SWD

Initial

Application

Received: 10/3/19

QEOPV-191003-C-1080

Revised March 23, 2017

RECEIVED: 10/3/19	REVIEWER:	TYPE: SWD	APP NO: pDM1927729147

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Geological & Engineering Bureau –
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Applicant: Permian Oilfield Partners, LLC. **OGRID Number:** 328259
Well Name: Ramrod Fee SWD #1 **API:** 30-015-Pending
Pool: SWD; Devonian-Silurian **Pool Code:** 97869

SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW

1) **TYPE OF APPLICATION:** Check those which apply for [A]
A. Location – Spacing Unit – Simultaneous Dedication
☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD

B. Check one only for [I] or [II]
[I] Commingling – Storage – Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
[II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

2) **NOTIFICATION REQUIRED TO:** Check those which apply.
A. ☒ Offset operators or lease holders
B. ☐ Royalty, overriding royalty owners, revenue owners
C. ☒ Application requires published notice
D. ☐ Notification and/or concurrent approval by SLO
E. ☐ Notification and/or concurrent approval by BLM
F. ☒ Surface owner
G. ☒ For all of the above, proof of notification or publication is attached, and/or,
H. ☐ No notice required

3) **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Gary E Fisher
Print or Type Name

Gary E Fisher
Signature

10-3-2019
Date

817-606-7630
Phone Number

gfisher@popmidstream.com
e-mail Address

PERMIAN OILFIELD PARTNERS

Mr. Phillip Goetze
New Mexico Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

Re: C-108 Application for Authorization to Inject
Permian Oilfield Partners, LLC
Ramrod Fee SWD #1
323' FSL & 2227' FEL
Sec 17, T21S, R28E
Eddy County, NM

Mr. Goetze,
Attached is a C-108 application for administrative approval of Permian Oilfield Partners LLC's proposed Ramrod Fee SWD #1 located in Sec 17, Twp 21S, Rge 28E, Eddy County, New Mexico. This well will be completed open hole in the Devonian-Silurian formation and will be operated as a commercial salt water disposal well.

Similar application exhibits were sent to all Affected Persons. The distribution list and proof of mailing, as well as affidavit of publication are enclosed. A copy of this application has also been sent to NM OCD District 2 in Artesia.

If you have any questions, please contact us at (817)606-7630.

Sincerely,

Sean Puryear
Permian Oilfield Partners, LLC
spuryear@popmidstream.com

Date: 10-3-2019

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

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

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: **Disposal**
Application qualifies for administrative approval? **Yes**

II. OPERATOR: **Permian Oilfield Partners, LLC.**

ADDRESS: **P.O. Box 3329, Hobbs, NM 88241**

CONTACT PARTY: **Sean Puryear** PHONE: **(817) 600-8772**

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? **No**

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: **Sean Puryear** TITLE: **Manager**

SIGNATURE:  DATE: 10-3-2019

E-MAIL ADDRESS: **spuryear@popmidstream.com**

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted.

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Additional Data

1. **Is this a new well drilled for injection?**
   Yes

2. **Name of the Injection Formation:**
   Devonian: Open Hole Completion

3. **Name of Field or Pool (if applicable):**
   SWD; Devonian-Silurian

4. **Has the well ever been perforated in any other zone(s)?**
   No: New Drill for Injection of Produced Water

5. **Give the name and depths of any oil or gas zones underlying or overlying the proposed Injection zone in this area:**

   Overlying Potentially Productive Zones:
   Delaware, Bone Spring, Wolfcamp, Strawn, Atoka & Morrow Tops all above 11,539'

   Underlying Potentially Productive Zones:
   None

WELL CONSTRUCTION DATA

Permian Oilfield Partners, LLC.
Ramrod Fee SWD #1
323' FSL, 2227' FEL
Sec. 17, T21S, R28E, Eddy Co. NM
Lat 32.4739003° N, Lon 104.1073833° W
GL 3207', RKB 3237'

Surface - (Conventional)

Hole Size: 26" **Casing:** 20" - 94# H-40 STC Casing
Depth Top: Surface
Depth Btm: 387'
Cement: 184 sks - Class C + Additives
Cement Top: Surface - (Circulate)

Intermediate #1 - (Conventional)

Hole Size: 18.5" **Casing:** 16" - 65# H-40 BTC Casing
Depth Top: Surface
Depth Btm: 1089'
Cement: 323 sks - Lite Class C (50:50:10) + Additives
Cement Top: Surface - (Circulate)

Intermediate #2 - (Conventional)

Hole Size: 14.75" **Casing:** 13.375" - 48# H-40 FJ Casing
Depth Top: Surface
Depth Btm: 2624' **ECP/DV Tool:** 1189'
Cement: 460 sks - Lite Class C (60:40:0) + Additives
Cement Top: Surface - (Circulate)

Intermediate #3 - (Conventional)

Hole Size: 12.25" **Casing:** 9.625" - 40# L-80 BTC Casing
Depth Top: Surface
Depth Btm: 9356' **ECP/**:724'
Cement: 1479 sks - Lite Class C (60:40:0) + Additives
Cement Top: Surface - (Circulate)

Intermediate #4 - (Liner)

Hole Size: 8.5" **Casing:** 7.625" - 39# P-110 FJ Casing"
Depth Top: 9156'
Depth Btm: 12851'
Cement: 214 sks - Lite Class C (60:40:0) + Additives
Cement Top: 9156' - Volumetric

Intermediate #5 - (Open Hole)

Hole Size: 6.5" **Depth:** 13530'
Inj. Interval: 12851' - 13530' (Open-Hole Completion)

Tubing - (Tapered)

Tubing Depth: 12806' **Tubing:** 7" - 26# HCP-110 FJ Casing & 5.5" 17# HCL-80 FJ Casing (Fiberglass Lined)
X/O Depth: 9156'
X/O: 7" 26# HCP-110 FJ Casing - X - 5.5" 17# HCL-80 FJ Casing (Fiberglass Lined)
Packer Depth: 12816' **Packer:** 5.5" - Perma-Pak or Equivalent (Inconel)

WELLBORE SCHEMATIC

Permian Oilfield Partners, LLC.
Ramrod Fee SWD #1
323' FSL, 2227' FEL
Sec. 17, T21S, R28E, Eddy Co. NM
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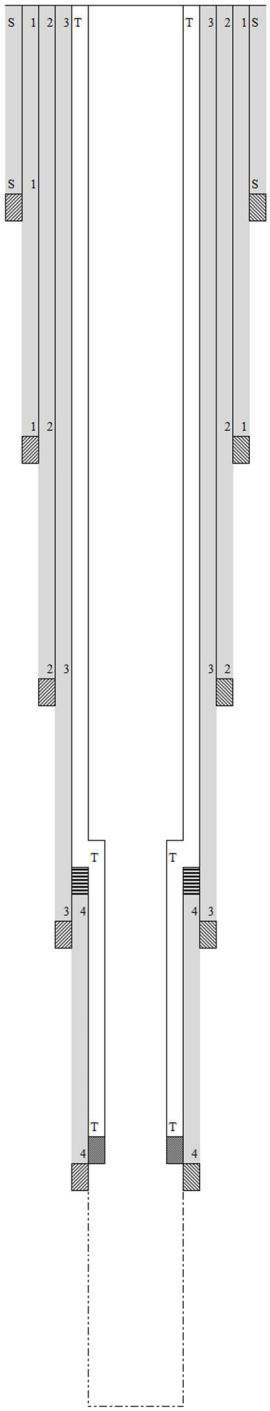
Cement: 1479 sks - Lite Class C (60:40:0) + Additives
Cement Top: Surface - (Circulate)
ECP/DV Tool: 2724'

Intermediate #4 - (Liner)
Hole Size: 8.5"
Casing: 7.625" - 39# P-110 FJ Casing"
Depth Top: 9156'
Depth Btm: 12851'
Cement: 214 sks - Lite Class C (60:40:0) + Additives
Cement Top: 9156' - Volumetric

Intermediate #5 - (Open Hole)
Hole Size: 6.5"
Depth: 13530'
Inj. Interval: 12851' - 13530' (Open-Hole Completion)



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X/O Depth: 9156'
X/O: 7" 26# HCP-110 FJ Casing - X - 5.5" 17# HCL-80 FJ Casing (Fiberglass Lined)
Packer Depth: 12816'
Packer: 5.5" - Perma-Pak or Equivalent (Inconel)

VI: There are no wells within the proposed injection well's 1 mile area of review that penetrate the Devonian Formation.

VII:

1. The average injected volume anticipated is 40,000 BWPD
   The maximum injected volume anticipated is 50,000 BWPD

2. Injection will be through a closed system

3. The average injection pressure anticipated is 2,000 psi
   The proposed maximum injection pressure is 2,570 psi

4. Disposal Sources will be produced waters from surrounding wells in the Delaware, Avalon, Bone Spring and Wolfcamp formations. These formation waters are known to be compatible with Devonian formation water. Representative area produced water analyses were sourced from Go-Tech's website and are listed below.

WELL NAME	COOTER 16 STATE COM #006H	INDIAN FLATS BASS FEDERAL #002	LONE TREE DRAW 13 STATE #007H	ZINNIA BKC FEDERAL #001
API	3001537876	3001521715	3001541650	3001527939
Latitude	32.123642	32.438549	32.48719020	32.5462378997
Longitude	-103.9862061	-104.0594788	-104.1454391	-104.0686035
Section	16	35	13	27
Township	25S	21S	21S	20S
Range	29E	28E	27E	29E
Unit	O	F	C	E
Ftg NS	330S	1980N	150N	1980N
Ftg EW	1650E	1980W	1980W	910W
County	EDDY	EDDY	EDDY	EDDY
State	NM	NM	NM	NM
Formation	AVALON UPPER	DELAWARE	BONE SPRING 2ND SAND	WOLFCAMP
Sample Date	7/22/2011	5/25/1998	6/11/2014	12/24/2001
PH	7	6.9	6.7	5.7
TDS mgL	193732.3	149252	191807.5	189739
Sodium_mgL	74027.8	48324.5	57602.5	
Calcium_mgL	513	9906.47	11751.7	23920
Iron_mgL	104	3.285	38	0.3
Magnesium_mgL	118	2856.86	1581.6	963.2
Manganese_mgL	1		1.42	
Chloride_mgL	113441	99299	118330	116724
Bicarbonate_mgL	1830	267.18	158.6	427
Sulfate_mgL	2665	2081.59		750
CO2_mgL	700	54.75	40	

5. Devonian water analysis from the area of review is unavailable. Representative area water analyses were sourced from Go-Tech's website and are listed below.

WELL NAME	BIG EDDY UT #001	FED UNION #001
API	3001502475	3001502416
Latitude	32.4421539	32.5527229
Longitude	-104.042305	-104.1623917
Sec	36	22
Township	21S	20S
Range	28E	28E
Unit	C	O
Ftg NS	660N	330S
Ftg EW	1980W	1650E
County	EDDY	EDDY
State	NM	NM
Field	N/A	N/A
Formation	DEVONIAN	DEVONIAN
Sample Source	DRILL STEM TEST	DRILL STEM TEST
PH	N/A	6.8
TDS_mgL	19941	39605
Chloride_mgL	10700	22620
Bicarbonate_mgL	640	810
Sulfate_mgL	1130	1618

VIII: Injection Zone Geology

Fluid injection will take place in the Devonian-Silurian formations. This sequence is bounded above by the Upper Devonian Woodford shale. Underlying the Woodford is the first injection formation, the Devonian, consisting of dolomitic carbonates & chert, followed by the Upper Silurian dolomites, and the Lower Silurian Fusselman dolomite. The lower bound of the injection interval is the limestone of the Upper Ordovician Montoya. This proposed well will TD above the top of the Montoya, and will not inject fluids into the Montoya itself, in order to provide a sufficient barrier to preclude fluid injection into the Middle Ordovician Simpson, the Lower Ordovician Ellenburger, the Cambrian, and the PreCambrian below.

Injection zone porosities are expected to range from 0% to a high of 8%, with the higher ranges being secondary porosity in the form of vugs & fractures due to weathering effects, with occasional interbedded shaly intervals. Permeabilities in the 2-3% porosity grainstone intervals are estimated to be in the 10-15 mD range, with the higher porosity intervals conservatively estimated to be in the 40-50 mD range. It is these intervals of high secondary porosity and associated high permeability that are expected to take the majority of the injected water.

The Devonian-Silurian sequence is well suited for SWD purposes, with a low permeability shale barrier overlying the injection interval to prevent upward fluid migrations to USDW's, sufficient permeabilities and porosities in zone, and multiple formations available over a large depth range. This large injection depth range means there is a large injection surface area available, allowing for low injection pressures at high injection rates.

Permian Oilfield Partners, LLC.
Ramrod Fee SWD #1
323' FSL, 2227' FEL
Sec. 17, T21S, R28E, Eddy Co. NM
Lat 32.4739003° N, Lon 104.1073833° W
GL 3207', RKB 3237'

GEOLOGY PROGNOSIS			
FORMATION	TOP KB TVD (ft)	BOTTOM KB TVD (ft)	THICKNESS (ft)
Salt	500	810	310
Capitan Reef	1,230	2,599	1,369
Delaware	2,650	5,749	3,099
Bone Spring	5,749	9,306	3,557
Wolfcamp	9,306	10,112	806
Lwr. Mississippian	12,253	12,730	477
Woodford	12,730	12,816	86
Devonian	12,816	13,251	435
Fusselman (Silurian)	13,251	13,555	304
Montoya (U. Ordovician)	13,555	13,686	131
Simpson (M. Ordovician)	13,686	13,856	170

2. According to the New Mexico Office of the State Engineer, there are 10 fresh water wells drilled within the proposed well's one-mile area of review, indicating fresh water in the Quaternary, at depths shallower than 295'. Regionally, shallow fresh water is known to exist at depths less than 295'. There are no underground sources of fresh water present below the injection interval.

IX: Formation chemical stimulation with 40,000 gals of 15% Hydrochloric Acid is planned after well completion.

X: A compensated neutron/gamma ray log will be run from surface to TD upon well completion. All logs will be submitted to the NMOCD upon completion.

XI: According to the New Mexico Office of the State Engineer, there are 10 fresh water wells drilled within the proposed well's one-mile area of review, as shown in the table below. Two wells were sampled, CP 01710 POD2 and CP00576. Water analyses are attached.

Well Name	Formation Name	Depth Top	Depth Bottom	Thickness	Status
CP 01710 POD2	Quaternary	149	160	11	Active-Sampled
CP 01710 POD1	Quaternary	151	160	9	Active
CP 00569	Quaternary	50	71	21	Not Found
CP 00576	Quaternary	32	295	263	Active-Sampled
CP 00527 POD1	Quaternary	Unknown	100	Unknown	Active
CP 00627	Quaternary	30	154	124	Active
CP 01744 POD1	Quaternary	82	90	8	Not Found
CP 00650	Quaternary	35	155	120	Not Found
CP 00529 POD1	Quaternary	Unknown	100	Unknown	Not Found
CP 00627 POD2	Quaternary	Unknown	175	Unknown	Not Found

XII: Hydrologic affirmative statement attached.

XIII: Proof of notice and proof of publication attached.

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
30-015-	97869	SWD; DEVONIAN-SILURIAN

4 Property Code	5 Property Name	6 Well Number
	RAMROD FEE SWD	1

7 OGRID NO.	8 Operator Name	9 Elevation
328259	PERMIAN OILFIELD PARTNERS, LLC	3207'

10 Surface Location

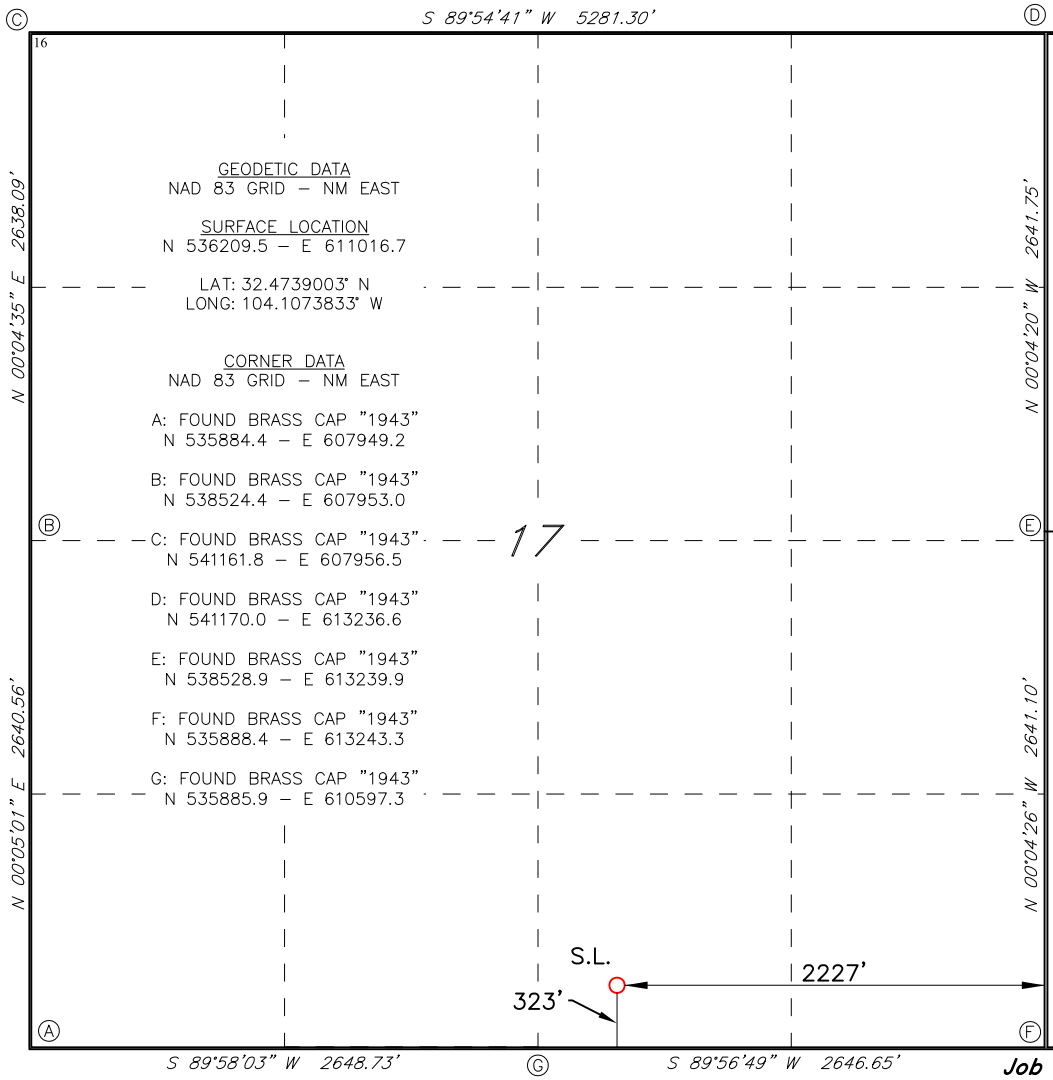
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet From the	East/West line	County
O	17	21S	28E		323	SOUTH	2227	EAST	EDDY

11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.

No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.



17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Gary E Fisher 9-25-2019
Signature Date

Gary E. Fisher
Printed Name

gfisher@popmidstream.com
E-mail Address

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

09-13-2019
Date of Survey

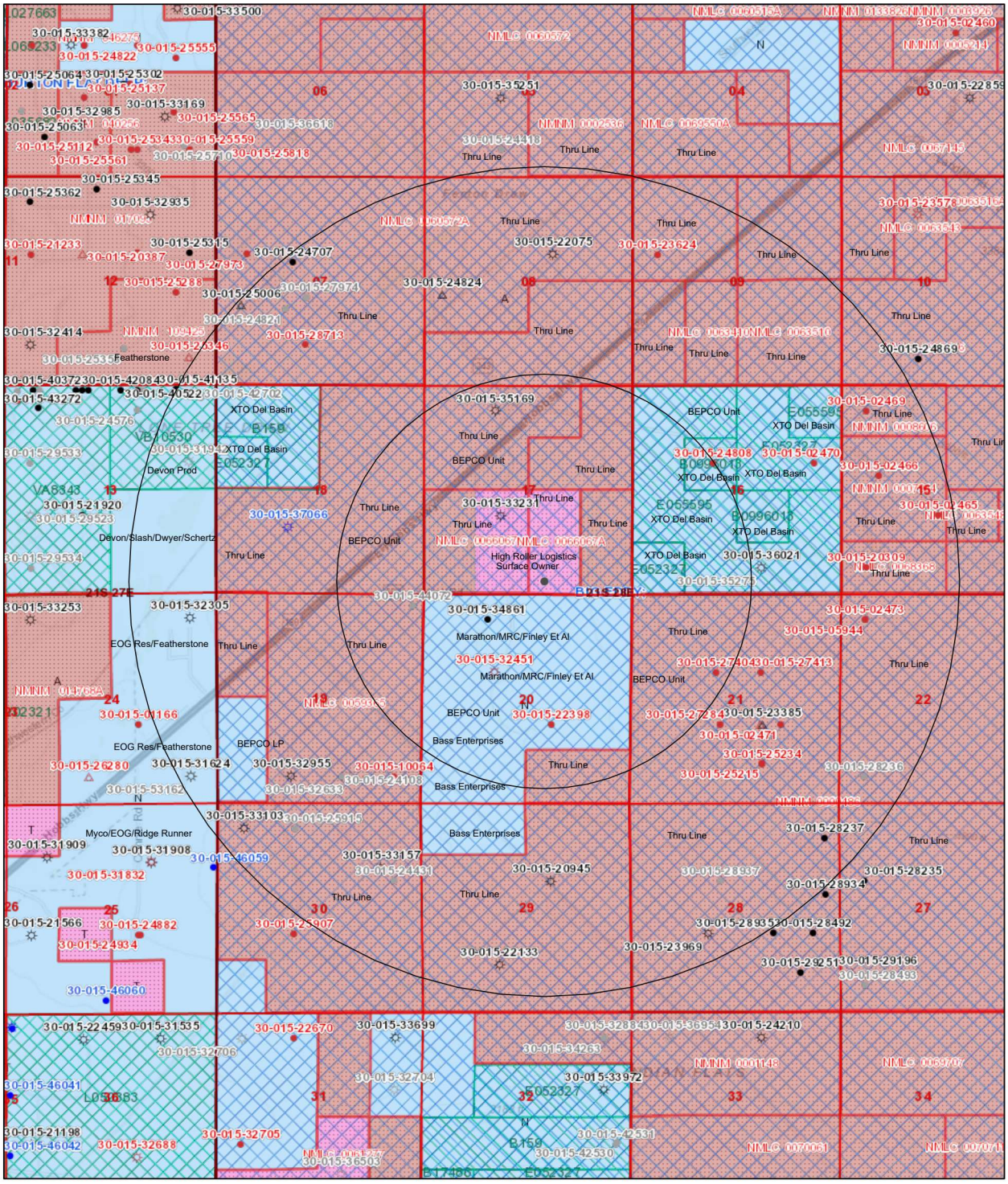
Signature and Seal of Professional Surveyor:

JEFFREY L. FANSLER
NEW MEXICO
10034
PROFESSIONAL SURVEYOR

10034
Certificate Number

Job No.: LS19090891

Ramrod Fee SWD #1, 1 & 2 Mile AOR



9/25/2019, 1:27:37 PM

1:36,112

0 0.35 0.7 1.4 mi

0 0.5 1 2 km

- Override 1

Well Locations - Small Scale
- Active
- New
- Plugged
- Cancelled
- Temporarily Abandoned

Well Locations - Large Scale
- Miscellaneous
- CO2 Active
- CO2 Cancelled
- CO2 New
- CO2, Plugged
- CO2, Temporaily Abandoned
- Gas Active
- Gas, Cancelled, Never Drilled
- Gas, New
- Gas, Plugged
- Gas, Temporarily Abandoned
- Injection, Active
- Injection, Cancelled
- Injection, New
- Injection, Plugged
- Injection, Temporarily Abandoned
- Oil, Active
- Oil, Cancelled
- Oil, New
- Oil, Plugged
- Oil, Temporarily Abondoned
- Salt Water Injection, Active
- Salt Water Injection, Cancelled
- Salt Water Injection, New
- Salt Water Injection, Plugged
- Salt Water InjectionTemporarily Abandoned
- Water, Active
- Water, Cancelled
- Water, New
- Water, Plugged
- Water, Temporarily Abandoned
- PLSS First Division

U.S. BLM
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c)

New Mexico Oil Conservation Division

Ramrod Fee SWD #1 - Wells within 1 Mile Area of Review

API Number	Current Operator	Well Name	Well Number	Well Type	Well Direction	Well Status	Section	Township	Range	OCD Unit Letter	Surface Location	Bottomhole Location	Formation	MD	TVD
30-015-22398	BOPCO, L.P.	BIG EDDY UNIT	#060	Oil	Vertical	Plugged, Site Released	20	T21S	R28E	J	J-20-21S-28E 1980 FSL 1980 FEL	J-20-21S-28E 1980 FSL 1980 FEL	BONE SPRING	12208	12208
30-015-24808	PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL	#099	Oil	Vertical	Plugged, Site Released	16	T21S	R28E	F	F-16-21S-28E 1980 FNL 2080 FWL	F-16-21S-28E 1980 FNL 2080 FWL	DELAWARE	5250	5250
30-015-27404	PRE-ONGARD WELL OPERATOR	PRE-ONGARD WELL	#003	Oil	Vertical	Plugged, Site Released	21	T21S	R28E	F	F-21-21S-28E 1980 FNL 2180 FWL	F-21-21S-28E 1980 FNL 2180 FWL	DELAWARE	6080	6080
30-015-32451	MARATHON OIL PERMIAN LLC	BOND	#001	Gas	Vertical	Plugged, Not Released	20	T21S	R28E	F	F-20-21S-28E 1980 FNL 1860 FWL	F-20-21S-28E 1980 FNL 1860 FWL	STRAWN	10770	10770
30-015-33231	XTO PERMIAN OPERATING LLC.	BIG EDDY UNIT	#150	Gas	Vertical	Active	17	T21S	R28E	K	K-17-21S-28E 1980 FSL 1980 FWL	L-17-21S-28E Lot: K 1980 FSL 1980 FWL	STRAWN	12310	12310
30-015-34861	MARATHON OIL PERMIAN LLC	BOND FEE	#002	Oil	Vertical	Active	20	T21S	R28E	C	C-20-21S-28E 660 FNL 1650 FWL	C-20-21S-28E 660 FNL 1650 FWL	MORROW	12270	12270
30-015-35169	XTO PERMIAN OPERATING LLC.	BIG EDDY UNIT	#169	Gas	Vertical	Active	17	T21S	R28E	C	C-17-21S-28E 660 FNL 1830 FWL	C-17-21S-28E 660 FNL 1830 FWL	MORROW	12112	12112
30-015-44072	MARATHON OIL PERMIAN LLC	BOND 20 FEE	#001C	Oil	Horizontal	Cancelled Apd	19	T21S	R28E	A	A-19-21S-28E 330 FNL 240 FEL	A-20-21S-28E 330 FNL 240 FEL	WOLFCAMP	14567	9500

PERMIAN OILFIELD PARTNERS

Statement of Notifications

Re: C-108 Application for Authorization to Inject
Permian Oilfield Partners, LLC
Ramrod Fee SWD #1
323' FSL & 2227' FEL
Sec 17, T21S, R28E
Eddy County, NM

Permian Oilfield Partners, LLC has mailed notifications to Affected Persons as per the following list:

Ramrod Fee SWD #1 - Affected Persons within 1 Mile Area of Review						
Notified Name	**Notified Address**	**Notified City, State, ZIP Code**	**Lease Location**	**Shipper**	**Tracking Number**	**Mail Date**
Bureau Of Land Management	620 E Greene St	Carlsbad, NM 88220		USPS	9414811899561999465602	10/3/2019
New Mexico State Land Office	310 Old Santa Fe Trail	Santa Fe, NM 87501		USPS	9414811899561999465527	10/3/2019
Marathon Oil Permian LLC	5555 San Felipe St.	Houston, TX 77056	Sec 20-21S-28E	USPS	9414811899561999465428	10/3/2019
BOPCO, L.P.	6401 Holiday Hill Rd Bldg 5	Midland, TX 79707	Sec 20-21S-28E	USPS	9414811899561999465985	10/3/2019
XTO Permian Operating LLC	6401 Holiday Hill Rd Bldg 5	Midland, TX 79707	Sec 17-21S-28E	USPS	9414811899561999462724	10/3/2019
XTO Delaware Basin LLC	6401 Holiday Hill Rd Bldg 5	Midland, TX 79707	Sec 16-21S-28E	USPS	9414811899561999462830	10/3/2019
BEPCO, L.P.	6401 Holiday Hill Rd Bldg 5	Midland, TX 79707	Unit, Sec 16, 17, 18, 19, 20, 21-21S-28E	USPS	9414811899561999465961	10/3/2019
Thru Line OG NM LLC	201 Main Street	Fort Worth, TX 76102	Sec 17, 18, 19, 20, 21-21S-28E	USPS	9414811899561999462861	10/3/2019
Bass Enterprises Co.	PO Box 2760	Midland, TX 79702	Sec 20, 29-21S-28E	USPS	9414811899561999465794	10/3/2019
Finley Resources Inc.	1308 Lake Street	Fort Worth, TX 76102	Sec 20-21S-28E	USPS	9414811899561999465060	10/3/2019
Axis Energy Corp.	PO Box 2107	Roswell, NM 88202	Sec 20-21S-28E	USPS	9414811899561999465756	10/3/2019
Energex LLC	4425 98th Street, Suite 200	Lubbock, TX 79424	Sec 20-21S-28E	USPS	9414811899561999465367	10/3/2019
Richard J. Forrest Jr.	208 Dickson Lane	Carlsbad, NM 88220	Sec 20-21S-28E	USPS	9414811899561999462250	10/3/2019
Ryan Miller	400 N. Pennsylvania Street, Suite 800	Roswell, NM 88201	Sec 20-21S-28E	USPS	9414811899561999462236	10/3/2019
Clarke Coll	PO Box 1818	Roswell, NM 88202	Sec 20-21S-28E	USPS	9414811899561999465107	10/3/2019
Coll Brothers Oil	PO Box 1818	Roswell, NM 88202	Sec 20-21S-28E	USPS	9414811899561999465138	10/3/2019
Thomas D. Ramage MD	2904 Avenida De Amigos	Roswell, NM 88201	Sec 20-21S-28E	USPS	9414811899561999462816	10/3/2019
Brad and Debbi Jeffers	607 Tierra Berrenda	Roswell, NM 88201	Sec 20-21S-28E	USPS	9414811899561999465978	10/3/2019
Eric J. Coll	PO Box 1818	Roswell, NM 88202	Sec 20-21S-28E	USPS	9414811899561999465343	10/3/2019
MRC Permian Co.	5400 LBJ Freeway, Suite 1500	Dallas, TX 75240	Sec 20-21S-28E	USPS	9414811899561999465480	10/3/2019
High Roller Logistics LLC	1008 Southview Circle	Center, TX 75935	Surface Owner	USPS	9414811899561999465039	10/3/2019

Sean Puryear
Permian Oilfield Partners, LLC
spuryear@popmidstream.com

Date: 10/3/2019

U.S. Postal Service **Certified Mail Receipt**

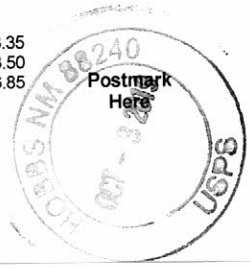
ARTICLE NUMBER: 9414 8118 9956 1999 4657 56

ARTICLE ADDRESSED TO:

Axis Energy Corp.
PO Box 2107
Roswell NM 88202-2107

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

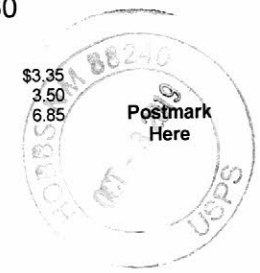
ARTICLE NUMBER: 9414 8118 9956 1999 4657 94

ARTICLE ADDRESSED TO:

Bass Enterprises Co.
PO Box 2760
Midland TX 79702-2760

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

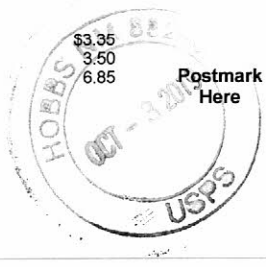
ARTICLE NUMBER: 9414 8118 9956 1999 4659 61

ARTICLE ADDRESSED TO:

BEPCO, LP
6401 Holiday Hill Rd., Bldg. 5
Midland TX 79707-2157

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

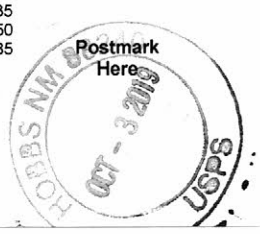
ARTICLE NUMBER: 9414 8118 9956 1999 4659 85

ARTICLE ADDRESSED TO:

BOPCO, LP
6401 Holiday Hill Rd, Bldg. 5
Midland TX 79707-2157

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

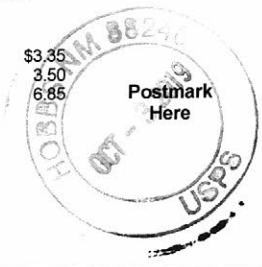
ARTICLE NUMBER: 9414 8118 9956 1999 4659 78

ARTICLE ADDRESSED TO:

Brad and Debbi Jeffers
607 Tierra Berrenda Dr
Roswell NM 88201-7865

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

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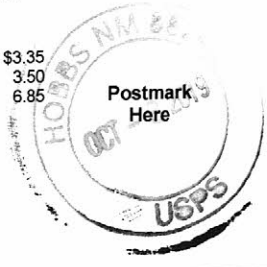
ARTICLE ADDRESSED TO:

Bureau of Land Management
620 E Greene St
Carlsbad NM 88220-6292

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

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ARTICLE ADDRESSED TO:

Clark Coll
PO Box 1818
Roswell NM 88202-1818

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85

U.S. Postal Service **Certified Mail Receipt**

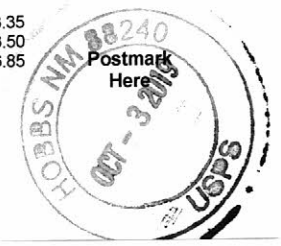
ARTICLE NUMBER: 9414 8118 9956 1999 4651 38

ARTICLE ADDRESSED TO:

Coll Brothers Oil
PO Box 1818
Roswell NM 88202-1818

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

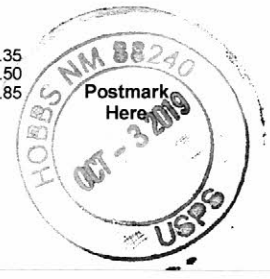
ARTICLE NUMBER: 9414 8118 9956 1999 4653 67

ARTICLE ADDRESSED TO:

Energex LLC
4425 98th Street, Suite 200
Lubbock TX 79424-5037

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

ARTICLE NUMBER: 9414 8118 9956 1999 4653 43

ARTICLE ADDRESSED TO:

Eric J. Coll
PO Box 1818
Roswell NM 88202-1818

FEES

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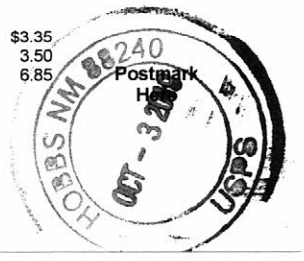
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

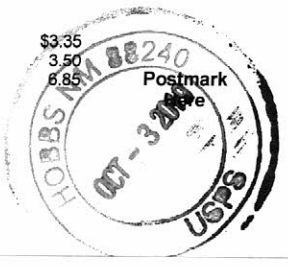
ARTICLE NUMBER: 9414 8118 9956 1999 4650 60

ARTICLE ADDRESSED TO:

Finley Resources Inc.
1308 Lake Street
Fort Worth TX 76102-4505

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

ARTICLE NUMBER: 9414 8118 9956 1999 4650 39

ARTICLE ADDRESSED TO:

High Roller Logistics LLC
1008 Southview Circle
Center TX 75935-4537

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85

U.S. Postal Service **Certified Mail Receipt**

ARTICLE NUMBER: 9414 8118 9956 1999 4654 28

ARTICLE ADDRESSED TO:

Marathon Oil Permian LLC
5555 San Felipe Street
Houston TX 77056-2701

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85

U.S. Postal Service **Certified Mail Receipt**

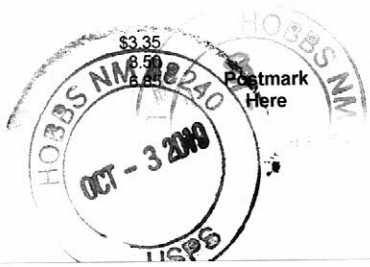
ARTICLE NUMBER: 9414 8118 9956 1999 4654 80

ARTICLE ADDRESSED TO:

MRC Permian Company
5400 LBJ Freeway, Suite 1500
Dallas TX 75240-1017

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

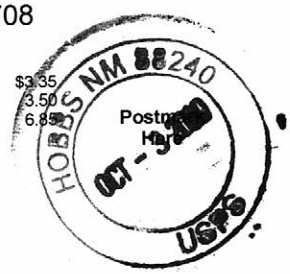
ARTICLE NUMBER: 9414 8118 9956 1999 4655 27

ARTICLE ADDRESSED TO:

New Mexico State Land Office
310 Old Santa Fe Trail
Santa Fe NM 87501-2708

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

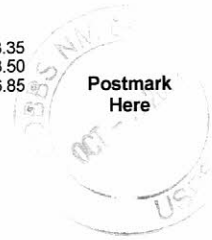
ARTICLE NUMBER: 9414 8118 9956 1999 4622 50

ARTICLE ADDRESSED TO:

Richard J. Forrest Jr.
208 Dickson Lane
Carlsbad NM 88220-8800

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

ARTICLE NUMBER: 9414 8118 9956 1999 4622 36

ARTICLE ADDRESSED TO:

Ryan Miller
400 N. Pennsylvania Ave Suite 800
Roswell NM 88201-4785

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85

U.S. Postal Service **Certified Mail Receipt**

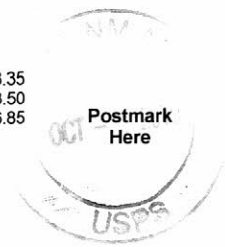
ARTICLE NUMBER: 9414 8118 9956 1999 4628 16

ARTICLE ADDRESSED TO:

Thomas D. Ramage MD
2904 Avenida De Amigos
Roswell NM 88201-9707

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

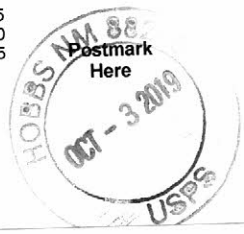
ARTICLE NUMBER: 9414 8118 9956 1999 4628 61

ARTICLE ADDRESSED TO:

Thru Line OG NM LLC
201 Main Street
Fort Worth TX 76102-3105

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

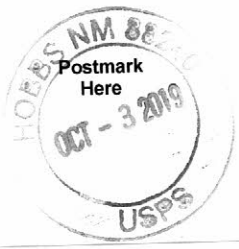
ARTICLE NUMBER: 9414 8118 9956 1999 4628 30

ARTICLE ADDRESSED TO:

XTO Delaware Basin LLC
6401 Holiday Hill Rd, Bldg. 5
Midland TX 79707-2157

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



U.S. Postal Service **Certified Mail Receipt**

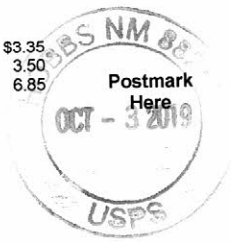
ARTICLE NUMBER: 9414 8118 9956 1999 4627 24

ARTICLE ADDRESSED TO:

XTO Permian Operating, LLC
6401 Holiday Hill Rd, Bldg #5
Midland TX 79707-2157

FEES

Postage Per Piece	$3.35
Certified Fee	3.50
Total Postage & Fees:	6.85



CARLSBAD
CURRENT-ARGUS

AFFIDAVIT OF PUBLICATION

Ad No.
0001296691

PERMIAN OILFIELD PARTNERS, LLC
PO BOX 3329

HOBBS NM 88241

I, a legal clerk of the **Carlsbad Current-Argus**, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

09/17/19

Kathleen Allen
Legal Clerk

Subscribed and sworn before me this
27th of September 2019.

Shelly Hora
State of WI, County of Brown
NOTARY PUBLIC

8-25-23
My Commission Expires

SHELLY HORA
Notary Public
State of Wisconsin

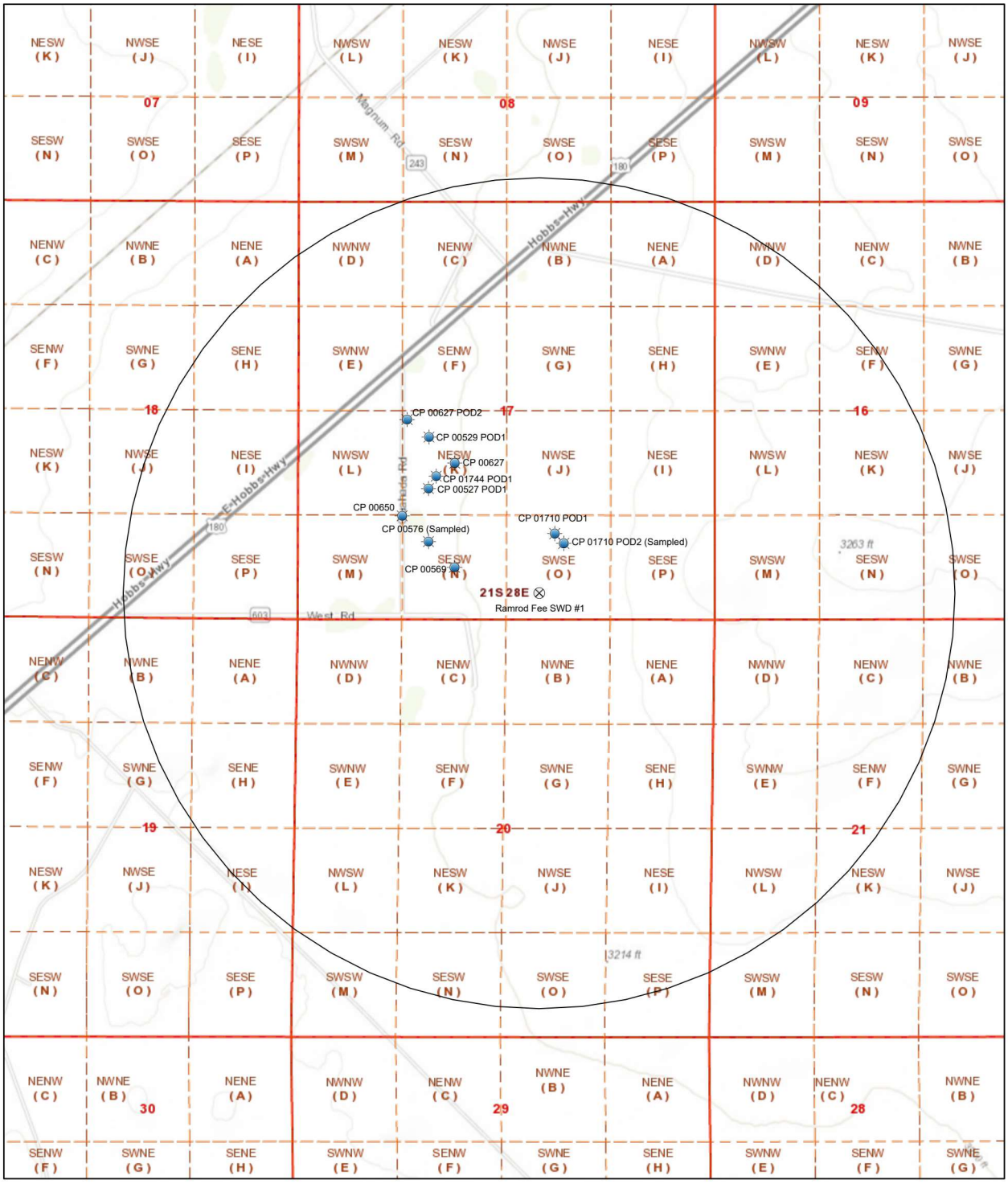
Ad#:0001296691
P O : Ramrod Fee SWD #1
# of Affidavits :0.00

Newspaper Publication Notice

Permian Oilfield Partners, LLC, PO Box 3329, Hobbs, NM 88241, phone (817) 606-7630, attention Gary Fisher, has filed form C-108 (Application for Authorization for Injection) with the New Mexico Oil Conservation Division seeking approval to drill a commercial salt water disposal well in Eddy County, New Mexico. The well name is the Ramrod Fee SWD #1, and is located 323' FSL & 2227' FEL, Unit Letter O, Section 17, Township 21 South, Range 28 East, NMPM. The well will dispose of water produced from nearby oil and gas wells into the Devonian formation from a depth of 12,851 feet to 13,530 feet. The maximum expected injection rate is 50,000 BWPD at a maximum surface injection pressure of 2,570 psi.
Interested parties must file objections or requests for hearing with the New Mexico Oil Conservation Division, 1220 South St. Francis Drive, Santa Fe, New Mexico, 87505 within 15 days.

September 17, 2019

Water Wells in 1 Mile AOR, Ramrod Fee SWD #1



10/3/2019, 9:47:25 AM

Points

- Override 1
- Override 2
- Override 1
- PLSS First Division
- PLSS Second Division
- PLSS Townships

1:18,056

0 0.17 0.35 0.7 mi

0 0.28 0.55 1.1 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

New Mexico Oil Conservation Division

New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

TWP 21S RGE 28E

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
C 03266 POD1		CUB	ED	3	4	4	04	21S	28E	585844	3596555*	260	80	180
C 03267 POD1		CUB	ED	4	3	3	04	21S	28E	584833	3596541*	52	40	12
C 03272 POD1		CUB	ED	4	3	1	18	21S	28E	581632	3594114*	22	9	13
CP 00516		CP	ED	4	4	4	12	21S	28E	590901	3594984*	275	205	70
CP 00527 POD1		CP	XX	3	2	3	17	21S	28E	583446	3593715*	100		
CP 00529 POD1		CP	LE	1	2	3	17	21S	28E	583446	3593915*	100		
CP 00569		CP	ED		4	3	17	21S	28E	583549	3593414*	71	50	21
CP 00576		CP	ED	1	4	3	17	21S	28E	583448	3593513*	295	32	263
CP 00627		CP	ED		2	3	17	21S	28E	583547	3593816*	154	30	124
CP 00627 POD2		CP	ED	1	2	3	17	21S	28E	583360	3593982	175		
CP 00650		CP	ED			3	17	21S	28E	583347	3593612*	155	35	120
CP 01016 POD1		CP	LE	2	2	4	30	21S	28E	679417	3591905	150		
CP 01118 POD1		CP	ED		1	4	35	21S	28E	588800	3588926	25		
CP 01118 POD2		CP	ED		1	4	35	21S	28E	588800	3588926	56		
CP 01118 POD5		CP	ED		1	4	35	21S	28E	544928	3588634	65		
CP 01171 POD1		CP	ED		1	4	35	21S	28E	588814	3588862	70		
CP 01171 POD2		CP	ED		1	4	35	21S	28E	588866	3588862	110		
CP 01171 POD3		CP	ED		1	4	35	21S	28E	588814	3588862	115		
CP 01710 POD1		CP	ED	1	3	4	17	21S	28E	583936	3593547	160	151	9
CP 01710 POD2		CP	ED	1	3	4	17	21S	28E	583971	3593509	160	149	11
CP 01744 POD1		CP	ED	3	2	3	17	21S	28E	583476	3593764	90	82	8

Average Depth to Water: **78 feet**
Minimum Depth: **9 feet**
Maximum Depth: **205 feet**

Record Count: 21

PLSS Search:

Township: 21S **Range:** 28E

***UTM location was derived from PLSS - see Help**

New Mexico Office of the State Engineer

Point of Diversion Summary

SAMPLED

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters)

Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
	CP 00576	1	4	3	17	21S	28E	583448	3593513*

Driller License: 817 **Driller Company:** WEST, BILLY GEORGE

Driller Name: WEST, BILLY GEORGE

Drill Start Date:	01/07/1987	**Drill Finish Date:**	01/29/1987	**Plug Date:**	
Log File Date:	02/09/1987	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	3 GPM
Casing Size:	4.00	**Depth Well:**	295 feet	**Depth Water:**	32 feet

Water Bearing Stratifications:	Top	Bottom	Description
	102	104	Other/Unknown
	275	276	Other/Unknown

***UTM location was derived from PLSS - see Help**

POD: CP 00576 Imperative Water Analysis Report

IMPERATIVE
CHEMICAL PARTNERS

SYSTEM IDENTIFICATION

Company: Permian Oilfield Partners LLC
Location: Ramrod Fee SWD 1 CP 00576
Sample Source: Tank Fresh Water
Account Rep: Danny Gonzales

Sample ID#: W-14641

Sample Date: 09-19-2019
Report Date: 09-24-2019

WATER CHEMISTRY

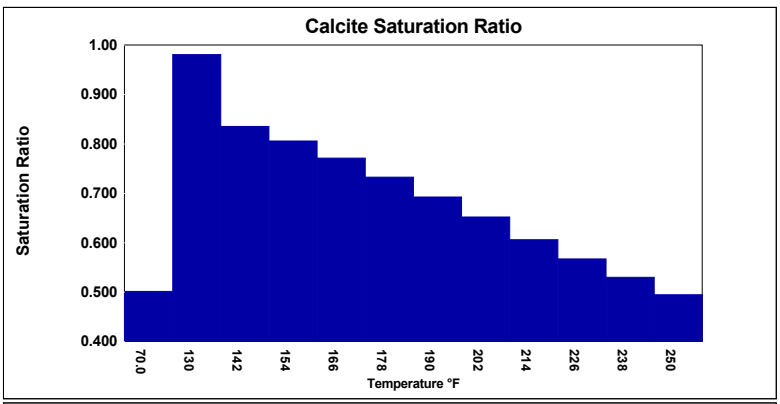
CATIONS		ANIONS	
Calcium(as Ca)	644.60	Chloride(as Cl)	2200
Magnesium(as Mg)	168.60	Sulfate(as SO_4)	1220
Barium(as Ba)	0.0170	Dissolved CO_2(as CO_2)	5.56
Strontium(as Sr)	8.49	Bicarbonate(as HCO_3)	61.00
Sodium(as Na)	967.51	H_2S (as H_2S)	8.50
Potassium(as K)	10.62	Boron(as B)	6.31
Lithium(as Li)	0.133		
Iron(as Fe)	0.396		
Manganese(as Mn)	0.01000		

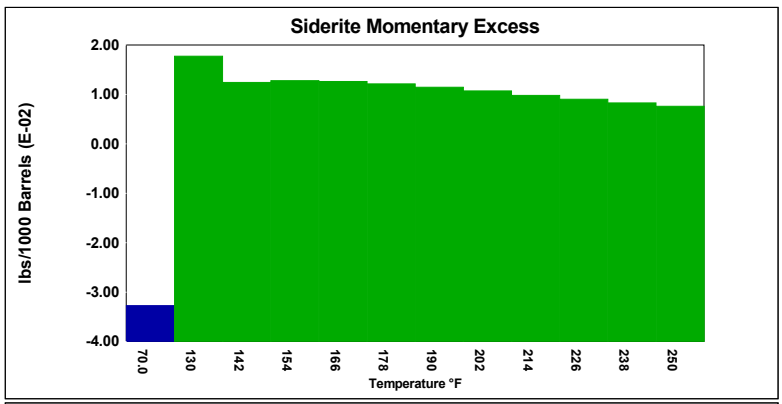
PARAMETERS			
Temperature(°F)	112.30	Sample pH	7.28
Conductivity	6476	Sp.Gr.(g/mL)	1.00
Resistivity	154.42	T.D.S.	5330

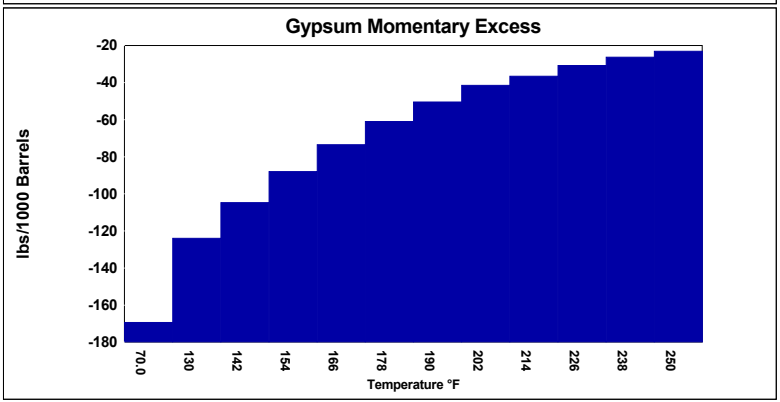
SCALE AND CORROSION POTENTIAL

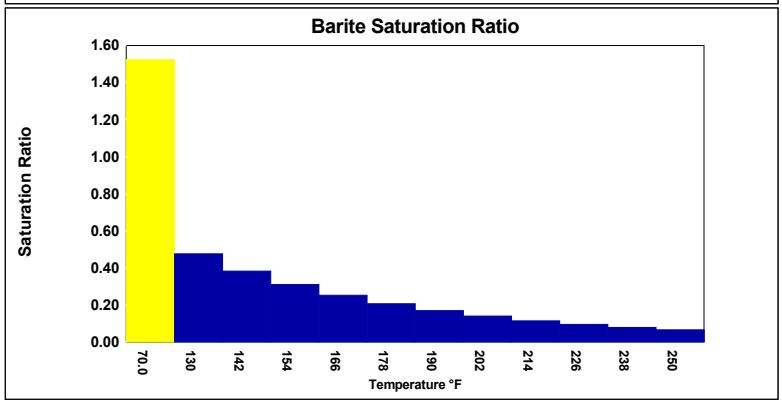
Temp. (°F)	Press. (atm)	Calcite $CaCO_3$		Anhydrite $CaSO_4$		Gypsum $CaSO_4*2H_2O$		Barite $BaSO_4$		Celestite $SrSO_4$		Siderite $FeCO_3$		Mackawenite FeS		CO_2 (mpy)	pCO_2 (atm)
70.00	1.000	0.501	-0.0416	0.343	-345.48	0.585	-169.45	1.52	0.00345	0.470	-6.82	0.525	-0.0327	10.18	0.0646	0.0111	0.00261
130.00	1.000	0.980	-0.00104	0.493	-190.91	0.646	-124.06	0.476	-0.0111	0.512	-5.77	1.53	0.0177	3.88	0.0509	0.0108	0.00261
142.00	10.900	0.835	-0.00832	0.557	-150.12	0.683	-104.76	0.383	-0.0162	0.511	-5.79	1.41	0.0124	3.61	0.0493	0.0347	0.0284
154.00	20.800	0.806	-0.00935	0.641	-107.63	0.718	-88.03	0.310	-0.0224	0.508	-5.84	1.47	0.0128	2.99	0.0448	0.0413	0.0543
166.00	30.700	0.771	-0.0106	0.752	-64.94	0.752	-73.53	0.253	-0.0298	0.504	-5.93	1.52	0.0126	2.47	0.0395	0.00872	0.0801
178.00	40.600	0.733	-0.0119	0.897	-23.36	0.784	-61.07	0.207	-0.0386	0.499	-6.05	1.55	0.0121	2.04	0.0333	0.0262	0.106
190.00	50.500	0.692	-0.0132	1.08	16.08	0.814	-50.47	0.170	-0.0492	0.492	-6.21	1.57	0.0114	1.68	0.0261	0.0215	0.132
202.00	60.400	0.652	-0.0145	1.33	52.67	0.840	-41.56	0.140	-0.0618	0.484	-6.41	1.59	0.0107	1.39	0.0177	0.0242	0.158
214.00	70.300	0.606	-0.0163	1.63	85.09	0.856	-36.62	0.115	-0.0778	0.470	-6.79	1.57	0.00979	1.13	0.00692	0.0360	0.183
226.00	80.200	0.567	-0.0176	2.04	114.98	0.875	-30.83	0.0950	-0.0959	0.458	-7.09	1.57	0.00901	0.936	-0.00410	0.0495	0.209
238.00	90.100	0.530	-0.0189	2.58	141.14	0.890	-26.34	0.0789	-0.117	0.446	-7.44	1.56	0.00827	0.780	-0.0164	0.0619	0.235
250.00	100.000	0.495	-0.0202	3.29	163.55	0.902	-23.13	0.0657	-0.143	0.433	-7.84	1.55	0.00758	0.651	-0.0302	0.0739	0.261
		xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels		

Saturation Ratios (xSAT) are the ratio of ion activity to solubility, e.g. $\{Ca\}\{CO_3\}/K_{sp}$. pCO_2 (atm) is the partial pressure of CO_2 in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.









New Mexico Office of the State Engineer

Point of Diversion Summary

SAMPLED

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters)

Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
2214C	CP 01710 POD2	1	3	4	17	21S	28E	583971	3593509

Driller License: 1708 **Driller Company:** ZIA DRILLING AND GEOTHERMAL, LLC

Driller Name: AINSWORTH, RYAN

Drill Start Date:	09/18/2018	**Drill Finish Date:**	09/19/2018	**Plug Date:**	
Log File Date:	01/23/2019	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	25 GPM
Casing Size:	5.75	**Depth Well:**	160 feet	**Depth Water:**	149 feet

Water Bearing Stratifications:	Top	Bottom	Description
	149	155	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	0	160

Meter Number:	17760	**Meter Make:**	RECORD ALL
Meter Serial Number:	18058164	**Meter Multiplier:**	100.0000
Number of Dials:	6	**Meter Type:**	Diversion
Unit of Measure:	Gallons	**Return Flow Percent:**	
Usage Multiplier:		**Reading Frequency:**	Quarterly

Imperative Water Analysis Report

IMPERATIVE
CHEMICAL PARTNERS

SYSTEM IDENTIFICATION

Company: Permian Oilfield Partners LLC
Location: Ramrod 1 Water Well CP 01710 POD2
Sample Source: Wellhead
Account Rep: Kevin Crispin

Sample brought in by Client to be tested. Chlorides: 4,444

Sample ID#: W-14769

Sample Date: 9-24-2019
Report Date: 10-02-2019

WATER CHEMISTRY

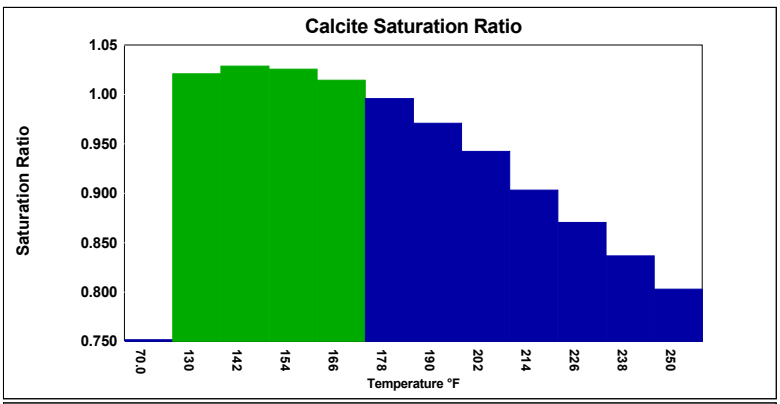
CATIONS		ANIONS	
Calcium(as Ca)	730.60	Chloride(as Cl)	3400
Magnesium(as Mg)	232.90	Sulfate(as SO_4)	1642
Barium(as Ba)	0.0520	Dissolved CO_2(as CO_2)	20.00
Strontium(as Sr)	11.08	Bicarbonate(as HCO_3)	85.40
Sodium(as Na)	1728	H_2S (as H_2S)	6.32
Potassium(as K)	18.61	Boron(as B)	3.91
Lithium(as Li)	0.225		
Iron(as Fe)	1.45		
Manganese(as Mn)	0.261		

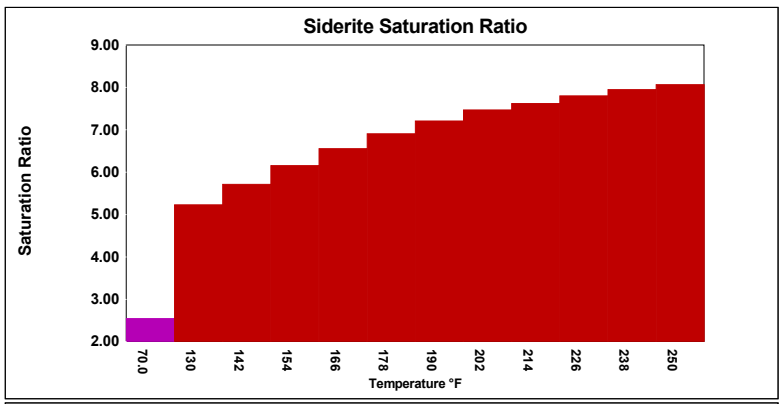
PARAMETERS			
Temperature(°F)	78.90	Sample pH	7.20
Conductivity	9755	Sp.Gr.(g/mL)	1.00
Resistivity	102.51	T.D.S.	7920

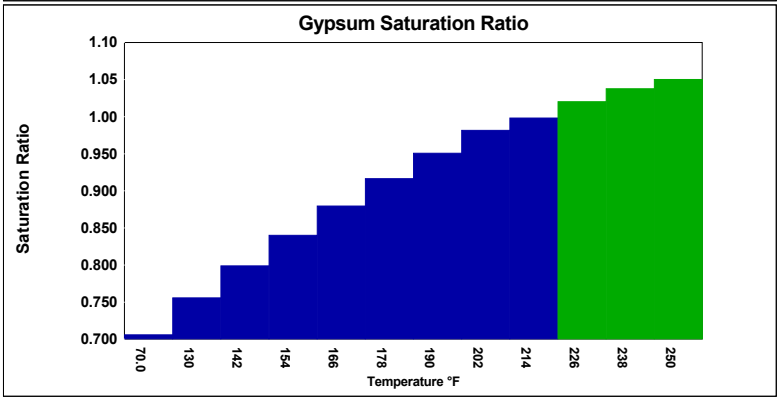
SCALE AND CORROSION POTENTIAL

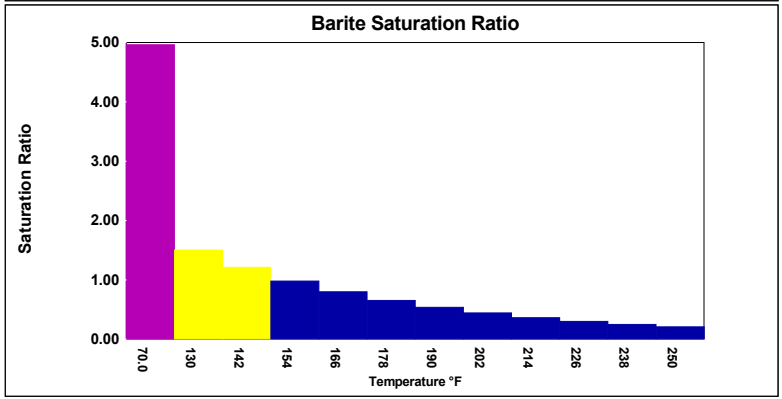
Temp. (°F)	Press. (atm)	Calcite $CaCO_3$		Anhydrite $CaSO_4$		Gypsum $CaSO_4*2H_2O$		Barite $BaSO_4$		Celestite $SrSO_4$		Siderite $FeCO_3$		Mackawenite FeS		CO_2 (mpy)	pCO_2 (atm)
70.00	1.000	0.752	-0.0231	0.415	-336.63	0.706	-131.28	4.96	0.0247	0.657	-4.19	2.54	0.0473	17.43	0.219	0.00912	0.00423
130.00	10.000	1.02	0.00127	0.577	-178.33	0.756	-95.76	1.50	0.0103	0.692	-3.56	5.23	0.0575	8.28	0.196	0.0419	0.0423
142.00	19.000	1.03	0.00166	0.652	-132.24	0.799	-74.48	1.21	0.00535	0.691	-3.58	5.71	0.0563	7.12	0.189	0.0426	0.0804
154.00	28.000	1.03	0.00141	0.750	-84.04	0.840	-56.14	0.979	>-0.001	0.687	-3.65	6.15	0.0544	6.08	0.181	0.0476	0.119
166.00	37.000	1.01	< 0.001	0.880	-35.35	0.879	-40.28	0.797	-0.00791	0.681	-3.74	6.55	0.0523	5.18	0.172	0.0512	0.157
178.00	46.000	0.996	>-0.001	1.05	12.32	0.916	-26.71	0.651	-0.0166	0.673	-3.87	6.90	0.0499	4.40	0.162	0.0494	0.195
190.00	55.000	0.971	-0.00145	1.27	57.87	0.951	-15.21	0.535	-0.0269	0.664	-4.04	7.20	0.0475	3.73	0.150	0.0265	0.233
202.00	64.000	0.942	-0.00278	1.55	100.46	0.981	-5.60	0.441	-0.0393	0.653	-4.24	7.47	0.0452	3.16	0.137	0.0234	0.271
214.00	73.000	0.903	-0.00465	1.91	138.59	0.998	-0.663	0.359	-0.0552	0.631	-4.65	7.62	0.0433	2.62	0.120	0.0286	0.309
226.00	82.000	0.871	-0.00612	2.39	174.25	1.02	5.51	0.298	-0.0730	0.616	-4.96	7.80	0.0412	2.22	0.103	0.0153	0.347
238.00	91.000	0.837	-0.00765	3.02	205.90	1.04	10.19	0.247	-0.0943	0.599	-5.32	7.94	0.0394	1.89	0.0851	0.0330	0.385
250.00	100.000	0.803	-0.00918	3.84	233.45	1.05	13.40	0.205	-0.120	0.580	-5.74	8.06	0.0377	1.60	0.0657	0.0533	0.423
		xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels		

Saturation Ratios (xSAT) are the ratio of ion activity to solubility, e.g. $\{Ca\}\{CO_3\}/K_{sp}$. pCO_2 (atm) is the partial pressure of CO_2 in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.









Item XII. Affirmative Statement

Re: C-108 Application for Authorization to Inject
Permian Oilfield Partners, LLC
Ramrod Fee SWD #1
323' FSL & 2227' FEL
Sec 17, T21S, R28E
Eddy County, NM

Permian Oilfield Partners, LLC. has examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

Gary Fisher
Manager
Permian Oilfield Partners, LLC.

Date: 9/13/2019

Plugging Risk Assessment

Permian Oilfield Partners, LLC.
Ramrod Fee SWD #1
323' FSL & 2227' FEL
Sec 17, T21S, R28E
Eddy County, NM

WELLBORE SCHEMATIC

Permian Oilfield Partners, LLC.
Ramrod Fee SWD #1
323' FSL, 2227' FEL
Sec. 17, T21S, R28E, Eddy Co. NM
Lat 32.4739003° N, Lon 104.1073833° W
GL 3207', RKB 3237'

Surface - (Conventional)
Hole Size: 26"
Casing: 20" - 94# H-40 STC Casing
Depth Top: Surface
Depth Btm: 387'
Cement: 184 sks - Class C + Additives
Cement Top: Surface - (Circulate)

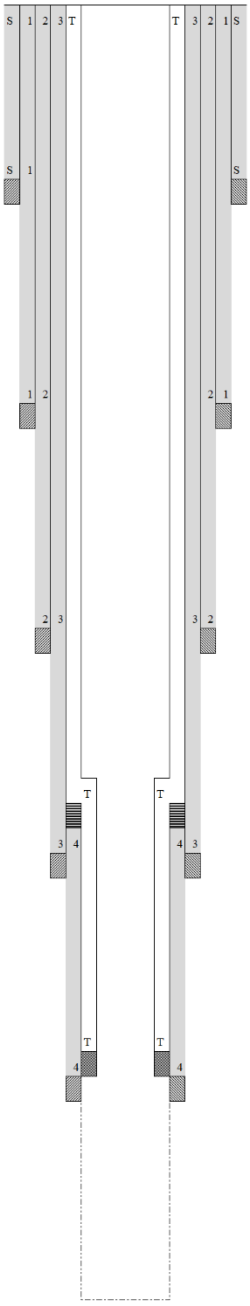
Intermediate #1 - (Conventional)
Hole Size: 18.5"
Casing: 16" - 65# H-40 BTC Casing
Depth Top: Surface
Depth Btm: 1089'
Cement: 323 sks - Lite Class C (50:50:10) + Additives
Cement Top: Surface - (Circulate)

Intermediate #2 - (Conventional)
Hole Size: 14.75"
Casing: 13.375" - 48# H-40 FJ Casing
Depth Top: Surface
Depth Btm: 2624'
Cement: 460 sks - Lite Class C (60:40:0) + Additives
Cement Top: Surface - (Circulate)
ECP/DV Tool: 1189'

Intermediate #3 - (Conventional)
Hole Size: 12.25"
Casing: 9.625" - 40# L-80 BTC Casing
Depth Top: Surface
Depth Btm: 9356'
Cement: 1479 sks - Lite Class C (60:40:0) + Additives
Cement Top: Surface - (Circulate)
ECP/DV Tool: 2724'

Intermediate #4 - (Liner)
Hole Size: 8.5"
Casing: 7.625" - 39# P-110 FJ Casing"
Depth Top: 9156'
Depth Btm: 12851'
Cement: 214 sks - Lite Class C (60:40:0) + Additives
Cement Top: 9156' - Volumetric

Intermediate #5 - (Open Hole)
Hole Size: 6.5"
Depth: 13530'
Inj. Interval: 12851' - 13530' (Open-Hole Completion)



Tubing - (Tapered)
Tubing Depth: 12806'
Tubing: 7" - 26# HCP-110 FJ Casing & 5.5" 17# HCL-80 FJ Casing (Fiberglass Lined)
X/O Depth: 9156'
X/O: 7" 26# HCP-110 FJ Casing - X - 5.5" 17# HCL-80 FJ Casing (Fiberglass Lined)
Packer Depth: 12816'
Packer: 5.5" - Perma-Pak or Equivalent (Inconel)

7" UFJ Tubing Inside of 9 ⅝" 40# Casing

Bowen Series 150 Releasing and Circulation Overshots

Maximum Catch Size 6⅝" to 7¼" Inclusive

Maximum Catch Size (Spiral)		6⅝	6¼	7	7¼
Maximum Catch Size (Basket)		5⅞	6⅛	6⅜	6⅝
Overshot O.D.		8¼	7⅞	8⅛	8⅜
Type		F.S.	S.H.	S.H.	S.H.
Complete Assembly	Part No.	C-3032	C-5222	9217	C-5354
(Dressed Spiral Parts)	Weight	280	243	251	260
Replacement Parts					
Top Sub	Part No.	A-3033	A-5223	9218	A-5355
Bowl	Part No.	B-3034	B-5224	9219	B-5356
Packer	Part No.	A-1814	B-5225	9224	B-5357
Spiral Grapple	Part No.	N-84	B-5227	9222	B-5359
Spiral Grapple Control	Part No.	M-89	A-5228	9223	B-5360
Standard Guide	Part No.	A-1818	A-5229	9226	A-5361
Basket Parts					
Basket Grapple	Part No.	N-84	B-5227	9222	B-5359
Basket Grapple Control	Part No.	M-89	A-5228	9223	B-5360
Mill Control Packer	Part No.	A-1814-R	B-5225-R	9224-R	B-5357-R

A 8.125" O.D. Bowen Series 150 Overshot will be used to perform this overshot operation. Details on the overshot are listed above. Casing to tubing clearance dimensions are listed below.

7" 26# FJ Casing Inside 9.625" 40# BTC Casing

Clearance (in)	Pipe Size (in)	Weight lb/ft	Grade	Conn.	Type	Body O.D. (in)	Coupling O.D. (in)	I.D. (in)	Drift (in)	Lined Wt. lb/ft	Lined I.D. (in)	Flare I.D. (in)	Lined Drift (in)
0.840	9 5/8	40.0	L-80	BTC	Casing	9.625	10.625	8.835	8.679	-	-	-	-
	7	26.0	HCP-110	FJ	Casing	7.000	7.000	6.276	6.151	28.500	6.080	5.940	5.815

*Red Indicates Tubing

Fishing Procedure

Overshot Fishing Procedure

In the Event of a Connection Break

- **If fishing neck is clean**

1. Trip in hole with overshot and engage fish.
2. Pick up 2 points over neutral weight.
3. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
4. Once released from packer, trip out of hole with fish.

   A skirted mill may be substituted for a standard mill to ensure pipe stabilization and the casing is not damaged while milling

- **If dressing fishing neck is required**

1. Trip in hole with mill and dress fishing neck to allow for overshot to engage tubing.
2. Trip out of hole with mill.
3. Trip in hole with overshot and engage fish.
4. Pick up 2 points over neutral weight.
5. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
6. Once released from packer, trip out of hole with fish.

   A skirted mill may be substituted for a standard mill to ensure pipe stabilization and the casing is not damaged while milling

In the Event of a Body Break

- **If fishing neck is clean**

1. Trip in hole with overshot and engage fish.
2. Pick up 2 points over neutral weight.
3. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
4. Once released from packer, trip out of hole with fish.

- **If dressing fishing neck is required**

1. Trip in hole with mill and dress fishing neck to allow for overshot to engage tubing.
2. Trip out of hole with mill.
3. Trip in hole with overshot and engage fish.
4. Pick up 2 points over neutral weight.

5. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
6. Once released from packer, trip out of hole with fish.

A skirted mill may be substituted for a standard mill to ensure pipe stabilization and the casing is not damaged while milling

Spear Fishing Procedure

If an overshot cannot be used to retrieve the fish, a spear may be used.

- Due to the use of insert lined tubing, the composite liner must be removed from the tubing before engaging the fish with a spear.

1. Trip in hole with spear sized to engage the I.D. of the insert liner.
2. Engage the insert liner inside the tubing with spear.
3. Pull the insert liner out of the tubing.
4. Trip out of hole with insert liner.
5. Trip in hole with spear sized to engage the I.D. of the tubing.
6. Engage the tubing with spear.
7. Pick up 2 points over neutral weight.
8. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
9. Once released from packer, trip out of hole with fish.

Inside Diameter Cutting Tool Fishing Procedure

If an overshot is required but a mill cannot be used to dress off a fishing neck, an inside diameter cutting tool may be used.

- Due to the use of insert lined tubing, the composite liner must be removed from the tubing before engaging the fish with a spear.

1. Trip in hole with spear sized to engage the I.D. of the insert liner.
2. Engage the insert liner inside the tubing with spear.
3. Pull the insert liner out of the tubing.
4. Trip out of hole with insert liner.
5. Trip in hole with inside diameter cutting tool and cut the tubing below the damaged fishing neck.
6. Trip out hole with cutting tool.
7. Trip in hole with spear sized to engage the I.D. of the tubing.
8. Engage the previously cut tubing segment with spear.
9. Trip out hole with cut tubing segment and spear.
10. Trip in hole with overshot and engage fish.
11. Pick up 2 points over neutral weight.
12. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
13. Once released from packer, trip out of hole with fish.

5 ½" UFJ Tubing Inside of 7 ⅝" 39# Casing

Series 150 Overshots

Tools are listed in order of maximum catch size.

The following table shows only a partial listing of available NOV Dowhole Bowen® overshots.

NOTE: Nitralloy Grapples are available upon request.

Bowen Series 150 Releasing and Circulation Overshots

Maximum Catch Size 4¼" to 5½" Inclusive

Maximum Catch Size (Spiral)		4¼	4⅝	4¾	4¾	5	5	5½
Maximum Catch Size (Basket)		3¹⁵⁄₁₆	4⅛	4¼	4¼	4¼	4¼	4⅞
Overshot O.D.		5⅜	5⅜	5⅜	5¾	5⅞	6⅜	6⅜
Type		F.S.	S.H.	S.H.	S.F.S.	S.H.	F.S.	S.H.
Complete Assembly	Part No.	5896	5698	C-5168	8975	C-5171	C-4825	8825
(Dressed Spiral Parts)	Weight	130	130	133	138	140	192	185
Replacement Parts								
Top Sub	Part No.	5897	5699	A-5169	8976	A-5172	B-4826	8826
Bowl	Part No.	5898	5700	B-5170	8977	B-5173	B-4827	8817
Packer	Part No.	169	1140	B-2199	6114	L-5950	L-4505	8818
Spiral Grapple	Part No.	165	1135	B-2201	6112	B-4369	M-1071	8819
Spiral Grapple Control	Part No.	186	1137	B-2202	6113	B-4370	M-1072	8820
Standard Guide	Part No.	187	1143	B-2203	6121	B-4371	L-1074	8821
Basket Parts								
Basket Grapple	Part No.	165	1135	B-2201	6112	B-4369	M-1071	8819
Basket Grapple Control	Part No.	186	1137	B-2202	6113	B-4370	M-1072	8820
Mill Control Packer	Part No.	169-R	1140-R	B-2199-R	6114-R	L-5950-R	M-4505	L-8818-R

A (6.625" turned down to **6.500"** O.D.) Bowen Series 150 Overshot will be used to perform this overshot operation. Details on the overshot are listed above. Casing to tubing clearance dimensions are listed below.

5.5" 17# FJ Casing Inside 7.625" 39# FJ Casing

Clearance (in)	Pipe Size (in)	Weight lb/ft	Grade	Conn.	Type	Body O.D. (in)	Coupling O.D. (in)	I.D. (in)	Drift (in)	Lined Wt. lb/ft	Lined I.D. (in)	Flare I.D. (in)	Lined Drift (in)
0.500	7 5/8	39.0	HCL-80	FJ	Casing	7.625	7.625	6.625	6.500	-	-	-	-
	5 1/2	17.0	HCL-80	FJ	Casing	5.500	5.500	4.892	4.767	18.500	4.520	4.400	4.275

*Red Indicates Tubing

Fishing Procedure

Overshot Fishing Procedure

In the Event of a Connection Break

- **If fishing neck is clean**

1. Trip in hole with overshot and engage fish.
2. Pick up 2 points over neutral weight.
3. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
4. Once released from packer, trip out of hole with fish.

   A skirted mill may be substituted for a standard mill to ensure pipe stabilization and the casing is not damaged while milling

- **If dressing fishing neck is required**

1. Trip in hole with mill and dress fishing neck to allow for overshot to engage tubing.
2. Trip out of hole with mill.
3. Trip in hole with overshot and engage fish.
4. Pick up 2 points over neutral weight.
5. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
6. Once released from packer, trip out of hole with fish.

   A skirted mill may be substituted for a standard mill to ensure pipe stabilization and the casing is not damaged while milling

In the Event of a Body Break

- **If fishing neck is clean**

1. Trip in hole with overshot and engage fish.
2. Pick up 2 points over neutral weight.
3. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
4. Once released from packer, trip out of hole with fish.

- **If dressing fishing neck is required**

1. Trip in hole with mill and dress fishing neck to allow for overshot to engage tubing.
2. Trip out of hole with mill.
3. Trip in hole with overshot and engage fish.
4. Pick up 2 points over neutral weight.

5. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
6. Once released from packer, trip out of hole with fish.

A skirted mill may be substituted for a standard mill to ensure pipe stabilization and the casing is not damaged while milling

Spear Fishing Procedure

If an overshot cannot be used to retrieve the fish, a spear may be used.

- Due to the use of insert lined tubing, the composite liner must be removed from the tubing before engaging the fish with a spear.

1. Trip in hole with spear sized to engage the I.D. of the insert liner.
2. Engage the insert liner inside the tubing with spear.
3. Pull the insert liner out of the tubing.
4. Trip out of hole with insert liner.
5. Trip in hole with spear sized to engage the I.D. of the tubing.
6. Engage the tubing with spear.
7. Pick up 2 points over neutral weight.
8. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
9. Once released from packer, trip out of hole with fish.

Inside Diameter Cutting Tool Fishing Procedure

If an overshot is required but a mill cannot be used to dress off a fishing neck, an inside diameter cutting tool may be used.

- Due to the use of insert lined tubing, the composite liner must be removed from the tubing before engaging the fish with a spear.

1. Trip in hole with spear sized to engage the I.D. of the insert liner.
2. Engage the insert liner inside the tubing with spear.
3. Pull the insert liner out of the tubing.
4. Trip out of hole with insert liner.
5. Trip in hole with inside diameter cutting tool and cut the tubing below the damaged fishing neck.
6. Trip out hole with cutting tool.
7. Trip in hole with spear sized to engage the I.D. of the tubing.
8. Engage the previously cut tubing segment with spear.
9. Trip out hole with cut tubing segment and spear.
10. Trip in hole with overshot and engage fish.
11. Pick up 2 points over neutral weight.
12. Turn pipe 10-15 turns to the right to release the seal assembly from the packer.
13. Once released from packer, trip out of hole with fish.

Abandonment Procedure

If the tubing cannot be recovered and the well is to be abandoned.

- The operator will ensure that all geologic formations are properly isolated.

1. Confirm the I.D. of the injection tubing is free from obstructions.
2. Run in hole with wireline set profile plug.
3. Set plug inside of packer assembly.
   (Plug will allow cement to fill the I.D. of the injection tubing and the tubing to casing annulus)
4. Run in hole with wireline conveyed perforating guns and perforate the tubing immediately above the packer.
5. Trip in hole with an overshot, spear, cement retainer or isolation tool that will provide a work string-to- injection tubing seal.
6. Engage the fish with sealing tool.
7. Confirm circulation down the tubing and up the tubing-to-casing annulus.
8. Cement the work string, injection tubing, injection tubing-to-casing annulus and work string-to-casing annulus to surface.
9. Confirm the entirety of the wellbore is cemented to surface and all zones are isolated.
10. ND wellhead and install permanent capping flange.

Attachment to C-108 Application for Authorization to Inject
Permian Oilfield Partners, LLC
Ramrod Fee SWD #1
323' FSL & 2227' FEL
Sec 17, T21S, R28E
Eddy County, NM

September 25, 2019

STATEMENT REGARDING SEISMICITY

Examination of the USGS and TexNet seismic activity databases has shown minimal historic seismic activity in the area (< 30 miles) of our proposed above referenced SWD well as follows:

Magnitude	Date	Lat	Lon	Distance (mi.)	Bearing (°)
M3.1 USGS	3/18/2012	32.281	-103.892	18.36	133.50
M4.1 USGS	3/28/2010	32.438	-104.501	23.23	276.13
M3.4 USGS	8/26/2004	32.582	-104.505	24.49	287.74
M3.0 USGS	10/28/2004	32.604	-104.499	24.67	291.35
M3.6 USGS	6/21/2003	32.665	-104.505	26.80	299.49

Permian Oilfield Partners does not own any 2D or 3D seismic data in the area of this proposed SWD well. Our fault interpretations are based on well to well correlations and publicly available data and software as follows:

1. USGS Quaternary Fault & Fold database shows no quaternary faults in the nearby area.
2. Based on offset well log data, we have not interpreted any faults in the immediate area.
3. Basement PreCambrian faults are documented in the Snee & Zoback paper, “State of stress in the Permian Basin, Texas and New Mexico: Implications for induced seismicity”, published in the February 2018 issue of the SEG journal, The Leading Edge, along with a method for determining the probability of fault slip in the area.
4. Fault data was also correlated to the publicly available USGS GIS geologic units & structural features database, to Ewing’s 1990 Tectonic map of Texas (via Ruppel’s 2005 Preparation of Maps Depicting Geothermal Gradient and PreCambrian Structure in the Permian Basin), and to fault maps as published in the New Mexico Geological Society Special Publication 13A, “Energy and Mineral Resources of New Mexico: Petroleum Geology,” by R. F. Broadhead, 2017.

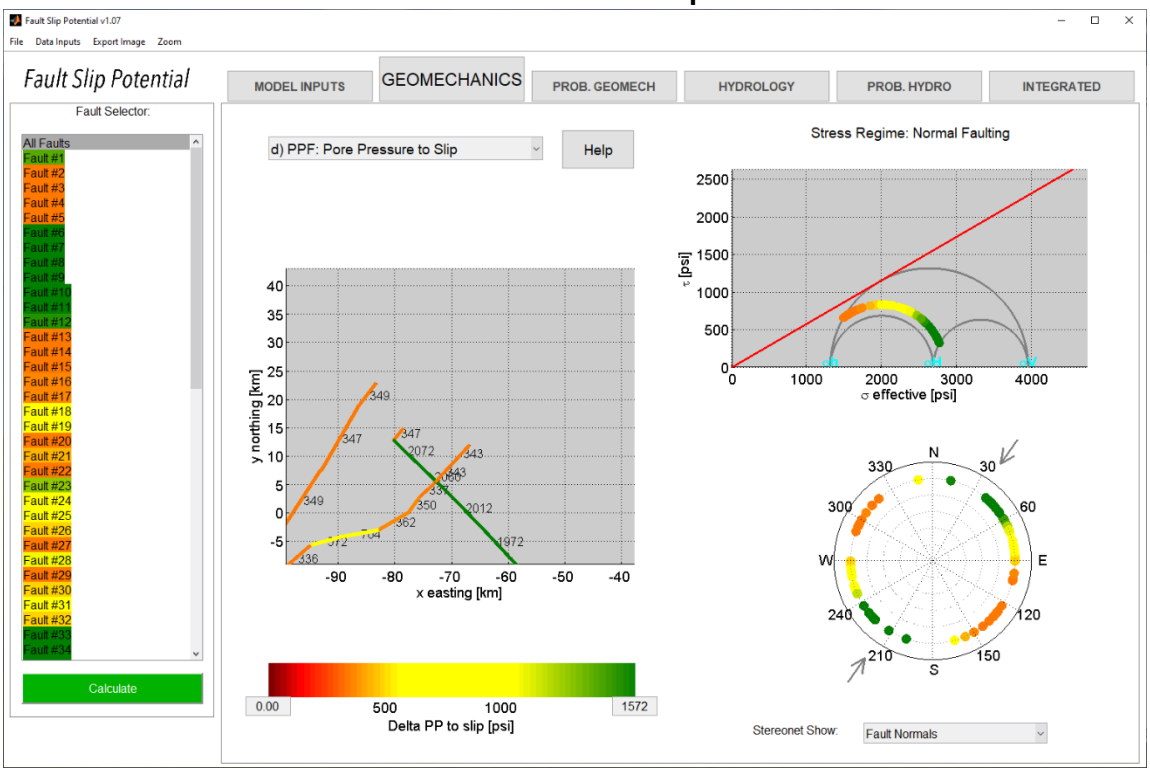
5. Software as discussed in #3 from the Stanford Center for Induced and Triggered Seismicity, “FSP 1.0: A program for probabilistic estimation of fault slip potential resulting from fluid injection”, was used to calculate the probability of a fault being stressed so as to create an induced seismic event, assuming full proposed capacity of 50,000 BBL/day for 30 years.
6. Two FSP scenarios were run:
    a. The first FSP scenario assumes PreCambrian faults as per the available data described above, with an improbable catastrophic well failure that would allow full rate injected water to penetrate the Montoya and Simpson permeability barriers, the Ellenburger, and the Cambrian to access the PreCambrian faults.
    b. Because there is evidence that the PreCambrian faults extend into the Devonian in areas, we ran a second FSP scenario with Devonian depth & lithology assumptions.
7. The distance from the proposed injection well to the nearest fault is approximately 22km. The probability of an induced seismic event in the PreCambrian is calculated to be 0% after 5, 10, 20, & 30 years as per the FSP results screenshots below. The probability of an induced seismic event in the Devonian is also calculated to be 0% after 5, 10, 20, & 30 years.
8. As per NM OCD requirements (injection well to injection well spacing minimum of 1.5 miles), this proposed above referenced SWD well is located 1.55 miles away from the nearest active or permitted Devonian disposal well (Judah Oil Shinnery Oak Fed SWD #2, in Sec 15-21S-28E).

Part 6 a: PreCambrian Fault Scenario

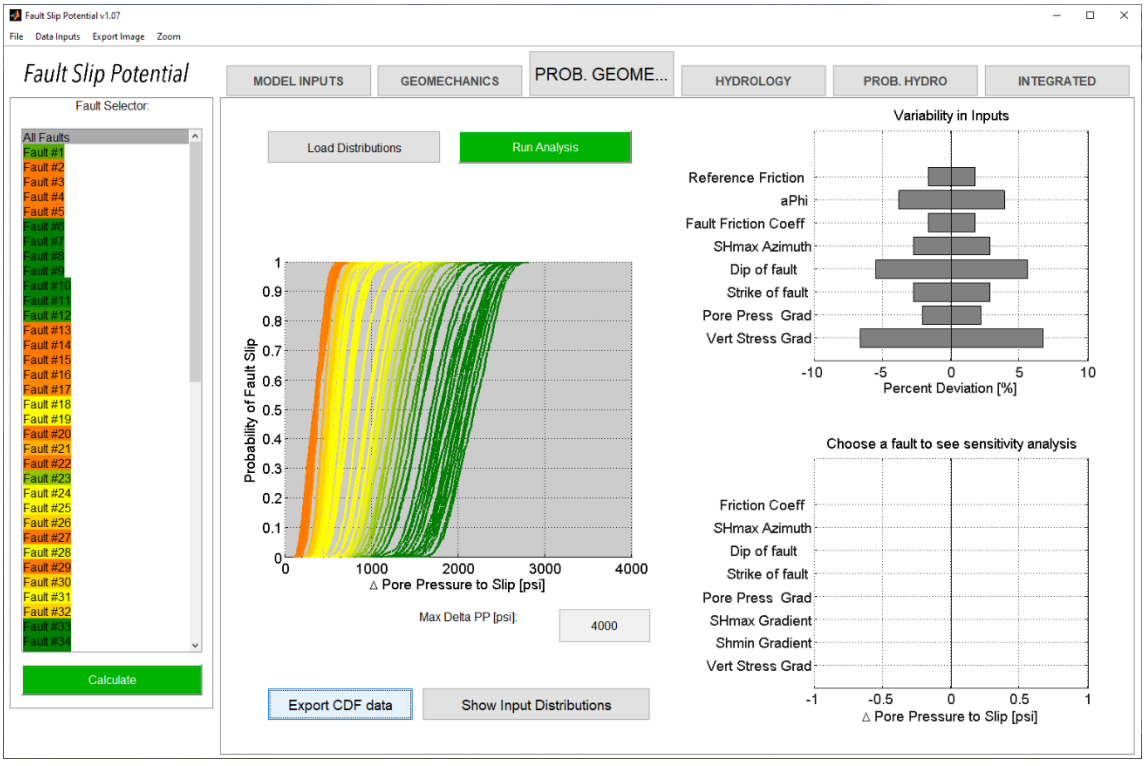
PreCambrian input assumptions:

Rate (BBL/day)	50000
Interval height (ft)	1000
Average Porosity (%)	3
Vert stress gradient (psi/ft)	0.75
Hor stress direction (deg N)	35
Fault dip (deg)	75
Ref depth (ft)	14126
Initial res press gradient (psi/ft)	0.47
A phi	0.52
Friction coefficient	0.58
Average perm (mD)	12.5
Fluid density (kg/m3)	1100
Dynamic viscosity (Pa-s)	0.0003
Fluid compressibility (/Pa)	4 e-10
Rock compressibility (/Pa)	1.08 e-09

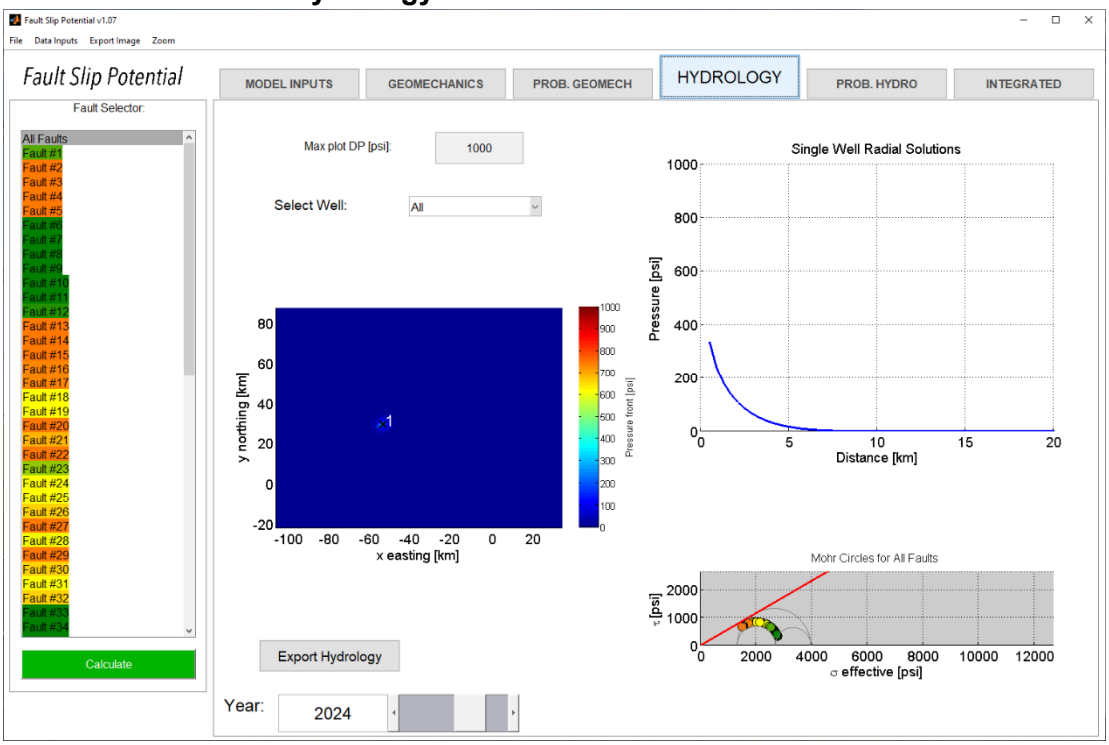
PreCambrian Geomechanics Pore Pressure to Slip



PreCambrian GeoMechanics Variability

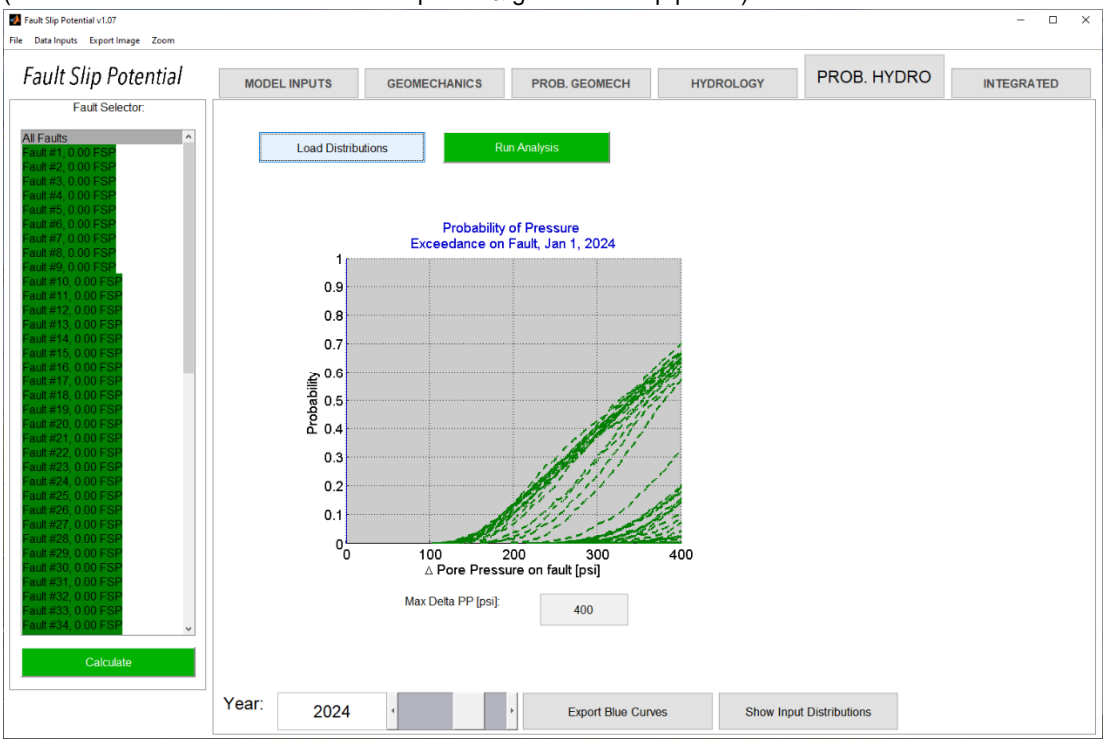


PreCambrian Year 5 Hydrology



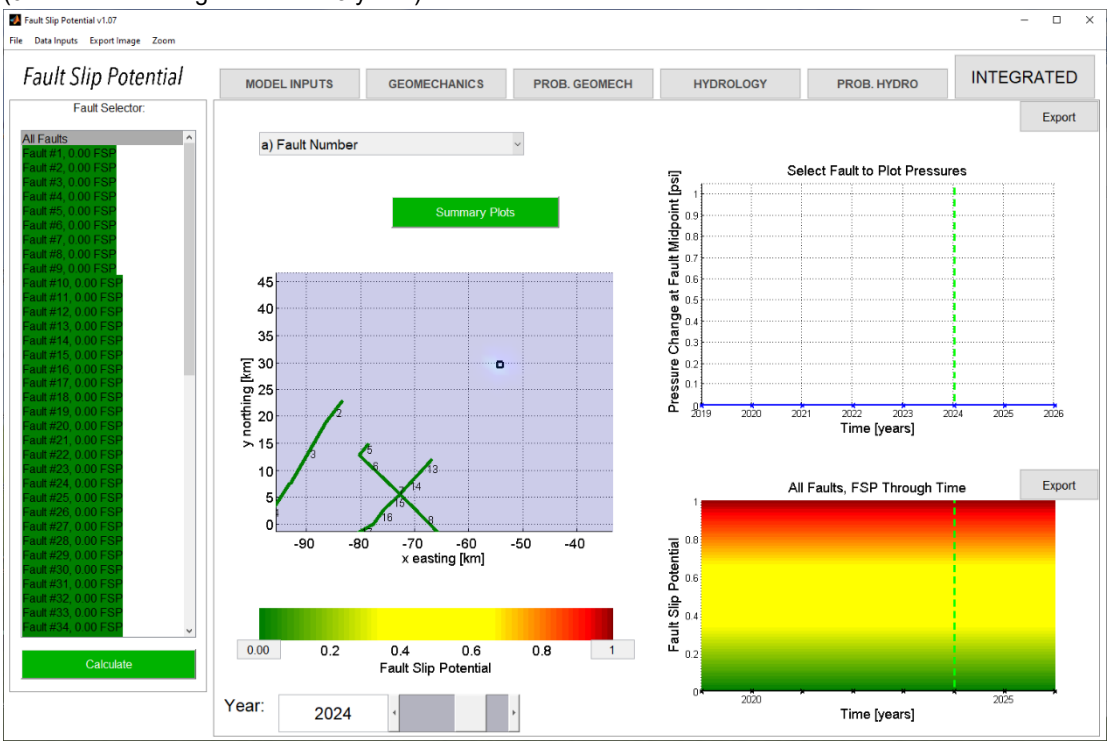
PreCambrian Year 5 Probabilistic Hydrology

(note no crossover between blue delta-press. & green fault slip press.)

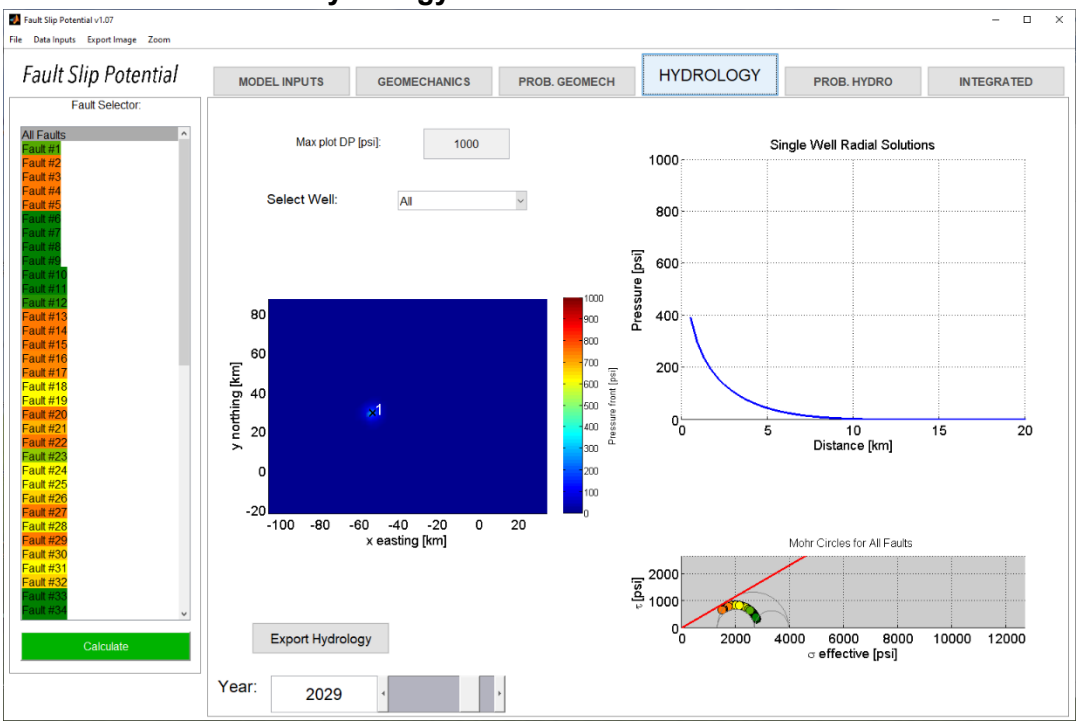


PreCambrian Year 5 Fault Slip Probability

(0% for all fault segments after 5 years)

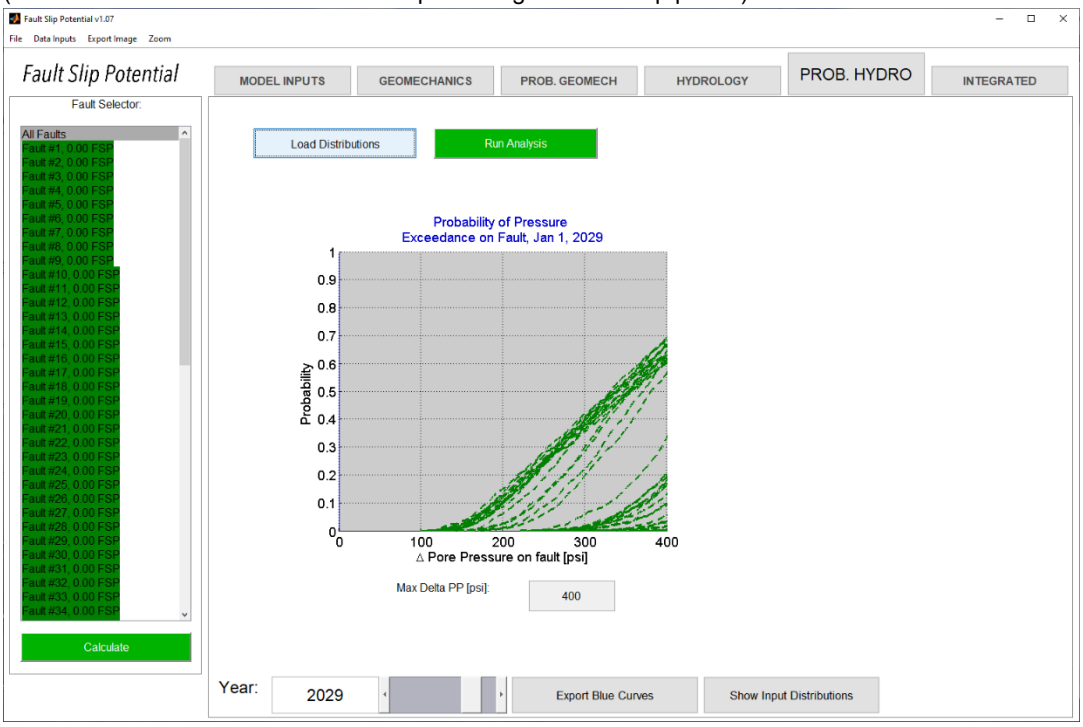


PreCambrian Year 10 Hydrology



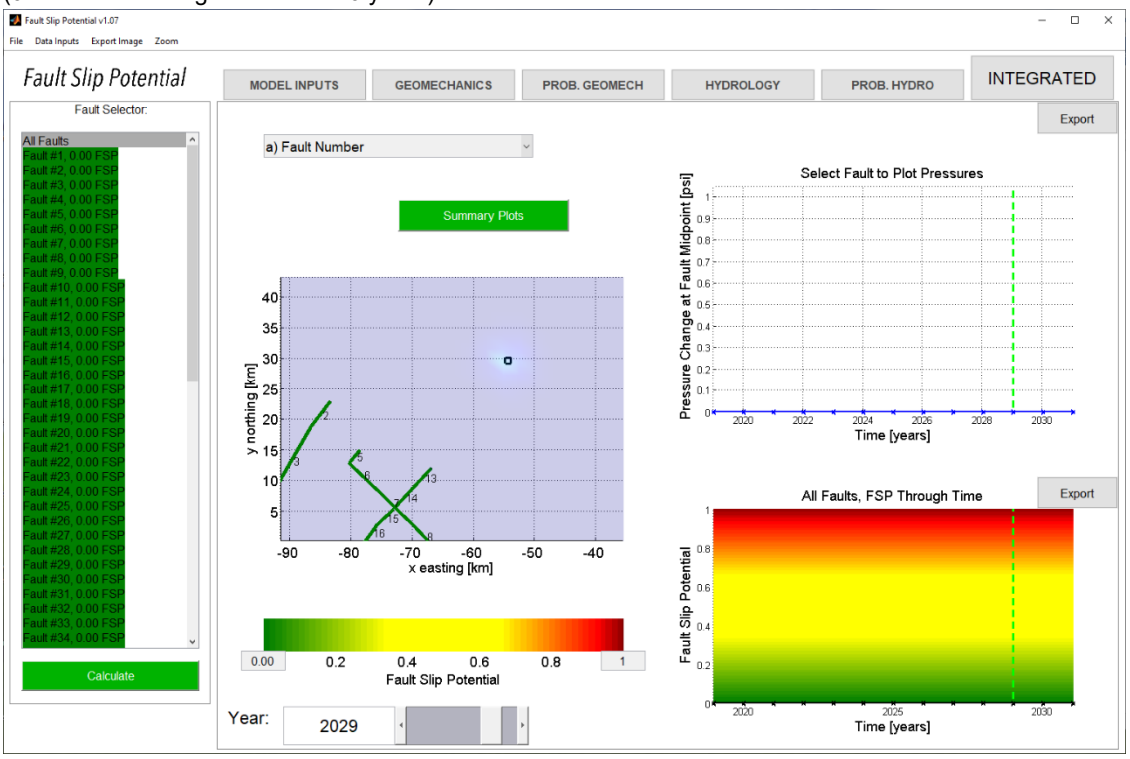
PreCambrian Year 10 Probabilistic Hydrology

(note no crossover between blue delta-press. & green fault slip press.)

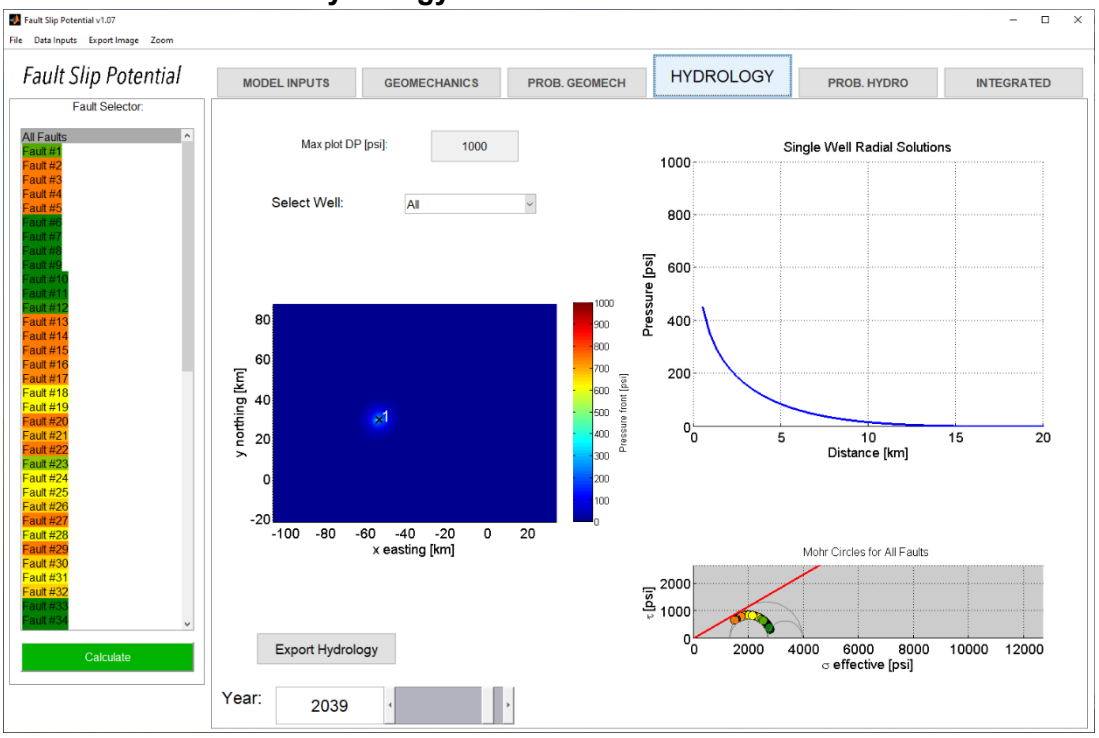


PreCambrian Year 10 Fault Slip Probability

(0% for all fault segments after 10 years)

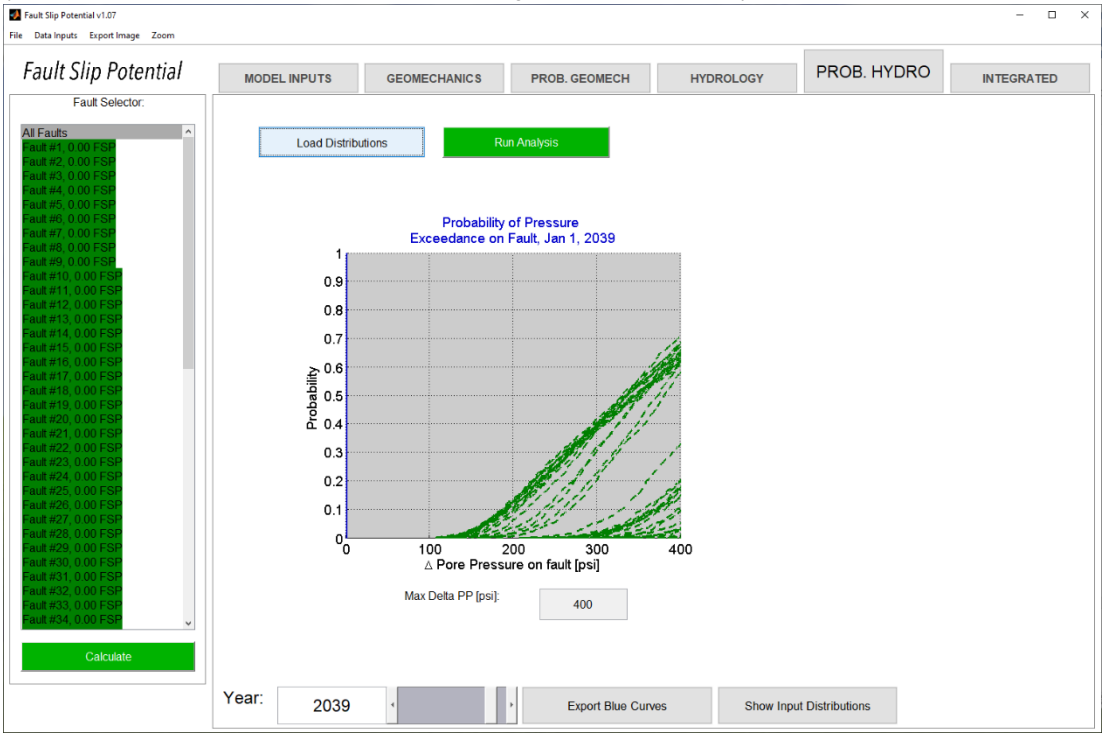


PreCambrian Year 20 Hydrology



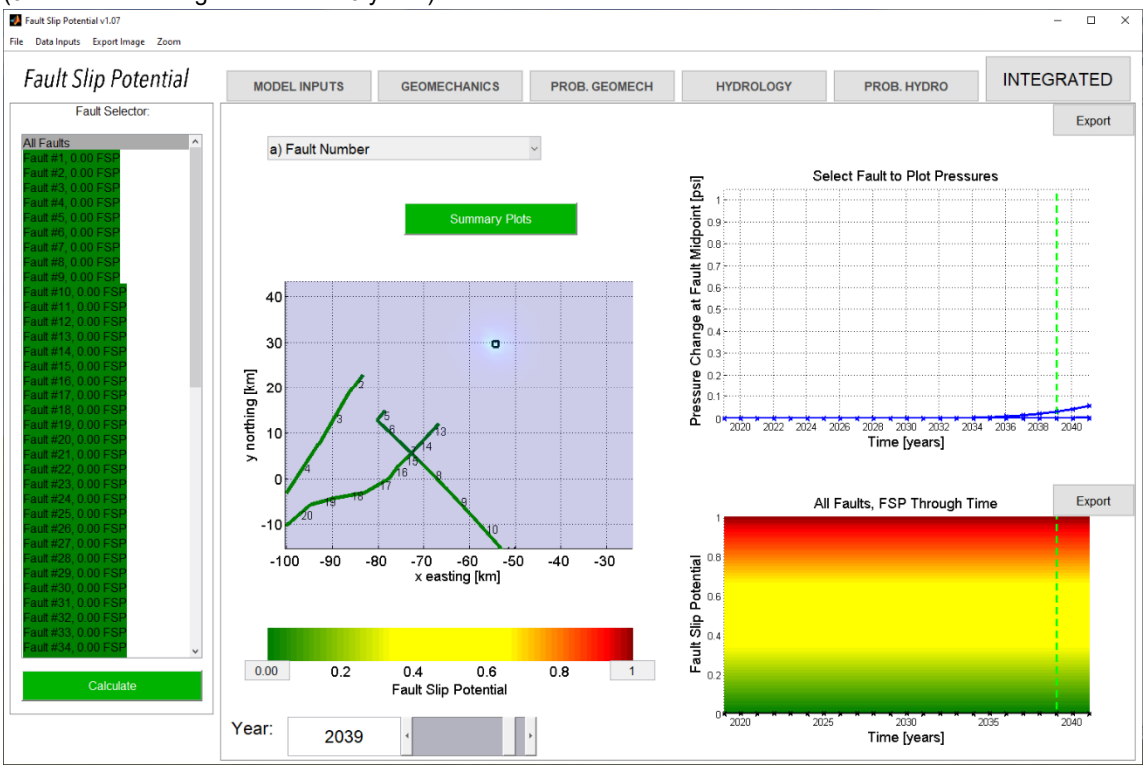
PreCambrian Year 20 Probabilistic Hydrology

(note no crossover between blue delta-press. & green fault slip press.)

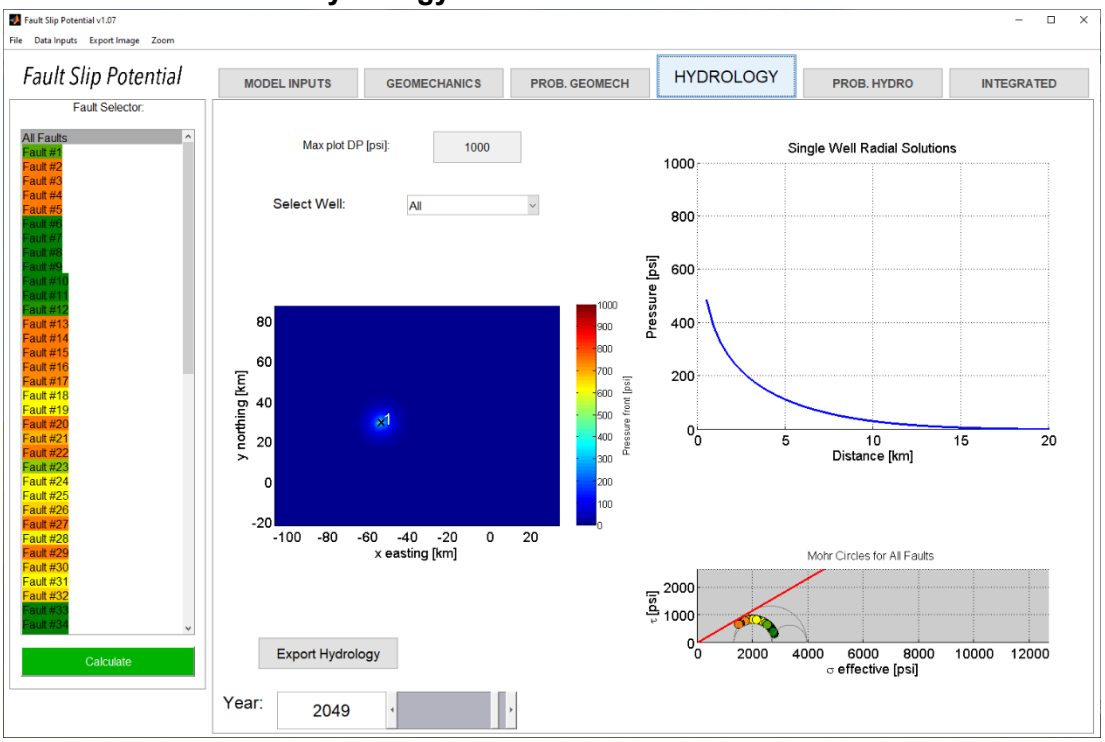


PreCambrian Year 20 Fault Slip Probability

(0% for all fault segments after 20 years)

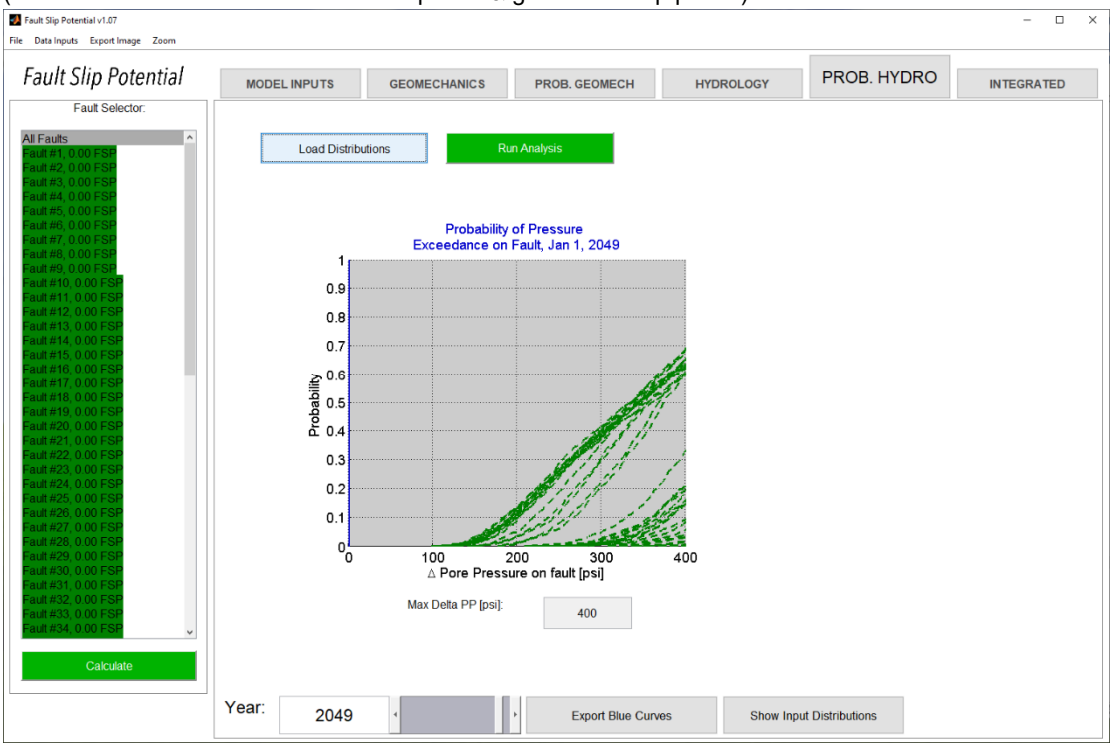


PreCambrian Year 30 Hydrology



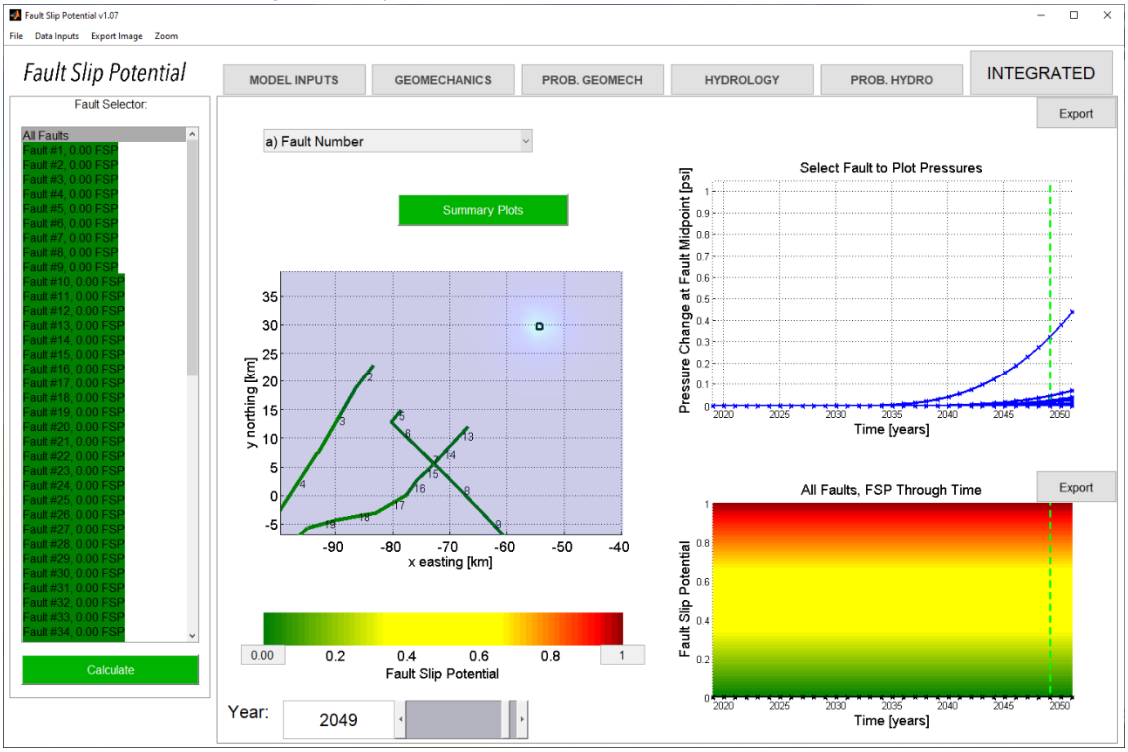
PreCambrian Year 30 Probabilistic Hydrology

(note no crossover between blue delta-press. & green fault slip press.)



PreCambrian Year 30 Fault Slip Probability

(0% for all fault segments after 30 years. 0.3 psi fault delta pressure is much less than the 343 psi required for fault slip in the closest fault segment #13)

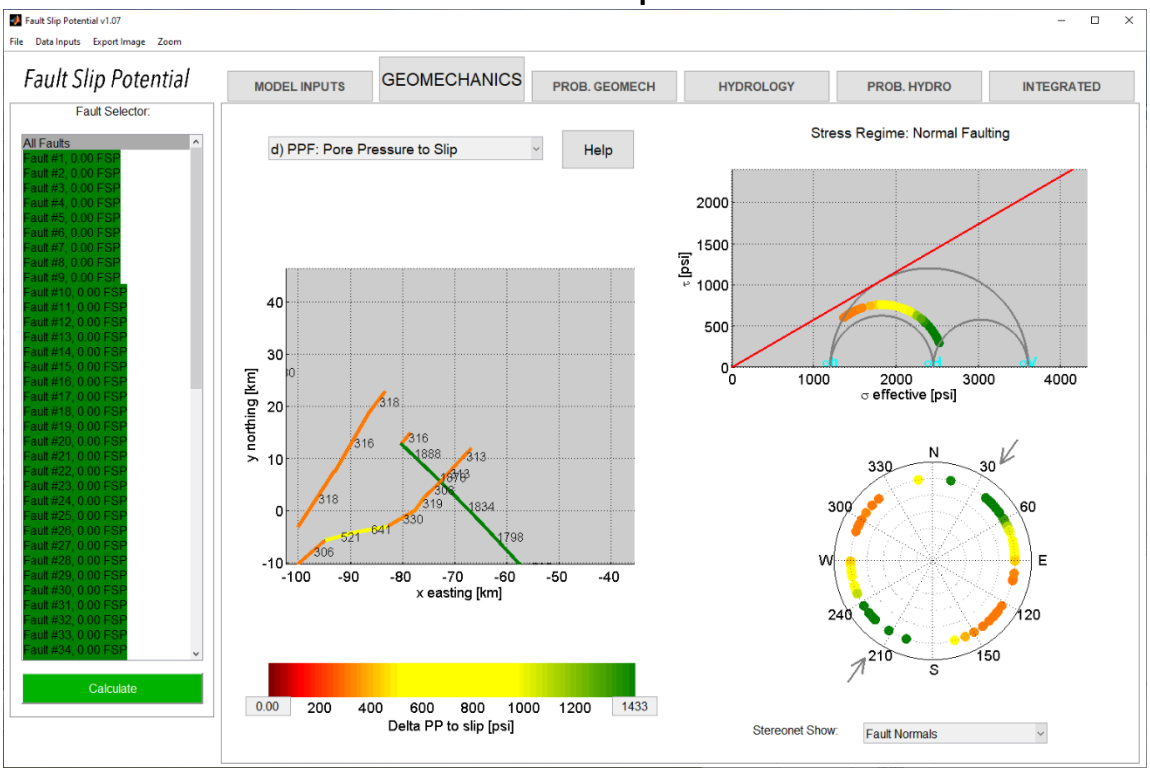


Part 6 b: Devonian Fault Scenario

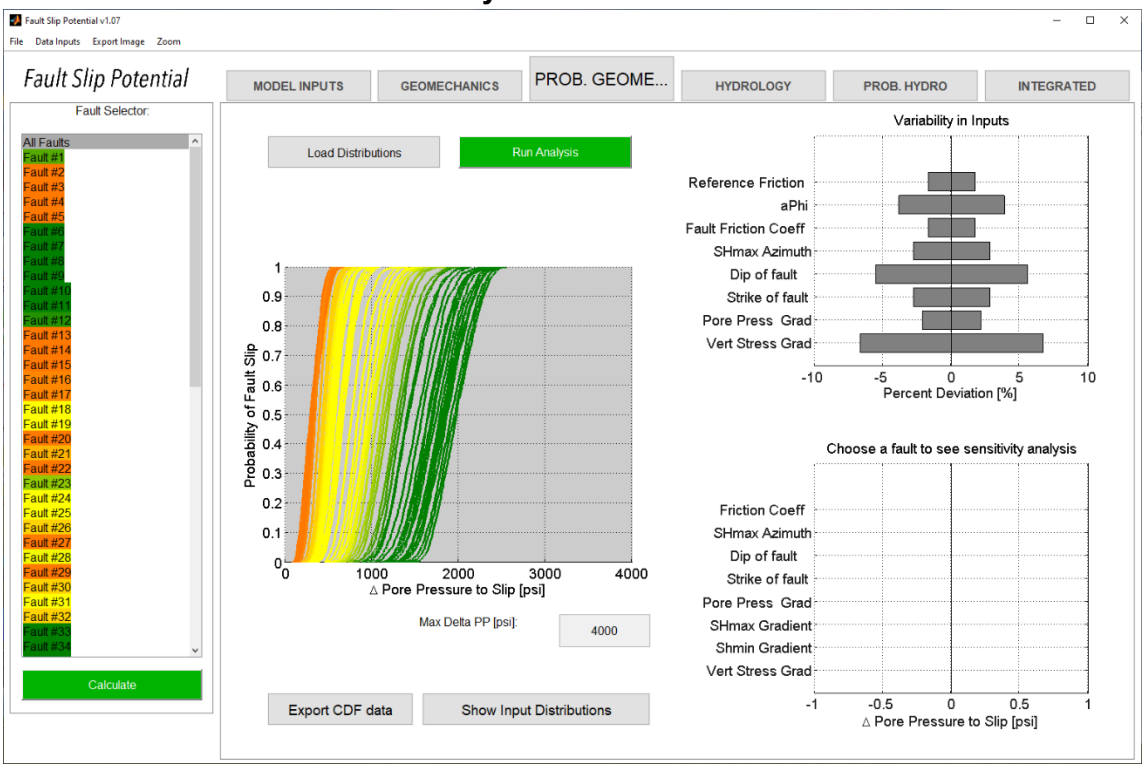
Devonian input assumptions:

Rate (BBL/day)	50000
Interval height (ft)	679
Weighted Average Porosity (%)	3.3
Vert stress gradient (psi/ft)	0.75
Hor stress direction (deg N)	35
Fault dip (deg)	75
Ref depth (ft)	12851
Initial res press gradient (psi/ft)	0.47
A phi	0.52
Friction coefficient	0.58
Weighted Average perm (mD)	19
Fluid density (kg/m3)	1100
Dynamic viscosity (Pa-s)	0.0003
Fluid compressibility (/Pa)	4 e-10
Rock compressibility (/Pa)	1.08 e-09

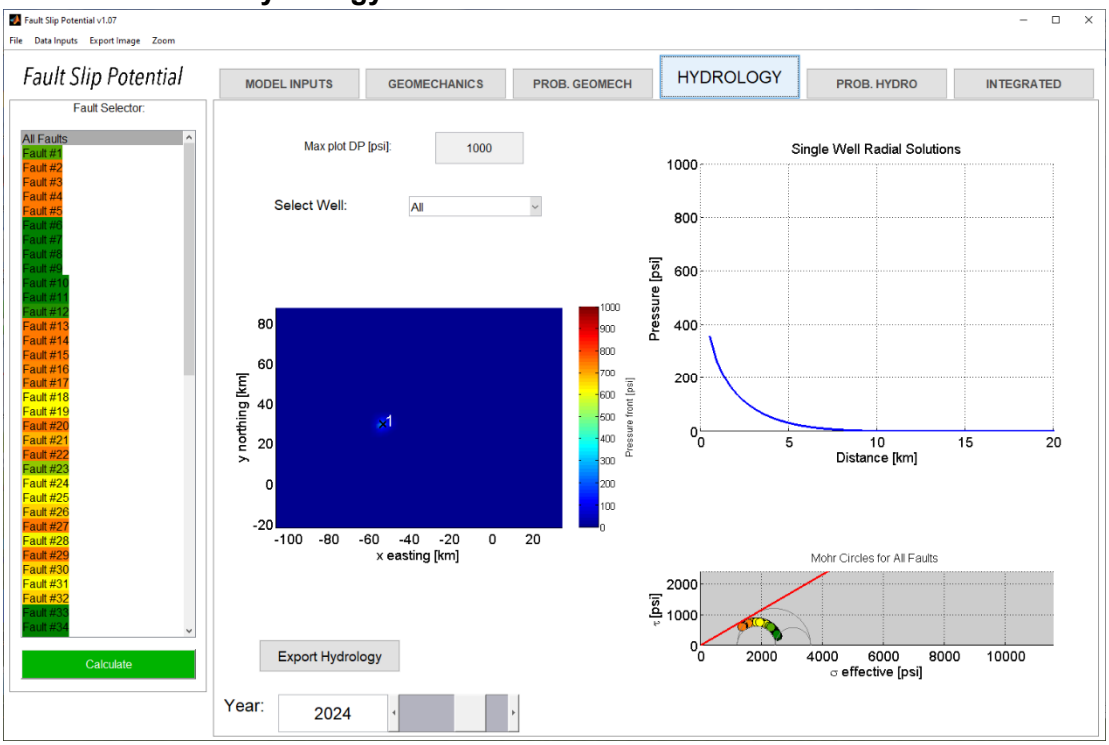
Devonian Geomechanics Pore Pressure to Slip



Devonian GeoMechanics Variability

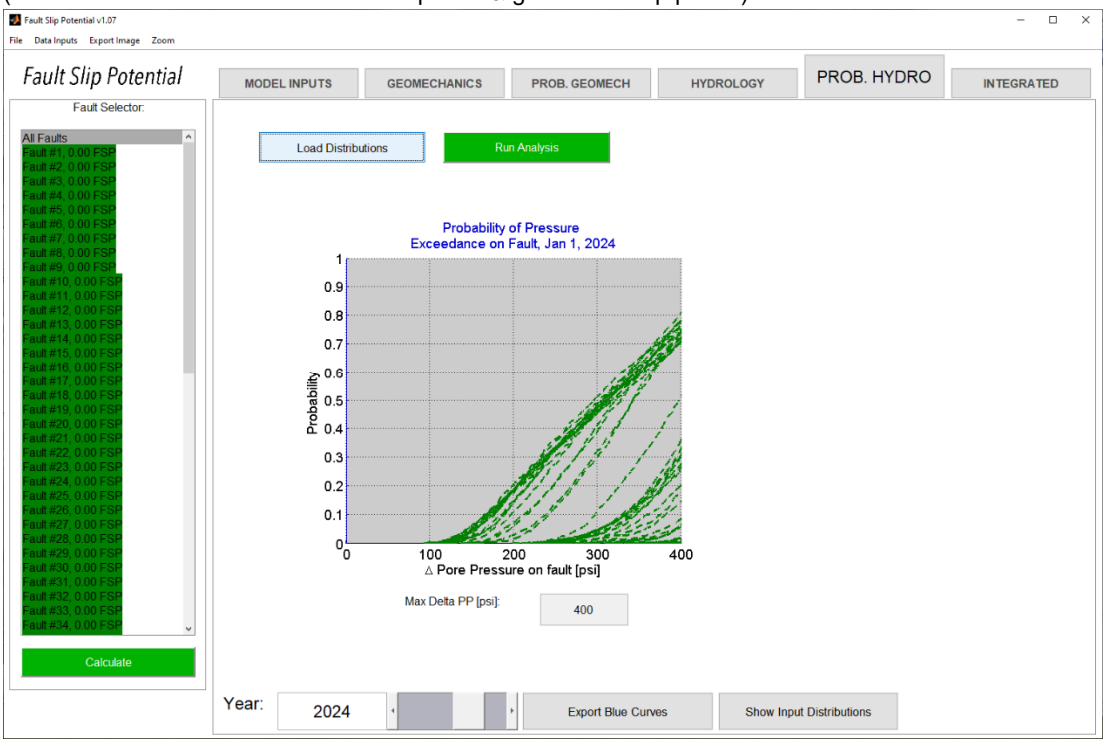


Devonian Year 5 Hydrology



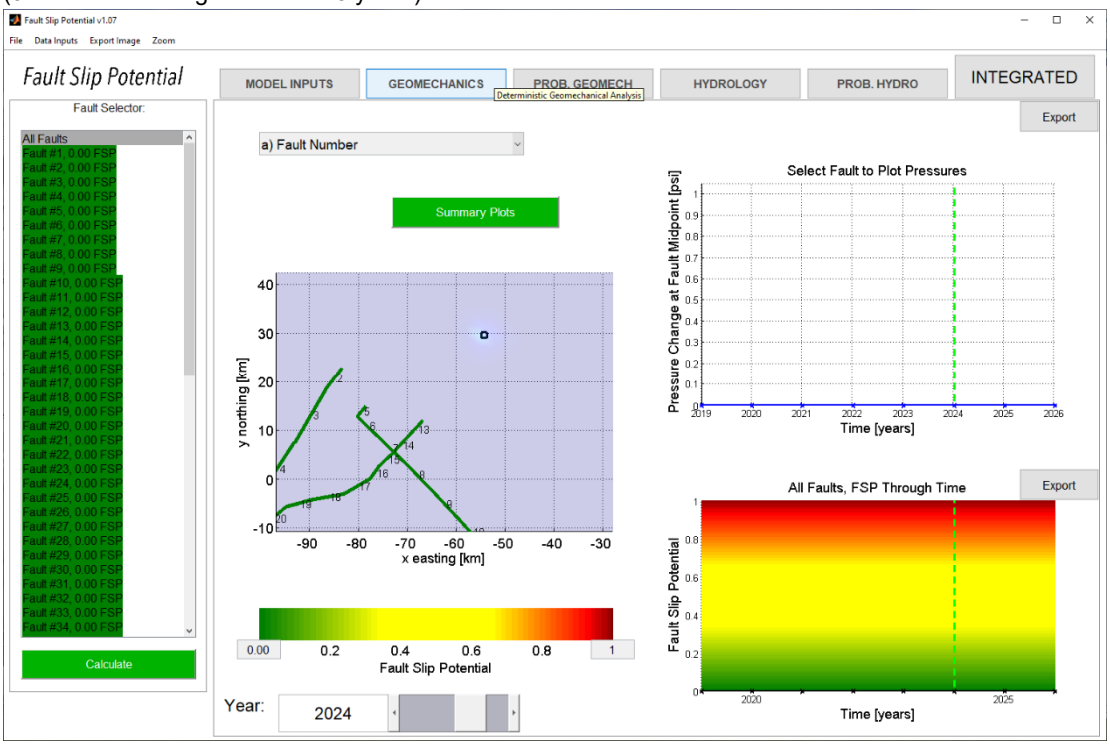
Devonian Year 5 Probabilistic Hydrology

(note no crossover between blue delta-press. & green fault slip press.)

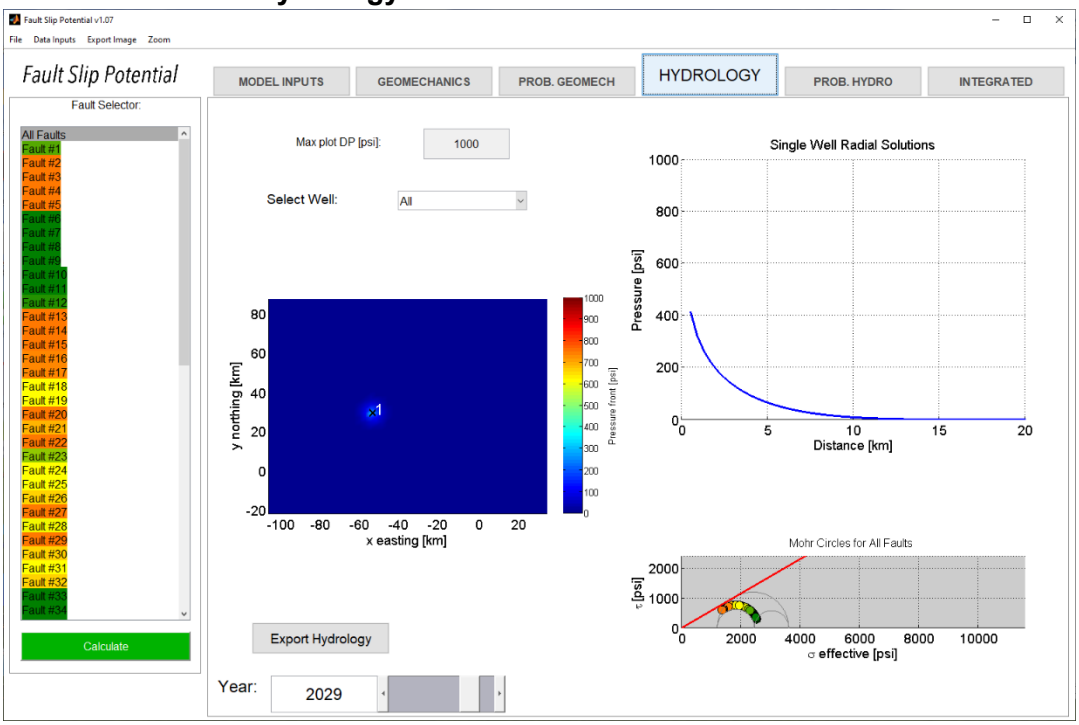


Devonian Year 5 Fault Slip Probability

(0% for all fault segments after 5 years)

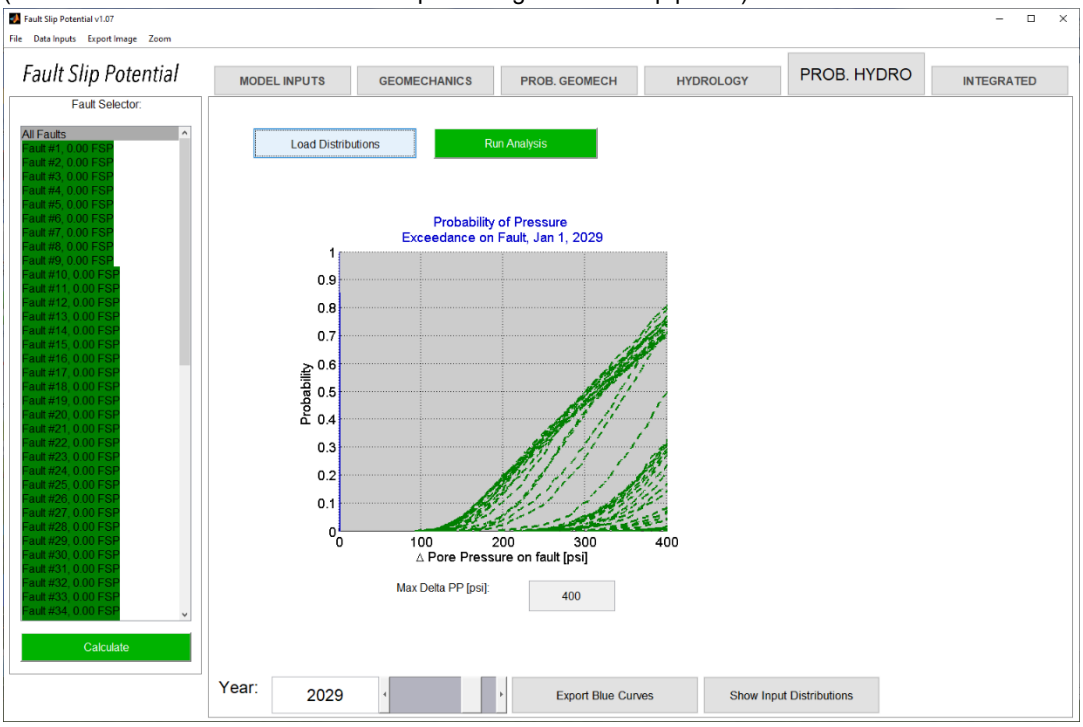


Devonian Year 10 Hydrology



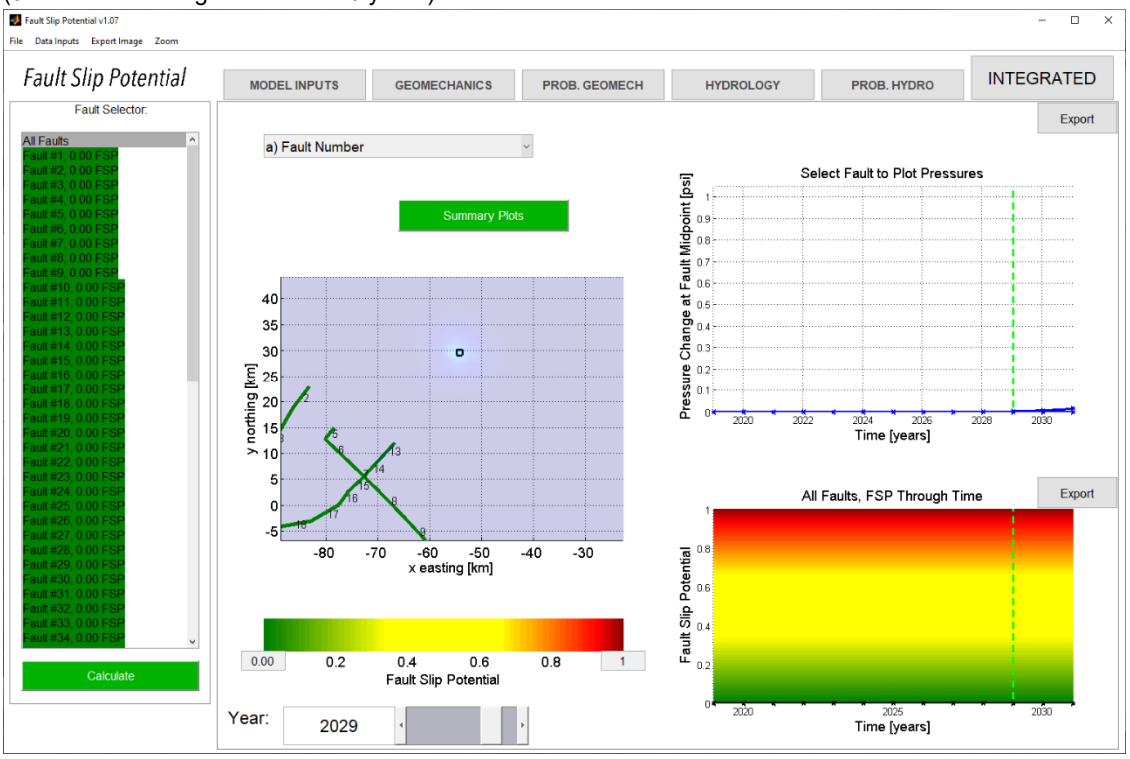
Devonian Year 10 Probabilistic Hydrology

(note no crossover between blue delta-press. & green fault slip press.)

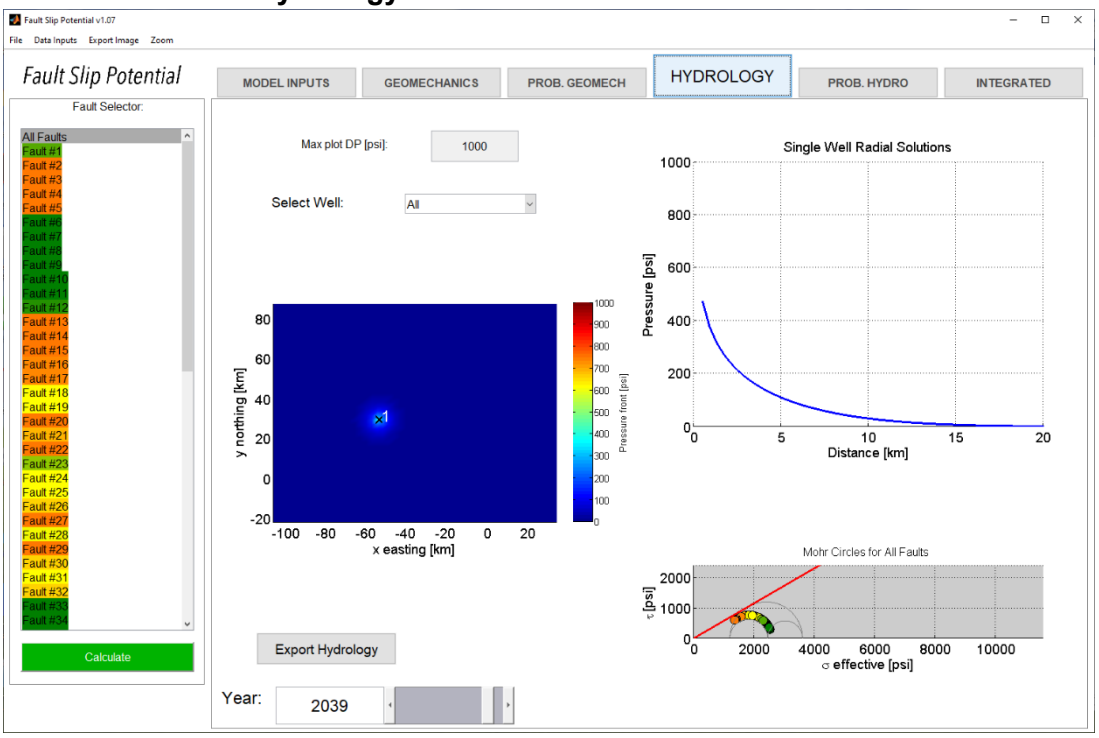


Devonian Year 10 Fault Slip Probability

(0% for all fault segments after 10 years)

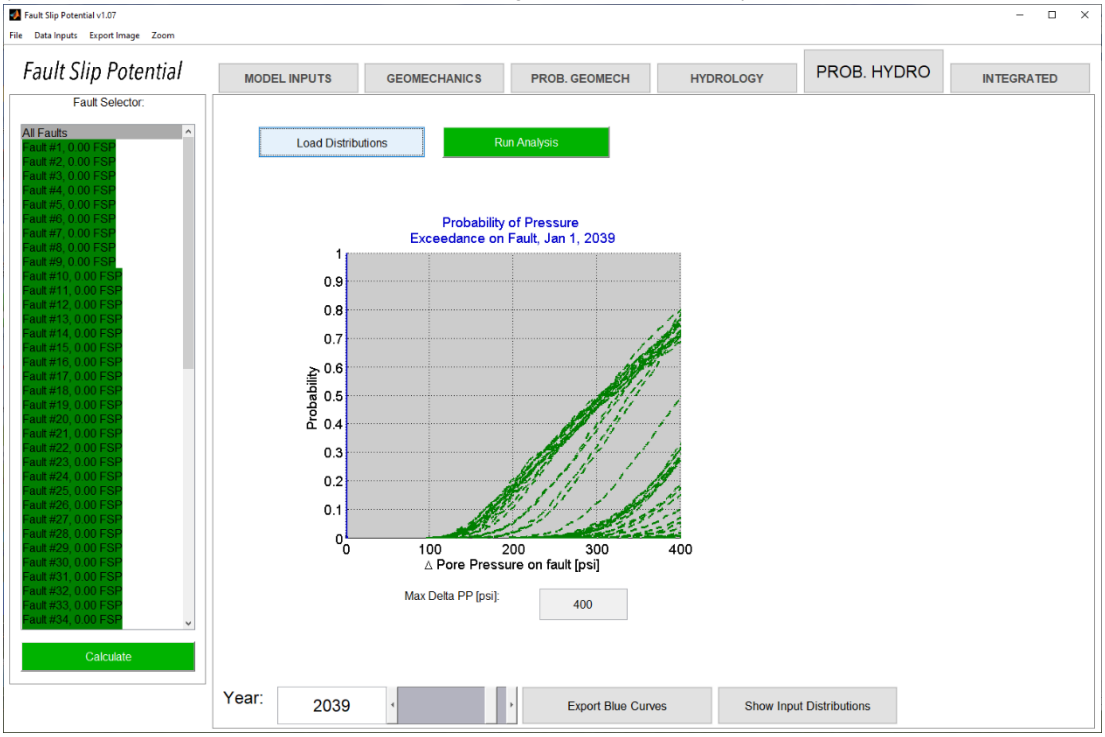


Devonian Year 20 Hydrology



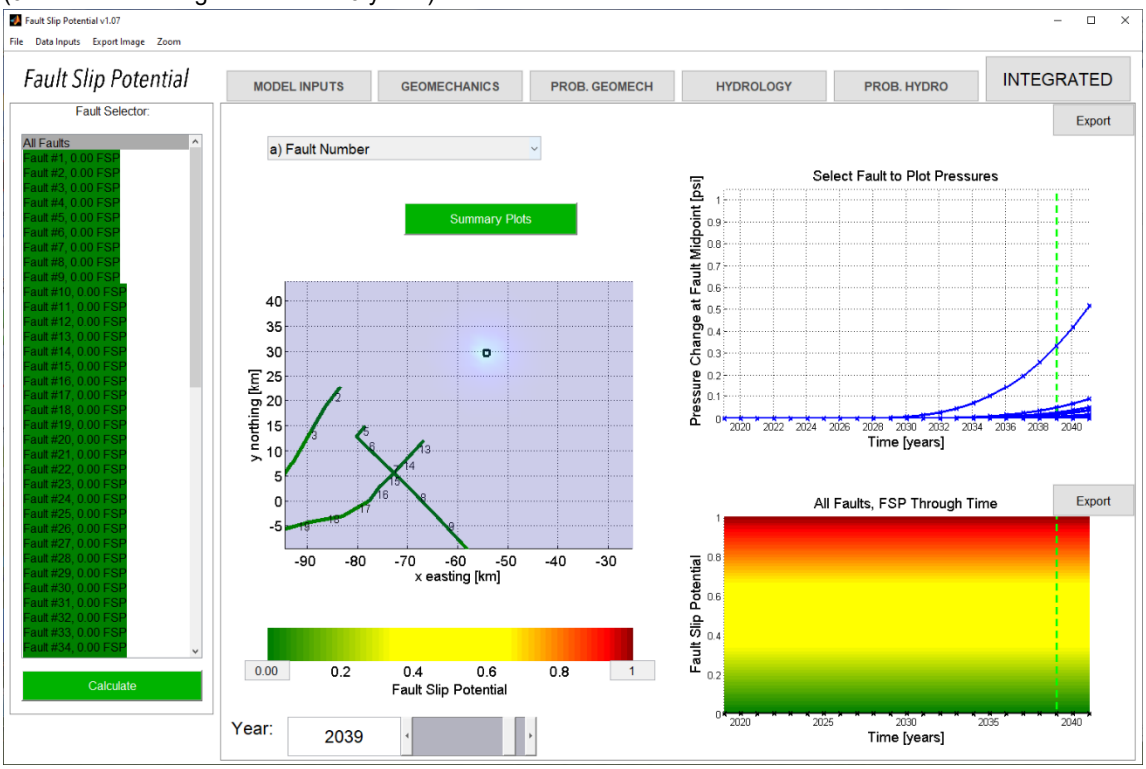
Devonian Year 20 Probabilistic Hydrology

(note no crossover between blue delta-press. & green fault slip press.)

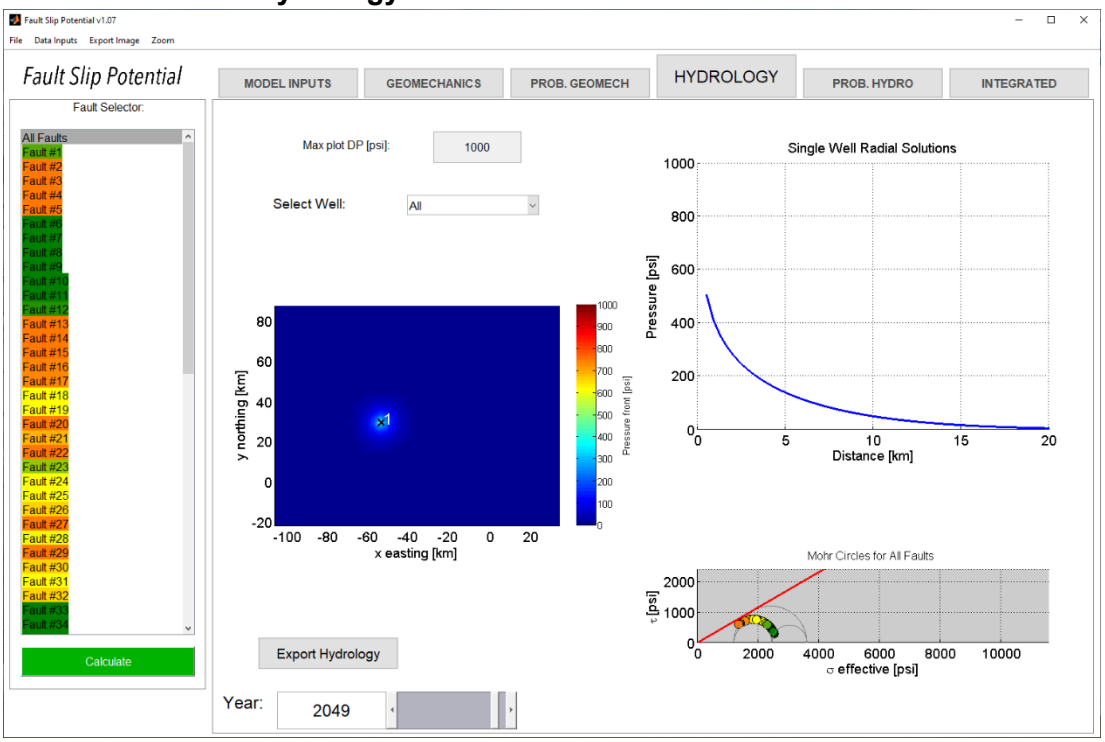


Devonian Year 20 Fault Slip Probability

(0% for all fault segments after 20 years)

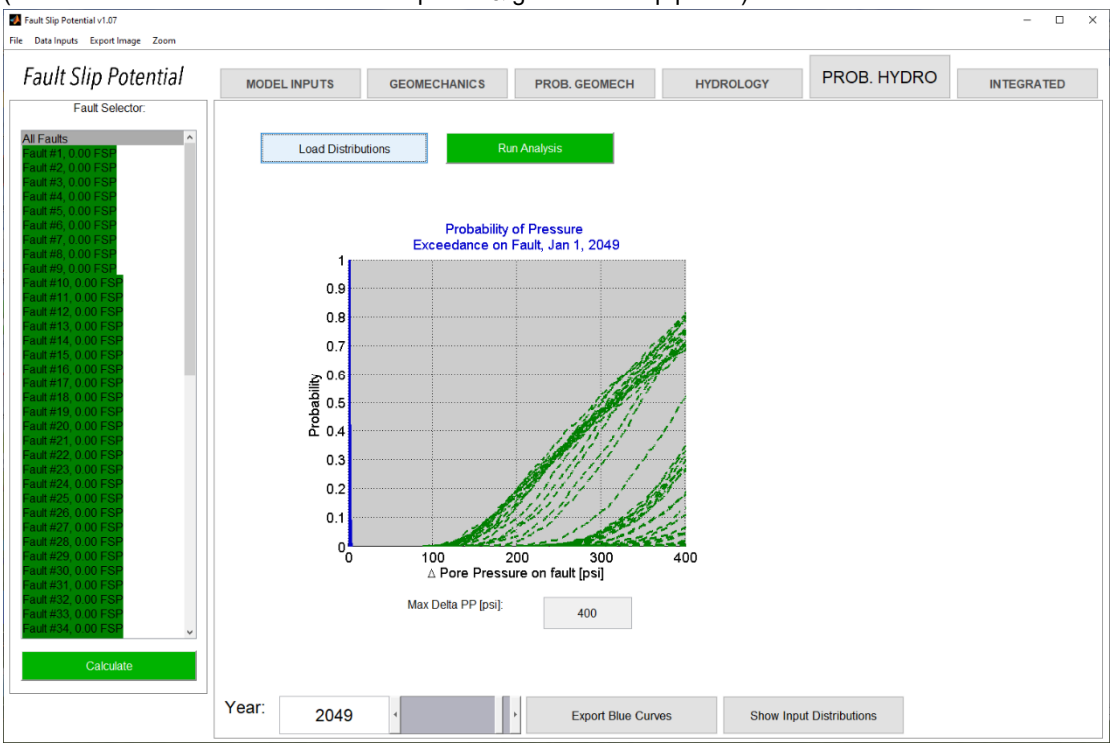


Devonian Year 30 Hydrology



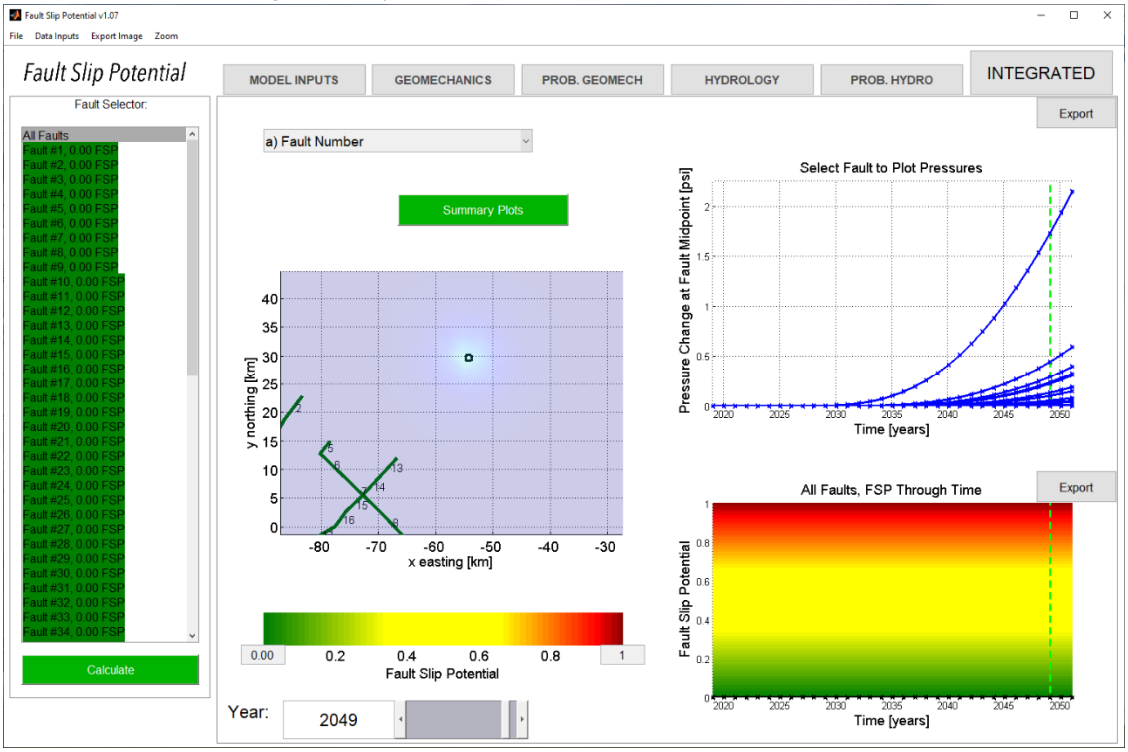
Devonian Year 30 Probabilistic Hydrology

(note no crossover between blue delta-press. & green fault slip press.)



Devonian Year 30 Fault Slip Probability

(0% for all fault segments after 30 years. 1.75 psi fault delta pressure is much less than the 313 psi required for fault slip in the closest fault segment #13)



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