handling, storing or disposing of this product or bag. See Section 8, for further information on respirators. Do not alter the respirator. Do not wear a tight-fitting respirator with facial hair such as a beard or mustache that prevents a good face to face piece seal between the respirator and face. Maintain, clean, and fit test respirators in accordance with applicable standards. Wash or vacuum clothing that has become dusty.

Participate in training, exposure monitoring, and health surveillance programs to monitor any potential adverse health effects that may be caused by breathing respirable crystalline silica. The OSHA Hazard Communication Standard, 29 CFR Sections 1910.1200, 1915.1200, 1917.28, 1918.90, 1926.59 and 1928.21, and state and local worker or community "right-to-know" laws and regulations should be strictly followed.

DO NOT USE U.S. SILICA COMPANY SAND OR GROUND SILICA FOR SAND BLASTING

Conditions for safe storage, including any incompatibilities: Use dust collection to trap dust produced during loading and unloading. Keep containers closed and store bags to avoid accidental tearing, breaking, or bursting.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure guidelines:

Component	OSHA PEL	ACGIH TLV	NIOSH REL
Crystalline Silica (quartz)	<u>10 mg/m³</u> %SiO ₂ + 2 TWA (respirable dust)	0.025 mg/m ³ TWA (respirable dust)	0.05 mg/m ³ TWA (respirable dust)
	<u>30 mg/m³</u> %SiO ₂ + 2 TWA (total dust)		

If crystalline silica (quartz) is heated to more than 870°C, quartz can change to a form of crystalline silica known as tridymite; if crystalline silica (quartz) is heated to more than 1470°C, quartz can change to a form of crystalline silica known as cristobalite. The OSHA PEL for crystalline silica as tridymite or cristobalite is one-half of the OSHA PEL for crystalline silica (quartz).

Appropriate engineering controls: Use adequate general or local exhaust ventilation to maintain concentrations in the workplace below the applicable exposure limits listed above.

Respiratory protection: If it is not possible to reduce airborne exposure levels to below the OSHA PEL or other applicable limit with ventilation, use the table below to assist you in selecting respirators that will reduce personal exposures to below the OSHA PEL. This table is part of the NIOSH Respirator Selection Logic, 2004, Chapter III, Table 1, "Particulate Respirators". The full document can be found at www.cdc.gov/niosh/nppt/topics/respirators; the user of this MSDS is directed to that site for information concerning respirator selection and use. The assigned protection factor (APF) is the maximum anticipated level

of protection provided by each type of respirator worn in accordance with an adequate respiratory protection program. For example, an APF of 10 means that the respirator should reduce the airborne concentration of a particulate by a factor of 10, so that if the workplace concentration of a particulate was 150 ug/m³, then a respirator with an APF of 10 should reduce the concentration of particulate to 15 ug/m³. In using chemical cartridges, consideration must be given to selection of the correct cartridge for the chemical exposure and the maximum use concentration for the cartridge. In addition a cartridge change-out schedule must be developed based on the concentrations in the workplace.

Assigned protection factor ¹	Type of Respirator (Use only NIOSH-certified respirators)
10	Any air-purifying elastomeric half-mask respirator equipped with appropriate type of particulate filter. ² Appropriate filtering facepiece respirator. ^{2,3} Any air-purifying full facepiece respirator equipped with appropriate type of particulate filter. ² Any negative pressure (demand) supplied-air respirator equipped with a half-mask.
25	Any powered air-purifying respirator equipped with a hood or helmet and a high efficiency (HEPA) filter. Any continuous flow supplied-air respirator equipped with a hood or helmet.
50	Any air-purifying full facepiece respirator equipped with N-100, R-100, or P-100 filter(s). Any powered air-purifying respirator equipped with a tight-fitting facepiece (half or full facepiece) and a high-efficiency filter. Any negative pressure (demand) supplied-air respirator equipped with a full facepiece. Any continuous flow supplied-air respirator equipped with a tight-fitting facepiece (half or full facepiece). Any negative pressure (demand) self-contained respirator equipped with a full facepiece.
1,000	pressure-demand supplied-air respirator equipped with a half-mask.
1. The protection offered by a given respirator is contingent upon (1) the respirator user adhering to complete program requirements (such as the ones required by OSHA in 29CFR1910.134), (2) the use of NIOSH-certified respirators in their approved configuration, and (3) individual fit testing to rule out those respirators that cannot achieve a good fit on individual workers. 2. Appropriate means that the filter medium will provide protection against the particulate in question. 3. An APF of 10 can only be achieved if the respirator is qualitatively or quantitatively fit tested on individual workers.	

Skin protection: Maintain good industrial hygiene. Protection recommended for workers suffering from dermatitis or sensitive skin.

Eye protection: Safety glasses with side shields or goggles recommended if eye contact is anticipated.

Other: None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.): White or tan sand: granular, crushed or ground to a powder.

Odor: None.

Odor threshold: Not determined	pH: 6-8
Melting point/freezing point: 3110°F/1710°C	Boiling point/range: 4046°F/2230°C
Flash point: Not applicable	Evaporation rate: Not applicable
Flammable limits: LEL: Not applicable	UEL: Not applicable
Vapor pressure: Not applicable	Vapor density: Not applicable
Relative density: 2.65	Solubility(ies): Insoluble in water

Partition coefficient: n-octanol/water: Not applicable	Auto-ignition temperature: Not determined
Decomposition temperature: Not determined	Viscosity: Not applicable
Flammability (solid, gas): Not applicable	

10. STABILITY AND REACTIVITY

Reactivity: Not reactive under normal conditions of use.

Chemical stability: Stable

Possibility of hazardous reactions: Contact with powerful oxidizing agents, such as fluorine, chlorine trifluoride and oxygen difluoride, may cause fires.

Conditions to avoid: Avoid generation of dust in handling and use.

Incompatible materials: Powerful oxidizers such as fluorine, chlorine trifluoride, and oxygen difluoride and hydrofluoric acid.

Hazardous decomposition products: Silica will dissolve in hydrofluoric acid and produce a corrosive gas, silicon tetrafluoride.

11. TOXICOLOGICAL INFORMATION

Acute effects of exposure:

Inhalation: Inhalation of dust may cause respiratory tract irritation. Symptoms of exposure may include cough, sore throat, nasal congestion, sneezing, wheezing and shortness of breath.

Ingestion: Ingestion in an unlikely route of exposure. If dust is swallowed, it may irritate the mouth and throat.

Skin contact: No adverse effects are expected.

Eye contact: Particulates may cause abrasive injury.

Chronic effects: Prolonged inhalation of respirable crystalline silica may cause lung disease, silicosis, lung cancer and other effects as indicated below.

The method of exposure that can lead to the adverse health effects described below is inhalation.

A. SILICOSIS

Silicosis can exist in several forms, chronic (or ordinary), accelerated, or acute:

Chronic or Ordinary Silicosis is the most common form of silicosis, and can occur after many years (10 to 20 or more) of prolonged repeated inhalation of relatively low levels of airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis. Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Complicated silicosis or PMF symptoms, if present, are shortness of breath and cough. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease secondary to the lung disease (cor pulmonale).

Accelerated Silicosis can occur with prolonged repeated inhalation of high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within five (5) years of initial exposure. Progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except

that lung lesions appear earlier and progression is more rapid.

Acute Silicosis can occur after the repeated inhalation of very high concentrations of respirable crystalline silica over a short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough, weakness and weight loss. Acute silicosis is fatal.

B. CANCER

IARC - The International Agency for Research on Cancer ("IARC") concluded that "crystalline silica in the form of quartz or cristobalite dust is *carcinogenic to humans (Group 1)*". For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C, "A Review of Human Carcinogens: Arsenic, Metals, Fibres and Dusts " (2011).

NTP classifies "Silica, Crystalline (respirable size)" as Known to be a human carcinogen.

C. AUTOIMMUNE DISEASES

Several studies have reported excess cases of several autoimmune disorders -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis -- among silica-exposed workers.

D. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to tuberculosis bacteria. Individuals with chronic silicosis have a three-fold higher risk of contracting tuberculosis than similar individuals without silicosis.

E. KIDNEY DISEASE

Several studies have reported excess cases of kidney diseases, including end stage renal disease, among silica-exposed workers. For additional information on the subject, the following may be consulted: "Kidney Disease and Silicosis", *Nephron*, Volume 85, pp. 14-19 (2000).

F. NON-MALIGNANT RESPIRATORY DISEASES

The reader is referred to Section 3.5 of the NIOSH Special Hazard Review cited below for information concerning the association between exposure to crystalline silica and chronic bronchitis, emphysema and small airways disease. There are studies that disclose an association between dusts found in various mining occupations and non-malignant respiratory diseases, particularly among smokers. It is unclear whether the observed associations exist only with underlying silicosis, only among smokers, or result from exposure to mineral dusts generally (independent of the presence or absence of crystalline silica, or the level of crystalline silica in the dust).

Sources of information:

The *NIOSH Hazard Review - Occupational Effects of Occupational Exposure to Respirable Crystalline Silica* published in April 2002 summarizes and discusses the medical and epidemiological literature on the health risks and diseases associated with occupational exposures to respirable crystalline silica. The *NIOSH Hazard Review* is available from NIOSH - Publications Dissemination, 4676 Columbia Parkway, Cincinnati, OH 45226, or through the NIOSH web site, www.cdc.gov/niosh/topics/silica, then click on the link "NIOSH Hazard Review: Health Effects of Occupational Exposure to Respirable Crystalline Silica".

For a more recent review of the health effects of respirable crystalline silica, the reader may consult *Fishman's Pulmonary Diseases and Disorders*, Fourth Edition, Chapter 57. "Coal Workers' Lung Diseases and Silicosis".

Finally, the US Occupational Safety and Health Administration (OSHA) published a summary of respirable crystalline silica health effects in connection with OSHA's Proposed Rule regarding occupational exposure to

respirable crystalline silica. The summary was published in the September 12, 2013 Federal Register, which can be found at www.federalregister.gov/articles/2013/09/12/2013-20997/occupational-exposure-to-respirable-crystalline-silica.

Numerical measures of toxicity:

Crystalline Silica (quartz): LD50 oral rat >22,500 mg/kg

12. ECOLOGICAL INFORMATION

Ecotoxicity: Crystalline silica (quartz) is not known to be ecotoxic.

Persistence and degradability: Silica is not degradable.

Bioaccumulative potential: Silica is not bioaccumulative.

Mobility in soil: Silica is not mobile in soil.

Other adverse effects: No data available

13. DISPOSAL CONSIDERATIONS

Discard any product, residue, disposable container or liner in full compliance with national regulations.

14. TRANSPORT INFORMATION

UN number: None

UN proper shipping name: Not regulated

Transport hazard classes(es): None

Packing group, if applicable: None

Environmental hazards: None

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code): Not determined

Special precautions: None known.

15. REGULATORY INFORMATION

UNITED STATES (FEDERAL AND STATE)

TSCA Status: Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.

RCRA: This product is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.

CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), 40 CFR §302.

Emergency Planning and Community Right to Know Act (SARA Title III): This product contains the following chemicals subject to SARA 302 or SARA 313 reporting: None above the de minimus concentrations.

Clean Air Act: Crystalline silica (quartz) mined and processed by U.S. Silica Company is not processed with or does not contain any Class I or Class II ozone depleting substances.

FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3)(xxvi).

California Proposition 65: Crystalline silica (airborne particles of respirable size) is classified as a substance known to the State of California to be a carcinogen.

California Inhalation Reference Exposure Level (REL): California established a chronic non-cancer effect REL of 3 µg for silica (crystalline, respirable). A chronic REL is an airborne level of a substance at or below which no non-cancer health effects are anticipated in individuals indefinitely exposed to the substance at that level.

Massachusetts Toxic Use Reduction Act: Silica, crystalline (respirable size, <10 microns) is “toxic” for purposes of the Massachusetts Toxic Use Reduction Act.

Pennsylvania Worker and Community Right to Know Act: Quartz is a hazardous substance under the Act, but it is not a special hazardous substance or an environmental hazardous substance.

Texas Commission on Environmental Quality: The Texas CEQ has established chronic and acute Reference Values and short term and long term Effects Screening Levels for crystalline silica (quartz). The information can be accessed through www.tceq.texas.gov.

CANADA

Domestic Substances List: U. S. Silica Company products, as naturally occurring substances, are on the Canadian DSL.

WHMIS Classification: D2A

OTHER NATIONAL INVENTORIES

Australian Inventory of Chemical Substances (AICS): All of the components of this product are listed on the AICS inventory or exempt from notification requirements.

China: Silica is listed on the IECSC inventory or exempt from notification requirements.

Japan Ministry of International Trade and Industry (MITI): All of the components of this product are existing chemical substances as defined in the Chemical Substance Control Law Registry Number 1-548.

Korea Existing Chemicals Inventory (KECI) (set up under the Toxic Chemical Control Law): Listed on the ECL with registry number 9212-5667.

New Zealand: Silica is listed on the HSNO inventory or exempt from notification requirements.

Philippines Inventory of Chemicals and Chemical Substances (PICCS): Listed for PICCS.

Taiwan: Silica is listed on the CSNN inventory or exempt from notification requirements.

16. OTHER INFORMATION

Date of preparation/revision: February 10, 2015

Hazardous Material Information System (HMIS):

Health *

Flammability 0

Physical Hazard 0

Protective Equipment E

* For further information on health effects, see Sections 2, 8 and 11 of this MSDS.

National Fire Protection Association (NFPA):

Health 0

Flammability 0

Instability 0

Web Sites with Information about Effects of Crystalline Silica Exposure:

The U. S. Silica Company web site will provide updated links to OSHA and NIOSH web sites addressing crystalline silica issues: www.ussilica.com, click on "Info Center", then click on "Health & Safety".

The U.S. National Institute for Occupational Safety and Health (NIOSH) and Occupational Safety and Health Administration (OSHA) maintain sites with information about crystalline silica and its potential health effects. For NIOSH, <http://www.cdc.gov/niosh/topics/silica>; for OSHA, <http://www.osha.gov/dsg/topics/silicacrystalline/index>.

The IARC Monograph that includes crystalline silica, Volume 100C, can be accessed in PDF form at the IARC web site, <http://monographs.iarc.fr/ENG/Monographs/PDFs/index.php>.

U. S. Silica Company Disclaimer

The information and recommendations contained herein are based upon data believed to be up to-date and correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects that may be caused by purchase, resale, use or exposure to our silica. Customers and users of silica must comply with all applicable health and safety laws, regulations, and orders. In particular, they are under an obligation to carry out a risk assessment for the particular work places and to take adequate risk management measures in accordance with the national implementation legislation of EU Directives 89/391 and 98/24.

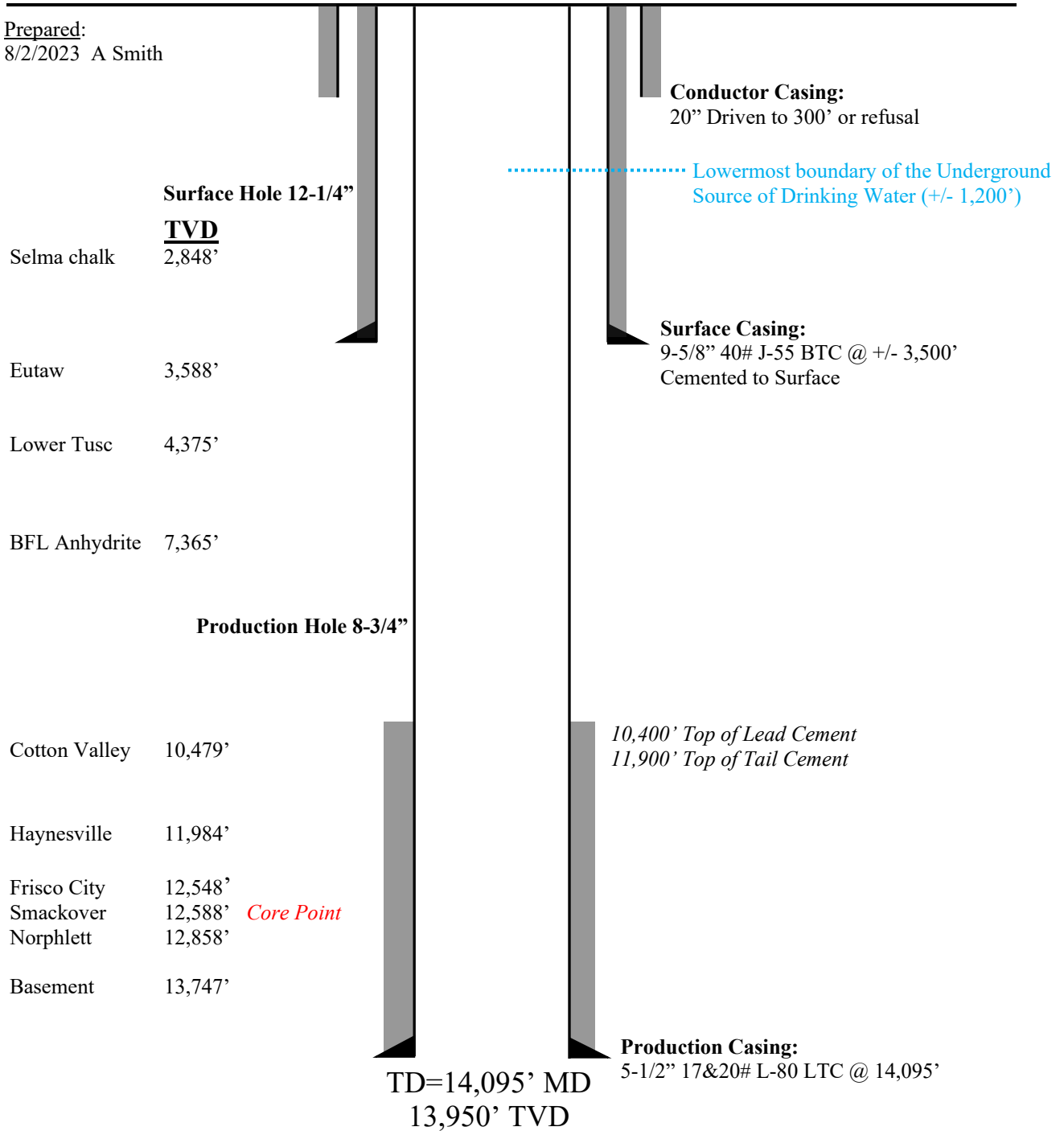
ATTACHMENT 20
WELL SCHEMATIC



Well Schematic
NLT Royalty Partners 10-4
Permit #1374
Sec 10 T3S – R9W
Calhoun County, FL

GLE 37.25' est
RKB 58.25' est

Prepared:
8/2/2023 A Smith



ATTACHMENT 21
WELL CONTROL PROTOCOL

WELL CONTROL PROTOCOL

Although higher than normal formation pressures are not anticipated in the formations being drilled, prudent well control procedures should be followed in the event a kick occurs. It is imperative to closely adhere to all well control precautions and to familiarize all rig personnel with proper kick control procedures.

All blowout preventers, choke manifold, and related blowout prevention equipment must be tested and maintained in excellent working condition. Pit volume and flow indicators will be installed. This data, along with other drilling data, will be gathered and monitored continually through the NOV / MD Totco computer system with computer screens on the rig floor and in the toolpushers quarters, company man quarters, and mud logger's shack.

All blowout prevention systems and procedures are to be in strict compliance with **Florida Department of Environmental Protection** rules and regulations.

GENERAL

1. Upon rig up and before entering the possible producing formations, all well control equipment will be pressure tested. All pressure tests of blowout prevention equipment are to be conducted in two stages. Equipment will be tested to 250 Psi and 5,000 Psi tests. It is essential that the 250 psi test be done first, since the high-pressure test may cause a preventer to hold when it may not have held at the lower pressure. Pressure tests should be recorded on a chart recorder.
2. Operate pipe rams and annular preventer at least once a week and blind rams each time pipe is out of hole. Record tests on the IADC Tour Sheet each time that the BOPE is operated.
3. Visually inspect all BOP's, stabilization and centralization systems daily.
4. **Record two slower pump rates and pressures each tour and on the IADC Tour Sheet. Record three times each tour on the IADC Tour Sheet: the mud weight and viscosity (in and out), the pump pressure, and the weight on bit.**
5. Crews are to be kept alert and familiar with the blowout prevention equipment. All members of the crew must be trained in blowout prevention, well control procedures, and H2S certified.
6. Conduct blowout prevention drills once per week for each tour. Ensure that the drills are recorded on the tour sheet.
7. Monitor pit volumes on connections and trips carefully (**Early detection of an influx into the mud system is key in order to minimize the amount of kick**). Keep hole full on trips. Fill hole every ten (10) stands (doubles or triples) or 125 psi hydrostatic pressure drop, whichever is less. Be certain fill occurs with proper number of strokes, or proper volume if a trip tank is used.
8. All mud level indicators and/or mudflow indicators are to be checked daily. Any malfunction is to be corrected immediately.

KICK CONTROL PROCEDURE (While Drilling):

1. Check all (5') five foot drilling breaks in possible pay zones or as conditions dictate.
2. Alert crew.
3. Stop rotary table.
4. Pick up off bottom so BOP's can close on tube of drill pipe.
5. Shut off pumps – check for flow.
6. Open choke line (HCR) valve on stack.
7. Close annular preventer.
8. Close choke, if not already closed.
9. Notify supervisors.
10. Read and record SIDPP and SICP every minute until they stabilize.
11. Measure mud volume increase.

KICK CONTROL PROCEDURE (While Tripping):

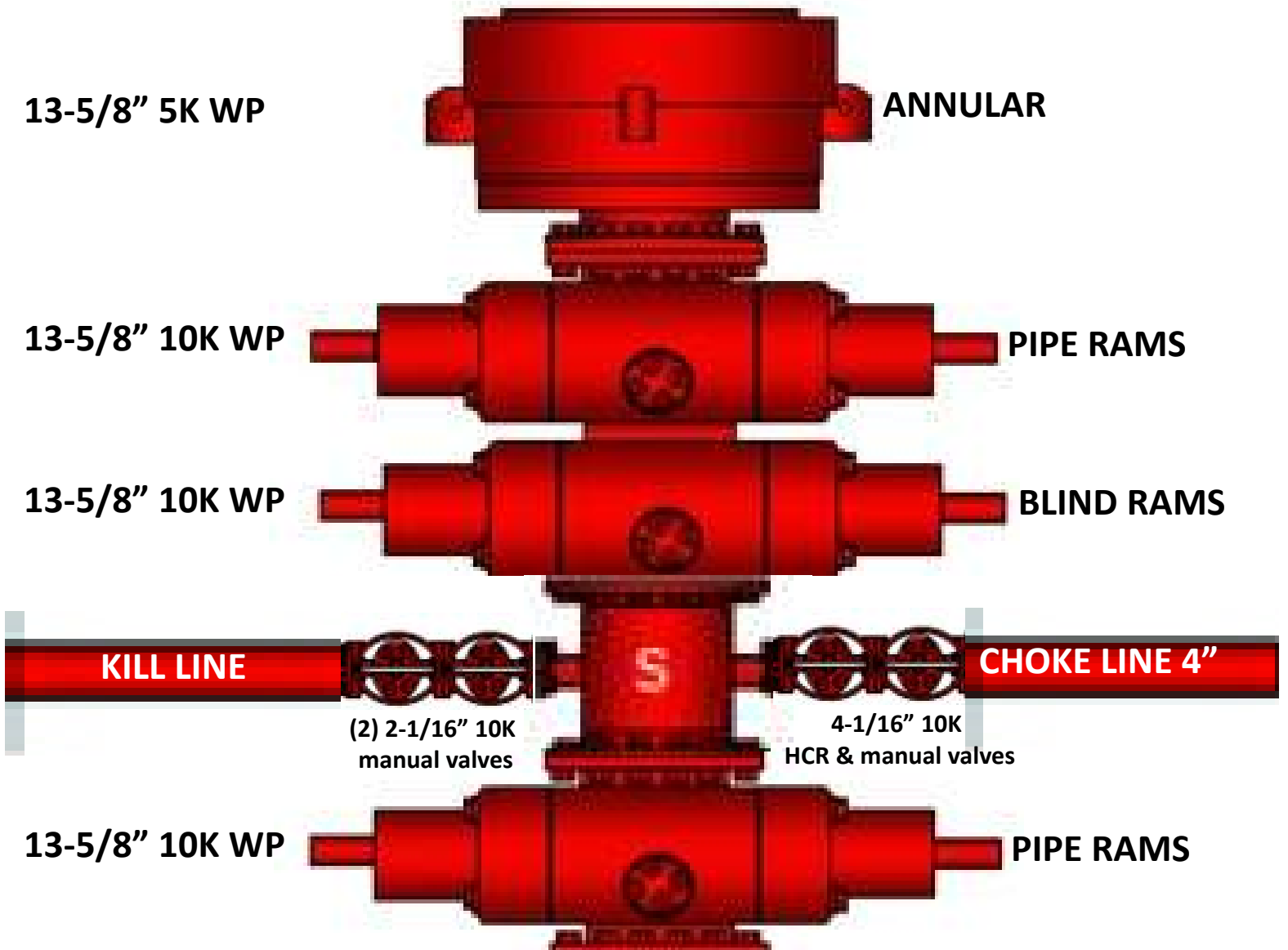
1. Alert crew.
2. Install safety valve in open position and close.
3. Open choke line (HCR) valve on stack.
4. Close annular preventer.
5. Close choke, if not already closed.
6. Notify supervisors.
7. Install Kelly, top drive or circulating swedge.
8. Open safety valve.
9. Read and record SIDPP and SICP every minute.
10. Measure mud volume increase.

Kill sheets for Driller's Method and Wait and Weight Method are to be available on location. If a kick is detected and after the well is shut in and data collected as noted above, rig and office personnel will discuss the optimum well kill procedures.

ATTACHMENT 22
BOP STACK DIAGRAM

BOP STACK DIAGRAM

13-5/8" 10,000 PSI



ATTACHMENT 23
PREMITTED SITE PLAN FOR NLT ROYALTY PARTNERS 10-4 WELL AT PAD 1

CALHOUN COUNTY OIL WELL

PAD 1

NLT ROYALTY PARTNERS 10-4 & 10-1

LOCATION

SECTION 10, TOWNSHIP 3S, RANGE 9W
CALHOUN COUNTY, FLORIDA




CALHOUN COUNTY



SHEET INDEX

SHEET 1 OF 4	COVER SHEET
SHEET 2 OF 4	SITE PLAN
SHEET 3 OF 4	EROSION CONTROL PLAN
SHEET 4 OF 4	CROSS SECTION

Date:
2019.07.18
14:18:46
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APPROVED: 
ERIC D. JACKSON, P.E.
Florida Licensed Professional Engineer
Registration No. 82938
Prints not valid unless signed and sealed



REVISIONS:
4-25-2019
FDP# COMMENTS
7-1-2019
FDP# COMMENTS

PREPARED FOR

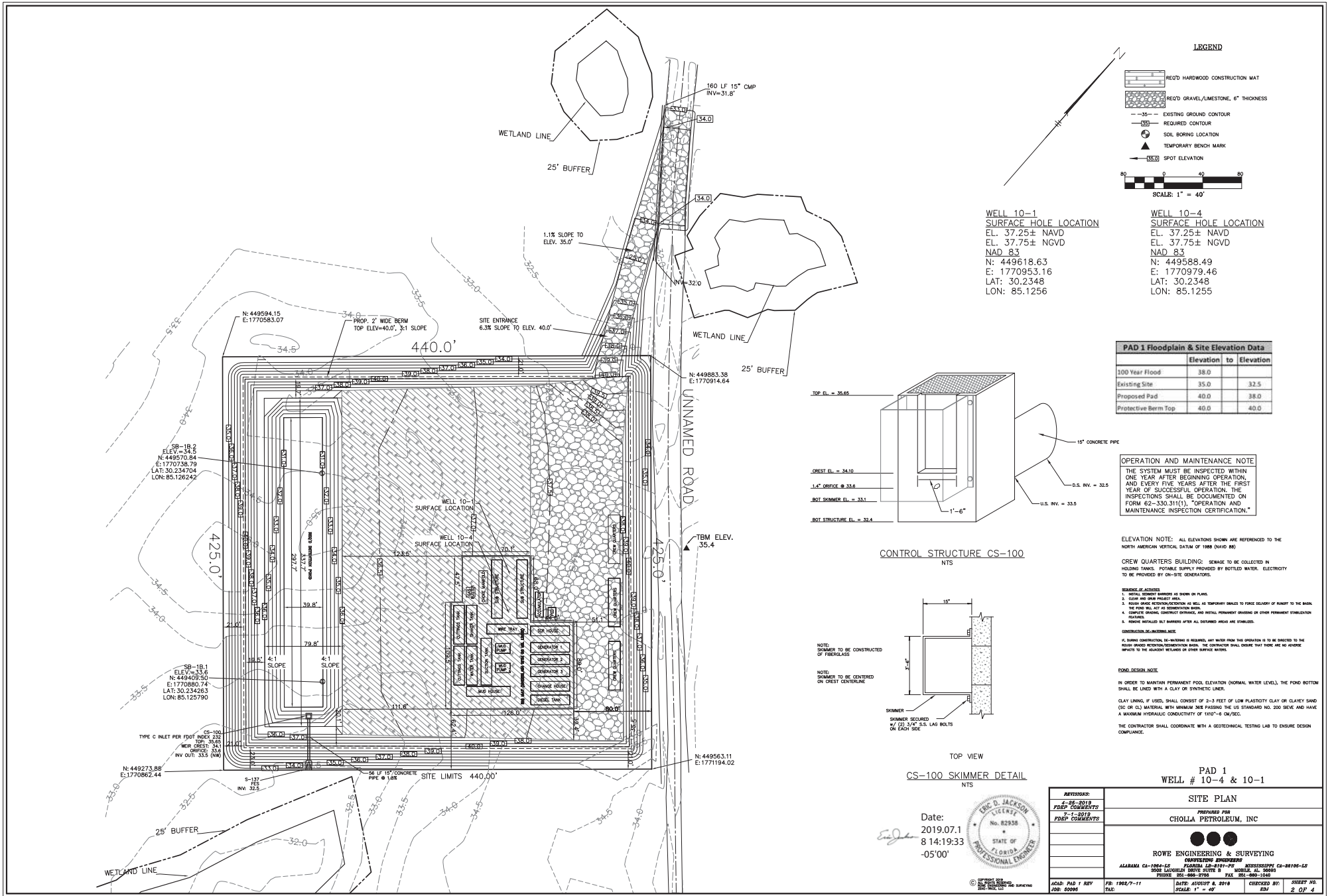
CHOLLA PETROLEUM, INC.
6688 N CENTRAL EXPY #1610
DALLAS, TX 75206
(214) 692-7052



ROWE ENGINEERING & SURVEYING CONSULTING ENGINEERS

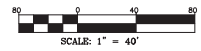
3502 LAUGHLIN DRIVE SUITE B MOBILE, AL. 36693
PHONE 251-666-2766 FAX 251-660-1040
FLORIDA CERTIFICATE OF AUTHORIZATION (FLCA) #31373

Accessibility to site: From the intersection of Highway No. 20 and Highway 71 head south for 12.5 miles, Turn left onto G U Parker road for 1.5 miles, Turn left on unnamed road for 0.8 miles, Turn left on unnamed road for 1.5 miles, Turn right on unnamed road for 1.4 miles, Turn left on unnamed road for 0.5 miles. The proposed well site is on the right side of the road.



LEGEND

- REO'D HARDWOOD CONSTRUCTION MAT
- REO'D GRAVEL/LIMESTONE, 6" THICKNESS
- 35- EXISTING GROUND CONTOUR
- (35) REQUIRED CONTOUR
- SOIL BORING LOCATION
- TEMPORARY BENCH MARK
- 35.0 SPOT ELEVATION



WELL 10-1 SURFACE HOLE LOCATION
 EL. 37.25± NAVD
 EL. 37.75± NGVD
 NAD 83
 N: 449618.63
 E: 1770953.16
 LAT: 30.2348
 LON: 85.1256

WELL 10-4 SURFACE HOLE LOCATION
 EL. 37.25± NAVD
 EL. 37.75± NGVD
 NAD 83
 N: 449588.49
 E: 1770979.46
 LAT: 30.2348
 LON: 85.1255

PAD 1 Floodplain & Site Elevation Data

	Elevation	to Elevation
100 Year Flood	38.0	
Existing Site	35.0	32.5
Proposed Pad	40.0	38.0
Protective Berm Top	40.0	40.0

OPERATION AND MAINTENANCE NOTE
 THE SYSTEM MUST BE INSPECTED WITHIN ONE YEAR AFTER BEGINNING OPERATION, AND EVERY FIVE YEARS AFTER THE FIRST YEAR OF SUCCESSFUL OPERATION. THE INSPECTIONS SHALL BE DOCUMENTED ON FORM 62-330.31(1), "OPERATION AND MAINTENANCE INSPECTION CERTIFICATION."

ELEVATION NOTE: ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

CREW QUARTERS BUILDING: SEWAGE TO BE COLLECTED IN HOLDING TANKS. POTABLE SUPPLY PROVIDED BY BOTTLED WATER. ELECTRICITY TO BE PROVIDED BY ON-SITE GENERATORS.

- REMARKS:**
1. SEWAGE TREATMENT BARRIERS AS SHOWN ON PLANS.
 2. SEWAGE TREATMENT BARRIERS AS WELL AS TEMPORARY DRALES TO FORCE SEWAGE TO REMAIN IN THE BASIN. SEE FORM 62-330.31(1) FOR SEWAGE TREATMENT BARRIERS.
 3. REMOVE GRAVEL/CONCRETE EXHAUSTION AND METAL PERMANENT GRASSING OR OTHER PERMANENT STABILIZATION FEATURES.
 4. REMOVE METAL BUILT BARRIERS AFTER ALL DESIRED AREAS ARE STABILIZED.

CONSTRUCTION/INSTALLATION NOTE:

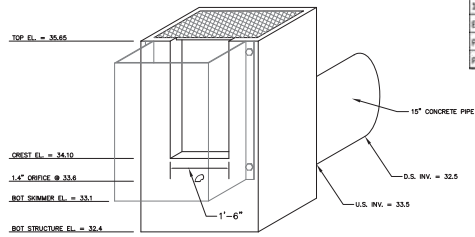
1. DRAINAGE CONSTRUCTION: SE-WARDING IS REQUIRED. ANY WATER FROM THIS OPERATION IS TO BE DIRECTED TO THE FLOOD GRATED RETENTION/GENERATION BASIN. THE CONTRACTOR SHALL ENSURE THAT THERE ARE NO JOINTS OR SEAMS TO THE CHANNEL BETWEEN OR OTHER ADJACENT AREAS.

FOND DESIGN NOTE:

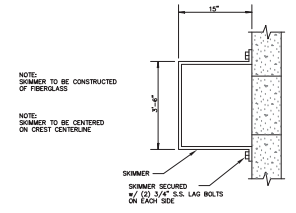
IN ORDER TO MAINTAIN PERMANENT POOL ELEVATION (NORMAL WATER LEVEL), THE FOND BOTTOM SHALL BE LINED WITH A CLAY OR SYNTHETIC LINER.

CLAY LINING, IF USED, SHALL CONSIST OF 2-3 FEET OF LOW PLASTICITY CLAY OR CLAYEY SAND (CS OR C) MATERIAL WITH MINIMUM 30% PASSING THE US STANDARD NO. 200 SIEVE AND HAVE A MAXIMUM HORISONTAL CONDUCTIVITY OF 1000+ OHM-CM.

THE CONTRACTOR SHALL COORDINATE WITH A GEOTECHNICAL TESTING LAB TO ENSURE DESIGN COMPLIANCE.



CONTROL STRUCTURE CS-100
 NTS



NOTE: SKIMMER TO BE CONSTRUCTED OF FIBERGLASS

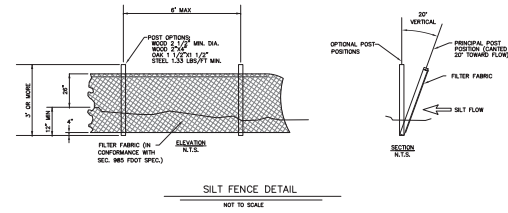
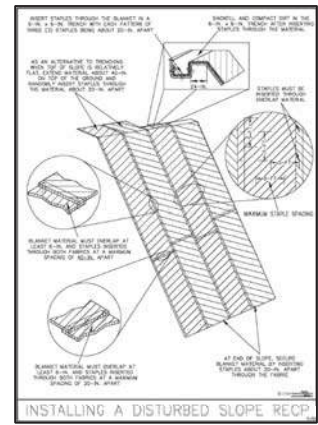
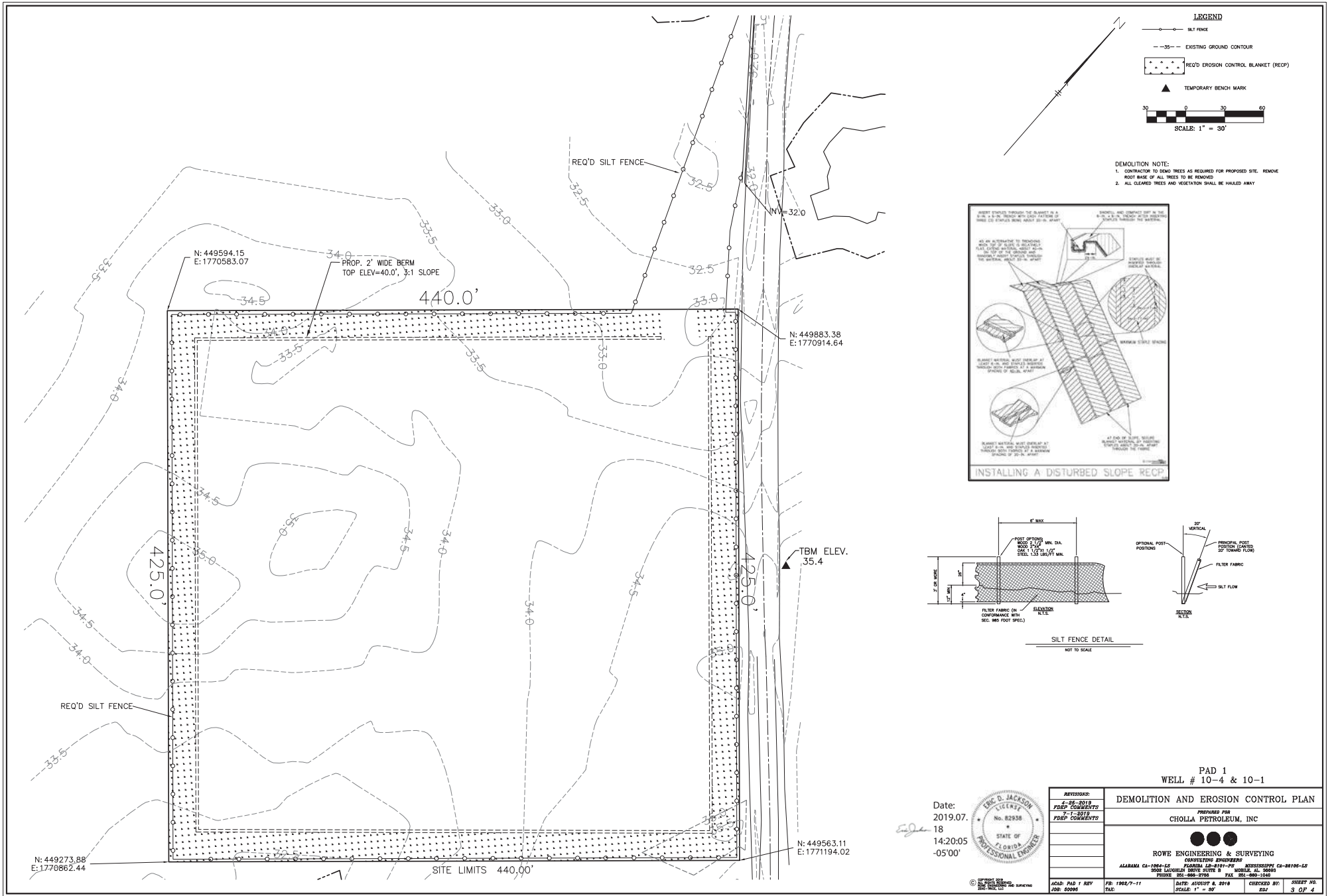
NOTE: SKIMMER TO BE CENTERED ON CREST CENTERLINE

TOP VIEW
CS-100 SKIMMER DETAIL
 NTS

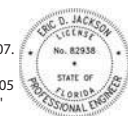
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NETWORK: 8-28-2019 F&P COMMENTS 7-1-2019 F&P COMMENTS		PAD 1 WELL # 10-4 & 10-1	
SITE PLAN		PREPARED FOR CHOLLA PETROLEUM, INC	
ROWE ENGINEERING & SURVEYING ALABAMA CA-1984-LS FLORIDA LA-2191-PS MISSISSIPPI DE-2018-LS NORTH CAROLINA PHONE 334-599-2700 FAX 334-599-1000		REGISTERED PROFESSIONAL ENGINEERS MISSISSIPPI CA-88106-LS NORTH CAROLINA PHONE 334-599-2700 FAX 334-599-1000	
ACAD: PAD 1 REV JOB: 50095	PR: 1982.7-11 TALK:	DATE: AUGUST 8, 2019 SCALE: 1" = 40'	CHECKED BY: EDJ SHEET NO: 2 OF 4



Date: 2019.07.18
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REVISIONS:
FOR 08-2019
FDEP COMMENTS
7-1-2019
FDEP COMMENTS

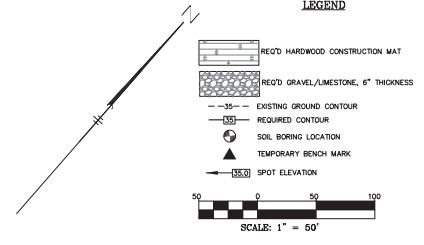
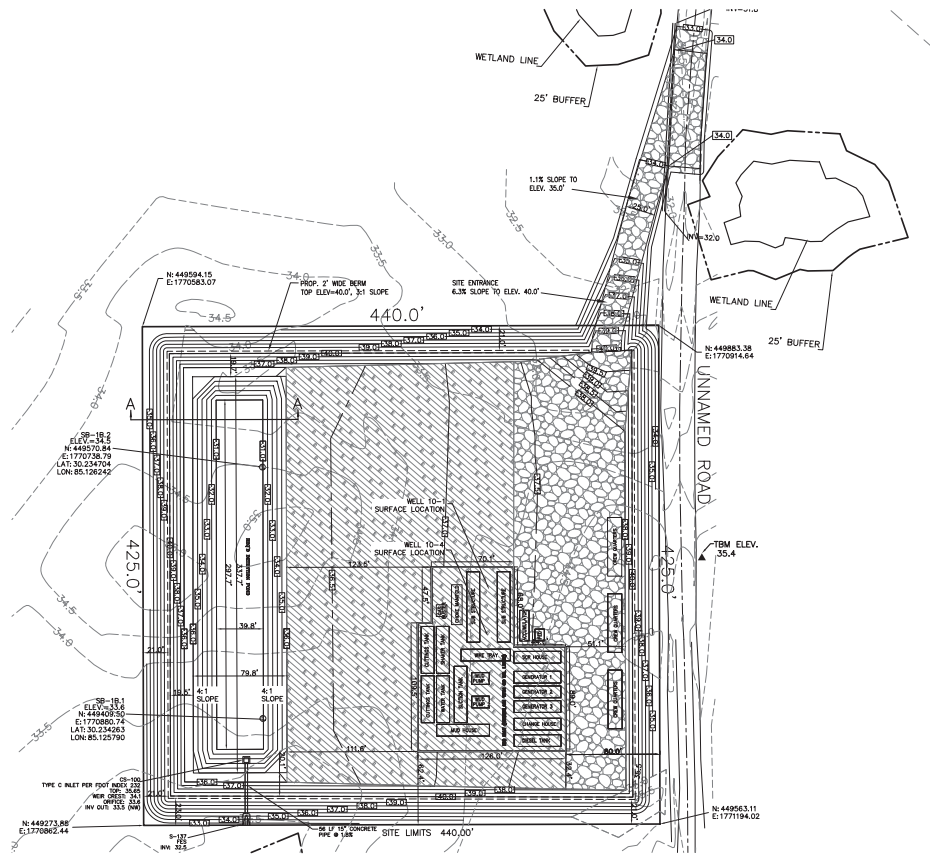
PAD 1
WELL # 10-4 & 10-1
DEMOLITION AND EROSION CONTROL PLAN

PREPARED FOR
CHOLLA PETROLEUM, INC

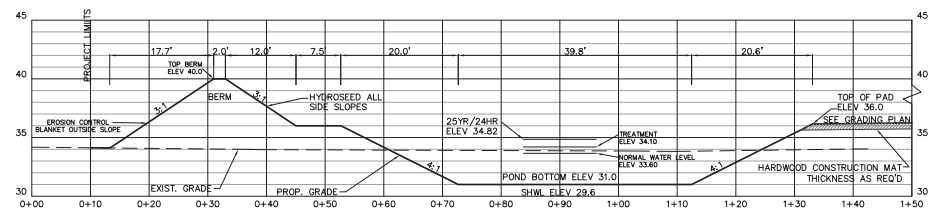
ROWE ENGINEERING & SURVEYING
CONSULTING ENGINEERS

ALABAMA CA-1086-LS
FLORIDA LA-101-PS
MISSISSIPPI CA-88106-LS
GEORGIA LA-101-PS
LOUISIANA CA-1086-LS
Tennessee CA-1086-LS
VIRGINIA CA-1086-LS

ACAD: PAD 1 REV 18
JOB: 50095
DATE: AUGUST 6, 2019
SCALE: 1" = 30'
SHEET NO. 3 OF 4



SECTION A-A
SCALE: 1" = 10' HORIZ.
1" = 5' VERTICAL



Date: 2019.07.18
14:20:52
-05'00"



REVISIONS:
NO. DATE BY COMMENTS
1 7-1-2019 JDE

PAD 1
WELL # 10-4 & 10-1

CROSS SECTION
PREPARED FOR
CHOLLA PETROLEUM, INC

ROWE ENGINEERING & SURVEYING
CORPORATION
ALABAMA CA-1884-LS FLORIDA LA-2191-PS MISSISSIPPI CA-88106-LS
1902 LAUREL DRIVE SOUTH BIRMINGHAM, AL 35204
PHONE 205-988-2700 FAX 205-988-1000

ACAD: PAD 1 REV	FR: 1982.7-11	DATE: AUGUST 8, 2019	CHECKED BY:
JDE: 50095	TAK:	SCALE: VARIES	EDJ: 4 OF 4