Producing thermal EOR in U.S.

Type/ Operator	Field	State	County	Start date	Area, acres	No. wells, prod	No. wells, inj.	Pay zone	Form-ation	Porosity %
Steam										
AERA	Belridge	Calif.	Kern	1961	3,489	2,900	975	Tulare	S	36
AERA	Cat Canyon	Calif.	Santa Barbara	3/85	1,000			Basal Sisquoc	S	32
AERA	Coalinga	Calif.	Fresno	1980	550	190	22	Temblor Zone I	S	32
AERA	Coalinga	Calif.	Fresno	11/87	260	172	48	Etchegoin	S	34
AERA	Cymric	Calif.	Kern	12/86	200	100	46	Tulare	S	36
AERA	Kern River	Calif.	Kern	1970	600	840	270	Kern River Series	S	30
AERA	Lost Hills	Calif.	Kern	6/90	125	100	36	Etchegoin	US	40
AERA	Lost Hills	Calif.	Kern	6/90	150	125	37	Tulare	US	40
AERA	McKittrick	Calif.	Kern	3/88	226	145	115	Tulare	S	36
AERA	Midway-Sunset	Calif.	Kern	10/70	400	381	32	Monarch	S	34
AERA	Midway-Sunset	Calif.	Kern	1979	70	66	0	Upper Spellacy	S	28
AERA	Midway-Sunset	Calif.	Kern	1/89	68	78	8	Lower	S	25
AERA	Midway-Sunset	Calif.	Kern	1983	143	205	25	Sub-Hoyt	S	31
AERA	Midway-Sunset	Calif.	Kern	1971	400	650	34	Potter	US	22-32
AERA	Midway-Sunset	Calif.	Kern	1980	85	145	8	Monarch	S	25
AERA	Mount Poso	Calif.	Kern	1971	800	75	16	Vedder	S	33
AERA	North Midway-Sunset	Calif.	Kern	11/67	410	376	21	Potter	S	35
AERA	San Ardo	Calif.	Monterey	6/68	470	100	28	Aurignac	S	34.5
AERA	San Ardo	Calif.	Monterey	3/80	95	42	14	Lombardi	S	32.5
AERA	South Belridge	Calif.	Kern	1969	870	510	263	Tulare	US	36.8
AERA	South Belridge	Calif.	Kern	1965	1,987	50		Tulare	US	36.8
AERA	Yorba Linda	Calif.	Orange	1971	310	203	11	Upper Conglomerate	S	22
ARCO	Kern River	Calif.	Kern	1970	80	88	11	Kern River Series	S	31
ARCO	Kern River	Calif.	Kern	1970	90	87	28	Kern River Series	S	33
ARCO	Kern River	Calif.	Kern	9/72	40	25	11	Kern River Series	S	31
ARCO	Kern River	Calif.	Kern	1972	50	80	39	Kern River Series	S	31
ARCO	Midway-Sunset	Calif.	Kern	1/72	40	63	7	Potter	S	32
ARCO	Midway-Sunset	Calif.	Kern	1971	53	137	13	Potter	S	34
ARCO	Midway-Sunset	Calif.	Kern	1983	115	109	42	L. Monarch	S	30
ARCO	Midway-Sunset	Calif.	Kern	1981	40	94	13	Monarch	S	32
ARCO	Midway-Sunset	Calif.	Kern	8/72	124	130	5	Monarch	S	32
ARCO	Midway-Sunset	Calif.	Kern	1984	15	7	0	Sub Lakeview	S	30
ARCO	Midway-Sunset	Calif.	Kern	1969	50	98	17	Metson	S	30
ARCO	Midway-Sunset	Calif.	Kern	1989	40	127	4	Potter/Tulare	S	30
ARCO	Midway-Sunset	Calif.	Kern	1977	107	222	32	Potter	S	36
ARCO	Midway-Sunset	Calif.	Kern	1986	40	69	3	Potter	S	27
ARCO	Midway-Sunset	Calif.	Kern	1984	80	87	4	Potter/Tulare	S	30
ARCO	Midway-Sunset	Calif.	Kern	1984	70	49	2	Potter/Tulare	S	30
ARCO	Midway-Sunset	Calif.	Kern	3/90	80	218	7	Potter/Crocker/Tulare	S	30
ARCO	Midway-Sunset	Calif.	Kern	3/90	120	314	27	Potter	S	30
ARCO	Midway-Sunset	Calif.	Kern	1988	80	34	8	Marviz	S	30
ARCO	Midway-Sunset	Calif.	Kern	1965	160	206	0	Potter	S	26
ARCO	Placerita	Calif.	Los Angeles	1986	95	106	55	L. Kraft	S	28
Berry	North Mid-Sunset	Calif.	Kern	1965	160	120		Potter	S	30
Berry	South Mid-Sunset	Calif.	Kern	1964	300	650		Monarch	S	30
Carrizo	Camp Hill	Tex.	Anderson	4/89	58	45	24	Carrizo	S	37
Chevron	Cymric 26W	Calif.	Kern	10/89	30	31	19	Tulare/Amnicola	S	33
Chevron	Cymric 35/36W	Calif.	Kern	5/75	285	130	47	Tulare/Amnicola	S	33
Chevron	Cymric 5Z	Calif.	Kern	2/91	12	14	4	Tulare/Amnicola	S	36
Chevron	Cymric 6Z	Calif.	Kern	2/86	30	31	19	Tulare/Amnicola	S	33
Chevron	Cymric 7Z	Calif.	Kern	5/91	177	30	30	Tulare	S	36
Chevron	Kern River KCL 39	Calif.	Kern	10/75	118	67	42	Kern River	S	33
Chevron	Kern River MC1	Calif.	Kern	4/76	132	120	76	Kern River	S	34
Chevron	Kern River MCII	Calif.	Kern	4/71	80	129	30	Kern River	S	34
Chevron	Kern River Sec. 3	Calif.	Kern	9/68	424	345	155	Kern River	S	34
Chevron	Kern River Sec. 4	Calif.	Kern	6/78	156	200	64	Kern River	S	34
Chevron	Kern River Sec. 9 HHF	Calif.	Kern	1/92		8		Kern River	S	34
Chevron	Kern River-ANO	Calif.	Kern	5/74	160	177	82	Kern River	S	32
Chevron	Midway-Sunset Sec. 15A	Calif.	Kern	5/78	23	36	5	Potter	S	36
Chevron	Midway-Sunset Sec. 26C	Calif.	Kern	11/75	84	243	81	Monarch	S	32
Chevron	Midway-Sunset Sec. 2F	Calif.	Kern	10/83	84	44	10	Webster	S	32
Chevron	West Coalinga 12-D	Calif.	Fresno	2/82	120	89	31	Temblor	S	33
Chevron	West Coalinga 13-D	Calif.	Fresno	5/73	550	182	104	Temblor	S	35
Chevron	West Coalinga 25-D	Calif.	Kern	5/80	36	131	95	Temblor	S	29
Chevron	West Coalinga 31A/36Z	Calif.	Fresno	3/89	100	70	21	Temblor	S	33
Chevron	West Coalinga 6C	Calif.	Fresno	7/84	105	131	18	Temblor	S	33
Exxon	Midway-Sunset	Calif.	Kern	8/90	200	136	75	Monarch Sand	S	30
Exxon	South Belridge	Calif.	Kern	12/87	90	48	24	Tulare	S	38
Naftex	Edison 27-RT	Calif.	Kern	7/77	30	65	29	Chanac	S	30
Oxy USA	Kern Front	Calif.	Kern	11/81	3,240	491	28	Etchegoin Chanac	S	33
Saba	North Belridge	Calif.	Kern	11/65	160	14	0	Tulare	S	38
Stockdale	Kern Front	Calif.	Kern	2/93	160	54	6	Etchegoin	S	30
Texaco	Belridge	Calif.	Kern	6/82	180	75	24	Tulare S.D.	S	33
Texaco	Coalinga	Calif.	Fresno	3/91	40	38	11	Upper Temblor	S	30
Texaco	Coalinga	Calif.	Fresno	3/79	35	36	7	Lower Temblor	S	30
Texaco	Coalinga	Calif.	Fresno	5/92	20	18	4	Etchegoin	S	35
Texaco	Kern River	Calif.	Kern	8/62	5,830	4,762	1,319	Kern River Series	S	31

Table B

Permeability, md	Depth, ft	Gravity °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod. b/d	Enh. prod. b/d	Proj. Eval.	Profit	Project Scope
2,400	400-1,400	13	1,900	95	Prim.	65		HF	37,000	37,000	Succ.	Yes	FW
500-1,000	2,500-4,500	6-12		90-150	Prim.	55		PP			TETT	Yes	FW
200-2,500	825-1,650	12-13	2,000-1E4	84-98	Prim.	60	10	NC	3,580	3,580	Succ.	Yes	FW
800-1,000	650-1,000	9-10		80-90	Prim.	55		HF	5,850	5,850	Succ.		FW
1,000-2,000	1,000	11-14	1,000-2,000	95-105	Prim.	65		JS	5,600	5,600	Succ.	Yes	LW
500-2,500	150-1,500	12-13	1E5-2E5	78-85	Prim.	55	10	HF	10,800	10,800	Succ.	Yes	FW
1,500	350	14	1,500	95	SS	55	20	JS	4,070	4,070	Prom.	Yes	FW
1,000	200	13	1,500	82	SS	60	20	JS	4,500	4,500	Prom.	Yes	FW
1,000-2,000	600	10-12		90-100	None	60		JS	4,500	4,500	Prom.		LW
4,000	950	13	800	85	Prim.	64	53	HF	12,000	12,000	Succ.	Yes	FW
1,500-2,500	900	13	2,235	90	Prim.	70		HF	800	800	Succ.	Yes	FW
700-2,500	800	11.6	5,000	90	Prim.	70		JS	1,600	1,600	Prom.		LW
2,000-3,000	1,080	13	3,000	100	Prim.	80		HF	4,300	4,300	Succ.	Yes	FW
	500-1,400	8.5-14		95	Prim.	75		HF	6,600	6,600	Succ.	Yes	FW
900	1,300	13	2,700	95	SS	75		HF	2,200	2,200	Succ.	Yes	FW
2,000-10,000	1,500-1,800	15-18	275	90-130	Prim.	55	10	NC	3,100	3,100	Succ.	Yes	FW
1,000	1,000	12	2,000	100	Prim.	65	30	HF	10,750	10,750	Succ.	Yes	FW
,2000	2,300	12	1,000	130	SS	55	27	HF	1,830	1,830	Succ.	Yes	FW
2,260	2,100	11	3,000	125	SS	55	27	HF	7,350	7,350	Succ.	Yes	P (Exp. L)
3,000	1,000	14	1,600	95	SS	62.9	21.1	HF	43,200	43,200	Succ.	Yes	Exp. L
3,000	1,000	14	1,600	95	Prim.	64.5	60.6	NC	460	460	Succ.	Yes	Exp. L
500-3,000	500-1,000	10-14		70-100	SS	66	20	NC	1,000	750	Succ.	Yes	FW
2,000	600	13	5,000	78	Prim.	63	15	NC	370	370	Succ.	Yes	LW
4,000	1,200	13	8,000	90	SS	55	20	NC	1,000	1,000	Succ.	Yes	LW
2,500	900	13	7,000	84	Prim.	70	15	HF	300	300	Succ.	Yes	LW
2,000	800	13	8,000	90	SS	60	15	NC	800	800	Succ.	Yes	LW
1,675	1,200	12	2,000	100	SS	65	15	HF	1,050	1,050	Succ.	Yes	LW
3,700	1,500	11.5	9,000	65	SS	67	15	HF	3,500	3,500	Succ.	Yes	LW
2,000	1,500	13	5,000	10	C	60	30	HF	2,500	2,500	Succ.	Yes	LW
1,500	1,200	13	30	200	SS	50	10	HF	1,250	1,250	Succ.	Yes	LW
1,500	1,000	13	1,500	100	SS	50	10	JS	900	900	Succ.	Yes	LW
4,500	1,300	13	4,000	90	Prim.	60	35	HF	120	120	Succ.	Yes	LW
3,000	1,100	11.4	9,500	130	Prim.	75	57	JS	2,700	2,700	Succ.	Yes	LW
3,500	1,500	12	4,000	105	Prim.	70	15	NC	1,750	1,750	Succ.	Yes	LW
2,000-5,000	600	13	6,000	110	SS	70	8-12	HF	4,500	4,500	Succ.	Yes	LW
,2200	700	11.9	74,000	80	Prim.	60	15	HF	650	650	Succ.	Yes	LW
1,500-3,000	800	12	10,000	95	Prim.	70	15	NC	450	450	Succ.	Yes	LW
3,500	800	12	10,000	95	SS	70	15	NC	300	300	Succ.	Yes	LW
2,500	900	11.5	10,000	95	SS	60	15	JS	3,500	3,500	Succ.	Yes	LW
3,500	900	11.5	10,000	95	Prim.	60	15	JS	7,200	7,200	Succ.	Yes	LW
300	1,100	12.7	3,500	104	SS	65	15	HF	700	700	Succ.	Yes	LW
4,000	810	13	10,000	90	SS	70	15	NC	2,400	2,400	Prom.	Yes	LW
3,000	1,800	12	7,500	100	Prim.	62	15	JS	3,000	3,000	Prom.	Yes	FW
3,000	1,300	14	4,000	85	Prim.	70	15	HF	1,000	700	Succ.	Yes	FW
2,000	1,000	13	8,000	80	Prim.	70	15	HF	7,000	5,000	Succ.	Yes	FW
2,500	400	18.4	1,200	75	Prim.	62	33	NC	200	200	Succ.	No	LW
2,900	1,200	12	5,500	100	SS	51	15	HF	1,461	1,461	Succ.	Yes	P
1,800	1,200	13	4,000	100	SS	52		NC	6,518	6,518	Succ.	Yes	LW
2,900	1,200	12	5,500	100	Prim.	51	15	HF	591	591	Succ.	Yes	LW
2,900	1,200	12	5,500	100	SS	51	15	HF	900	900	Succ.	Yes	LW
2,900	600	12	5,500	100	CS	53	15	NC	70	70	Succ.	Yes	LW
3,100	1,400	14	2,000	90	Prim.	65		HF	379	379	Succ.	Yes	P
2,800	960	14	2,000	90	Prim.	59		HF	2,072	2,072	Succ.	Yes	FW
2,800	960	14	2,000	90	Prim.	59		HF	2,274	2,274	Succ.	Yes	FW
3,389	775	14	2,000	90	Prim.	55		HF	8,340	8,340	Succ.	Yes	FW
3,000	850	14	2,000	90		60		HF	3,778	3,778	Succ.	Yes	FW
3,000	800	14	2,000	90	SS	55		HF	158	158	Succ.	Yes	FW
3,000	1,000	14	2,000	90	Prim.	55		HF	3,643	3,643	Succ.	Yes	FW
3,900	1,400	14	900	120	SS	61	20	NC	1,600	1,600	Succ.	Yes	P
1,100	1,300	14	1,500	150	SS	58	20	HF	7,381	7,381	Succ.	Yes	FW
2,000	1,800	12	7,000	90	SS	60		HF	2,251	2,251	Succ.	Yes	RW
2,400	1,600	13	6,000	100	SS	50	15	HF	617	617	Succ.	Yes	LW
1,000	1,200	13	1,000	90	Prim.	46	15	NC	2,465	2,465	Succ.	Yes	FW
1,000	2,500	12	2,300	100	Prim.	50	12	HF	5,441	5,441	Succ.	Yes	FW
2,300	1,700	13	6,000	100	SS	44	15	JS	1,382	1,382	Succ.	Yes	LW
2,400	1,500	13	5,700	100	SS	49	15	HF	689	689	Succ.	Yes	LW
2,500	1,500	12	11,000	95				HF	1,200	1,200	Succ.	Yes	FW
2,000	1,250	13	450	95				HF	1,100	800	Succ.	Yes	FW
2,800	1,000	14	2,000	90	Prim.	50	15	NC	550	550	Succ.	Yes	FW
3,250	1,300-1,500	14	1,525	95	Prim.	50	15	JS	5,400	5,400	Succ.	Yes	FW
2,500	800	13.6	450	130	Prim.	63	49	HF	166	66	Prom.	No	FW
1,000	2,000	13		80	SS	70		JS	700	550	Succ.	Yes	Exp. L
1,100	650	14	2,200	100	SS	65	25	HF	2,000	2,000	Succ.	Yes	FW
100-3,000	1,200	14	1,900	75	SS	45	15	HF	650	600	Succ.	Yes	LW
100-3,000	850-1,800	14	1,900	75	SS	35	15	NC	550	500	Succ.	Yes	LW
4,000-6,000	530	11	3,500	70	Prim.	65	25	HF	180	150	Succ.	Yes	Exp. L
4,000	1,000	13	4,060	90	Prim.	50	20	HF	95,000	95,000	Succ.	Yes	FW

Producing thermal EOR in U.S. (continued)

Type/ Operator	Field	State	County	Start date	Area, acres	No. wells, prod	No. wells, inj.	Pay zone	Formation	Porosity %
Texaco	McKittrick	Calif.	Kern	1984	18	17	2	Tulare	S	38
Texaco	Midway	Calif.	Kern	1964	740	770		Potter Cyclic	S	30
Texaco	Midway	Calif.	Kern	1970	400	500		Spellacy Cyclic	S	30
Texaco	Midway	Calif.	Kern	6/82	800	250		Tulare Cyclic	S	33
Texaco	San Ardo	Calif.	Monterey	7/87	51	24	7	Lombardi	S	32
Texaco/Four Star	Lost Hills	Calif.	Kern	8/77	35	43	12	Etchegoin	S	40
Texaco/Four Star	Lost Hills	Calif.	Kern	11/75	60	65	21	Tulare	S	38
Tidelands	Wilmington	Calif.	Los Angeles	4/89	180	43	37	T & D Tar	S	30
Tidelands	Wilmington (DOE)	Calif.	Los Angeles	5/96	37	2	2	D Tar	S	30
Tidelands	Wilmington (Parcel A)	Calif.	Los Angeles	6/96	44	3	2	S Tar	S	31
Torch Operating	Cymric	Calif.	Kern	1964	370	305	53	Tulare	S	35
Torch Operating	Midway-Sunset	Calif.	Kern	1974	81	52	17	Potter	S	34.5
Torch Operating	Midway-Sunset	Calif.	Kern	1983	81	50	0	Tulare	S	31
Torch Operating	Midway-Sunset	Calif.	Kern	6/77	50	79	20	Potter	S	24
Torch Operating	Midway-Sunset	Calif.	Kern	5/69	150	185	0	Potter	S	24
Hot water										
Texaco	San Ardo	Calif.	Monterey	7/87	51	24	7	Lombardi	S	32
Combustion										
Bayou State	Bellevue	La.	Bossier	1970	200	85	15	Nacatoch	S	32
Greenwich Oil	Forest Hill	Tex.	Wood	9/76	1,900	100	21	Harris Sand	S	28
Texaco	Midway-Sunset	Calif.	Kern	1982	24	47	10	Potter	S	35
Continental Resources	Medicine Pole Hills	N.D.	Bowman	1985	8,960	17	7	Red River B & C	Dolo.	18.9
Continental Resources	Buffalo	S.D	Harding	1979	7,680	23	12	Red River B	Dolo.	20
Continental Resources	West Buffalo	S.D	Harding	1987	4,640	16	6	Red River B	Dolo.	20
Continental Resources	South Buffalo	S.D	Harding	1983	20,800	43	19	Red River B	Dolo.	20

Producing CO_2 gas EOR in U.S.

Type/ Operator	Field	State	County	Start date	Area, acres	No. wells prod	No. wells inj.	Pay zone	Formation	Porosity, %
CO_2 miscible										
Altura	Anton Irish	Tex.	Hale	4/97	1,600	82	40	Clearfork	Dolo.	7
Altura	Bennett Ranch Unit	Tex.	Yoakum	6/95	160	15	7	San Andres	Dolo.	10
Altura	Cedar Lake	Tex.	Gaines	8/94	2,500	175	166	San Andres	Dolo.	14
Altura	Mid Cross- Devonian Unit	Tex.	Crane & Upton	7/97	1,326	12	6	Devonian	Tripol	18
Altura	N. Cross	Tex.	Crane & Upton	4/72	1,155	25	12	Devonian	Tripol	22
Altura	North Cowden	Tex.	Ector	2/95	200	30	18	San Andres	Dolo.	10
Altura	S. Cross	Tex.	Crockett	6/88	1,200	21	10	Devonian	Tripol	21
Altura	Slaughter (Central Mallet)	Tex.	Hockley	1984	6,412	175	134	San Andres	Dolo./LS	10.8
Altura	Slaughter Estate	Tex.	Hockley	12/84	5,700	185	161	San Andres	Dolo./LS	12
Altura	Slaughter Frazier	Tex.	Hockley	12/84	1,600	59	52	San Andres	Dolo./LS	10
Altura	Wasson (Denver)	Tex.	Yoakum & Gaines	4/83	27,848	735	365	San Andres	Dolo.	12
Altura	Wasson (South)	Tex.	Gaines	1/86	4,960	105	70	Clearfork	Dolo.	6
Altura	Wasson ODC	Tex.	Yoakum	11/84	7,800	293	290	San Andres	Dolo./LS	9
Amerada Hess	Adair San Andres Unit	Tex.	Gaines	11/97	5,338	82	63	San Andres	Dolo.	15
Amerada Hess	Seminole Unit-Main pay	Tex.	Gaines	7/83	15,699	408	160	San Andres	Dolo.	12
Amerada Hess	Seminole Unit-ROZ pilot	Tex.	Gaines	7/96	500	15	10	San Andres	Dolo.	12
Amoco	Lost Soldier	Wyo.	Sweetwater	5/89	1,345	54	60	Tensleep	S	9.9
Amoco	Lost Soldier	Wyo.	Sweetwater	5/89	790	20	41	Darwin-Madison	S/LS-Dolo	10.3
Amoco	Lost Soldier	Wyo.	Sweetwater	6/96	120	5	4	Cambrian	S	7
Amoco	Wertz	Wyo.	Carbon, Sweetwater	10/86	1,400	28	41	Tensleep	S	10
ARCO	Wasson-Willard	Tex.	Yoakum	1/86	8,000	282	226	San Andres	Dolo.	10
Burlington Resources	El Mar	Tex.	Loving	4/94	6,000	69	56	Delaware	S	21.8
Chevron	Goldsmith	Tex.	Ector	12/96	330	16	9	San Andres	Dolo.	11.6
Chevron	Rangely Weber Sand	Colo.	Rio Blanco	10/86	15,000	204	200	Weber SS	S	12
Conoco	Ford Geraldine Unit	Tex.	Reeves & Culberson	2/81	3,850	91	69	Delaware	S	23
Conoco	Maljamar	N.M.	Lea and Eddy	1/89	1,760	94	2	Grayburg-San Andres	Dolo/S	10.8
Exxon	Cordona Lake	Tex.	Crane	12/85	2,084	30	20	Devonian	Tripol.	22
Exxon	Means (San Andres)	Tex.	Andrews	11/83	8,500	484	284	San Andres	Dolo	9
Exxon	Slaughter	Tex.	Hockley	5/85	569	24	11	San Andres	Dolo.	12.5
Exxon	Wasson (Cornell Unit)	Tex.	Yoakum	7/85	1,923	62	50	San Andres	Dolo.	8.6
Fasken	Hanford	Tex.	Gains	7/86	1,120	28	26	San Andres	Dolo.	10.5
Fasken	Hanford East	Tex.	Gains	3/97	340	7	4	San Andres	Dolo.	10
Fina	East Penwell (SA) Unit	Tex.	Ector	5/96	540	34	13	San Andres	Dolo.	10
Fina	West Brahaney Unit	Tex.	Yoakum	6/96	400	15	8	San Andres	Dolo.	10
Henry Petroleum	Sho-Vel-Tum	Okla.	Stephens	9/82	1,100	60	40	Sims	S	16
Mitchell Energy	Alvord South Field	Tex.	Wise	1980	2,291	11	1	Caddo	Congl.	12.8
Mobil	GMK South	Tex.	Gaines	1982	1,143	24	24	San Andres	Dolo.	9.8
Mobil	Greater Aneth Area	Utah	San Juan	2/85	13,440	143	120	Ismay Desert Creek	LS	14
Mobil	Postel	Okla	Texas	11/95	11,000	140	110	Morrow	SS	16
Mobil	Salt Creek	Tex.	Kent	10/93	12,000	85	48	Canyon	LS	20
Mobil	Slaughter	Tex.	Hockley	6/89	2,495	84	47	San Andres	Dolo	10.3

Table B

Permeability, md	Depth, ft	Gravity °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod. b/d	Enh. prod. b/d	Proj. Eval.	Profit	Project Scope
2,800	1,000	13	35	220	SS	60	30	HF	115	115	Disc.	No	P
2,500	1,300	12	4,000	100	Prim.	60	33	HF	40,000	40,000	Succ.	Yes	FW
2,250	900	11.5	6,500	100	Prim.	60	33		5,000	4,500	Succ.	Yes	FW
1,300	1,200	11	5,000	100	Prim.	50	43		700	700	Succ.	Yes	Exp L
5,500	1,900	11	1,200	135	C	58	15	JS	2,200	2,200	TETT	No	P (Exp. L)
2,000	400	13	10	250	SS	63	30	NC	1,200	1,200	Succ.	Yes	LW
2,000	200	13	20	220	SS	70	30	NC	1,000	1,000	Succ.	Yes	LW
1,500	2,500	14	300	123	WF	55	20	HF	2,420	2,420	Succ.		LW
1,500	2,500	13	300	125	WF	55	28	JS	280	280	TETT		P
1,000	2,300	13	300	125	WF	58	28	JS	620	620	Prom.		P
1,500	1,100	11.8	2,921	100	Prim.	65	45	NC	6,654	6,319	Succ.	Yes	FW
3,700	1,100	11.4	10,000	110	SS	57.2	32.3	HF	727	700	Succ.	Yes	FW
1,146	700	11.4	10,000	100	Prim.	54	37.8	HF	1,082	1,050	Succ.	Yes	FW
1,500	1,000	11.3	100	220	SS	55	34	NC	1,559	1,520	Succ.	Yes	FW
1,500	1,000	11.3	500	170	Prim.	57	35	NC	2,255	1,980	Succ.	Yes	FW
5,500	1,900	11	1,200	135	S	58	31	JS	2,200	2,200	TETT	Yes	P (Exp. L)
650	400	19	660		Prim.	94	49	HF	400	400	Succ.	Yes	FW
950	5,000	10	1,060	185		63	32	JS	400	400	Prom.	No	FW
500-4,000	1,700	11.5	2,770	110	SS	70	11.5	HF	1,000	900	Succ.	Yes	Exp. L
14.9	9,500	39	0.48	230	Prim.	52	30	HF	725	725	Succ.	Yes	FW
10	8,450	30	2.1	215	Prim.	55	20	NC	550	550	Succ.	Yes	FW
10	8,450	30	2.1	215	Prim.	55	20	HF	365	365	Succ.	Yes	FW
10	8,450	30	2.1	215	Prim.	55	20	HF	1,420	1,420	Succ.	Yes	FW

Table C

Permeability, md	Depth, ft	Gravity °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
5	5,900	28	2.7	115	Prim, WF			JS	5,000	1,000	TETT		FW
7	5,200	33	1.2	105	WF	55	37	HF	3,200	100	TETT		P
5	4,700	32	2.4	103	WF			HF	6,365	1,744	TETT	Yes	LW
2	5,400	42	0.38	105	Prim, GI	60	20	JS	50	0	TETT		FW
5	5,300	44	0.42	106	GI	49	21	HF	1,345	1,345	Succ.	Yes	FW
2-5	4,200	34	1.46	91	WF			JS	17,600	839	TETT	Yes	LW
4	5,200	43	0.6	104	GI	43	24	HF	1,570	1,500	Prom.		Exp. L
2.2	4,900	31	1.4	105	WF			HF	4,400	2,600	Succ.	Yes	FW
5	4,950	31	1.4	105	WF			HF	7,400	4,200	Succ.	Yes	FW
4	4,950	31	1.4	105	WF			HF	2,500	1,600	Succ.	Yes	FW
8	5,200	33	1.24	105	WF	51	30.5	HF	36,600	30,700	Succ.	Yes	FW
2	6,700	35	1	105	WF	60		JS	5,000	1,000	Prom.		FW
5	5,100	32	1.3	110	WF			HF	13,313	9,300	Succ.	Yes	FW
8	4,852	35	1	98	WF			JS	1,800		TETT		
1.3-123	5,300	35	1.07	104	WF			HF	32,000	30,000	Succ.	Yes	FW
1.3-123	5,300	35	1.07	104	Prim.			JS	1,000	500	TETT		P
31	5,000	35	1.3	178	WF			NC	4,500	4,050	Succ.	Yes	FW
4.2	5,400	35	1.4	181	WF			NC	1,600	1,100	Succ.	Yes	FW
10	7,000	35			WF			JS	1,350	1,080	Succ.	Yes	FW
20	6,000	35	1.16	163	WF			NC	1,000	800	Succ.	Yes	FW
1.5	5,100	32	2.01	105	WF	55.5	41	JS	6,000	4,900	Succ.	Yes	FW
23.7	4,500	40.5		97	Prim./WF	40.3		JS	630	630	TETT		RW
32	4,200				WF			JS			TETT		P
10	6,000	35	1.7	160	WF	38	29	JS	23,881	13,881	Succ.		FW
64	2,680	40	1.4	83	Prim./WF	41	35	NC	600	600	Succ.	No	FW
4.9	3,650-4,200	37	1	95	Prim/GI/WF	55.6	40	NC	1,400	100	TETT		Exp. UL
3.5	5,500	40	0.5	101	WF			HF	1,100	400	Prom.	Yes	LW
20	4,300	29	6	97	WF			HF	10,700	7,200	Succ.	Yes	FW
6.3	4,900	32	1.3	110	WF			HF	700	550	Succ.	Yes	LW
1.9	4,500	33	1	106	WF			HF	1,600	1,100	Prom.	Prom.	LW
4.01	5,500	32	1.38	104	Prim.	60.7	18.7	HF	600	600	Succ.		LW
4	5,500	32	1.38	104	WF		18.7	JS	110	50	Succ.		LW
4	4,000	34	2	86	WF	55	40	JS	575	100	Prom.	Yes	RW
2	5,300	33	2	108	WF	66	50	JS	79	—	TETT		RW
70	6,200	30	3.3	115	WF	59	42	HF	1,700	1,700	Succ.	Yes	LW
55	5,700	44	0.39	154	WF	60	52	NC	60	60	Prom.	No	FW
3.1	5,400	30	2.57	101	WF	55	28	JS	1,300	400	Succ.	Yes	LW
5	5,600	41	0.5	125	Prim.	50		JS	7,000	3,500	Succ.	Yes	LW
30	6,100	36	1.3	147	WF	37	25	JS	5,800	4,600	TETT		Exp. L
12	6,300	39.2	0.95	125	WF	89	15	JS	26,000	12,000	Succ	Yes	Exp. L
3.3	5,000	32	1.6	107	WF	45	8	JS	6,800	2,000	Succ.	Yes	LW

Producing CO_2 gas EOR in U.S. (continued)

Type/ Operator	Field	State	County	Start date	Area, acres	No. wells prod	No. wells inj.	Pay zone	Formation	Porosity, %
Mobil	Wasson	Tex.	Yoakum	10/85	640	30	26	San Andres	Dolo.	13
Orla Petco	East Ford	Tex.	Reeves	7/95	1,953	12	8	Delaware, Ranosen	S	23
Oxy USA	North Dollarhide	Tex.	Andrews	11/97	1,280	22	4	Devonian	S	22
Oxy USA	Northeast Purdy	Okla.	Garvin	9/82	3,400	75	44	Springer	S	13
Oxy USA	South Welch	Tex.	Ector	4/96	900	38	19	San Andres	Dolo.	11
Oxy USA	West Welch	Tex.	Ector	10/97	640	30	13	San Andres	Dolo.	11
Pennzoil	SACROC Unit	Tex.	Scurry	1/72	49,900	325	57	Canyon Reef	LS	3.93
Phillips	South Cowden	Tex.	Lea	2/81	4,900	192	100	San Andres	Dolo.	11.7
Phillips	Vacuum	N.M.	Lea	2/81	4,900	192	100	San Andres	Dolo.	11.7
Shell	Little Creek Field	Miss.	Lincoln & Pike	12/85	6,200	19	19	Lower Tuscaloosa	S	23
Shell	Olive	Miss.	Pike	10/87	1,280	8	4	Lower Tuscaloosa	S	26
Shell	West Mallalieu	Miss.	Lincoln	11/86	5,760	6	2	Lower Tuscaloosa	S	25
Southwest Royalty	East Huntley	Tex.	Garza	1/94	700	38	15	San Andres	Dolo.	16.9
Southwest Royalty	South Huntley	Tex.	Garza	1/94	560	31	8	San Andres	Dolo.	15.1
Spirit Energy	Dollarhide	Tex.	Andrews	5/85	6,183	83	66	Devonian	Dolo./Tripol	13.5
Spirit Energy	Dollarhide (Clearfork)	Tex.	Andrews	11/95	160	21	4	Clearfork	Dolo.	11.5
Spirit Energy	Reinecke	Tex.	Borden	1/98	700	25	5	Cisco Canyon Reef	LS/Dolo	10.5
Stanberry Oil	Hansford Marmaton	Tex.	Hansford	6/80	2,010	9	10	Marmaton	S	18.1
Texaco	Mabee	Tex.	Andrews-Martin	1/92	12,824	390	85	San Andres	Dolo.	9
Texaco	Paradis	La.	St. Charles	2/82	347	20	1	Lower 9,000-ft	S	26
Texaco	Slaughter Sundown	Tex	Hockley Co	1/94	8,685	280	187	San Andres	Dolo.	11
Texaco	Vacuum	N.M.	Lea Co.	7/97	2,240	95	85	San Andres	Dolo.	12
Texaco/MVP	Paradis	La.	St. Charles	5/89	298	4	2	#16 Sand	S	24
Weiser Oil	Wellman	Tex.	Terry	7/83	1,400	14	9	Wolfcamp	LS	9.2
Whiting	Sable	Tex.	Yoakum	3/84	825	33	32	San Andres	Dolo.	8.4
Hydrocarbon miscible										
ARCO	Kuparuk River	Alas.		6/88-12/96	62,000	163	142	A&C Sands	S	24
ARCO	Prudhoe Bay	Alas.		12/82-2/87	55,000	350	130	Sadlerochit	S	22
Exxon	South Pass Block 89	OCS		12/83	204	15	7	X and Y Series	S	26
Exxon	South Pass Block 89	OCS		7/89	20	3	3	X Series	S	26
Hunt	Fairway	Tex.	Anderson/Henderson	3/66	22,618	92	51	James	LS	12.6
Kerr-McGee	North Buck Draw(Dakota)	Wyo.	Campbell	12/88	5,700	11	8	Dakota	S	9.3
Kerr-McGee	Sand Dune (Muddy) Unit	Wyo.	Converse	7/91	12,438	15	9	Muddy	S	11.8
Oryx	Fordoche W-12	La.	Pt. Coupee	5/80	3,400	7		Wilcox	S	19
Oryx	Fordoche W-8	La.	Pt. Coupee	5/80	3,300	8		Wilcox	S	20
True Oil	Red Wing Creek	N. Dak.	McKenzie	1/82	640	8	1	Mission Canyon	LS	10
Hydrocarbon immiscible										
ARCO	Kuparuk River	Alas.		2/86	8,000	37	34	A & C Sands	S	24
Nitrogen & Hydrocarbon immiscible										
ARCO	Block 31	Tex.	Crane	6/49	7,840	152	77	Devonian	LS	15
Nitrogen miscible										
Exxon	Jay-Little Escambia Creek	Fla/Ala.	Santa Rosa/Escambia	1/81	14,415	56	30	Smackover	LS	14
Unocal	Chunchula Fieldwide Unit	Ala.	Mobile	4/82	2,600	33	8	Smackover Carbonate	Dolo.	12.35
Phillips	Binger	Okla.	Caddo	1977	12,960	55	23	Marchand	S	7.5
Nitrogen immiscible										
Chevron	East Painter	Wyo.	Uinta	11/83	1,500	17	7	Nugget	S	11
Chevron	Painter	Wyo.	Uinta	6/80	1,360	33	13	Nugget	S	11.9
Exxon	Hawkins	Tex.	Woodbine-East FB	8/87	2,800	24	6	Woodbine	S	28
Exxon	Hawkins	Tex.	Woodbine-West FB	1/94	7,790	264	17	Woodbine	S	28
Marathon Oil	Yates	Tex.	Pecos & Crockett	f1/85	14,300	619	29	Grayburg/San Andres	Dolo.	17
Unocal	Chunchula Fieldwide Unit	Ala.	Mobile	4/82	26,000	33	8	Smackover Carbonate	Dolo.	12.35

Producing chemical and microbial EOR projects in U.S.

Type/ Operator	Field	State	County	Start date	Area, acres	No. wells prod	No. wells inj.	Pay zone	Formation	Porosity, %
Polymer										
Bison Production	N. Kremlin	Okla.	Garfield	1/94		10	8	Misener	S	10.4
Kerr-McGee	Horse Creek	Wyo.	Campbell	2/88	24,200	69	61	Sussex	S	12
Mitchell Energy	Alba Northeast Unit	Tex.	Wood	7/80	410	8	3	Sub-Clarksville	S	21.4
Mitchell Energy	Alba SEFB Unit	Tex.	Wood	2/72	731	11	6	Sub-Clarksville	S	23.3
Mitchell Energy	Alba North Central Unit	Tex.	Wood	1/91	512	12	6	Sub-Clarksville	S	21
Mitchell Energy	Alba West Unit	Tex.	Wood	12/91	567	11	7	Sub-Clarksville	S	21
Coleman Oil & Gas	Jacksboro S.	Tex.	Jack	5/82	270	5	6	Strawn	S	19.9
Plans Petroleum	Bracken Unit	Wyo.	Campbell	7/86	120	3	2	Minnelusa	S	16.5
Presidio	Culp Draw Unit	Wyo.	Campbell	7/85		40	43	Shannon	S	
Presidio	Table Mountain	Wyo.	Campbell	8/91		18	8	Shannon	S	
Microbial										
Hughes Eastern	North Blowhorn Creek	Ala.	Lamar	1/94		14	4	Carter	S	12

Table C

Permeability, md	Depth, ft	Gravity °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
6.2	5,100	33	0.97	110	WF	54.4	39.2	HF	1,700	300	Succ.	Yes	LW
64	2,680	40	0.77	83	Prim.	49	36	JS	60	60	TETT		FW
3-4	8,000	40	0.6	123	WF			JS	2,000		TETT		RW
44	9,400	38	1.2	148	WF	46	40	HF	2,600	1,950	Succ.		FW
4	4,550	34	2.1	98	WF	50	38	JS	1,900	950	Prom.	Yes	RW
4	4,900	34	2.1	98	WF			JS	240		TETT		RW
19.4	6,700	41	0.35	130	Prim./WF	63.3	46.8	NC	9,000	9,000	Succ.	Yes	FW
11	4,500	38	1	101	Prim.	70	50	JS	500	250	Succ.	Yes	FW
11	4,500	38	1	101	Prim.	70	50	HF	7,800	4,700	Succ.	Yes	FW
33	10,640	39	0.4	248	WF	15	2	NC	850	850	Prom.		FW
50	10,500	39	0.34	250	WF	17	2	NC	320	320	Succ.	Yes	FW
20	10,365	38	0.5	245	Prim.	15	1	NC	225	225	Disc.		P (Exp. UL)
5.6	3,100	37	2.1	100	WF	45	31	JS	450	130	TETT	TETT	FW
6.1	3,400	37	2.6	105	WF	45	34	JS	1,300	150	TETT	TETT	FW
9	8,000	40	0.44	122	Prim./WF	35	22	JS	2,350	900	Yes		FW
3.5	6,500	40	0.44		Prim./WF			JS	355		TETT		P
150	6,800	43.5	2-3	140	WF	32-36	4-6	JS	1,900		TETT		RW
48	6,500	44	1.56	142	Prim.	43		HF	440	440	Succ.	Yes	FW
4	4,700	32	2.3	104	WF	36	10	JS	6,500	5,500	Prom	No	FW
770	10,400	37	0.5	205	Prim.	62	48	HF	100	100	Prom.	No	RW
6	4,950	33	1.4	105	WF	41	25	JS	6,700	4,400	TETT	Yes	LW
22	4,550	38	1	101	WF	36	15	JS	3,900		TETT	Yes	FW
245	9,950	38	35.0	190	Prim.	44	24	HF	270	270	Prom.		P
>100.0	9,800	43.5	0.54	151	WF	35	10	HF	1,400	1,400	Succ.	Yes	FW
1.5	5,200	32	1.46	107	WF			NC	520	300	Succ.	Yes	FW
50-500	6,000	24	2	160	WF/Hyd. Imm.	50	25	JS	120,000	23,500	Succ.		P
400	8,800	27	0.9	210	WF	50	25	HF	180,000	50,000	Succ.		FW
100-1,500	9,500	38.0-40.0	0.40-0.60	165	Prim.			HF	7,300	3,800	Succ.	Yes	RW
1000	11,000	38	0.7	165	Prim.			NC	1,450	600	Succ.	Yes	RW
11	9,900	48	0.15	260	Prim.	73	36	HF	6,010	6,010	Succ.	Yes	FW
3	12,450	46	0.12	282	Prim.	85	35	JS	11,000	8,000	Succ.		RW
70	12,500	41	0.3	240	Prim.	83	40	JS	10,000	10,000	Succ.	Yes	FW
4.6	13,650	45	0.126	274				NC	47	47	Succ.	Yes	FW
8.6	13,200	44	0.126	267				NC	96	96	Succ.	Yes	FW
0.1	9,000	40	0.25	241	Prim.	60	20	JS	1,200		Succ.	Yes	FW
50-500	6,000	24	2	160	WF			NC	18,000		Prom	Yes	Exp. UL
5.4	8,600	48	0.25	130	Prim.			NC	4,350	4,350	Succ.	Yes	FW
35	15,400	51	0.2	285	WF			NC	11,300	11,300	Succ.	Yes	FW
10	18,500	54	0.07	325	Prim.	80	45	JS	7,100	2,300	Succ.	Yes	FW
0.2	10,000	38	0.3	190	Prim.	76	59	HF	1,050	1,050	Succ.	Yes	FW
3	12,000	46	0.2	185	HC	98.5	52	HF	9,065	9,065	Succ		FW
4	11,500	46	0.2	174	HC	47		HF	1,102	1,102	TETT		FW
2800	4,600	24	3.7	168				HF	900	900	Succ.	Yes	RW
2800	4,600	24	3.7	168				JS	7,700	100	Prom.		RW
175	1,100-1,700	30	5.5	82	GI			HF	54,400		Succ.		FW
10	18,500	54	0.07	325	Prim.	80	45	JS	7,100	2,300	Succ.	Yes	FW

Table D

Permeability, md	Depth, ft	Gravity, °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
10	6,300	42.5		136							TETT	Yes	P
14	8,200	36	0.96	179	Prim.	59	35	JS	1,450		TETT	Yes	FW
471	4,100	15.1	75	150	WF	62.6	52.1	NC	62	62	Disc.	Yes	FW
525	4,200	15.5	75	150	Prim.	69.5	51.8	NC	80	80	Succ.	Yes	FW
471	4,010	15	75	150	Prim.	62	56	JS	122	122	Prom.	Prom.	FW
471	4,050	15	75	150	Prim.	65	56	JS	92	92	Prom	Prom.	FW
86	1,975	40	1.73	100	Prim.	50	22	NC	20	20	Succ.	Yes	FW
173	7,150	20.2	16.6	150	Prim.	76.1	59.4	HF	189	139	Succ.	Yes	FW
	9,300				Prim.			NC			Succ.	Yes	FW
	9,600				Prim.			HF			Succ.	Yes	Exp. L
1-200	2,300	33	15	90	WF	55	45	JS	290	0	Prom.	TETT	P, Exp. L

Completed, terminated, postponed, and delayed U.S. projects*

Type/ Operator	Field	State	County	Start date	Area, acres	No. wells prod	No. wells inj.	Pay zone	Formation	Porosity, %
Polymer										
Gallagher Drilling	Stewart East	Wyo.	Campbell	7/82		4	1	Minnelusa	S	15.7
Alkaline/surfactant										
True	Driscoll	Wyo.	Crook	12/95	1	1	1	Minnelusa	S	16
Micellar polymer Combustion										
Chevron	W. Heidelberg Cotton Valley	Miss.	Jasper	12/71	362	9	3	Cotton Valley 4 & 5	S	14
Hydrocarbon miscible										
Phillips	Chatom	Ala.	Washington	8/76	3,200	7	2	Smackover lime	Dolo.	22
CO_2 projects										
Chevron	North Ward Estes	Tex.	Ward	32568	3,840	190	194	Yates	S	16
Stanberry Oil	Farnsworth, North	Tex.	Ochiltree	6/80	1,431	9	5	Marmaton B	LS	11.5
George R. Brown	Rose City North	Tex.	Orange	4/81	800	3	5	Hackberry	S	37
George R. Brown	Rose City South	Tex.	Orange	1/83	900	4	5	Hackberry	S	37
Texaco	Port Neches	Tex.	Orange	7/93	235	5	4	Marginulina	S	30
Texaco	Garden Island Bay	La.	Plaquemines	12/95	91	1	1	8,500 Sand	S	29
Texaco	Paradis	La.	St. Charles	1/88	44.2	1	1	9,500 ft	S	24
Texaco/MVP	Paradis	La.	St. Charles	5/90	102	1	1	10,000 ft. sand	S	26
Steam										
AERA	Arroyo Grande	Calif.	San Luis Obispo	1/87	20	65	18	M6	S	31
Amoco	Winkleman Dome	Wyo.	Fremont	1964	160	19	13	Nugget	S	22.8
ARCO	Midway-Sunset	Calif.	Kern	2/72	200	50	3	Potter	S	32
Flour Daniel	Teapot Dome NPR-3	Wyo.	Natrona	10/85	90	190	30	Shannon	S	18
MacPherson Oil Co.	Mt. Poso Field-West area	Calif.	Kern	5/89	240	40	2	Vedder	US	35
Monteray Resources	Kern River	Calif.	Kern	10/89	235	314	0	Kern River Series	S	33
Monteray Resources	Midway	Calif.	Kern	1991	10	9	4	Tulare S.D.	S	33
Monteray Resources	Midway	Calif.	Kern	1/85	350	530	78	Potter S.D.	S	30
Monteray Resources	Midway	Calif.	Kern	1991	30	30	8	Spellacy S.D.	S	30
Texaco	McKittrick	Calif.	Kern	9/96	5			Tulare		13
Texaco	Midway-Sec 35	Calif.	Kern	1977	27	51	7	Potter	US	35
Texaco	Midway-Sec. 36	Calif.	Kern	1989	38	62	11	Potter	US	36
Texaco	Midway-Sec. 36	Calif.	Kern	1991	24	24	6	Potter	US	36
Texaco	Midway-Security	Calif.	Kern	11/77	36	72	15	Potter	US	33
Texaco	Midway-Sunset	Calif.	Kern	1/94	9.5	15	3	Potter A	S	28
Texaco	Midway-Sunset	Calif.	Kern	8/96	5			Spelecy		12
Texaco	Midway-Sunset	Calif.	Kern	8/96	5			Potter		13
Texaco	North Midway	Calif.	Kern	11/81	77	27	9	Potter	US	30
Hot water										
ARCO	Kern River	Calif.	Bakersfield	1986	50	45	10	Kern River Series	S	31

Producing Canadian EOR Projects

Type/ Operator	Field	Province	Start date	Area, acres	Wells Prod.	Wells Inj.	Pay zone	Formation type	Porosity, %	Permeability, md
CO_2 miscible										
Shell Canada	Midale	Sask.	1992	2,560	60	8	Mississippian Midale	LS/Dolo.	10-35	1-100
Vikor	Joffre Viking	Alta.	8/85	480	6	2	Viking	S	13	500
Vikor	Joffre Viking	Alta.	6/88	480	4	1	Viking	S	13	500
Vikor	Joffre Viking	Alta.	11/91	1,280	5	2	Viking	S	13	500
Combustion										
Mobil Oil Canada	Battrum Field	Sask.	10/66	4,920	94	15	Battrum/Roseray	S	26	1,265
Mobil Oil Canada	Battrum Field	Sask.	8/67	2,400	35	7	Battrum/Roseray	S	25	930
Mobil Oil Canada	Battrum Field	Sask.	11/65	680	22	3	Roseray	S	27	930
Hydrocarbon miscible										
Amoco Canada	Bigoray Nisku B	Alta.	2/80	251	5	1	Nisku D-2	LS	5	1,130
Amoco Canada	Kaybob South	Alta.	7/84	8,000	40	9	Triassic	Dolo.	11.5	92
Amoco Canada	Nipisi	Alta.	2/84	28,480	168	68	Gilwood	S	18	200
Canadian Hunter Expl.	Brassey	B.C.	8/89	6,043	13	7	Artex Triassic	S	16.6	137
Imperial Oil	Pembina `G' Pool	Alta.	9/89	328	2	1	Nisku	Dolo.	8	900
Imperial Oil	Pembina `K' Pool	Alta.	1984	126	1	1	Nisku	Dolo.	12.7	2,020
Imperial Oil	Pembina `L' Pool	Alta.	1985	625	4	2	Nisku	Dolo.	10.5	1,060

Table E

Permeability, md	Depth, ft	Gravity, °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
215	7,950	20	20	124							Succ.	Yes	FW
60	5,300	22	15.6	155	WF	43.5		JS	50	0	TETT	TETT	FW
85	11,300	18.0-27.0	6	221	Prim.	80		NC	200	200	Succ.	Yes	FW
12	15,900	54	0.04	293	Prim.			C	280	280	Succ.	Yes	FW
37	2,600	35	1.4	83	WF	25	10	HF	1,491	1,491	Disc.		Exp. UL
140	6,400	44	1.61	131	WF	57		C					FW
4,500	8,200	37	2	180	WF	50	35	NC	100	100	Prom.	Yes	FW
4,500	8,200	37	2	180	WF	50	35	HF	350	350	Prom.	Yes	FW
750	5,800	38	2.4	165	WF	30		JS	225	225	TETT	No	RW
500	8,000	36	0.5	190	Prim.	48	31	JS	0	0	TETT		P
252	9,800	38	35.0	192	Prim.	45	33	HF	100	100	Prom.	No	RW
162	11,400	38.5	0.3	192	Prim.	45	33	HF	40	40	Prom.	No	RW
500-800	200-2,000	13-15	2,500-3,000	80-100	Prim.	56		JS			Prom.		FW
481	1,225	14	1,000	81	Prim.	71		NC			Succ.		FW
2,500	1,200	14	1,500	100	Prim.	65		NC	900	900	Succ.	Yes	LW
63	325	33	10	65	Prim.	50	15	NC			Succ.	Yes	RW
2,000	2,500	17	350	105	Prim.	50	20	JS			TETT		LW (Exp. L)
1,500-2,200	100-900	13	1,500-15,000	90	Prim., SS, SD	46	37	Del	5,000	5,000	Succ	Yes	FW
2,500	1,500	12	4,000	100	SS	60	20	Del	11,500	11,000	Succ.	Yes	FW
2,250	1,700	13	5,000	100	SS	60	25	Del	325	300	Prom.		Exp. L
1,300	1,300	11	5,000	100	SS	50	20	Del	100	100	Prom.		P
	1,000							Del					
2,000	1,600	12	6,500	230	SS	55	20	Del	700	590	TETT	Yes	FW
3,000	1,600	14		220	SS	61	21	Del	1,880	1,061	Succ.	Yes	FW
3,000	1,600	14		90	SS	61	21	Del	640	121	TETT	No	FW
5,000	950	12	1,500	280	S	60	20	Del	1,100	825	Succ.	Yes	FW
3,000	1,500	12	3,000	115	SS	50	20	Del	60	60	Disc.	No	P
	1,500												
	1,500												
3,400	1,000	13	1,500	220	S	60	20	Del	2,400	1,462	Succ.	Yes	FW
3,000	900	13.5	8,000	90	S	30	20	HF	150	150	Succ.	Yes	FW

Table F

Depth, ft	Gravity, °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
4,500	27	3	145	WF	50		JS	750	250	Prom.		10% of field
5,140	42	1.14	133	WF	38	28	NC			Succ.		FW
5,075	42	1.14	133	WF	36	28	HF			Succ.		FW
5,000	42	1.14	133	WF	38	28	HF			Succ.		FW
2,900	18	70.3	110	Prim.	66		HF	3,700	3,700	Succ.	Yes	FW
2,900	18	70	110	Prim.	62		HF	1,200	1,200	Succ.	Yes	FW
2,900	18	70	110	Prim.	70		HF	1,350	1,350	Succ.	Yes	FW
7,500	34	1.4	169	Prim.	70	30	HF	800	660	Succ.	Yes	FW
6,981	40	0.419	190	WF	46	31	NC	1,890	400	Prom.	Yes	FW
5,500	41	0.84	131	WF	30	5	HF	12,578	6,000	Succ.	Yes	FW
9,850	57	0.097	210		98	33	HF	4,000	4,000	Succ.	Yes	FW
9,541	43.2	0.33	204	Prim.	80	5	NC	708	708	Succ.	Yes	FW
9,469	43.6	0.37	198	Prim	82	5	NC	864	864	Succ.	Yes	FW
9,415	40.9	0.42	199	WF	88	5	NC	2,258	2,258	Succ.	Yes	FW

Producing Canadian EOR Projects (continued)

Type/ Operator	Field	Province	Start date	Area, acres	Wells Prod.	Wells Inj.	Pay zone	Formation type	Porosity, %	Permeability, md
Imperial Oil	Pembina `M' Pool	Alta.	1983	192	2	1	Nisku	Dolo.	9	540
Imperial Oil	Pembina `O' Pool	Alta.	11/83	346	2	1	Nisku	Dolo.	11.8	3,100
Imperial Oil	Pembina `P' Pool	Alta.	10/83	420	3	1	Nisku	Dolo.	10.3	2,400
Imperial Oil	Pembina `Q' Pool	Alta.	2/85	301	2	1	Nisku	Dolo.	9.8	1,970
Imperial Oil	Wizard Lake	Alta.	1969	2,725	49	14	Leduc D-3A	Dolo.	10.5	1,375
Imperial Oil	Rainbow "FF" Pool	Alta.	9/71	102	2	1	Keg River	Dolo.	7.3	
Imperial Oil	Rainbow "T" Pool	Alta.	6/69	222	2	1	Keg River	Dolo.	8.6	
Imperial Oil	Rainbow "Z" Pool	Alta.	2/71	221	9	2	Keg River	Dolo.	4.25	
Gulf Canada	Fenn-Big Valley	Alta.	4/83	1,268	26	7	Nisku	Dolo.	8	400
Gulf Canada	Goose River	Alta.	10/86	2,847	24	7	Beaverhill Lake	LS	8	240
Home Oil	Swan Hills	Alta.	10/85	19,440	150	50	Beaverhill Lake	LS	8.5	54
Husky Oil	Rainbow B Pool	Alta.	6/84	2,500	32	10	Keg River	LS	8	300
Husky Oil	Rainbow E Pool	Alta.	6/72	173	6	1	Keg River	LS	12	300
Husky Oil	Rainbow EEE Pool	Alta.	4/70	150	2	1	Keg River	LS	16.8	500
Husky Oil	Rainbow G Pool	Alta.	10/72	163	3	1	Keg River	LS	8	300
Husky Oil	Rainbow H Pool	Alta.	6/73	165	3	1	Keg River	LS	9.4	200
Husky Oil	Rainbow KRA Pool	Alta.	12/68	633	17	2	Keg River	Dolo.	10.1	100
Husky Oil	Rainbow KRD Pool	Alta.	3/76	85	1	1	Keg River	LS	10	200
Husky Oil	Rainbow O Pool	Alta.	2/70	703	9	1	Keg River	Dolo.	6	150
Husky Oil	Rainbow South E	Alta.	3/94	320	2	2	Keg River	LS	9.1	50
Husky Oil	Rainbow South G Pool	Alta.	5/95	180			Keg River	Dolo.	8	50
Mobil Oil Canada	Rainbow	Alta.	7/83	320	5	1	Keg River	Dolo./LS	8.5	100-5,000
Mobil Oil Canada	Rainbow	Alta.	9/72	800	14	2	Keg River	Dolo./LS	8.6	100-5,000
Mobil Oil Canada	Rainbow South	Alta.	8/72	490	5	2	Keg River	Dolo.	6	40
Shell Canada	Virginia Hills	Alta.	11/89	4,575	50	14	Beaverhill Lake	LS	9	1-500
Hydrocarbon immiscible										
Husky Oil	Rainbow F Pool	Alta	6/93	1,920	12	4	Keg River	Dolo.	5	1,000
Hot water										
Alberta Energy	S. Jenner Up. Mannville J Pool	Alta.	9/89	2	3	1	Glauconitic	S	25.0	1,560
Polymer										
Encor Energy	Rapdan Unit	Sask.	1/86	440	12	5	Upper Shaunavon	S	17	85
Steam										
Canadian Natural Res.	Tangleflags East	Sask.	9/94	412	4	3	Lloydminster Sand	S	33	3,000-5,000
Canadian Natural Res.	Tangleflags North	Sask.	12/87	285	10	10	Lloydminster Sand	S	32.5	3,000-5,000
Gulf Canada	Surmont		6/97							
Norcen	Provost	Alta.	3/86	20	8	1	McLaren	S	27-30.0	4,000
Stampeder Exploration	Cactus Lake		4/97							
Stampeder Exploration	Kerrobert		1997							
Tarragon	Bolney	Alta.	1997							

Completed, terminated Canadian projects

Type/ Operator	Field	Province	Start date	Area, acres	Wells Prod.	Wells Inj.	Pay zone	Formation type	Porosity, %	Permeability, md
Hydrocarbon miscible										
Chevron Canada Resources	Acheson D-3A	Alta.	7/87	650	16	1	Leduc D3	Dolo.	12	5,000
Chevron Canada Resources	Mitsue, Stage 1 & 2	Alta.	5/85	17,280	140	55	Gilwood	S	13.4	282
Chevron Canada Resources	Pembina Nisku F	Alta.	6/86	200	3	1	Nisku F	Dolo.	12.7	660
Petro-Canada	Brazeau River D	Alta.	9/81	640	2	1	Nisku	LS	7	50
Petro-Canada	Caroline	Alta.	9/84	8,680	16	11	Cardium	S	10	12
Imperial Oil	Judy Creek A Pool	Alta.	5/85	29,050	96	64	Beaverhill Lake	LS	9	43
Imperial Oil	Judy Creek B Pool	Alta.	1/87	8,290	30	15	Beaverhill Lake	LS	9.2	41
Carbon dioxide miscible										
Shell Canada	Harmattan East	Alta.	8/88	1,600	20	8	Mississippian Turner Valley	Dolo	14	10-300

Table F

Depth, ft	Gravity, °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
9,333	41.1	0.14	198	Prim.	93	5	NC	1,649	1,649	Succ.	Yes	FW
9,332	43.4	0.32	190	Prim	84	5	NC	565	565	Succ.	Yes	FW
9,531	45.4	0.36	200	Prim.	87	5	NC	1,185	1,185	Succ.	Yes	FW
9,421	41.3	0.42	196	Prim.	91	5	NC	704	704	Succ.	Yes	FW
6,500	38	0.4	167	Prim.	93	5	NC	2,450	2,450	Succ.	Yes	FW
4,160	37	0.59	188	Prim.	90		NC	250	250	Succ.	Yes	RW
4,330	40	0.69	188	Prim.	88		NC	400	400	Succ.	Yes	RW
4,040	38	0.547	190	Prim.	73.5		NC	1,900	1,900	Succ.	Yes	RW
5,249	32.8	1.34	136	Prim.	33		HF	590	590	Succ.	Yes	FW
9,200	41	0.4	234	WF			HF	9,600	3,014	Prom.		Exp. L.
8,300	41	0.4	225	WF	30	5	JS	17,500	4,900	Succ.	Yes	FW (Exp. L)
6,000	39	0.83	180	WF	52	23	JS	4,635	4,635	Prom.	Yes	FW
5,932	39	0.439	175	Prim.	91	27	HF	1,900	1,900	Succ.	Yes	FW
6,085	37	0.542	180	Prim.	95	29	NC	70	70	Succ.	Yes	FW
6,151	39	0.485	185	Prim.	92	28	HF	1,528	1,528	Succ.	Yes	FW
6,210	39	0.596	187	Prim.	92	28	HF	572	572	Succ.	Yes	FW
6,380	43	0.29	195	Prim.	90	30	HF	2,610	2,610	Succ.	Yes	FW
6,310	40	0.426	195	Prim.	90	27	NC	141	141	Succ.	Yes	FW
6,053	42	0.28	180	Prim.	87	26	NC	650	650	Succ.	Yes	FW
6,300		0.39	195	WF	67	0.5	JS	900		TETT		FW
6,500	39	0.4	195	WF	67	0.5	JS	500	0	TETT		FW
5,500	39	0.46	190	WF	45	15	HF	600	600	Prom.	Yes	FW
5,500	39	0.47	184	GI/WF	92	15	NC	1,100	1,100	Succ.	Yes	FW
6,200	40	0.3	183	Prim.			NC	1,075	955	Succ.	Yes	FW
9,500	34	0.53	221	WF	56	36	HF	8,000	4,000	Succ.		Exp. L
6,000	48	0.25	180	WF	50	40	JS	2,800	400	TETT		FW
2,950	14	170	90	Prim	75		JS	95		TETT		P
4,500	23	10	132	WF	55	43	HF	880	660	Succ.	Yes	P(Exp.L)
1,924	11.5	32,000	68	Prim.	75	40	JS	1,200	1,200	TETT		P
1,476	13	13,000	66	Prim.	90	38	JS	5,000	5,000	Succ.	Yes	FW
2,430	12	2,000	80	Prim.	82	45	JS	420	420	Prom.	No	P(Exp.L)
	11											

Table G

Depth, ft	Gravity, °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
5,000	39	0.85	139	Prim.	90	18	NC	1,600	1,600	Succ.	Yes	LW
5,000	41	0.65	147	WF	30	19	NC	9,200	8,000	Succ.	Yes	FW
8,000	40	0.5	208	WF	75	43.3	NC	2,271	705	Succ.	Yes	FW
10,091	42	0.38	216	Prim.	90	35	NC	1,200	1,200	Succ.	Yes	FW
8,200	46	0.25	173	GI	85	45	HF	900	850	Succ.	Yes	FW
8,850	41.6	0.38	206	WF	84	10	NC	9,500	9,500	Succ.	Yes	FW
9,150	42.1	42	206	WF	83	10	NC	3,200	3,200	Succ.	Yes	FW
8,500	39	0.3	198	WF	40		HF	600	500	Prom		Exp. L

Producing EOR projects outside U.S. and Canada

State/Area	Operator	Type Project	Field	Start date	Area, acres	No. wells prod	No. wells inj.	Pay zone	Form-ation	Porosity, %
China										
Jilin Province	CNPC-Jilin	Microbial	Fuju	1994		44	44		S	22-26
Dongyin, Shandong Province	CNPC-Shengli Bureau	Steam	Sanjasi	1984	3,162	280		Ng, Ea, El, Ea	S	30
Dongyin, Shandong Province	CNPC-Shengli Bureau	Steam	Lean	1989	10,613	658		Ea, Ng	S/Cong.	15-30
Liaoling Province	CNPC-Liaohe Bureau	Steam	Gaoshen 2-3	1982	3,583	450		3rd sand	S/Dolo.	20-25
Nanyang, Henan Province	CNPC-Henan Bureau	Steam	Jinglou	1986	1,210	177		E	S	32
Nanyang, Henan Province	CNPC-Henan Bureau	Steam	Gueheng	1987	1,655	132		E	S	27-34
Pnajin, Liaoning Province	CNPC-Liaohe Bureau	Steam	Shu I 7-5	1990	237	38	11	Middle	S	25.6
Pnajin, Liaoning Province	CNPC-Liaohe Bureau	Steam	Shu I	1984	5,718	1,149		Middle & Upper	S	23-28
Pnajin, Liaoning Province	CNPC-Liaohe Bureau	Steam	Xiao Wa	1992	2,100	311		2nd Dongying, '3rd sand	S	27.5
Pnajin, Liaoning Province	CNPC-Liaohe Bureau	Steam	Huanxiling	1985	7,067	1,848		2nd and 3rd sand	S	32
Xinjiang Province	CNPC-Xinjiang Bureau	Steam	Karamay 9-1	1984	469	128	41	Qigu	S	32
Xinjiang Province	CNPC-Xinjiang Bureau	Steam	Karamay 9-2	1986	444	79	21	Qigu	S	32
Xinjiang Province	CNPC-Xinjiang Bureau	Steam	Karamay 9-3	1986	115	62	31	Qigu	S	31
Xinjiang Province	CNPC-Xinjiang Bureau	Steam	Karamay 9-4	1988	963	358	32	Qigu	S	30
Xinjiang Province	CNPC-Xinjiang Bureau	Steam	Karamay 9-5 - 9-9	1991	2,495	1,136		Qigu	S	32
Xinjiang Province	CNPC-Xinjiang Bureau	Steam	Karamay 6	1989	963	211	45	Qigu	S	31
Heilongjiang Province	CNPC-Daqing	Polymer	Lamadian-2	1/94	516	21	9	K	S	26
Heilongjiang Province	CNPC-Daqing	Polymer	Sarto	1/93	273	36	25	K	S	25
Heilongjiang Province	CNPC-Daqing	Polymer	Lamadian-1	6/94	559	25	16	K	S	26
Henan Province	CNPC-Henan	Polymer	Shuanghe	2/96	744	12	3	E	S	20
Jilin Province	CNPC-Jilin	Polymer	Fuyu	6/93	519	86	21	K	S	25
Liaoling Province	CNPC-Liaohe Bureau	Polymer	Huanxiling-16	3/93	346	11	3	B	S	28.5
Shandong Province	CNPC-Shengli Bureau	Polymer	Guodao, Pilpt	9/92	138	10	4	N	S	32
Shandong Province	CNPC-Shengli Bureau	Polymer	Guodong	1/91	1,008	52	39	N	S	33
Shandong Province	CNPC-Shengli Bureau	Polymer	Guodao	12/94		82	40	N	S	32
Tianjin City	CNPC-Dagang	Polymer	Gangxi 3-2, West	12/91	255	19	6	N	S	31
Tianjin City	CNPC-Dagang	Polymer	Dagang-West	10/91	277	11	6	N	S	31
Daqing	CNPC, Liupukang	Polymer		7/96	3,803			K		
Daqing	CNPC, Liupukang	Polymer		1/97	4,740			K		
Shengli	CNPC, Liupukang	Polymer		8/96	2,989			N		
Shengli	CNPC, Liupukang	Polymer		9/96	1,536			N		
Henan	CNPC, Liupukang	Polymer		9/96	2,717			E		
Nemangu	CNPC, Nemangu	Combustion	Kerxing	1996	6					
Jilin Province	CNPC, Jilin	Microbial		4/96						
Liaoling Province	Qi-40	Steam drive	Panjin	1996	1962					
Snadong	Cheo-20	Steam drive	Dongyi	1996	964					
Colombia										
Mid. Magdalena Basin	Omimex	Steam	Teca	2/84	3,448	342		Oligocene A & B	S	28
Mid. Magdalena Basin	Omimex	Steam	Teca	1/91	60	20	12	Oligocene B	S	28
France										
Paris	Elf Aquitaine	Polymer	Chateaurenard (Courtenay)	1/89	250	12	4	Neocomian	S	30
Germany										
Lower Saxony	BEB	Steam	Ruhlermoor II	8/86	360	37	4	Valanginian	S	27-31
Lower Saxony	BEB	Steam	Georgsdorf I	1/75	165	15	1	Valanginian	S	25
Lower Saxony	BEB	Steam	Georgsdorf II	12/79	144	15	3	Valanginian	S	25
Lower Saxony	BEB	Steam	Georgsdorf II	10/90	60	6	1	Valanginian	S	25
Lower Saxony	BEB	Steam	Ruhlermoor I	11/80	220	30	4	Valanginian	S	28-30
Lower Saxony	BEB	Steam	Ruhlermoor III	12/87	400	40	5	Valanginian	S	25-28
Northwest	Preussag AG	Polymer	Vorhop-Knesebeck	11/89	345	3	1	Dogger-Beta	S	28
	RWE-DEA	Polymer	Ploen OST	1/89	30	3	1	Dogger-Beta	S	19
Lower Saxony	Wintershall AG	Hot water	Emlichheim 17	10/74	82	9	1	Valenginian	S	30
Lower Saxony	Wintershall AG	Hot water	Emlichheim 1	10/67	115	7	1	Valenginian	S	30
Lower Saxony	Wintershall AG	Hot water	Emlichheim 3	6/90	95	6	1	Valenginian	S	30
Lower Saxony	Wintershall AG	Steam	Ruehlertwist	12/78	237	26	2	Valenginian	S	28
Lower Saxony	Wintershall AG	Steam	Emlichheim 11	3/92	80	10	3	Valenginian	S	28
Lower Saxony	Wintershall AG	Steam	Emlichheim 10	6/94	47	7	1	Valenginian	S	30
India										
Gujarat	ONGC	Polymer	Jhalora	6/93	11	4	1	Kalol Sand IX+X	S	33
Gujarat	ONGC	Combustion	Balol	3/90	6	4	1	Kalol Sand I	US	28
Gujarat	ONGC	Combustion	Lanwa	8/92	10	4	1	Kalol Sand I	US	30
Gujarat	ONGC	Combustion	Balol	10/96	3,450			Kalol sand-I		
Gujarat	ONGC	Combustion	Santhal	6/96	3,450			Kalol sand-I & II		
Gujarat	ONGC	Combustion	Bechraji	11/96	3,120			Kalol sand-I		
Indonesia										
Pekanbaru	PT Caltex	Steam	Duri	4/85	7,020	1,654	703	Pertama - Kedua	US	34
Pekanbaru	PT Caltex	Steam	Duri	7/94	—	13	3	Rindu	US	34
	Total	Micellar polymer	Handil	1982	4	1	3		S	30
Libya										
	Zueitina Oil	HC miscible	Intisar 103D	1/69	3,325	20	6	" D" Reef	LS	23.9

Table H

Permeability, md	Depth, ft	Gravity, °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
180	935-1,572	31.5	19-31	86		54		NC			Succ.	Yes	Exp. L
5,000	3,673-3,938	11-19	9,200	131	Prim	65		HF	9,116	9,116	Succ.		FW
3,000-4,500	2,885-3,132	11-18	10,000-40,000	129	Prim	60		HF	21,735	21,735	Succ.		FW
2,200	5,081-5,740	16-19	1,000-2,000	150	Prim.	65		HF	10,136	7,868	Succ.		RW
1,500-3,000	459-1,936	16-25	9,600-16,000	70-90	Prim.	65		HF	1,965	1,965	Succ.		FW
1,351-7,134	513-1,627	14-22	6,000-137,000	66	Prim.	65-73		HF	1,663	1,663	Succ.		FW
1,601	3,345	13	15,000-18,900	129	C	65		HF	2,117	920	Succ.		RW
560-1,500	2,755-5,051	13-20	620-25,900	118-134	Prim.	65		HF	32,124	25,760	Succ.		FW
1,683	3,772-4,592	11-13	4,000-11,000	115-122	Prim.	65		JS	15,020	15,020	Succ.		FW
450-512	2,050-3,440	14	700-14,000	104	Prim.	65		HF	59,595	42,122	Succ.		FW
3,170	820	16-24	2,000	66	Prim.	65		HF	1,329	1,329	Prom.		RW
2,290	754	16-24	2,240	66	Prim.	65		HF	951	951	Prom.		RW
1,730	525-1,180	16-24	4,000	65	Prim.	65		HF	913	913	Disc.		RW
3,000	656-1,312	16-24	7,200	66	Prim.	65		HF	2,709	2,709	Prom.		RW
1,350-2,000	721-1,146	16-24	5,400-54,000	66	Prim.	65		HF	16,632	16,632	Succ.		RW
2,500-3,100	853-1,016	16.5-23	6,400-80,000	66	Prim.	65		HF	2,948	2,948	Succ.		RW
580	3,212	33	10.2	108	WF	70		HF	3,313	1,492	Prom.		Exp. L
871	3,376	34	9	115	WF	72		NC	8,913	4,149	Succ.		Exp. L
622	3,215	33	10	108	WF	70		HF	7,620	4,884	Succ.		Exp. L
173	4,568	33	7	162	WF	68		NC	953	391	Succ.		Exp. L
180	1,311	31.5	32	87	WF	73		JS	812	53	Prom.		RW
908	4,626	30	17.4	133	WF	65		HF	1,179	596	Succ		Exp. L
875	3,911	15.5	46.3	154	WF	69		NC	1,072	387	Succ		Exp. L
901	3,921	14	80	149	WF	71		HF	2,084	707	Prom.		Exp. L
875	3,911	15.5	46.3	158	WF	69		NC	3,984	1,026	Prom.		RW
412	3,238	21	19	127	WF	60		NC	1,082	446	Succ.		Exp. L
538	3,346	21	22	123	WF	60		NC	365	211	Succ.		Exp. L
	3,215	33											
	3,376	33.5											
	3,911	15.5											
	3,921	13.6											
	4,560	32.08											
	1,640-2,065	29											
	935-1,575	31.5											
	2,132-3,464	12											
	2,886-3,149	14-20											
1,200	2,100	12.8	2,965	108	Prim.	57		NC	13,000	8,000	Succ.	Yes	FW
1,200	2,100	12.8	2,965	108	SS	57	10	HF	1,000	500	Disc.	No	P(Exp. UL)
2,000	1,950	27	40	86	Prim.	45		HF	635	459	Succ.	Yes	RW
600-1,000	1,700-2,100	25	120		Prim.	78		HF	1,940	1,620	Succ.	Yes	
460-1,150	2,130-2,790	27	120	95	Prim.			NC	690	610	Succ.	Yes	Exp. UL
1,000-1,300	2,130-2,790	27	120	95	Prim.			NC	500	280	Succ.	Yes	Exp. L
1,000-1,200	2,130	27	120	95	WF	65		JS	700	630	Prom.		
300-1,000	2,070-2,460	25	120	96	Prim.			HF	1,310	1,150	Succ.	Yes	
300-800	1,700-2,100	25	120	96	WF			HF	2,410	1,840	Succ.	Yes	Exp. L
1,000	3,600	33	4	133	WF	65.5	55.2	HF	250	50	Succ.	Yes	P (Exp. L)
200-1,500	9,400	35	1.3	195	WF	34		NC					P
6,000	2,300	24.5	175	95	WF	66	55	NC	295	295	Succ.	Yes	FW
6,000	2,560	24.5	175	95	WF	76	62	HF	240	200	TETT		FW
6,000	2,500	24.5	175	95	WF	72	60	HF	235	225	TETT		FW
5,000	2,650	25	175	100	WF	51	42	NC	760	750	Succ.	Yes	P (Exp. L)
5,500	2,800	24.5	175	100	HW	71	45	HF	880	870	Succ.	Yes	FW
5,000	2,600	24.5	175	100	WF,HW	72	50	JS	710	710	TETT	c	FW
5,000	4,000	25.7	10	185	Prim.	82		HF			TETT		P
8,000-15,000	3,440	15.6	100-150	158	Prim.	70		NC	190	190	Succ.		P (FW)
8,000-15,000	3,440	13.5	550	158	Prim.	80		HF	165	165	Prom.		P (Exp. L)
	3,450	15.6											
	3,450	17											
	3,120	15.6											
1,550	625	22	157	101	Prim.	62	25	JS	310,000	310,000	Succ.	Yes	Exp. L
	340	22	400	100	Prim.	70		JS	—	—	TETT		P
1,000	4,500	33	0.4	115	WF	35			400	400			
226	8,849	39.2	0.46	226		80	18	NC	40,000	40,000	Succ.	Yes	FW

Producing EOR projects outside U.S. and Canada (continued)

State/Area	Operator	Type Project	Field	Start date	Area, acres	No. wells prod	No. wells inj.	Pay zone	Form-ation	Porosity, %
Trinidad										
Forest Reserve	Petrotrin	CO2 immiscible	Area 2102	6/76	58	6	2	Forest Sands	S	32
Forest Reserve	Petrotrin	CO2 immiscible	Area 2121	1/74	29	2	2	Forest Sands	S	30
Forest Reserve	Petrotrin	CO2 immiscible	Area 2124	1/86	184	3	1	Forest Sands	S	31
Oropouche	Petrotrin	CO2 immiscible	Oropouche	6/90	175	4	3	Retrench	S	30
Guapo	Petrotrin	Steam	Cruse E	8/70	531	125	29	Cruse E	S	25
Point Fortin	Petrotrin	Steam	Cruse E	2/86	66	17	7	Cruse E	S	31
Point Fortin	Petrotrin	Steam	Parrylands	7/81	86	20	10	Forest	S	30
Forest Reserve	Petrotrin	Steam	Project III	7/65	135	36	12	Forest Zone 5.1	S	33
Forest Reserve	Petrotrin	Steam	Phase I Cyclic	8/76	58	10	0	Forest Sands	S	31
Forest Reserve	Petrotrin	Steam	Phase I West	12/88	50	10	10	Forest Sands	S	30
Fyzabad	Petrotrin	Steam	Fyzabad Forest	8/79	129	37	11	Forest	S	28
Fyzabad	Petrotrin	Steam	Fyzabad Cruse	8/79	150	29	4	Cruse	S	25
Palo Seco	Petrotrin	Steam	Central Los Bajos	2/74	280	123	34	LMLE	S	28
Palo Seco	Petrotrin	Steam	Palo Seco North	11/69	438	170	62	LMLE	S	28
Palo Seco	Petrotrin	Steam	Palo Seco B.V.	11/85	150	49	10	LMLE	S	28
Quarry	Petrotrin	Steam	Apex Quarry	2/81	278	86	18	LMLE	S	28
Premier Consolidated Oilfields		Steam	Fyzabad	1989	21	19	3	Lower Forest	US	28
Turkey										
Batman	TPAO	CO2 immiscible	Bati Raman	3/86	10,709	145	41	Garzan	LS	18
UAE										
Abu Dhabi	Total	Hydrocarbon misc.	Abu Al Bu Khoosh	8/91	50	3	1	Arab D	LS	15
Venezuela										
Anzoategui	PDVSA E&P	Steam	Bare (F.O)	3/85	16,452	55	48	U1,3(YAC.MFB-53)	US	31.9
Anzoategui	PDVSA E&P	Steam	Bare (F.O).	3/87	8,066	66	65	U2,3(YAC.MFB-23)	US	28.6
Anzoategui	PDVSA E&P	Steam	Arecuna (F.O.)	2/85	1,668	5	5	5	US	30.7
Anzoategui	PDVSA E&P	Steam	Arecuna (F.O)	12/83	1,544	15	15	T(YAC.MFA-52)	US	30.6
Campo Cerro Negro	PDVSA E&P	Steam	B.E.P.-Cerro Negro	1984	49,090	186		Morichal-Memb.	S	35
Campo Jobo	PDVSA E&P	Steam	Jobo	12/69	25,410	88		Jobo Member	S	31
Campo Jobo	PDVSA E&P	Steam	Jobo - P.E.T.C.	8/85	267	17		Morichal	S	30
Campo Jobo	PDVSA E&P	Steam	Jobo	12/69	34,099	301		Morichal	S	30
Campo Pilon	PDVSA E&P	Steam	West Pilon	12/69	1,065	8		Oficina-1	S	31
Zulia	PDVSA E&P	Steam	Bachaquero	12/80	343	2		Bachaquero Superior	S	23
Zulia	PDVSA E&P	Steam	Lagunillas	2/71	9,343	522	2	Bachaquero	S	34
Zulia	PDVSA E&P	Steam	Tia Juana	2/70	1,692	25		Lagunillas Inferior	S	31
Zulia	PDVSA E&P	Steam	Lagunillas	4/65	420	59		U.L.H.	S	35
Zulia	PDVSA E&P	Steam	Lagunillas	8/64	76	7		L.L.	S	33.7
Zulia	PDVSA E&P	Steam	Lagunillas	7/67	618	54		U.L.H.	S	35
Zulia	PDVSA E&P	Steam	Lagunillas	1/70	3,025	147		L.L.	S	33.7
Zulia	PDVSA E&P	Steam	Lagunillas	4/70	2,565	220		U.L.H.	S	35
Zulia	PDVSA E&P	Steam	Lagunillas	8/70	2,114	175		U.L.H.	S	35
Zulia	PDVSA E&P	Steam	Lagunillas	11/79	3,101	261		L.L.	S	33.7
Zulia	PDVSA E&P	Steam	Lagunillas	10/80	3,565	297		U.L.H.	S	35
Zulia	PDVSA E&P	Steam	Bachaquero	11/84	7,795	640		Post-Eoceno	S	33.5
Zulia	PDVSA E&P	Steam	East Tia Juana	4/59	341	32		L.L.	S	33.5
Zulia	PDVSA E&P	Steam	East Tia Juana	2/61	35	7		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	East Tia Juana	9/64	411	36		L.L.	S	38
Zulia	PDVSA E&P	Steam	East Tia Juana	5/68	2,755	201		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	East Tia Juana	8/68	3,218	250		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	East Tia Juana	12/68	1,961	168		L.L.	S	38
Zulia	PDVSA E&P	Steam	East Tia Juana	3/69	1,768	145		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	East Tia Juana	8/69	1,642	148		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	East Tia Juana	12/69	392	36		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	East Tia Juana	11/74	1,848	135	21	L.L.	S	38.1
Zulia	PDVSA E&P	Steam	East Tia Juana	9/86	1,380	88		L.L.	S	36
Zulia	PDVSA E&P	Steam	Main Tia Juana	10/63	867	82		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	Main Tia Juana	6/66	144	15		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	Main Tia Juana	7/67	1,271	114		L.L.	S	38
Zulia	PDVSA E&P	Steam	Main Tia Juana	7/67	1,500	134		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	Main Tia Juana	10/67	2,323	197		L.L.	S	38.1
Zulia	PDVSA E&P	Steam	Main Tia Juana	10/67	1,286	86		L.L.	S	38.1

Producing Worldwide heavy oil EOR projects (Primary production)

Type/ Operator	Field	Country/ prov.	Start date	Area, acres	No. wells prod	No. wells inj.	Pay zone	Form-ation	Porosity, %
Steam									
Amoco	Wolf Lake/Primrose	Alta.	4/85	10,130			Clearwater	S	31-35
Gibson	Athabasca Oil Sands	Alta.	7/84	50,000	3	3	McMurray	US	30-35
Imperial Oil	Cold Lake	Alta.	1964		2,100	2,100	Clearwater	US	35
Husky Oil	Pikes Peak	Sask.	1/81	400	102	27	Waseca	US	33
Murphy Oil	Lindbergh	Alta.	1/74	212	68	68	Lower Grand Rapids	US	33
Shell Canada Ltd	Peace River	Alta.	10/86	450	163	53	Cretaceous-Bullhead	S	28

Table H

Permeability, md	Depth, ft	Gravity, °API	Oil, cp	Oil, °F.	Prev. Prod.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
175	3,000	19	16	120	Prim.	56		HF	270	270	Succ.	Yes	RW
150	2,600	17	32	120	Prim	60		HF	50	50	Prom.		RW
300	4,200	25	6	130	WF	44		HF	77	77	Prom		RW
36	2,400	29	5	120	Prim.	53	48	HF	88	88	Prom.		P
250	2,300	14	3,500	108	Prim.	65		HF	1,500	1,500	Succ.	Yes	RW
95	1,400	17	175	110	Prim.	58	18	HF	310	310	Prom.		P
500	1,100	11	5,500	104	Prim.	75	20	HF	300	300	Succ.	Yes	RW
340	1,100	15	140	110	Prim.	70	20	NC	800	800	Succ.	Yes	RW
205	1,200	19	32	105	Prim.	57	15	NC	50	50	Disc.	No	RW
430	1,500	17	160	105	Prim.	67	25	JS	50	50	Disc.	No	RW
275	1,100	14	220	98	Prim.	70		NC	230	230	Succ.	Yes	RW
19	2,000	20	150	105	Prim.	65		NC	120	120	Succ.	Yes	RW
250	1,500	16	550	102	Prim.	70		HF	1,800	1,800	Succ.	Yes	RW
250	1,700	16	550	102	Prim.	70		HF	2,500	2,500	Succ.	Yes	RW
250	1,200	21	160	98	Prim.	70		HF	400	400	Succ.	Yes	RW
250	2,100	19	185	105	Prim.	65		HF	1,100	1,100	Succ.	Yes	RW
350	350-700	14	1,100	100	Prim.	70	40	JS	120	94	Prom.		P
58	4,265	13	592	129		78		NC	14,000	13,500	Succ.	Yes	FW
200	8,000	32		200	Prim.	45	25	JS	500	300	TETT	Yes	P
6,600	2,650	9.3	376	131	Prim.	88	75	HF	65,000	20,000	Succ.	Yes	RW (Exp. L)
5,000	3,050	9.2	351	136	Prim.	83	75	HF	4,500	500	Succ.	Yes	RW (Exp. L)
5,800	2,850	10	370	135	Prim.	82	74	NC	0	0	Disc.	No	P (Exp. UL)
4,500	3,150	9.8	560	140	Prim.	80	72	NC	0	0	Prom.	Yes	RW
10,000	2,000	8.5	5,5000	125	Prim.	80		HF	650	400	Succ.	Yes	P (Exp. L)
2,500	3,260	13.5	138	130	Prim.	80		HF	14,101	0	Succ.	Yes	FW
5,000	3,600	9	1,952	132	Prim.	85		NC	1,530	0	Succ.	Yes	P (Exp. L)
5,000	3,600	9	1,952	132	Prim.	85		JS	5,607	514	Succ.	Yes	FW
8,000	3,350	10	727	139	Prim.	82		JS	23,912	0	Succ.	Yes	RW
1,500	3,400	14	185	135	Prim.	85		JS	32,517	17,997	Succ.	Yes	P (Exp. L)
4,000	2,690	12	600	128	Prim.	84		HF	44,219	31,135	Succ.	Yes	FW
1,250	2,537	15	93	119		72		HF	5,916	3,815	Succ.	Yes	P(Exp. L)
	2,300	11.4	3,500	117	Prim.	75	44	NC	3,989	3,989	Succ.	Yes	FW
	2,850	15.2	2,500	125	Prim.	80	50	NC	241	241	Succ.	Yes	FW
	2,300	11.4	3,500	117	Prim.	75	46	NC	4,106	4,106	Succ.	Yes	FW
	2,850	15.2	2,500	122	Prim.	87	54	HF	3,706	3,706	Succ.	Yes	FW
	2,300	11.8	7,000	115	Prim.	75	54	HF	24,517	24,517	Succ.	Yes	FW
	2,300	11.4	3,500	118	Prim.	75	63	HF	9,789	9,789	Succ.	Yes	FW
	2,850	15	580	126	Prim.	87	66	HF	4,677	4,677	Succ.	Yes	FW
	2,300	11	20,000	125	Prim.	75	63	HF	25,268	18,580	Succ.	Yes	FW
575	2,000	13	500	117	Prim.	84.5	40	JS	42,809	42,699	Succ.	Yes	FW
	1,500	12	1,000	108	Prim.	85	48	HF	409	409	Succ.	Yes	FW
1,300	1,746	13.6	13,000	100	Prim.	85	45	NC	274	80	Succ.	Yes	P
3,000	1,250	12	3,000	104	Prim.	85	65	HF	459	459	Succ.	Yes	FW
	1,200	12	750	104	Prim.	85	64	HF	3,583	3,583	Succ.	Prom.	FW
3,000	872	12	5,000	104	Prim.	81	74	HF	5,319	5,319	Succ.	Yes	FW
	1,250	12	7,500	106	Prim.	85	67	HF	7,631	7,577	Succ.	Yes	FW
780	1,700	12.1	2,000	111	Prim.	85	67	HF	3,821	3,776	Succ.	Yes	FW
1,300	1,250	10	12,000	102	Prim.	85	77	HF	6,024	5,989	Succ.	Yes	FW
	1,000	11.1	10,000	95	Prim.	85	72	HF	1,114	1,058	Succ.	Yes	FW
780	1,597	12	1,000	111	Prim.	85	46	HF	2,328	2,328	Succ.	Yes	FW
1,000-4,000	760	9-11	5,000-30,000	110	Prim.	85	82	HF	15,050	14,409	Succ.	Yes	FW
1,400	1,750	13.1	750	113		85	57	NC	895	838	Succ.	Yes	FW
675	1,250	13.1	1,300	104	Prim.	85	65	NC	132	132	Succ.	Yes	FW
675	1,209	13.1	5,000	123	Prim.	85	61	HF	3,565	3,565	Succ.	Yes	FW
1,000	1,400	13.1	1,000	110	Prim.	85	65	HF	4,020	3,723	Succ.	Yes	FW
1,000	1,746	13.1	4,100	110	Prim.	85	62	HF	5,516	5,428	Succ.	Yes	FW
1,000	1,746	13.1	1,200	110	Prim.	85	76	HF	1,539	1,528	Succ.	Yes	FW

Table I

Permeability, md	Depth, ft	Gravity, °API	Oil, cp	Oil, °F.	Satur. % start	Satur. % end	Proj. Matur.	Tot. prod., b/d	Enh. prod., b/d	Proj. Eval.	Profit	Project Scope
1,000-3,000	1,600	10-12	30-230,000	60	54-66		HF	10,000	10,000			
0.1-10	500	8	5,000,000	45	85	15	HF	2,000	2,000	Succ.	Yes	Exp. L
1,500	1,509	10.2	100,000	55	70		HF	120,000	120,000	Succ.		FW
7,500	1,640	12	25,000	70	85		HF	7,500	7,500	Succ.	Yes	RW
2,500	1,600	11	102,500	70	82	65	PP	2,500	2,500	Prom.	Yes	Exp. L
100-2,000	1,800	7.5	100,000	60	80		HF	8,000	8,000	Succ.		Exp. L