STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSES OF CONSIDERING:

APPLICATION OF MELROSE OPERATING COMPANY TO EXPAND ITS ARTESIA UNIT WATERFLOOD PROJECT AND AMEND DIVISION ADMINISTRATIVE ORDER WFX-768, EDDY COUNTY, NEW MEXICO **CASE 12709**

MELROSE OPERATING COMPANY'S PROPOSED ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on September 6, 2001, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this ___day of September, 2001, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

- (1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.
- (2) Melrose is the current operator of the Artesia Unit Waterflood Project which is approved by the Division for water injection into the Queen, Grayburg and San Andres formations of the Artesia Queen-Grayburg-San Andres Pool.

- (3) The Project Area contains approximately 2240 acres with approximately 16 injection wells and approximately 35 producing wells within portions of Sections 25, 26 34, 35, 36 of Township 17 South, Range 28 East and Sections 2 and 3 of Township 18 South, Range 28 East, NMPM.
- (4) Melrose seeks to expand its Artesia Unit Waterflood project and amend Division Administrative Order WFX-768, Eddy County, New Mexico. Applicant, pursuant to Division Rule 701(G) seeks authority to expand its waterflood project by injection of water into the Queen, Grayburg and San Andres formations of the Artesia Queen-Grayburg-San Andres Pool in the following injection wells:

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Unit Well No. 2. 330 feet FSL & 330 feet FWL, Section 26, T17S, R28E
Unit Well No. 3. 330 feet FSL & 1750 feet FWL, Section 26, T17S, R28E
Unit Well No. 10. 330 feet FNL & 1950 feet FWL, Section 35, T17S, R28E
Unit Well No. 11. 360 feet FNL & 360 feet FWL, Section 35, T17S, R28E
Unit Well No. 12. 1980 feet FNL & 660 feet FWL, Section 35, T17S, R28E
Unit Well No. 13. 1980 feet FNL & 1980 feet FWL, Section 35, T17S, R28E
Unit Well No. 16. 1980 feet FNL & 660 feet FWL, Section 36, T17S, R28E
Unit Well No. 18. 1980 feet FSL & 1980 feet FWL, Section 36, T17S, R28E
Unit Well No. 19. 1980 feet FSL & 660 feet FWL, Section 36, T17S, R28E
Unit Well No. 22. 1980 feet FSL & 1980 feet FWL, Section 35, T17S, R28E
Unit Well No. 23. 1980 feet FSL & 660 feet FWL, Section 35, T17S, R28E
Unit Well No. 28. 990 feet FEL & 330 feet FSL, Section 35, T17S, R28E
Unit Well No. 44. 1980 feet FNL & 1070 feet FWL, Section 3, T17S, R28E
Unit Well No. 46. 2310 feet FNL & 2267 feet FWL, Section 3, T18S, R28E
Unit Well No. 54. 1654 feet FSL & 2272 feet FWL, Section 3, T18S, R28E
Unit Well No. 57. 1570 feet FSL & 1070 feet FWL, Section 3, T18S, R28E
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(5) The Division orders applicable in the project area are as follows:

Artesia Unit:

OCD Order R-2869 dated February 11, 1965

OCD Order R-2876 dated March 5, 1965

OCD Order R-3311 dated September 11, 1967

OCD Order R-3494 dated September 12, 1968

OCD Order R-4027 dated September 10, 1970

OCD Administrative Order WFX-733 dated March 4, 1998

OCD Administrative Order WFX-768 dated November 28, 2000

- (6) Melrose's proposed expansion of the Artesia Unit waterflood project is estimated to cost 13.54 million dollars and includes 16 additional injection wells, the drilling of 35 producers and the conversion of 41 wells to injectors
- (7) Melrose estimates that 4.069 million barrels of additional oil may be recovered by this expansion project.
- (8) In accordance with Division Rule 701, Melrose submitted satisfactory evidence on Division Form C-108 in compliance with Division Rule 701.
- (9) Within the one-half mile "Area of Review" there are approximately 215 wells which have penetrated to or through the Queen, Grayburg and San Andres formations of the Artesia Queen-Grayburg-San Andres Pool including 35 plugged and abandoned wells, 19 open hole completion wells, 79 wells with production casing, 76 wells with deep producing casing, well with deep production liner with intermediate casing, and 5 wells with no Division data available.

plugged wellbores

- (10) Melrose has submitted schematic diagrams of the 35 plugged and abandoned wellbores within the Area of Review and testified that 34 were cased, cemented and plugged in such a manner to preclude the migration of fluid from the proposed injection interval into fresh water strata or potentially productive zones above or below the injection zone. Melrose also testified that, with one exception, these wells have been plugged and abandoned in a manner acceptable to the Division at the time they were plugged.
- (11) Melrose identified one potential problem well from the group of plugged and abandoned wellbores:
 - (a) the Maloney-Chambers State Well No. 1 (API #30-015-02559), Unit H, Section 4, T18S, R28E which was drilled on December 15, 1925 and then plugged for which there is no plugging report on file with the Division. Melrose demonstrated that the injection interval is not currently productive nor is it expected to be productive within one-half mile of this wellbore; that this well is in an area where the reservoir is non-productive because of low permeability; and that producers will be drilled between this wellbore and proposed injection wells.

old wellbores without data

(12) Melrose identified 19 potential problem wells that are captioned ("old wells") which were drilled in the 1920's for which there is no available data on file at the Division. See Exhibit "A". Seven of these wells are plugged and are addressed under the "Plugged Well" category. For the remaining 12 wells, Melrose recommends that before injection take place within 1/2 mile radius of any of these wells that Melrose will a run cement bond log and determine the actual top of cement in each well and if the cement does not cover the injection zone, the well will be squeezed with sufficient cement to cover the injection interval.

wells without surface pipe

(13) Melrose identified 8 potential problem wells that are captioned ("wells without surface pipe") for which there is no available data on file at the Division concerning the depth of the surface casing. See Exhibit "B" Three of these wells have adequate cement to protect fresh water. Two wells are adequately plugged to protect fresh water. This leaves three wells that need to be addressed. Melrose recommends that before injection take place within 1/2 mile radius of any of these wells, that Melrose will dig up the wellhead to determine if surface pipe is present and if present then fresh water is protected, but if not, then a cement bond log will be run to determine the actual bottom of cement in each well and if the cement does not protect fresh water to a depth of 300 feet, the wells will be squeezed with sufficient cement to protect the fresh water to a depth of 300 feet.

unplugged wellbores

(14) Melrose submitted well construction and cementing data for 174 unplugged wells within the Area of Review and testified that all such wells were constructed in such a manner to preclude the migration of fluid from the proposed injection interval in the Artesia Queen-Grayburg-San Andres Pool into freshwater strata or potentially productive zones above or below the proposed injection zone.

wellbores using 50% vs 25% excess calculations

- (15) Melrose submitted adequate data to demonstrate that, with the exception of 7 "potential problem wells" (See Exhibit C") all unplugged wellbores, either by measurement or by calculation, had adequate cement such that the interval from the top to the base of the injection interval is protected using the following Division guideline: cement bond logs or temperature surveys for all wellbores with measured top of cement and if measured tops of cement were not available, then to calculate the top of cement by using a yield of 1.32 cf/sk plus a 50% excess such that the top of cement is to or above the Grayburg formation.
- (16) Melrose presented data to demonstrate that when an 88% efficiency factor is applied to an analysis of 9 wellbores with actual measured tops of cement within the Artesia Unit, the calculated tops of cement were adequate to reach the top of the Grayburg formation
- (17) Based upon this analysis, Melrose demonstrated that Division's 50% excess guideline can be reduced to 25% excess for the wellbores listed on Exhibit C which is sufficient under these circumstances to preclude the migration of fluid from the proposed injection interval in the Artesia Queen-Grayburg-San Andres Pool into freshwater strata or potentially productive zones above or below the proposed injection zone.
- (18) The Division should not require corrective or remedial action for wells listed on Exhibit C.

HYS 400 cement wellbores using 50% vs 36% excess calculations

- (19) Melrose, with the assistance of BP Amoco, provided wellbore data for 16 potential problem wells operated by BP Amoco in its Empire Abo Unit which were cemented with HYS 400 cement. See Exhibit D.
- (20) Of these wells, the cement top in the BP Amoco Empire Abo Unit Well No. E-39, Unit B, Section 35, T17S, R28E is calculated to be adequate to reach to or above the top of the Grayburg formation if a 36% excess is used in the calculation.
- (21) Melrose presented data to demonstrate that when a 64& efficiency factor is applied to an analysis of 5 wellbores with actual measured tops of cement within the Empire Abo Unit, the calculated tops of cement were adequate to reach the top of the Grayburg formation.

- (22) Based upon this analysis, Melrose demonstrated that Division's 50% excess guideline can be reduced to 36% excess for the wellbores listed on Exhibit D without risk to potentially productive zones above or below the injection interval.
- (23) Melrose presented data to demonstrate that the use of HYS 400 cement by Arco (now BP Amoco) in cementing of the wells listed on Exhibit D is sufficient under these circumstances to preclude the migration of fluid from the proposed injection interval in the Artesia Queen-Grayburg-San Andres Pool into freshwater strata or potentially productive zones above or below the proposed injection zone.
- (24) The Division should not require corrective or remedial action for wells listed on Exhibit D.

Administrative Order WFX-768

(25) Melrose demonstrated that it has satisfied the conditions of Division Administrative Order WFX-768 by satisfactory remedial work on the Artesia Unit Well No. 12, Unit E Section 35, T17S, R28E and on the Artesia Unit Well No. 13, Unit F Section 35, T17S, R28E and by demonstrating the top of cement in the Empire Abo Unit G Well No. 38, Unit K, Section 35, T17S, R28E has been recalculated such that no require remedial work is now required on this wellbore.

IT IS THEREFORE ORDERED THAT:

- (1) The applicant, Melrose Operating Company is hereby granted authority to expand its Artesia Unit Waterflood project and to inject water into the Queen, Grayburg and San Andres formations of the Artesia Queen-Grayburg-San Andres Pool in the injection wells listed in Finding (2) above.
- (2) Division Administrative Order WFX-768 is hereby amended to conform to this order.
- (3) Injection into these wells shall be accomplished through fiberglass lined tubing installed in a packer set approximately 100 feet from the uppermost injection perforation or casing shoe; the casing-tubing annulus shall be filled with an inert fluid and a gauge or approved leak-detection device shall be attached to the annulus in order to determine leakage in the casing, tubing or packer.

- (4) Prior to commencing injection operations within one-half mile of any well listed on **Exhibit** "A" Melrose shall a run cement bond log and determine the actual top of cement in each well and if the cement does not cover the injection zone, the well will be squeezed with sufficient cement to cover the injection interval.
- (5) Prior to commencing injection operations within one-half mile of any well listed on **Exhibit** "B" Melrose shall dig up the wellhead to determine if surface pipe is present and if present then fresh water is protected, but if not, then to run a cement bond log and determine the actual bottom of cement in each well and if the cement does is below 300 feet, then fresh water is protected, and if not, then the well will be cemented to protect fresh water down to a depth of 300 feet.
- (6) The operator shall give advance notification to the supervisor of the Artesia District Office of the Division of the date and time of the installation of injection equipment, the conductance of remedial cement operations, and of the mechanical integrity pressure tests, in order that the same may be witnessed.
- (7) The applicant shall immediately notify the supervisor of the Artesia District Office of the Division of the failure of the tubing, casing or packer in any of the injection wells, the leakage of water or oil from or around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area, and shall take such steps as may be timely and necessary to correct such failure or leakage.
- (8) Jurisdiction of this case is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year designated above.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

LORI WROTENBERY
Director

These are wells drilled in the 1920's and	le 1920'	s and ha	have no data avai	available on them.	em.						
Well and Location	Туре	Status	Perforations	Casing Size	Depth	No. Sacks	Meas. TOC	Calc. TOC	Date Drilled	API Number	Ω
T-17-S R-28-E Section 35											
Welch	P&A			Unk.		Unk.			9/9/26	30-015-01729	2710
State #1									P&A 8/14/34		
2310 FNL & 250 FWL (E)											
T-18-S, R-28-E, Section 3											
Melrose Energy	ō	Inactive	2313-2345	10 1/2	370	Ukn.			1/1/27	30-015-01799	2365
Artesia Unit #40				8 1/4	520	Ukn.					
1070 FNL & 1570 FWL (C)				5 3/16	2260	Ukn.					
					!						
Meirose Energy	ō	Inactive	2282-2326	Ukn.	Ukn.	Ckn.			6/15/28	30-015-01790	2366
Artesia Unit #43											
1980 FNL & 250 FWL (E)											
Melrose Energy	ō	Inactive	2390-2400	10	305	Ukn.			1927	30-015-01775	2965
Artesia Unit #45				8 1/4	518	Ukn.					
2390 FNL & 1570 FEL (F)											
Molroe Engrav	ē	di di di	2400 2420	1 1 2	11/2				7144106	20 04 04700	0770
Artesia I Init #55	5	וומכווגנ	0747-0047	ONI.	O S				07/11//	20-013-01780	7447
2390 FSI & 1570 FWI (K)											
Melrose Energy Artesia Unit #56	ō	Inactive	2072-2442	7	2072	Uku.			3/28/26	30-015-01797	2442
1570 FSL & 1570 FWL (K)											
Melrose Energy	ō	P&A	2320-2432	8 1/4	682	Ukn			8/23/27	30-015-01795	2438
Artesia Unit #57				7	619	Ukn.					
1570 FSI & 1070 FWL (L)											
			0.7.0								
Meirose Energy	5	Active	2403-2418	2	324	Č.			1/30/26	30-015-01791	2445
Artesia Unit #58				8 1/4	635	UKn.					
1070 FSL & 250 FWL (M)										TIGITA	
										EANIDII	
									5277	C	

Page 1

Melrose Energy	ō	Inactive	2403-2443	9	354	U.S.			2/23/26	30-015-01792	2474
Artesia Unit # 59				8 1/4	807	Ukn.					
330 FSL & 330 FWL (M)				4 1/2	2362	200	1425		Temp Survey		
Flynn Welch	P&A			10	328	l lak			5/13/26	30-015-01704	2432
State 647 #42				8 1/4	723	n k			045	10.000	7047
2390 FSL & 1070 FWL (L)											
Flynn Welch	P&A			10	374	Unk.			5/7/26	30-015-01793	2428
State 647 #41				8 1/4	715	Unk.					
1570 FSL & 250 FWL (L)											
T-18-S, R-28-E, Section 4											
Melrose Energy	ō	Inactive	2040-2344	10	310	Ukn.			9/16/25	30-015-02580	2344
Levers State #1					009	Ukn.					
1070 FSL & 1070 FEL (P)				6 5/8	2040	Ukn.					
Meirose Energy	ö	Inactive	2270-2402	8 1/4	520	Ukn.			11/29/25	30-015-02581	2402
- 1				5 1/2	2310	25		2167			
250 FSI & 1070 FEL (P)											
Melrose Energy	ō	Inactive	2353-2400	8 1/4	200	Ukn.			12/26/25	30-015-02582	2400
Levers State #3				6 5/8	2151	Ukn.					
250 FSI & 250 FEI (P)											
Moiroso Enorav	7	Continue	2047 2202	0 4 17	272				10,100	170	!
Mellose Erleigy	5	IIIacuve	2047-7393		010	GKJ			12/4/25	30-015-02583	2417
				9/0 0	2148	Č.					
10/0 FSL & 250 FEL (P)											
Fina	ō	P&A	2414-2416	10	535	Unk.			12/1/25	30-015-02573	2416
Levers State #5				8 1/4	850	Unk.					
1070 FSL & 1570 FEL (O)				9/2 9	869	Unk.					
				4 1/2	244	Unk.					
Welcon, Observed	800										
Maioney-Chambers State #1	7 2								12/15/25	30-015-02559	2500
2390 FNL & 1070 FEL (H)											
Frontier Petroleum	P&A								12/23/25	30-015-02565	2408
McQuigg #5											
1570 FSL & 1570 FEL (J)											

State #1												
2390 FM - 8-1070 FEE: (1)								<u> </u>				
Frontier Petroleum	P&A									12/23/2025	12/23/2025 30-015-02565	2408
McQuigg #5												
1570 FSL & 1570 FEL (J)												
Sunray DX Oil	P&A									12/25/2025	12/25/2025 30-015-02560	2425
Bookman State #1												
1570 FSI & 1070 FEL (I)												
						-						
A Company of the Comp				-				1				
RECOMMENDATION:												
Run CBL's and determine the actual Top of Cement. If the cement does not cover injection zone well will be squeeze cemented to cover zone.	tual Top	of Cemer	it. If the cen	nent does	not cover	injection .	zone well	will be squ	leeze cemented	to cover zone.		

Well and Location	Type	Status	Locator	Comment	Recommened Action
Marboh Energy	Ö	P& A	Page 3	P& A	No action
N G Phillips #5			200		fresh water protected
1650 FSL & 1650 FEL (J)		:			
Marbob Energy	Oil	Active	Page 3	Cement to surf	No action
Walker State #2					fresh water protected
330 FSL & 1650 FEL (O)					
Melrose Energy	Oil	Inactive	Page 9	Calc TOC	No action
Artesia Unit #11				(ij 616 @)	fresh water protected
360 FNL & 360 FWI (D)					
Melrose Energy	liO	Inactive	PAGE 17		No action
Artesia Unit #44		WIW			fresh water protected
2310 FNL & 990 FWL (E)					
Melrose Energy	ē	Inactive	Page 17		Dig out well head
Artesia Unit #43			٥		If surface is present
1980 FNL & 250 FWL (E)					fresh water protected
Melrose Energy	Oil	Inactive	Page 18		Dig out well head
Artesia Unit #56					If surface is present
1570 FSL & 1570 FWL (K)					fresh water protected
Melrose Energy	Oil	Inactive	Page 18		Dig out well head
Artesia Unit #55					If surface is present
2390 FSI & 1570 FWI (K)			:		fresh water protected
Melrose Energy	Oil	P&A	Page 18		Well Plugged
Artesia Unit #61					fresh water protected
660 FSL & 2310 FEL (O)					

On wells with unknow surface casing the proposed procedure is as follows:

- 1) Dig up wellhead to determine if surface pipe is present/ if present fresh water is protected
- 2) If surface pipe is not present/ run CBL to determine cement tops on Production pipe If cement is above injection zone fresh water is protected
- If cement is below injection zone well will be squeezed cemented to protect fresh water

Well Name	Reference page	Reference page # of 1/2 mile radius data	is data
Larue, C.E. & Muncy B.M. Moore State #1 1650 FNI & 330 FFI (H)	page 6		
Melrose Energy Artesia Unit # 7	page 15		
480 FNL & 330 FWL (D)			
Melrose Energy Artesia Unit #53 1650 FSI & 1650 FEL (J)	Page 18		
Melrose Energy Artesia Unit # 33 330 FSL & 1631 FWL (N)	Page 15		:
Melrose Energy Artesia Unit #35 330 FNL & 1650 FWL (C)	Page 16		
Melrose Energy Artesia Unit #37 990 FNL & 990 FEL (A)	Page 17		
Melrose Energy Artesia Unit #54 1654 FSI & 2272 FWL (K)	Page 18		

Top th	17 17 17 18 18 18 18 18	17 17 17 17 17 17 17 17					Solog			DEDTIN		2		
Marche 6300-6316 658 738 375 5476 5576 Eff 718 720 7	National Packs 6300-6316 858 738 375 81460-8 1550	1,00	Well and Location	Туре	Status	Perforations	Size	Depth	No. Sacks	TOC	foc	Drilled	API Number	TD.
Machine 6300-6316 8 5/8 738 335 14500 14	Machine 6300-6316 8 5/8 738 375 1450	No. Inactive 6300-6316 8 5/8 738 335 1550												
(ii) Inactive 6300-6316 8 5/8 738 320° 5/56 EH	Machine 6300-6316 858 720 350 350 1450 155	(N) Inactive 6300-6316 8 5/8 720 330 320 1550 EH. 126 Oil Active 6152-6172 8 5/8 720 350 350 1483 (U) Active 6162-6072 8 5/8 720 350 1483 (U) Active 6060-6080 8 5/8 720 330 1483 (U) Active 6060-6080 8 5/8 720 330 1483 (U) Active 6060-6080 8 5/8 720 330 1483 (U) Active 6060-6080 8 5/8 738 330 15/8 8 15/8	T-17-S R-28-E Section 25											
(b) Active 6192-6172 8 5/8 720 350 8 4/8 incor 55/8 Eff. (c) Active 6192-6172 8 5/8 720 350 8 4/8 incor 55/8 Eff. (d) Active 6192-6172 8 5/8 720 350 8 4/8 incor 55/8 Eff. (e) P&A 6198-6224 8 5/8 720 375 8 150 8 4/8 incor 1014 (e) Coil Active 6060-6080 8 5/8 738 350 8 1/8 incor 1034 (f) Active 6060-6080 8 5/8 738 350 8 1/8 incor 1034 (h) Active 6060-6100 8 5/8 738 300 8 1/8 incor 1034 (h) Active 6168-6170 8 5/8 738 300 Circ. 5/8 Eff. (h) Active 6168-6170 8 5/8 738 300 Circ. 5/8 Eff. (h) Active 6169-6222 8 5/8 738 300 Circ. 5/8 Eff. (h) Active 6169-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6169-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6169-6232 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6169-6232 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6169-6232 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6169-6232 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6169-6232 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6209-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6209-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6209-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6209-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6209-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6209-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6209-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6209-6222 8 5/8 732 300 Circ. 5/8 Eff. (h) Active 6209-6222 8 5/8 732 320 300 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-6224 8 5/8 734 320 320 Circ. 5/8 Eff. (h) Active 6209-622	(b) Face of 152-6172	(b) Active 6152-6172 8 5/8 720 350 surfaces 55% Eff. 612 cmtd will 170 st HYS & 150 st 4% incor 65% Eff. 612 cmtd will 170	ВР Атосо	ō	Inactive	6300-6316	8 5/8	738	375		surface	8/20/60	30-015-01537	6392
(b) Active 6152-6172 8 5/8 720 350 8 1483 (c) Active 6162-6172 8 5/8 720 350 8 1483 (d) Active 6060-6080 8 5/8 720 375 8 1483 (e) Active 6060-6080 8 5/8 720 375 8 1483 (f) Active 6060-6080 8 5/8 738 350 8 1486 (h) Active 6060-6080 8 5/8 738 350 8 1486 (h) Active 6080-6100 8 5/8 738 300 Circ. 2428 (h) Active 6199-6210 8 5/8 739 300 Circ. 2428 (h) Active 6199-6210 8 5/8 732 300 Circ. 1638 (h) Active 6199-6210 8 5/8 732 300 Circ. 1638 (h) Active 6199-6210 8 5/8 732 300 Circ. 1638 (h) Active 6199-6210 8 5/8 732 300 Circ. 1638 (h) Active 6199-6210 8 5/8 732 300 Circ. 1638 (h) Active 6199-6210 8 5/8 732 300 Circ. 1638 (h) Active 6199-6210 8 5/8 732 300 Circ. 1497 (h) Active 6199-6210 8 5/8 732 300 Circ. 1497 (h) Active 6199-6210 8 5/8 732 300 Circ. 1497 (h) Active 6199-6210 8 5/8 732 300 Circ. 1497 (h) Active 6199-6210 8 5/8 732 300 Circ. 1497 (h) Active 6199-6210 8 5/8 732 300 Circ. 1497 (h) Active 6199-6210 8 5/8 732 300 Circ. 1497 (h) Active 6199-6210 8 5/8 730 300 Circ. 1497 (h) Active 6199-6210 8 5/8 730 300 Circ. 1497 (h) Active 6199-6210 8 5/8 730 300 Circ. 1497 (h) Active 6199-6210 8 5/8 730 300 Circ. 1497 (h) Active 6199-6210 8 5/8 730 300 Circ. 1497 (h) Active 6199-6210 8 5/8 730 300 Circ. 1497 (h) Active 6199-6210 8 5/8 730 300 Circ. 1497 (h) Active 6199-6210 8 5/8 730 300 Circ. 1497	(b) Active 6152-6172 8 5/8 720 350 st.4% Incor 65% Eff. 6122-6172 8 5/8 720 350 st.4% Incor 65% Eff. 6132-6172 8 5/8 720 375 st.4% Incor 65% Eff. 6132-6172 8 5/8 720 375 st.4% Incor 65% Eff. 6132-6172 8 5/8 720 375 st.4% Incor 65% Eff. 6132-6172 8 5/8 720 375 st.4% Incor 65% Eff. 6132-6172 8 5/8 728 320° st.4% Incor 65% Eff. 6132-6172 8 5/8 739 300 Circ. 2428 8 6/8 739 300 Circ. 2428 8 6/8 739 320° Circ. 2428 8 6/8 730° Circ. 2428 8 6/8 7	(b) Active 6152-6172 8 5/8 720 3560 surface 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 61/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 61/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 61/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 6188-6170 8 5/8 739 300 Circ. 65% Eff. 61/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 65% Eff. 61/2 cmtd w/ 170 sx HYS & 150 sx 4	Empire Abo Unit D 42				5 1/2	6383	320*		1550			
Oil Active 6152-6172 8 5/8 720 350 surface Oil P&A 6198-6224 8 5/8 720 375 67/8 ff. Oil P&A 6198-6224 8 5/8 720 375 51/2 ff. Oil Active 6060-6080 8 5/8 738 350 1014 Oil Active 6060-6100 8 5/8 738 350 1393 Oil Active 6060-6100 8 5/8 739 300 Circ. 2428 Oil Active 6060-6100 8 5/8 739 300 Circ. 2428 Oil Active 6060-6100 8 5/8 739 300 Circ. 2428 Oil Active 6060-6100 8 5/8 739 300 Circ. 2428 Oil Active 6060-6100 8 5/8 739 300 Circ. 55% Eff. Oil Active 6208-6222 8 5/8 712 643	Oil Active 6152-6172 8 5/8 720 350 surface Oil P&A 6198-6224 8 5/8 720 375 1493 Oil P&A 6198-6224 8 5/8 720 375 surface Oil Active 6060-6080 8 5/8 720 375 surface Oil Active 6060-6080 8 5/8 738 350 surface Oil Active 6060-6080 8 5/8 738 300 Circ. 340° Oil Active 6060-6080 8 5/8 738 350 Circ. 340° Oil Active 6060-6080 8 5/8 739 300 Circ. 340° Oil Active 6060-6080 8 5/8 739 300 Circ. 540° 5 1/2 cmtd w/ 125 sx HYS & 150 sx 4% incor 650% Eff. 650% Eff. 650% Eff. 650% Eff. Oil Active 6168-6170 8 5/8 739 300 <td< td=""><td>Oil Active 6152-6172 8 5/8 720 350 1493 Oil P&A 6198-6224 6 5/8 F/F 6326 320 1493 Oil P&A 6198-6224 8 5/8 720 375 5 1/4 1493 Oil P&A 6198-6224 8 5/8 720 375 5 1/4 1014 Oil Active 6060-6080 8 5/8 738 350 1014 1014 Oil Active 6080-6100 8 5/8 739 300 Circ. 2428 Oil Active 6080-6100 8 5/8 739 300 Circ. 2428 Oil Active 6080-6100 8 5/8 739 300 Circ. 2428 Oil Active 6168-6170 8 5/8 739 300 Circ. 55% Eff Oil Active 6158-6170 8 5/8 732 300 Circ. 55% Eff Oil Active</td><td>660 FSL & 1980 FWL (N)</td><td></td><td></td><td></td><td>*5 1/2 cmt</td><td>d w/ 170 sx</td><td></td><td></td><td>55% Eff.</td><td></td><td></td><td></td></td<>	Oil Active 6152-6172 8 5/8 720 350 1493 Oil P&A 6198-6224 6 5/8 F/F 6326 320 1493 Oil P&A 6198-6224 8 5/8 720 375 5 1/4 1493 Oil P&A 6198-6224 8 5/8 720 375 5 1/4 1014 Oil Active 6060-6080 8 5/8 738 350 1014 1014 Oil Active 6080-6100 8 5/8 739 300 Circ. 2428 Oil Active 6080-6100 8 5/8 739 300 Circ. 2428 Oil Active 6080-6100 8 5/8 739 300 Circ. 2428 Oil Active 6168-6170 8 5/8 739 300 Circ. 55% Eff Oil Active 6158-6170 8 5/8 732 300 Circ. 55% Eff Oil Active	660 FSL & 1980 FWL (N)				*5 1/2 cmt	d w/ 170 sx			55% Eff.			
Oil Active 6152-6172 8 5/8 720 350 surface Oil P&A 6198-6224 8 5/8 720 375 surface Oil P&A 6198-6224 8 5/8 720 375 surface Oil Active 6060-6080 8 5/8 720 375 surface Oil Active 6060-6080 8 5/8 738 350 surface Oil Active 6060-6100 8 5/8 738 350 clic. 2428 Oil Active 6060-6100 8 5/8 739 300 clic. 2428 Oil Active 6060-6100 8 5/8 739 300 clic. 2428 5 1/2 cmfd 4/10 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmfd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. Oil Active 6199-6219 8 5/8 714 375 1497 Oil Active 6199-6219 8 5/8 714 375 </td <td> Oil Active 6152-6172 6.56 720 350 320 1483 1483 15 (12 cmtd w/ 170 st HYS & 150 st 4% Incor 55% Eff 6310 340° 1014</td> <td> Oil Active 6152-6172 8 5/8 720 350 34/8 148/3 148/3 15 1/2 cmtd w/ 170 st HYS & 150 st 4% Incor 55% Eff. 6310 375 148/3 15 1/2 cmtd w/ 190 st HYS & 150 st 4% Incor 55% Eff. 6310 Active 6060-6080 8 5/8 738 350 330 55% Eff. 638/8 738 350 51% 65% Eff. 6226 51% 6218 739 300 61% 65% Eff. 6310 Active 6060-6100 8 5/8 739 300 Circ. 51% 61% </td> <td></td>	Oil Active 6152-6172 6.56 720 350 320 1483 1483 15 (12 cmtd w/ 170 st HYS & 150 st 4% Incor 55% Eff 6310 340° 1014	Oil Active 6152-6172 8 5/8 720 350 34/8 148/3 148/3 15 1/2 cmtd w/ 170 st HYS & 150 st 4% Incor 55% Eff. 6310 375 148/3 15 1/2 cmtd w/ 190 st HYS & 150 st 4% Incor 55% Eff. 6310 Active 6060-6080 8 5/8 738 350 330 55% Eff. 638/8 738 350 51% 65% Eff. 6226 51% 6218 739 300 61% 65% Eff. 6310 Active 6060-6100 8 5/8 739 300 Circ. 51% 61%												
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1483 12 cmtd wil 170 sx HYS & 150 sx 4% Incor 158% Eff. Oil P&A 6198-6224 8 5/8 720 375 1014 Oil Active 6080-6080 8 5/8 738 350 340 1014 Oil Active 6080-6100 8 5/8 738 350 300 312 Oil Active 6158-6170 8 5/8 732 320 312 65% Eff. Oil Active 6158-6170 8 5/8 732 320 312 688 688 678 6	1483 1483	5 1/2 cmt/d w/ 170 sx H/S & 150 sx 4% Incor 55% Eff. Oil P&A 6198-6224 8 5/8 720 375 1014 5 1/2 cmt/d w/ 170 sx H/S & 150 sx 4% Incor 55% Eff. Oil Active 6060-6080 8 5/8 738 350 300 1393 Oil Active 6158-6170 8 5/8 738 300 Circ. 55% Eff. Oil Active 6199-6229 8 5/8 732 320° 1535 Oil Active 6199-6229 8 5/8 732 320° 1535 Oil Active 6199-6229 8 5/8 732 320° 1535 Oil Active 6199-6219 8 5/8 734 375 1535 Oil Active 6199-6219 8 5/8 744 375 150 sx 4% Incor 1535 Oil Active 6199-6219 8 5/8 744 375 150 sx 4% Incor 1535 Oil Active 6199-6219 8 5/8 744 375 150 sx 4% Incor 1535 Oil Active 6199-6219 8 5/8 744 375 1497 Oil Active 6199-6219 8 5/8 774 375 1497 Oil Active 6199-	BP Amoco	ō	Active	6152-6172	8 5/8	720	350		surface	7/22/60	30-015-01554	6326
Oil P&A 6198-6224 8 5/8 720 375 Surface	12 Cmfd wi 170 sx HYS & 150 sx 4% Incor 55% Eff.	Coli	Empire Abo Unit #39				5 1/2	6326	320*		1493			
Oil P&A 6198-6224 8 5/8 720 375 surface	Oil P&A 6199-6224 8 5/8 720 375 surface 5 1/2 cmtd wt 190 sx HYS & 150 sx 4% Incor 55% Eff. 1/2 cmtd wt 190 sx HYS & 150 sx 4% Incor 55% Eff. 5 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 55% Eff. 5 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 55% Eff. 6218 739 300 circ. 2428 5 1/2 cmtd wt 125 sx HYS & 150 sx 4% Incor 55% Eff. 5 1/2 cmtd wt 125 sx HYS & 150 sx 4% Incor 55% Eff. 5 1/2 cmtd wt 125 sx HYS & 150 sx 4% Incor 55% Eff. 5 1/2 cmtd wt 162 sx HYS & 150 sx 4% Incor 155% Eff. 5 1/2 cmtd wt 162 sx HYS & 150 sx 4% Incor 155% Eff. 5 1/2 cmtd wt 162 sx HYS & 150 sx 4% Incor 155% Eff. 5 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 155% Eff. 5 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 155% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 155% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 155% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 155% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 155% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 155% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 160 circ. 55% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 160 circ. 55% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 160 circ. 55% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 160 circ. 55% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 160 circ. 55% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 160 circ. 55% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 160 circ. 55% Eff. 6 1/2 cmtd wt 170 sx HYS & 150 sx 4% Incor 160 circ. 6 1/497 circ.	Oil P&A 6199-6224 8 5/8 720 375 surface 5 1/2 cmt'd w' 190 sx HYS & 150 sx 4% incor 55% Eff.	1650 FSL & 1980 FEL (J)				*5 1/2 cmť	d w/ 170 sx	HYS & 150 sx 4% Incor		55% Eff.			
Oil P&A 6198-6224 8 5/8 720 375 5104	Oil P&A 6198-6224 8 5/8 720 375 5104	Oil P&A 6198-6224 8 5/8 720 375 540° 1014												
Marchine 6060-6080 8 5/8 738 350 320° 1014 1033 1038	Marchine 6060-6080 8 5/8 738 350 320° 1014 1039 1014	Marchine 1014 101	BP Amoco	ō	P&A	6198-6224	8 5/8	720	375		surface	7/8/60	30-015-01553	6310
Matchine Color Form Fo	Matchine Color-Gobol Col	Matchine Color-6080 State Sta	Empire Abo Unit C #38				5 1/2	6310	340*		1014			
Oil Active 6060-6080 8 5/8 738 350 surface 51/2 cmtd w/170 sr HYS & 150 sx 4% Incor 55% Eff. Oil Active 6168-6170 8 5/8 739 300 Circ. 2428 Oil Inactive 6158-6170 8 5/8 739 300 Circ. 55% Eff. Oil Active 6168-6222 8 5/8 732 300 Circ. 55% Eff. Oil Active 6199-6219 8 5/8 732 300 Circ. 1497 Oil Active 6199-6219 8 5/8 734 375 sx 4% Incor 1487 Oil Active 6199-6219 8 5/8 734 320 Circ. 1487 Oil Inactive 6208-6222 8 5/8 774 375 sx 4% Incor 1535 Oil Active 6199-6219 8 5/8 774 375 sx 4% Incor 55% Eff. Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1487 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inactive 6297-6315 8 5/8 750 3300 Circ. 1467 Oil Inac	Oil Active 6060-6080 8 5/8 738 350 surface 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. Oil Active 6080-6100 8 5/8 739 300 clirc 2428 Oil Inactive 6158-6170 8 5/8 732 300 clirc 55% Eff. Oil Active 6109-6219 8 5/8 732 300 clirc 55% Eff. Oil Active 6109-6219 8 5/8 732 300 clirc 55% Eff. Oil Active 6109-6219 8 5/8 732 300 clirc 55% Eff. Oil Active 6109-6219 8 5/8 732 300 clirc 55% Eff. Oil Active 6109-6219 8 5/8 714 375 sx 4% Incor 55% Eff. Oil Inactive 6208-6222 8 5/8 732 300 clirc 55% Eff. Oil Active 6109-6219 8 5/8 714 375 sx 4% Incor 55% Eff. Oil Inactive 6208-6315 8 5/8 750 300 clirc 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467	Oil Active 6060-6080 8 5/8 738 350 320° 1393					*5 1/2 cmt	d w/ 190 sx	HYS & 150 sx 4% Incor		55% Eff.			
Oil Active 6060-6080 8 5/8 738 350 55% Eff. Oil Active 6080-6100 8 5/8 739 300	Oil Active 6060-6080 8 5/8 738 350 surface 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 175 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 125 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 125 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 125 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 150 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 150 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 50 sx 4% Incor 50 sx 4% I	Oil Active 6060-6080 8 5/8 738 350 surface 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 175 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 125 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 125 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 125 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 150 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 150 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1497 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467 55% Eff. 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467 51/2 cmt/d w/ 170 sx HYS & 150 sx 4% Incor 1467												
1393 1393	1383 1383	1320° 1383 5 1/2 cm/d w/ 170 sx HYS & 150 sx 4% Incor 1383 15 1/2 cm/d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 15 1/2 cm/d w/ 125 sx HYS & 150 sx 4% Incor 55% Eff. 16 1	BP Amoco	ō	Active	0809-0909	8 2/8	738	350		surface	8/27/60	30-015-01557	6280
10 Active 6080-6100 85/8 739 300 55% Eff. 10 Active 6080-6100 85/8 739 300 Circ. 10 Active 6158-6170 85/8 739 300 Circ. 10 Inactive 6158-6170 85/8 739 300 Circ. 10 Active 6208-6222 85/8 732 300 Circ. 10 Active 6208-6222 85/8 732 320° 1535 10 Active 6199-6219 85/8 714 375 1535 Sw. 4% Incor 10 Active 6199-6219 85/8 714 375 Sw. 4% Incor 11 Inactive 6297-6315 85/8 750 300 Circ. 12 Active 6298-6219 85/8 714 375 Circ. 13 Active 6297-6315 85/8 750 300 Circ. 14 Active 6297-6315 85/8 750 300 Circ. 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 12 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 15 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 15 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 15 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 15 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 15 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 15 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 15 15 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 16 17 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 17 17 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 17 17 17	19 Active 6080-6100 85/8 739 300 55% Eff. 19 Active 6080-6100 85/8 739 300 Circ. 55% Eff. 10 Active 6158-6170 85/8 739 300 Circ. 55% Eff. 10 Active 6158-6170 85/8 732 300 Circ. 55% Eff. 10 Active 6208-6222 85/8 732 300 Circ. 688	19 Active 6080-6100 85/8 739 300 Surface 51/2 cm²²² 478.8 150 sx 4% Incor 55% Eff. Oil Active 6158-6170 85/8 739 300 Circ. 55% Eff. Oil Active 6158-6170 85/8 732 300 Circ. 55% Eff. Oil Active 6208-6222 85/8 732 300 Circ. 55% Eff. Oil Active 6199-6219 85/8 732 320° 1535 Circ. Oil Active 6199-6219 85/8 714 375 Surface 51/2 cm²² 41/3 320° 1535 Circ. Oil Active 6207-6315 85/8 750 300 Circ. 55% Eff. Oil Inactive 6297-6315 85/8 750 300 Circ. 55% Eff. Oil Inactive 6297-6315 85/8 750 300 Circ. 1497 Circ. 51/2 cm²² 41/3 81/	Empire Unit #37				5 1/2	6226	320*		1393			
Oil Active 6080-6100 8 5/8 739 300 surface Oil Inactive 6168-6170 8 5/8 739 300 Circ. 55% Eff. Oil Active 6158-6170 8 5/8 739 300 Circ. 55% Eff. Oil Active 6208-6222 8 5/8 732 300 Circ. 688 Oil Active 6199-6219 8 5/8 714 375 1535 1497 Oil Active 6199-6219 8 5/8 714 375 1487 5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 6 0il Inactive 6297-6315 8 5/8 750 320° 1467 6 0il Inactive 6297-6315 8 5/8 750 320° 1467 7 630 320° 1467 55% Eff. 6405 320° 1467	Oil Active 6080-6100 8 5/8 739 300 clrc. surface Oil Inactive 6186-6170 8 5/8 739 300 Circ. 55% Eff. Oil Inactive 6158-6170 8 5/8 739 300 Circ. 55% Eff. Oil Active 6158-6170 8 5/8 739 300 Circ. 688 Oil Active 6208-6222 8 5/8 732 300 Circ. 688 Oil Active 6208-6222 8 5/8 732 320 1535 1497 Oil Active 6199-6219 8 5/8 714 375 1497 1497 5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 5 0il Inactive 6297-6315 8 5/8 750 320° 1467 5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 1487 1487 1487	Oil Active 6080-6100 8 5/8 739 300 curtace Oil Inactive 6168-6170 8 5/8 739 300 Circ. 55% Eff. Oil Inactive 6158-6170 8 5/8 739 300 Circ. 55% Eff. Oil Active 6158-6170 8 5/8 732 300 Circ. 55% Eff. Oil Active 6208-6222 8 5/8 732 300 Circ. 688 Oil Active 6199-6219 8 5/8 714 375 1535 surface 5 1/2 6332 320° 1535 surface 51/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 5 1/2 6330 320° 1697 55% Eff. 5 1/2 6330 320° 55% Eff. 55% Eff. 5 1/2 6330 320° 55% Eff. 55% Eff. 60 1 Inactive 6297-6315 8 5/8 750 300 Circ. 55% Eff. <	1650 FSL & 990 FWL (L)				*5 1/2 cmt	d w/ 170 sx	HYS & 150 sx 4% Incor		55% Eff.			
Oil Active 6080-6100 8 5/8 739 300 51/2 2428 275° Circ. 2428 Circ. 2428 275° Cir	Oil Active 6080-6100 85/8 739 300 Circ. 24/28	Oil Active 6080-6100 85/8 739 300 Circ. 2428 275° Circ. 2428 Circ. 2428 275° Circ. 2428 Circ. 2428 275° Circ. 2428												
Single S	Dil Inactive 6158-6170 85/8 739 300 Circ. 2428	Dil Inactive 6158-6170 85/8 739 300 Circ. 2428	BP Amoco	5	Active	6080-6100	8 5/8	739	300		surface	6/3/60	30-015-01551	6220
The country	Oil Inactive 6158-6170 8 5/8 739 300 Circ. 65% Eff. Oil Active 6208-6222 8 5/8 732 300 Circ. 6/18/60 30-015-01550 Oil Active 6199-6219 8 5/8 712 cmfd w/ 170 sx HYS & 150 sx 4% Incor Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555	Oil Inactive 6158-6170 8 5/8 739 300 Circ. 65% Eff. Oil Active 6208-6222 8 5/8 714 8 150 sx 4% Incor Oil Active 6199-6219 8 5/8 714 375 Store 61997 Oil Active 6297-6315 8 5/8 750 300 Circ. 67/16/0 30-015-01552 Oil Inactive 6297-6315 8 5/8 750 300 Circ. 67/16/0 30-015-01555 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor Sign	Empire Abo Unit D #37				5 1/2	6218		Circ.	2428	Circulate 1	o surface after so	do[ezeenl
Oil Inactive 6158-6170 8 5/8 739 300 Circ. 6/18/60 30-015-01550 O 61/2 6435 312* 688 61/8 688 61/8 61/8 61/8 61/8 61/8 61/8 61/8 61/8 61/8 61/8 61/8 61/8 732 300 7/1/80 7/1/80 30-015-01552 61/2 61/2 61/2 6332 320* 1535 7/1/80 30-015-01552 61/2	Oil Inactive 6158-6170 8 5/8 739 300 Circ. 688 6/18/60 30-015-01550	Oil Inactive 6158-6170 8 5/8 739 300 Circ. 6/18/60 30-015-01550 Oil Active 6208-6222 8 5/8 732 300 Circ. 7/1/60 30-015-01552 Oil Active 6208-6222 8 5/8 732 300 Circ. 7/1/60 30-015-01552 Oil Active 6199-6219 8 5/8 714 375 surface 7/2/60 30-015-01552 Oil Active 6199-6219 8 5/8 714 375 surface 7/2/60 30-015-01555 Active 6199-6219 8 5/8 714 375 surface 7/2/60 30-015-01555 Active 6199-6219 8 5/8 760 300 Circ. 5/2/60 30-015-01557 Active 6199-6219 8 5/8 760 300 Circ. 5/2/60 30-015-01737 Active 6199-6215 8 5/8 750 300 Circ. 6/19/60 30-015-01737	550 FSL & 820 FWL (M)				*5 1/2 cmt	d w/ 125 sx			55% Eff.			
Colin Inactive Origo-origin Colin Co	Marcine C130-0170 C139 C142 C1435	Marcure 1100-0170 0.300 0.40c.	DD Amoon	Ö	o ilean	6450 6470	0/2/0	1		Ö		00,07,0	21.70	40,0
) Active 6208-6222 8 5/8 732 300 Circ. 7/1/60 30-015-01552 5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor Solution of the control of the control of the correction of the corre	Coli	Active 6208-6222 8 5/8 732 300 Circ 7/1/60 30-015-01552 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor 1535 1536 310-015-01552 1536 310	Empire Abo I lait D # 38	5	ווימכוועם	0/10-0010	0 2/0	6425	2000	٥		0/10/0	00010-010-00	0455
Oil Active 6208-6222	Oil Active 6208-6222 8 5/8 732 300 Circ. 7/1/60 30-015-01552	Oil Active 6208-6222	330 ECL 8 2340 EMIL 24				3/1/2	0450	c	000				
Oil Active 6208-6222 8 5/8 732 300 Circ. 7/1/60 30-015-01552 Oil Active 6199-6219 8 5/8 714 8 150 sx 4% Incor 1497 30-015-01555 5 1/2 cmt²d w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 30-015-01737 5 1/2 cmt²d w/ 170 sx HYS & 150 sx 4% Incor 6/19/60, 30-015-01737 5 1/2 cmt²d w/ 170 sx HYS & 150 sx 4% Incor 6/19/60, 30-015-01737 5 1/2 cmt²d w/ 170 sx HYS & 150 sx 4% Incor 1467	Oil Active 6208-6222 8 5/8 732 300 Circ. 7/1/60 30-015-01552 Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555 6 5 1/2 6330 320° 1497 1497 1497 5 5 1/2 6330 320° 1497 55% Eff. 55% Eff. 6 1 172 61/2 61/2 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 6 5 1/2 6405 320° 1467 6/19/60, 30-015-01737 6 5 1/2 6405 320° 1467 6/19/60, 30-015-01737	Oil Active 6208-6222 8 5/8 732 300 Circ. 7/1/60 30-015-01552 Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555 S Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555 S Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 S Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 S 1/2 6405 320° 1467 6/19/60, 30-015-01737 S 1/2 6405 320° 1467 6/19/60, 30-015-01737	330 F3L & 2310 FVVL (N)				2) 1/2 cmt	d W/ 162 SX	-ಶ					
Solution	Solution	5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1535 15260 30-015-01555 5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1497 5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 55% Eff. 6 0ii Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60 30-015-01737 5 1/2 cmtd w/ 170 sx HYS & 150 sx 4% Incor 1467 EXHI	BP Amoco	ō	Active	6208-6222	8 5/8	732	300	Ö		7/1/60	30-015-01552	6332
Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555	Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555	Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor 5	Empire Abo Unit #39				5 1/2	1	320*	1535				
Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555 35 5 1/2 6330 320° 1497 </td <td>Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555</td> <td>Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555</td> <td>330 FSL & 1980 FEL (O)</td> <td></td> <td></td> <td></td> <td>*5 1/2 cmt</td> <td>'d w/ 170 sx</td> <td>જ</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555	Oil Active 6199-6219 8 5/8 714 375 surface 7/25/60 30-015-01555	330 FSL & 1980 FEL (O)				*5 1/2 cmt	'd w/ 170 sx	જ					
373 379	35 Surface (125)60 30-015-01555 Surface (125)60 30-015-01737 Surface (125)60 30-01737 Surface (125)60 S	35 Oil Inactive 6297-6315 8 5/8 750 Surface 7/25/60 30-015-01555 Surface 7/25/60 30-015-01555 Surface 7/25/60 30-015-01555 Surface 7/25/60 30-015-01555 Surface 7/25/60 30-015-01737 Surface 7/25 Surface 7/25/60 30-015-01737 Surface 7/25/60 30-015-01737 Surface 7/25 Surface 7/25/60 30-015-01737 Surface 7/25/60 30-015-01737 Surface 7/25/60 Surface 7/2	DD Amoso	ē	Action	6400 6240	0/2/0	7777				0011011	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0000
35 Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60 30-015-01737 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor 1467 6/19/60 1 30-015-01737 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor	35 Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60 30-015-01737 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor 1467 FYH	35 Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor	Empire Abo Unit #40	5	DAIIN	0190-0719	5 1/2 1/2	6330	370*		Sullace 4404	00/07//	30-010-01000	0230
35 Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60 30-015-01737 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor	35 Section of the control of the	35 Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor	GEO COL 8 GEO CEL 101				45 475 0	0000	6		149/			
35 Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor *5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor 1467 6/19/60, 30-015-01737	35 Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 5 1/2 6405 320° 1467 6/19/60, 30-015-01737 *5 1/2 cm²d w/ 170 sx HYS & 150 sx 4% Incor *5 1/2 cm²d w/ 170 sx HYS & 150 sx 4% Incor *FXHI	35 Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor *5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor EXHI	OOU LOL & OOU LEL (F)				2 1/2 CMI	XS O/1 /M D	ಶ		55% Eff.			
Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 *5 1/2 6405 320* 1467 **	Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60 p 30-015-01737 *5 1/2 cm²d w/ 170 sx HYS & 150 sx 4% incor *5 1/2 cm²d w/ 170 sx HYS & 150 sx 4% incor FXHI	Oil Inactive 6297-6315 8 5/8 750 300 Circ. 6/19/60, 30-015-01737 *5 1/2 6405 320* 1467 ** *5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% incor *EXHI	T-17-S R-28-E Section 35											
\$ 1/2 6405 320° 1467 *5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor	\$ 1/2 6405 320° 1467	\$ 1/2 6405 320° 1467	BP Amoco	ō	Inactive	6297-6315	8 2/8	750	300	Circ.		6/19/60	30-015-01737	6405
	*5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor	*5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor	Empire Abo Unit E #40				5 1/2	6405	320*	1467				
	EXHIRIT	EXHIBIT	660 FNL & 660 FEL (A)				*5 1/2 cmt	'd w/ 170 sx	HYS & 150 sx 4% Incor					
	TXHIRT	EXHIBIT												

Well and Location	Туре	Status	Perforations	Casing Size	Depth	No. Sacks	REPT'D TOC	Meas. TOC	Date Drilled	API Number	ΩL
BP Amoco	Ö	Inactive	6210-6324	8 5/8	750	275	C Circ		6/1/60	30-015-01735	6350
Empire Abo Unit E #39				5 1/2	6350	275*		1939′			
660 FNL & 1980 FEL (B)				*5 1/2 cmt'c	*5 1/2 cmt'd w/ 125 sx HYS &	HYS & 150 sx 4% Incor		64% Eff.			
BP Amoco	Ĉ	hactive	6246-6254	8,5/8	062	250	ç <u>i</u>		E/46/60)	20 045 04733	6404
Empire Abo Unit F #38				5 1/2	200	275*	2 2		3	-	\$
1650 FNL & 1650 FWL (F)				*5 1/2 cmt'o	*5 1/2 cmt'd w/ 125 sx HYS &	150	5				
4											
BP Amoco	5	Inactive	6200-6210	8 2/8	708	350		surface	7/13/60	30-015-01738	6350
Empire Abo Unit F #39				5 1/2	6350			822			
11650 FNL & 2310 FEL (G)				*5 1/2 cmt'd	1 w/ 200 sx HYS &	4YS & 150 sx 4% Incor		55% Eff.			
	ē			!							
BP Amoco	5	Inactive	62/4-6284	8 5/8	857	375		surface	9/6/61	30-015-01740	6421
Empire Abo Unit F #40				5 1/2	6421	340*		1125			
1650 FNL & 990 FEL (H)				*5 1/2 cmt'c	l w/ 190 sx l	*5 1/2 cmt'd w/ 190 sx HYS & 150 sx 4% Incor		55% Eff.			
BP Amoco	ö	Inactive	6243-6308	8 5/8	757	350		surface	8/23/61	30-015-01739	6378
Empire Abo Unit G #38				5 1/2	6378	320*		1545			
2310 FSL& 1650 FWL (K)				*5 1/2 cmfc	*5 1/2 cmt'd w/ 170 sx HYS &	1YS & 150 sx 4% Incor		55% Eff.			
Br Amoco	5	Inactive	6226-6238	8 5/8	720	300	į	surface	6/25/60	30-015-01734	6351
Empire Abo Unit G #37				5 1/2	6351	320*	1935				
2310 FSL & 330 FWL (L)				*5 1/2 cmt'c	l w/ 170 sx l	*5 1/2 cmt'd w/ 170 sx HYS & 150 sx 4% Incor					
T-17-S, R-28-E, Section 36											
BP Amoco	ō	Inactive	6238-6252	8 5/8	748	350		surface	10/7/61	30-015-05760	6400
Empire Abo Unit E #41				5 1/2	6400	320*		1567			
330 FNL & 330 FWL (D)				*5 1/2 cmt'c	*5 1/2 cmt'd w/ 170 sx HYS &	1YS & 150 sx 4% Incor		55% Eff.			
RECOMMENDATION:											
No recommended action at this time because the tops appear sufficient to protect the injection interval and any fresh water zones.	s time b	ecanse the	tops appear sui	ficient to pro	tect the inje	ction interval and any frest	h water zones				