PRA

Petroleum Remediation Additive

PRODUCT INFORMATION

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PRA
Petroleum Remediation Additive

Plutus Environmental Group (PEG) offer a new and entirely environmentally safe approach to hydrocarbon remediation problems.

We specialise in quick, effective and environmentally-safe products, specifically designed to provide solutions to companies who deal with the treatment of hydrocarbons. PEG sell worldwide and also have exclusive rights to trade these products. For more information on our unique products, international client-base, successful case studies and our 100% proven track record, contact us today at **info@plutuseg.com**

What is **PRA**?

- **PRA** is a Paraffin Remediation Additive which is a direct injection product for paraffin management.
- **PRA** is New Technology which is a proprietary blend of organic emulsifiers and surfactants that is completely environmentally safe.
- **PRA** acts as a tension breaker which lowers the water/ paraffin molecule surface tension.
- **PRA** dehydrates the paraffin wax formation causing the paraffin to return to the oil phase where it will remain until the refining process.
- **PRA** is NOT A SOLVENT

PRA
Petroleum Remediation Additive

The most cost-effective solution to your wax problem

Plutus Environmental Group (PEG) offer the most cost efficient, environmentally safe and effective hydrocarbon remediation solutions available on the market today. Our products have a 100% success rate. They are proven to lower the viscosity of your crude oil with no loss in productivity during the application process.
For more information on a specialised treatment for your needs contact us today **info@plutuseg.com** or visit our website **www.plutus-environmental.com**

Clean, wax-free jet pump 16 weeks after well was treated with PRA

WHAT IS IT?

An environmentally safe, highly confidential blend of natural emulsifiers and surfactants.

Plutus Environmental Group's products are 100% biodegradable and zero Hazmat rated.

They contain no solvents, are non-toxic, non-flammable and contain no chemicals, dispersants or detergents.

For more information contact us today **info@plutuseg.com** or visit our website **www.plutus-environmental.com**

HOW DOES IT WORK?

PRA is a tension breaker that lowers the water/paraffin molecule surface tension. Our product dehydrates the paraffin wax formation, causing the paraffin to return to the oil phase.

It keeps the re-entered oil/paraffin in its oil phase until it can be broken out during the normal refining process.

Piping shown above was completely blocked and pressure gauge not functioning, all paraffins cleared and pressure gauge operating within minutes of injecting PRA.

HOW CAN WE SAVE YOU MONEY?

Increase Productivity

- Reduce the need for expensive and time consuming pipeline shutdowns. PRA has been proven to continuously keep your pipeline operations running.

Recover More Oil

- Our clients report that after applying PRA they have recovered up to 20% more oil per quarter.

100% Effective

- PEG products are proven to be 3 to 5 times more effective than chemical dispersants.

Save Money

- Offset extra recovered oil against product costs. Our clients have found that after one treatment the products pay for themselves.
- Reduce the need for expensive mechanical clean-ups.
- Eliminate expensive environmental clean-ups with our range of other environmentally safe hydrocarbon remediation products.

Ask about Plutus Environmental Group's products ESafe and Sheen Magic.

PRA downhole application

Rods 3 weeks after a traditional Hotwash

PRA application in storage tanks

Rods 13 weeks after the introduction of PRA©

HOW CAN WE IMPROVE YOUR PRODUCTIVITY?

Continuous Flow

- PRA increases the overall flow of oil. Keep your pipeline operations ongoing.
- PRA has been proven to reduce the viscosity of heavy crude oil by up to 90%.

Increase Productivity

- This PEG product eliminates existing paraffin build-ups and prevents future paraffin deposits.
- PRA increases the effectiveness of your corrosion inhibitors.

Reduce Stoppages

- Applying PRA reduces the scheduled number of line scrapings operations.
- The application of PRA reduces the number of stoppages due to build-up and accumulation problems.
- 100% Effective even in difficult conditions Our product PRA works in hot or cold water and conditions. It is time and cost effective in clogged or kinked pipelines.

WHERE CAN PEG PRODUCTS BE USED?

Anywhere

Our products are effective cleaning solutions for a variety of commercial and industry processes.

- Down-hole paraffin problems
- Petroleum and crude pipelines
- Subsea and offshore wells
- Oil and Fuel storage tanks (PRA even kills algae and mould growth)
- FPSO
- Remediation and environmental clean up

Ask about Plutus Environmental Group's range of other environmentally safe hydrocarbon remediation products ESafe and Sheen Magic.

PROVE IT!

Plutus Environmental Group's products have been thoroughly tested in the industry and the laboratory. We can also offer full disclosure to you on request of our test results, successful case studies and our growing number of satisfied clients including many international companies.

Working clean rod and wellhead following PRA treatment

For more information contact us today **info@plutuseg.com** or visit our website **www.plutus-environmental.com**

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PRA **Trial Treatment Reports**

Trial at Horndean X3 & Heriard X3z: October 2009

Trial at Horndean X2: January - March 2010

Long Clawson C1 & C2 Site: June 2009

REPORTS SUBMITTED BY PLUTUS ENVIRONMENTAL GROUP LTD & STAR ENERGY

StarEnergy

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Trial at Horndean X3 & Heriard X3z

October 2009

Lasham X3Z Herriard Well - published with the kind permission of Star Energy Lincolnshire and Hampshire Oilfield Operations

Objective

To trial PRA product on two different types of beam pump producing wells, one being the Horndean X3 well and one the Herriard X3z well.

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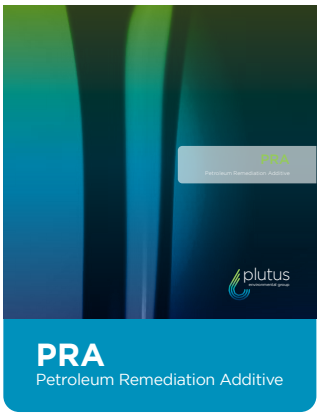
Horndean X3 has very little water cut and Herriard X3z has 80% production water cut. Both wells are prone to heavy paraffin wax build up and both have scale issues in and around the pump.

History

Horndean X3 has been producing roughly the same amount for the last five years, with a water production of only 5-6%, this well is hot oil washed every four weeks with 150bbls of dry crude. If the well is stopped for any reason after three weeks the chance of the rods hanging up due to wax is approximately 75%. If the four week wash passes the chance is increased to approx 90%. The fluid level on **X3** has been maintained at approx 30ft above pump which is set at 4300ft.

Herriard X3z has been on production since the 80s and for the last five years has maintained a steady oil/water cut of approx 20bbls oil and 140bbls water. Again the well is hot oil washed with 130bbls of dry crude every four weeks, because of the high water cut the paraffin wax build up is very fast. The fluid level on **X3z** has been maintained at 150ft above the pump which is set at 4000ft.



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Treatment

Both wells were treated with 45gals of PRA, **Horndean X3** on the 20th October and **Herriard X3z** on the 28th October. PRA was pumped into the Annulus whilst injecting crude from the flow line at the same time; after the 45gals had been pumped away the wells were circulated for two complete tubing strings volume then put back on line to production.

Results

Horndean X3 is in the 8th week of production after the hot oil wash, since adding the PRA and the Amps (power to run the beam pump) have been maintained at 19/23 since the wash, there has been no build up of wax on the rods. The well has been stopped for routine trip checks and usually after the 4 week hot oil wash if the unit was stopped then the rods would hang up due to heavy wax build up. There is still no sign of the rod string building up weight from wax, also production has increased slightly.

Herriard X3z has had samples taken every day since applying PRA, the oil water cut has been steadily increasing with the samples cutting out into a three stage cut; oil emulsion and water. After applying heat via a hot water bath, the cut was more prominent (oil/water). The usual oil production from this well is around the 25bbls/day. We have seen the well increase this to 55-60bbls/day. We are also seeing the same Amp readings as **Horndean X3** ie. no build up of wax causing the rod string to gain weight.

The well is still ongoing trials but early indications are looking very good.

Dale Whitehouse
Well Services Supervisor
Star Energy

StarEnergy

Results

Below are more detailed stats for the **Herriard X3z** well showing both oil and water cut levels before and after the application of PRA on the 28th October.

Herriard X3z

Oil/Water Cut - 12th September -27th October 2009 - before PRA

Date	Time	Gross BBLS	BS & W % H2O	H2O BBLS	NETT BBLS	
12.09.09	8.00	101.0	90%	90.9	10.1	
13.09.09	8.00	99.1	89%	88.2	10.9	
14.09.09	8.00	89.2	92%	82.1	7.1	
15.09.09	8.00	84.3	95%	80.1	4.2	
16.09.09	8.00	0.0	0%	0.0	0.0	Hot wash during this time
17.09.09	8.00	0.0	0%	0.0	0.0	
18.09.09	8.00	0.0	0%	0.0	0.0	
19.09.09	8.00	128.4	100%	128.4	0.0	
20.09.09	8.00	106.8	100%	106.8	0.0	
21.09.09	8.00	91.7	100%	91.7	0.0	
22.09.09	8.00	135.3	97%	131.7	3.6	
23.09.09	8.00	204.2	85%	173.6	30.6	
24.09.09	8.00	211.7	82%	173.6	38.1	
25.09.09	8.00	197.0	70%	137.9	59.1	
26.09.09	8.00	187.7	84%	157.7	30.0	
27.09.09	8.00	144.0	85%	122.4	21.6	
28.09.09	8.00	169.8	85%	144.3	25.5	
29.09.09	8.00	171.9	85%	146.1	25.8	
30.09.09	8.00	175.2	85%	148.9	26.3	
01.10.09	8.00	169.2	85%	143.8	25.4	
02.10.09	8.00	160.3	85%	136.3	24.0	
03.10.09	8.00	168.9	89%	150.3	18.6	
04.10.09	8.00	160.6	94%	151.0	9.6	
05.10.09	8.00	150.8	85%	128.2	22.6	
06.10.09	8.00	159.6	90%	143.6	16.0	
07.10.09	8.00	168.3	85%	143.1	25.2	
08.10.09	8.00	109.7	100%	109.7	0.0	
09.10.09	8.00	176.2	77%	135.7	40.5	
10.10.09	8.00	180.4	77%	138.9	41.5	
11.10.09	8.00	164.7	82%	135.1	29.6	
12.10.09	8.00	140.4	75%	105.3	35.1	
13.10.09	8.00	176.9	79%	139.8	37.1	
14.10.09	8.00	169	79%	133.5	35.5	
15.10.09	8.00	171.4	79%	135.4	36.0	
16.10.09	8.00	164.3	79%	129.8	34.5	
17.10.09	8.00	32.5	79%	25.7	6.8	
18.10.09	8.00	0.0	0.0	0.0	0.0	
19.10.09	8.00	132.7	79%	104.8	27.9	
20.10.09	8.00	25.5	100%	25.5	0.0	
21.10.09	8.00	0.0	0.0	0.0	0.0	Rod break during this time
22.10.09	8.00	0.0	0.0	0.0	0.0	
23.10.09	8.00	0.0	0.0	0.0	0.0	
24.10.09	8.00	0.0	0.0	0.0	0.0	
25.10.09	8.00	0.0	0.0	0.0	0.0	
26.10.09	8.00	0.0	0.0	0.0	0.0	
27.10.09	8.00	202.3	79%	159.8	42.5	
Averages before PRA		**111.4**	**71%**	**97.5**	**16.3**	

Herriard X3z

Oil/Water Cut - 28th October -30th November 2009 - after PRA

Date	Time	Gross BBLS	BS & W % H2O	H2O BBLS	NETT BBLS
PRA added					
28.10.09	8.00	224.7	85%	191	33.7
29.10.09	8.00	143.6	85%	122.1	21.5
30.10.09	8.00	168	85%	142.8	25.2
31.10.09	8.00	164.5	95%	156.3	8.2
01.11.09	8.00	158	87%	137.5	20.5
02.11.09	8.00	165.2	87%	143.7	21.5
03.11.09	8.00	154.6	87%	134.5	20.1
04.11.09	8.00	156.1	87%	135.8	20.3
05.11.09	8.00	155.2	73%	113.3	41.9
06.11.09	8.00	152.7	81%	123.7	29.0
07.11.09	8.00	150.6	80%	120.5	30.1
08.11.09	8.00	81.3	64%	52.0	29.3
09.11.09	8.00	166.2	82%	136.3	29.9
10.11.09	8.00	153.5	87%	133.5	20.0
11.11.09	8.00	154.1	85%	131.0	23.1
12.11.09	8.00	154.3	80%	123.4	30.9
13.11.09	8.00	148.8	80%	119.0	29.8
14.11.09	8.00	148.7	80%	119.0	29.7
15.11.09	8.00	24.8	80%	19.8	5.0
16.11.09	8.00	149.4	75%	112.1	37.4
17.11.09	8.00	155.6	85%	132.3	23.3
18.11.09	8.00	148.7	73%	108.6	40.1
19.11.09	8.00	147.2	65%	95.7	51.5
20.11.09	8.00	147.2	58%	85.4	61.8
21.11.09	8.00	145.9	59%	86.1	59.8
22.11.09	8.00	142.9	57%	81.5	61.4
23.11.09	8.00	39.2	49%	19.2	20.0
24.11.09	8.00	121.4	85%	103.2	18.2
25.11.09	8.00	135.2	90%	121.7	13.5
26.11.09	8.00	145.7	87%	126.8	18.9
27.11.09	8.00	141.7	80%	113.4	28.3
28.11.09	8.00	136.8	80%	109.4	27.4
29.11.09	8.00	138	80%	110.4	27.6
Averages after PRA		**143**	**76%**	**114**	**29.1**

Result

In the one month period PRA was added to the well, average (BOPD) increased by 12.8 barrels per day, an overall increase of 78%.

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Trial at Horndean X2

March 2010

Horndean X2 Well - published with the kind permission of Star Energy Lincolnshire and Hampshire Oilfield Operations

Objective

To trial PRA product on a beam pump producing well, the Horndean X2 well.

The well is prone to heavy paraffin wax build up and has a scale issue in and around the pump.

StarEnergy

Results

Below are detailed stats for the **Horndean X2** well showing both oil and water cut levels before and after the application of PRA.

Horndean X2

Oil/Water Cut - 12th Jan - 9th Feb 2010 - before PRA

Date	Time	Oil Prod.	Water Prod.
12.01.2010	7.00	5.8	7.6
13.01.2010	7.00	65.0	3.3
14.01.2010	7.00	57.5	10.1
15.01.2010	7.00	56.3	7.0
16.01.2010	7.00	56.3	7.0
17.01.2010	7.00	56.3	7.0
18.01.2010	7.00	58.6	4.9
19.01.2010	7.00	45.8	9.6
20.01.2010	7.00	55.9	5.5
21.01.2010	7.00	74.0	7.1
22.01.2010	7.00	56.5	6.0
23.01.2010	7.00	56.5	6.0
24.01.2010	7.00	56.5	6.0
25.01.2010	7.00	55.3	5.8
26th Jan - 31st Jan - shutdown for Hotwash			
01.02.2010	7.00	57.8	3.3
02.02.2010	7.00	47.4	6.8
03.02.2010	7.00	58.9	4.1
04.02.2010	7.00	56.2	8.7
05.02.2010	7.00	54.3	6.0
06.02.2010	7.00	54.3	6.0
07.02.2010	7.00	54.3	6.0
08.02.2010	7.00	51.8	10.9
09.02.2010	7.00	47.6	9.3
Total Barrels		**1238.9**	**154.0**
Average		**44.2**	**5.5**

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Horndean X2

Oil/Water Cut - 11th Feb - 10th March - after PRA

Date	Time	Oil Prod.	Water Prod.
10th February - PRA added to the well			
11.02.2010	7.00	54.3	7.6
12.02.2010	7.00	57.4	6.7
13.02.2010	7.00	57.4	6.7
14.02.2010	7.00	57.4	6.7
15.02.2010	7.00	50.9	9.3
16.02.2010	7.00	67.2	11.4
17.02.2010	7.00	52.0	6.1
18.02.2010	7.00	72.1	2.9
19.02.2010	7.00	58.6	9.0
20.02.2010	7.00	58.6	9.0
21.02.2010	7.00	58.6	9.0
22.02.2010	7.00	55.8	2.4
23.02.2010	7.00	55.8	2.4
24.02.2010	7.00	55.8	2.4
25.02.2010	7.00	0.0	0.0
01.03.2010	7.00	57.6	8.2
02.02.2010	7.00	54.7	2.2
03.03.2010	7.00	60.5	4.6
04.03.2010	7.00	52.2	4.0
05.03.2010	7.00	55.4	4.3
06.03.2010	7.00	55.4	4.3
07.03.2010	7.00	55.4	4.3
08.03.2010	7.00	59.7	3.0
09.03.2010	7.00	51.2	10.0
10.03.2010	7.00	56.5	6.1
11.03.2010	7.00	58.4	3.5
12.03.2010	7.00	55.9	5.5
13.03.2010	7.00	55.9	5.5
14.03.2010	7.00	55.9	5.5
15.03.2010	7.00	56.0	4.8
16.03.2010	7.00	56.0	4.8
17.03.2010	7.00	59.2	2.7
18.03.2010	7.00	52.0	6.0
Total Barrels		**1898.8**	**180.9**
Average		**56.9**	**5.7**

Result

In the period PRA was added to the well, average (BOPD) increased by 12.7 barrels per day, **an overall increase of 28.7%.**

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Trial at Long Clawson C1 and C2

June 2009

Objective

To trial PRA product on Long Clawson C1 and C2 production wells to reduce the timescale between well intervention work caused by paraffin wax build up in 2 3/8" production tubing and reduce down time.

StarEnergy

History
Long Clawson C1 and C2 wells were drilled in the early 1990s for crude oil production. The wells are produced from sandstone formations circa 3000'bgl via a rod pump system to onsite storage tanks with a surface flowing pressure of 10psi, annulus fluid level 2800'bgl.

The wells have to be hot water washed and de-waxed on a 4-6 weekly routine to keep production tubing clear of wax build up to prevent production rods from standing up in wax. In between hot wash routines, if the wells are shut down for a few hours there is an 80% chance of the wells standing in wax when restarted.

Treatment
The wells were treated with 45 gallons (per well) of PRA on the 9th June 2009. The PRA was pumped into the annulus and then returned via production tubing utilising the rod pump system with 4 hours circulation time.

Results
Long Clawson C1 was last hot watered prior to treatment on the 27th April 2009 and Long Clawson C2 on the 3rd June 2009.
After treatment. no production increase or decrease was noted on either well. The wells have been producing post PRA treatment, to date, 10 weeks with no production problems or hot water de-wax treatments being carried out. Over the 10 week period the wells have been shut down due to electrical power cuts for a 2 hour period and then a 3 hour period were the wells were restarted with out any waxing issues.

Conclusion
The test is to continue to determine duration requirements between PRA treatments and then retreat wells and continue tests.

Result after PRA
In the period PRA was added to the well, average BOPD increased by 19.6%.

Long Clawson C2

Well is fitted with a Legrand L10 unit set at 42" S.L. and 12 S.P.M. Runs 24hrs/day

Oil/Water Cut - 6th June - 1st July 2009 - before and after PRA

Date	Time	Gross BBLS	BS & W % H2O	H2O BBLS	NETT BBLS
06.06.09	9.00	58	22%	12.8	45.2
07.06.09	9.00	50	23%	11.5	38.5
08.06.09	9.00	59	17%	10	49
09.06.09	9.00	63	19%	12	51
Totals		**230**		**46.3**	**183.7**
Averages before PRA©		**57.5**	**20.2%**	**11.6**	**45.9**
PRA added - 45 gallons					
10.06.09	9.00	60	20%	12	0.0
11.06.09	9.00	57	19%	10.8	0.0
12.06.09	9.00	57	17%	9.7	0.0
13.06.09	9.00	60	17%	10.2	0.0
14.06.09	9.00	61	15%	9.2	0.0
15.06.09	9.00	59	16%	9.4	0.0
16.06.09	9.00	62	12%	7.4	3.6
17.06.09	9.00	67	12%	8	30.6
18.06.09	9.00	46	10%	4.6	38.1
19.06.09	9.00	60	8%	4.8	59.1
20.06.09	9.00	62	10%	6.2	30.0
21.06.09	9.00	60	8%	4.8	21.6
22.06.09	9.00	60	8%	4.8	25.5
23.06.09	9.00	62	8%	5	25.8
24.06.09	9.00	60	8%	4.8	26.3
25.06.09	9.00	57	9%	5.1	25.4
26.06.09	9.00	58	8%	4.6	24.0
27.06.09	9.00	58	8%	4.6	18.6
28.06.09	9.00	58	9%	5.2	9.6
29.06.09	9.00	62	8%	5	22.6
30.06.09	9.00	58	8%	4.6	16.0
01.07.09	9.00	57	8%	4.6	25.2
Totals		**1301**		**145.4**	**1155.6**
Averages after PRA©		**59.1**	**11.2%**	**6.6**	**52.5**

Long Clawson C2

Well is fitted with a Legrand L10 unit set at 42" S.L. and 12 S.P.M. Runs 24hrs/day

Oil/Water Cut - 8th July - 26th July 2009 - after PRA

Date	Time	Gross BBLS	BS & W % H2O	H2O BBLS	NETT BBLS
08.07.09	8.00	52	4%	2.1	49.9
09.07.09	8.00	63	5%	3.2	59.8
10.07.09	8.00	59	6%	3.5	55.5
11.07.09	8.00	67	8%	5.4	61.6
12.07.09	8.00	63	8%	5	58
13.07.09	8.00	62	7%	4.3	57.7
14.07.09	8.00	63	8%	5	58
15.07.09	8.00	56	7%	3.9	52.1
16.07.09	8.00	56	7%	3.9	52.1
17.07.09	8.00	63	7%	4.4	58.6
18.07.09	8.00	57	7%	4	53
19.07.09	8.00	52	6%	3.1	48.9
20.07.09	8.00	72	4%	2.9	69.1
21.07.09	8.00	53	5%	2.6	50.4
22.07.09	8.00	56	6%	3.4	52.6
23.07.09	8.00	53	7%	3.7	49.3
24.07.09	8.00	57	8%	4.6	52.4
25.07.09	8.00	52	8%	4.2	47.8
26.07.09	8.00	61	9%	5.5	55.5
Totals		**1117**		**74.7**	**1042.3**
Averages after PRA©		**58.8**	**6.6%**	**3.9**	**54.9**

Result

In the period PRA was added to the well, average BOPD increased by 19.6%.

GeoEnpro

TO WHOM SO EVER IT MAY CONCERN

SUB: Performance result for use of PRA (Petroleum Remediation Additive)

PRA was treated by GEPL in two wells KSG#12 and KSG#21 at GeoEnpro Kharsang Oil Field, Arunachal Pradesh, India on 9th September 2010.

It was observed that both wells produced for 33/34 weeks from one application of PRA without any sucker rod restriction and wax problem.

Prior to PRA treatment in both the wells, routine well servicing jobs were being carried out by the regular solvent treatment at every 20 to 25 weeks interval for continual paraffin maintenance issues.

Due to the very positive results seen on the test wells we have sought additional supply of the material for further treatment in High Wax Crude wells at the site.

Dated: 03-Nov.2011

Place: Noida, India

For GeoEnpro Petroleum Limited

K D MADAN
DGM - Engineering & Procurements

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14th March 2011

PRA Testimonial

During the last 18 months we have been working with PRA to manage our paraffin problems, prior to which our maintenance program was to hot oil our wells on 4 weekly cycles and have observed the following:

PRA treatment timelines allow 12-15 weekly cycles.

During the Christmas period 2010/2011 our area suffered with adverse weather conditions seeing weeks of snow and temperatures down to -20c, as a result of these many of our wells were shut in for up to 5 weeks as it was not possible for the road tankers to reach the sites to export tanks.

All of the PRA treated wells when switched back to production experienced no start up problems.

There were also no flow line problems.

Some of these wells had reached 18 weeks from their last PRA treatment.

Previously with our hot oil maintenance program there would have been little or no chance of any of these wells coming straight back on to production without first hot oiling, and the flow lines would also have been required to be steam cleaned and hot washed to dissolve the paraffin accumulation in them.

PRA has recently been effective in cleaning the drilling mud on a new completion where 400 litres were injected after other methods had failed.

Karl Fisher

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Summary of PRA for 2010-2011

Star Energy was first introduced to PRA in March 2009 and conducted our first pilot wells on Long Clawson C1 and C2 on June 9th 2009.

Upon successful trials we now have a full year of statistics having around 50 of our wells treated in all four of our regions, where previously the paraffin maintenance program was to hot oil or hot wash the wells on 4 weekly intervals.

It is proven with the data from the last year that with the implementation of PRA we have observed the following:

Increased maintenance timelines from 4 weeks up to 13 weeks

Significantly reduced deferred production

Far fewer rod breaks, this obviously resulting in less down time

Less rods being pulled resulting in less contamination on site

More free man hours as reduced reactive maintenance from far fewer rod breaks

More free man hours by not overseeing frequent hot oil programs

Other savings which are more difficult to quantify are less energy required to drive motors as the wells are running cleaner and more efficiently

Plutus material can be stored in any location on site as is not required to be placed in a contained area because of the environmental classification

By introducing an environmentally safe product to replace a high risk maintenance operation also reduces the HSE risk and moves our company to a safer, more environmentally sound future"

Stewart Reast

Operations Director

Star Energy Production Division

JUNE 2010

TANK CLEAN OUT, HORNDEAN X2 AND X3

Horndean well site comprises of two beam pumped wells, flowing to nine oil storage tanks, three allocated to HND X3 and five allocated to HND X2, (one water tank).

At the point of the tank clean out operation the status of the wells were as follows….HND X3 was being treated with PRA on a 12 weekly turn around and HND X2 was still being hot oil washed.

The preferred method of tank cleaning was to empty the tank of as much liquid as possible, purge the tank with nitrogen then get personnel inside the tank with breathing apparatus to dig away all the wax and solids that had accumulated over the years.
This also includes having a safety man stood on top of the tank in case of any personnel needing to be rescued.

The tank clean up started off with HND X2 tanks first, although HND x3 was also shut in to eliminate against possible leak path into HND X2 tanks.
As in the past the tanks were entered by personnel in breathing gear and the bottom of the tanks dug out using a bucket to winch the solids to surface, when all solids had been removed the walls were washed down with a steam cleaner and sucked out using a gully sucker tanker, this causes the inside of the tank to become humid and also churns up gas trapped within any wax left in the tank.

Time to clean out one tank was averaging 4-5hrs.

It was noted that when personnel went to carry out the same work scope on HND X3 tanks the solids left in the bottom of the tanks were more liquefied than HND X2 tanks, personnel were told to exit the tank and the gully sucker was dropped in, from the top of the tank the steam cleaner was lowered in to wash down the sides of the tank.

Point to note at this point is that HNDX3 tanks had not been treated with PRA….only the returns from the well had been introduced, therefore only a fraction of PRA was enough to carry on breaking down the wax solids back to the oil state.

Time to clean out one tank averaged 1-2hrs.

Plans are to introduce PRA direct to the tanks, all the tanks on this site have the export line 6” from the bottom of the tank meaning that up to 6bbls of fluid will always stay within the tank, thoughts are to pump 5bbls of PRA into each tank, as the tanks will be agitated every time the well is flowing into it so solids will form, when the tank is shut in to allow the produced water to drop out before being exported so will the PRA, meaning that the frequency between tank doses is drawn out.

HOFS
HEAVY'S OIL FIELD SERVICE, LLC
2774 County Road 21 N., Fayette, AL 35555 / 205-932-7617

STANLEY HUBBERT
OWNER

Lease: Weyerhaeuser 33-15
Past production record on lease before circulating PRA parifen solution:

Date:	09/24/2013	09/25/2013	09/26/2013
Tubing	80#	80#	80#
Casing	570#	570#	580#
Oil Produced	0 Bbls	1.67 Bbls	1.67 Bbls
MCF	234	232	234
Line Pressure	70#	70#	70#

On October 4, 2013, hands broke out piping on casing and tubing on well head. Pump truck loaded on 55 gallons of PRA into tank on truck. Loaded on 40 Bbls of oil from production tank. Hooked hose from well head to open vent tank. Hooked onto pump discharge and then to casing on well head. Started venting pressure off tubing to tank. Pressure down to 0# in 10 minutes. Casing pressure 520#. Started chemical flow with oil down back side at 10:37 a.m. Started charting pressure at 12:30 p.m. then every hour.

	Casing #	Tub
12:30 p.m.	570	0
1:30 p.m.	510	0
2:30 p.m.	490	0
3:30 p.m.	475	0
4:30 p.m.	465	0
5:30 p.m.	460	0
6:30 p.m.	450	0
7:30 p.m.	438	0
8:30 p.m.	436	0
9:00 p.m.	430	0

Caught fluid samples every 2 hours. Total of samples caught, 4. Shut well in at 9:07 p.m. Casing pressure at 430#, tubing pressure, 1 minute timed. Shut in casing pressure 440#, tubing pressure 440#. Pulled 2" perf plug off top of well head. Shined flashlight down to tubing valve gate. Shone like polished silver. No parifen in hose, tank or 2" TEE. Total circulating time 10 ½ hours. Shut well in for 18 hours, allowing pressure to balloon. PRA out in perfs to clean parifen out. Casing pressure 440#, tubing pressure 440#. Opened up well at 3:30 p.m. Next 3 days production recorded.

Date:	10/6/2013	10/7/2013	10/8/2013
Tubing	130#	120#	110#
Casing	445#	430#	430#
Oil Produced	13.36 Bbls	6.68 Bbls	6 Bbls
MCF	382	283	276
Line Pressure	245#	115#	105#

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OWNER

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