

0022

**KAISER
COAL**

KAISER COAL CORPORATION
Sunnyside Coal Mines
P.O. Box 10
Sunnyside, Utah 84539
Telephone (801) 888-4421

File ACT/007/007 #6
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DIVISION OF
OIL, GAS & MINING

September 7, 1988

Mr. Rick Smith
Utah Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

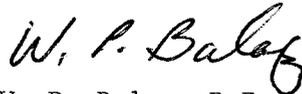
Dear Mr. Smith:

Re: Sunnyside Subsidence Report
ACT/007/007, Carbon County, Utah

This letter transmits the 1988 Annual Subsidence Report for Kaiser's Sunnyside Mines. This activity established five (5) additional points in Bear Canyon and monitored thirteen (13) points in Whitmore Canyon.

Please feel free to call if you have any questions.

Sincerely,



W. P. Balaz, P.E.
Manager of Administration

WPB:th

cc: Lou Kuchinic, Jr.
Denise Drago

Enclosure

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INTRODUCTION

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As required by its approved mine permit ACT/007/007, Kaiser performed 1988 subsidence monitoring in Bear and Whitmore Canyons during August. This work included:

- (1) Monitoring of thirteen (13) subsidence monitoring points in Whitmore Canyon
- (2) Monitoring of five (5) existing subsidence points in Bear Canyon
- (3) Establishment of five (5) additional points in Bear Canyon

Kaiser has extended the Whitmore Canyon subsidence monitoring network up to the toe of the dam on Grassy Trail Reservoir. Plate No. III-1, 2 of 3, shows the locations of the subsidence monitoring points.

This work was started in June, 1988, and completed during August, 1988. This work terminated NOV 88-19-2-1 which was written on May 12, 1988, for failure to monitor subsidence during 1987.

Discussion

The survey work was performed using a Wilde T-2, 1 Second Theodolite, TopCon EDM, and Zeiss Self-Leveling Level. The field notes for the work are attached for reference. Kaiser estimates the accuracy of the survey at $\pm .2$ feet.

Table 1 summarizes the Whitmore Canyon subsidence data for the years 1986-1988. Comparing 1986 to 1988 shows the stations in Whitmore Canyon have gone up from .03 to .54 feet. Station 12 has been destroyed by maintenance activities on a municipal water pipeline. Station 13 has been included as a replacement for Station 12. This data indicates no subsidence movement in Whitmore Canyon.

Table 2 summarizes the Bear Canyon data for 1986, 1987, and 1988. The results in Bear Canyon for Stations S-1 to S-5 are variable between 1986 and 1987. Movement ranges from up .15 to down 1.54 feet. The comparison between 1987 and 1988 shows the elevation went up from .09 to .18 feet. Kaiser feels the 1.54-foot difference on S-4 is due to the longwall mining. No change in S-5 is noticed due to its proximity to the longwall gate entries. It is possible that as 21st Left, the current panel being mined, passes Point S-5 that a change in elevation will be noticed.

With the recent earthquake, Kaiser resurveyed portions of the Bear Canyon subsidence network to see if any changes occurred between June and August. The elevations were essentially unchanged - $\pm .08$ feet. Therefore, it is concluded that the August earthquake activities have not caused any localized effects on the subsidence network.

It is Kaiser's understanding based on phone conversations with DOGM that thirteen (13) stations in Whitmore Canyon are sufficient. This is due to the fact that longwall mining passed this area in 1985 prior to extending subsidence monuments to the dam. The operator will include monuments as required should longwall mining resume in the #1 Mine inside panels.

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Table 1

KAISER COAL CORPORATION
 BEAR CANYON TO WHITMORE GATE
 LEVEL CIRCUIT DETERMINATIONS

STATION	ELEV. 1986	ELEV. 1988	POSITION
S-1000	7147.32	7147.32	
S-1001	7156.18	7156.72	+0.54
S-1002	7173.64	7173.70	+0.06
S-1003	7185.56	7185.63	+0.08
S-1004	7199.21	7199.31	+0.10
S-1005	7227.49	7227.53	+0.04
S-1006	7254.45	7254.48	+0.03
S-1007	7254.53	7254.60	+0.07
S-1008	7263.11	7263.21	+0.10
S-1009	7266.99	7267.06	+0.07
S-1010	7281.75	7281.81	+0.06
S-1011	7293.76	7293.86	+0.10
S-1012	7306.43	Missing Destroyed	
S-1013	7335.48	7335.63	+0.15
S-1014	7358.78		
S-1015	7391.50		
S-1016	7309.45		
S-1017	7327.12		
S-1018	7436.37		
S-1019	7439.19		
S-1020	7455.54		
S-1021	7468.33		
S-1022	7483.88		
S-1023	7494.34		
S-1024	7506.37		
S-1025	7516.59		

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Table 2

BEAR CANYON SUBSIDENCE COMPARISONS

	<u>1986</u>	<u>1987</u>		<u>1988</u>	
S-1	7163.18	7163.33	+ .15'	7163.51	+.18'
S-2	7188.05	7187.99	- .06'	7188.16	+.17'
S-3	7202.58	7202.13	- .45'	7202.29	+.16'
S-4	7223.34	7221.80	-1.54'	7221.89	+.09'
S-5	7250.67	7250.73	+ .06'	7350.83	+.10'

+ Indicates Movement Up

- Indicates Movement Down

8-24-88

B.F. ALLEED

R.T. JARAMILLO

BEAR CANYON TO

WHITMORE GATE

SUBSIDENCE NET

DIFFERENTIAL

LEVEL

CIRCUIT

BIG CHIEF
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STA.	+	HI.	-	IFS	1988 ELEV'S	3-WIRES RECORDED.	
T.B.M.	T.301 M-246 B-121	71 65	12 24 11 47 10 70		8/23/88 7163.33		1ST BEAR CANYON MONITOR JOB POINT S-1. TOP "O" ROOF BOLT
TP1	180	71 56	12 24 11 47 10 70		54 32		ROCK
S-10 00	563 467 370	71 51	9/8 8/79 8/47	(880)	47 32 7147 32		R.B. & TP2
TP3	11 18 10 70 10 44	(1081) 71 60	3/21 2/42 1/63		49 57		ROCK
S-10 01	12 36 11 40 10 75	(1141) 71 68	4/08 3/28 3/28		56 70 7156 70		R.B. & TP4
TP5	10 64 9 84 9 04	71 76	1 25 1 54 1 14	(155)	46 56		ROCK
S-10 02	10 20 10 01 9 11	71 63	3/20 2/1 2 22		73 69 7173 69		R.B. & TP6
TP4	12 27 11 28 10 28	71 93	2/63 1 25 1 26		81 75		ROCK
S-10 03				8 46 8 10	88 63 7185 63		R.B.
TP8	11 31 10 70 10 08	72 63	1 48 7 02 0 36		92 21		ROCK
S 10 04	12 22 12 20 11 41	72 71	4 87 4 10 3 21	(411)	99 30 7199 30		R.B. & TP9
TP10	11 22 11 21 10 52	(1138) 72 21	1 69 1 28 0 28		7210 22		ROCK
TP11	11 10 10 58 10 02	72 31	1 09 0 70 0 70		20 20		ROCK
S-10 05				4 21 3 25 2 45	27 53 7227 53		R.B.
TP12	12 24 11 42 11 13	72 42	1 21 0 65 0 38		30 81		ROCK
TP13	13 37 12 27 12 37	72 54	1 22 0 32 0 58	(099)	41 51		ROCK
ROMEO				4 20 6 10 4 09	72 47 28		(PIN) TOP "O" D.S. IN CONCR.

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STA	+	H I	-	3301 ELEV	1988 ELEV'S			
TP 14	888 ⁹ 770 650	72 61 ³⁸	137 069 070 002	7253 ⁶⁸		ROCK		
S-10 06			801 621 522	54 ⁴⁸	7254 ⁴⁸	R.B.		
S-10 07	306 219 133	72 56 ⁷⁸	820 629 559	54 ⁵⁸	7254 ⁵⁸	R.B. & TP 15		
TP 16	1266 1207 1142	72 66 ⁸⁷	305 129 023	54 ⁷⁰		ROCK		
S-10 08			532 344 360	63 ²¹	7263 ²¹	R.B.		
TP 17	1004 898 791	72 75 ²⁰	110 065 022	66 ²²		ROCK		
S-10 09	1310 1190 1020	72 78 ⁹⁵	913 815 74	67 ⁰⁵	7267 ⁰⁵	R.B. & TP 18		
TP 19	1075 915 757	72 87 ³⁸	121 073 025	78 ²²		ROCK		
S-10 10			628 555 482	81 ⁸³	7281 ⁸¹	R.B.		
TP 20	963 868 775	72 94 ⁵³	212 153 093	85 ⁸⁵		ROCK	3'x3'x3'	BARROW PIT, E. SIDE RD
S-10 11	1029 925 821	73 03 ¹⁴	098 046 035	93 ⁸⁶	7293 ⁸⁶	R.B. & TP 21		
TP 22	1285 1197 1109	73 13 ⁶¹	236 149 063	7301 ⁶⁴		ROCK		
TP 23	1305 1255 1184	73 24 ⁴⁵	190 171 151	1190		"		
TP 24	1102 1051 993	73 33 ⁰²	231 193 156	2251		"		
TP 25	610 594 528	73 38 ⁴⁷	077 050 022	3252		"		
S-10 13	272 252 233	73 38 ¹⁵	302 284 265	3563	7335 ⁶³	R.B. & TP 26		
TP 25	134 111 087	73 33 ⁶¹	578 563 542	3250				

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GIL CASPARI

STA	+	HI	-	EL.				
TP 24	116 064 017	73 23 ¹⁴	11 25 11 12 10 32	7322 ⁴⁹				
" 23	095 064 032	73 53 12 53	11 27 10 20	11 89				
" 22	2 42 160	73 24 03 24	11 64 10 39 10 13	01 64				
" 21	076 042 038	72 27 94 27	10 44 9 39 8 33	7293 ⁸⁵		S-1011		
" 20	191 127 063	72 10 87 10	9 35 8 44 7 52	85 83				
" 19	134 098 062	72 20 79 20	10 44 9 38 8 34	78 21				
" 18	8 55 765 675	72 72 74 72	13 41 12 16 10 55	67 07		S-1009		
" 17	1432-84 114 244 064 204	72 40 67	9 64 8 46 7 32	66 26				
" 16						NOT USED		
" 15	857 728 528	72 89 61 89	12 79	54 61		S-1007		
" 14	179 115 047	72 84 54 84	9 49 8 18 6 86	53 71				
" 13	107 065 025	72 19 42 19	13 30	41 54				
" 12	169 119 068	72 04 32 04	11 88 11 33 10 00	30 85				
" 11	077 041 005	72 34 21 34	11 71 11 11 10 50	20 93				
" 10	2 39 2 21 1 63	72 27 12 27	11 56 11 23 10 60	10 26				
" 9	4 69 3 88 2 92	72 12 03 12	12 95	7199 ³²		S-1004		
" 8	1 51 0 88 0 20	71 59 93 59	10 98 10 38 9 51	92 73				

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STA.	+	HI	-	EL.					
TP 7	203 133 062	71 8311	1291 11 81 1081	718178					
" 6	315 251 200	7129 76	1027 940 853	7371				S-10 02	
" 5	176 133 090	7193 67	1040 949 898	6660					
" 4	424 376 326	7149 60	1211 1119 1027	5674				S-10 01	
" 2	1114 1078 1042	7114 58	1313	4736				S-10 00	
" 1	1225 1151 1027	71 6585	445 380 315	5434					
S-1			306 250 194	6335				STARTING ELEV. POINT	
	+ TOT. 309.97		- TOT. 93 389.						
		0.04'	MIS-CLOSURE						

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6-7-88

BFA. 30.

DE. DL

WARM WINDGISTS

RADIAL SURVEY
TO LOCATE 5 ADDITIONAL
SUBSIDENCE MONUMENTS
IN BEAR CANYON

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	S-A	T	F.S	T-190 52.8"
	ROWEN	OSCAR	S-010	PRM 17
1	0° 00'	04'	12.7"	
-	38°	46'	12.7"	
1	213°	46'	29.4	
E	180°	04'	41.6"	
S			11.8V	
⊙	38	37	41.9	
ADJ 4	38	37	42.8	
	S-010	OSCAR	ROWEN	
1	0°	08'	52.3"	
E	321°	21'	03.5"	
1	141°	21'	17.7"	
A 2	80°	08'	56.1"	
S			10.4V	
⊙	321	22	16.4V	
ADJ	321	22	17.2	
360°			-0.7V	
	OSCAR	TO	S-010	H1 HS
ZD	93°	10'	57.3"	4.75 526
ER	266°	49'	04.7"	
S			02.0V	
⊙	93	10	56.3V	
Z & MIN.	93	10	116.6	
S.DIST	2,124.715		HED = 8,172.181	
RETURN SIGNAL - 07			GRID = 8,172,345	
	S-010	TO	OSCAR	
Z D	86°	50'	23.0"	
R	213	09	32.7	
S			03.7	N 68,347.74
⊙	86	50	23.2	E 53,540.573
S-010 EL.	7444.	395		

	S-A	T	F.S	T-190 52.8"
	ROWEN	OSCAR	S-010	PRM 17
1	0° 03'	04'	51.4	
2	31°	24'	32.0	
1	217°	24'	41.2	
2	180°	04'	06.2	
S			5.6V	
⊙	317-20-37.8			
ADJ	317-20-41.1			
	S-09	TO	OSCAR	
1	0°	25'	52.8"	
2	323°	05'	11.1"	
1	143°	05'	20.8"	
2	180°	26'	03.3"	
S			5.6V	
⊙	322-39-15.4			
BADJ	322-39-13.9			
360°			-06.8	
	OSCAR	TO	S-010	H1 HS
ZD	93°	46'	01.7"	475 526
ER	266°	14'	02.7"	
S			01.4V	
⊙	93-45-59.5			
M	93-45-23.0			
S DIST	7,629.005		HED = 7612.690	
RYN.	314.-06		GRID = 7612.859	
	S-09	TO	OSCAR	
ZD	86-15-08.1			
R	273-44-49.1		N 66,008.66	
S			02.8	E 53,001.73
⊙	86-15-09.5			
S-09 ELE	7397.162			

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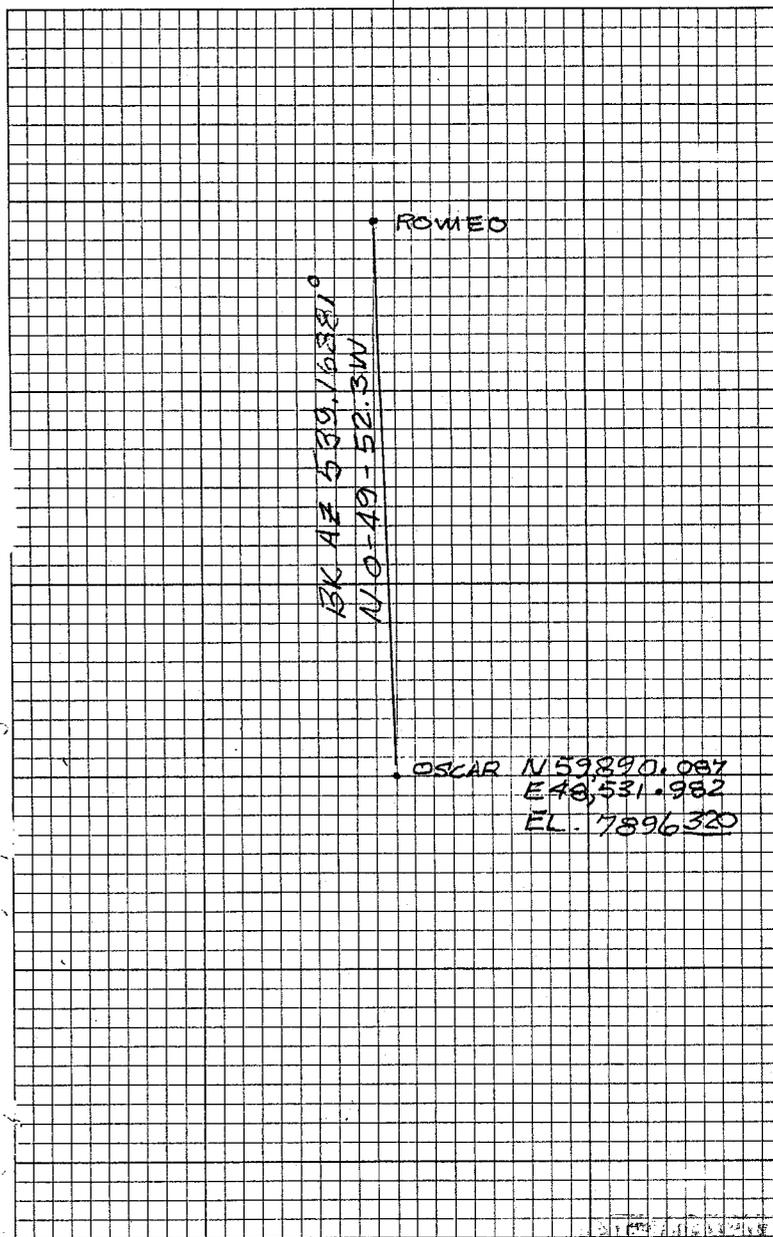
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	BS	T	FS	T B PRM
	BORNO	OSCAR	S-08	
1	0	04	20.4	
2	36°	17	23.9	
1	216	17	38.8	
2	180	04	32.8	
S			2.5	✓
LC @	36	13	04.9	
ADJ	36	13	02.8	
	S-08	OSCAR	ROMEO	
1	0	04	16.3	
2	323	51	14.1	
1	143	51	26.6	
2	180	04	29.2	
A S			0.4	✓
LC @	323	46	57.6	
ADJ	323	46	57.2	
360°			+2.4	✓
	OSCAR	TO	S-010	HT H.S.
ZD	94	26	19.1	475 528
ZB	263	33	53.4	57.4
S				HT 09.4
@	94	26	11.3	
M	94	25	39.0	
S DIST	6,946.6	6,945.855		
RTN	514. -10		GRID=6,946.021	
	S-08	TO	OSCAR	
ZD	85	34	50.0	
R	274	25	03	
S			07.0	NGS, 552.95
@	85	34	53.3	FE2, 554.32
S-08	EL=	7358.973		

	BS	T	FS	T B PRM
	ROMEO	OSCAR	S-07	
1	0	05	56.3	
2	35	34	06.4	
T	215	34	9.1	
2	180	06	17.0	
S			8.04	
@	35-28-06.1			
ADJ	35-28-09.1			
	-07	OSCAR	ROMEO	
1	0	05	57.4	
2	324	37	48.3	
T	44	37	57.6	
2	180	06	09.8	
S			3.6	✓
@	324-31-49.6			
ADJ	324-31-52.9			
360°			-4.3	
	OSCAR	TO	S-010	HT H.S.
ZD	95	02	13.6	475 528
ZB	264	57	51.3	
S			4.9	
@	95-02-11.2			
HT	95-01-36.8			
S DIST	6386.413	HT 6361.849		
RTN	514. -11	GRID=6,362.007		
	S-07	TO	OSCAR	
ZD	84-58-55			NGS, 124.49
R	275-01-00			E 52,148.08
S		05		
@	84-58-57.5			
S-07	EL=	7337.063		

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	BS	T	FS	T B VRM
	5-010	OSCAR	5-06	
1	0	05	16.5	
2	33	32	30.9	
1	2.3	32	38.4	
2	120	05	25.6 ✓	
1	5		1.6	
2	33	47	13.6	
ADJ	33	47	14.0	
	5-010	OSCAR	5-06	
1	0	05	10.7	
2	326	17	38.9	
1	146	18	35.6	
2	190	05	27.3	
1	S		09.9 ✓	
2	@ 326	12	43.3	
ADJ	326	12	46.1	
	326		-3.2 ✓	
	OSCAR	TO	5-06	HI -15
20	96	04	42.3	475 541
25	163	55	13.2	
			5.5 ✓	
1	96	04	39.6	
W-	96	04	07.5	
1	5795.135		HZD = 5,762.658	
RTN. SIG. 09			GRID = 5,762.814	
			5-06 EL = 7283.670	
	5-06	TO	OSCAR	
Z D	83	56	24.2	
R	276	03	35.1	N44, 725.60
S			00.7	E51, 1666.93
@	83	56	24.6	



1988 SUBSIDENCE MONITORING
 BEAR CANYON NET 8/23/88
 8th SHOOTING

T- 22°C
 B- 22.2"
 DPM- 76

	OSCAR TO	SUBA	HI	HS
Z D	100° 55'	29.9"	4.85'	370
R	259° 04'	33.8"		
S		3.7"		
@	100° 55'	28.1"		
2x ADJ.	100 55	06.6		
S.D.	3503.600			

H2D = GRID = 3440.278' (+0.208)

SUB EL 7234.088 (10/10/87 = 7233.880 T- 28°C)

OSCAR EL = 7896.320 B- 22.8" DPM 74

	S-1 TO	SUBA	HI	HS
Z D	78° 35'	41.8"	5.01'	370
R	281° 24'	30.9"		
S		12.7"		
@	78° 35'	35.5"		
2x ADJ.	78 35	25.4		
S.D.	350.260			

H2D. GRID = 343.343

S-1 EL. = 7163.512 (10/10/87 = 7163.329)

D.	78° 35'	46.9"	(+0.183)	
R.	281° 24'	23.9"		
S.		10.8"		
* @	78° 35'	41.5"		
	SUB TO OSCAR			
Zx @	79 05	15.0		
Z4 @	101 24	26.2		

* Z4 @ used from subsidence
 visual survey book

R.T. JARAWILLO
 B.F. ALLEED
 J. DALEY

DBL. VEZT *

T-2'S & TORON EDM.

H2DIST. = MINE GRID/
 REL. TO SEA LEVEL

ELEV. = MINE GRID/REL.
 TO SEA LEVEL

	S-2 TO	SUBA	HI	HS
Z D	85° 33'	46.7"	5.49'	370
R	274° 26'	21.8"		
S		8.5"		
@	85° 33'	42.4"		
2x ADJ.	94 26	21.8		
S.D.	570.920			

H2D GRID = 569.208'

S-2 EL = 7188.163 (10/10/87 = 7187.991)

(+0.173)

SUB TO S-2

Zx @ 94° 26' 26.0"

OSCAR EL:

	S-3	TO	SUB	HI	HS
ZD	88°	08'	29.9"	5.33'	370
R	271°	51'	41.4"		
S		0310	11.3" ✓		
@	88°	08'	29.3" ✓		
ZX ADJ.	91	51	478 ✓		
S.D.	928.425'				

H2D GRID = 927.935'
 S-3 ± 7202.288 (10/10/87 = 7202.130) +0.158

D	88°	08'	29.3"		
R	271°	51'	45.1"		
S			9.9" ✓		
@	88°	08'	19.6" ✓		

SUB TO S-3

ZX @ 91 51 55.2 ✓

OSCAR EL:

	S-4	TO	SUB	HI	HS
ZD	89°	33'	00.1"	5.17'	370
R	270°	27'	12.2"		
S		U09	12.6" ✓		
@	89°	32'	54.1" ✓		
ZX ADJ.	90	27	13.5 ✓		
S.D.	1359.780'				

H2D GRID = 1359.738'
 S-4 EL = 7221.888 (10/10/87 = 7221.795) +0.093

D	89°	32'	59.9"		
R	270°	27'	06.3"		
S			58.6.2" ✓		
@	89°	32'	56.6" ✓		

SUB TO S-4

ZX @ 90° 27' 21.1 ✓

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⊙ SCAR EL =

	S-5	TO	SUB	HI	HS
ZD	90°	34'	28.3"	5.21'	3.70
R	269°	85'	48.6"		
S	VOID	VOID	16.9"		
⊙	90°	34'	19.9"		
* ADJ	89	25 26	5 26.6		
S.O.	1834.920'				

HZD GRID = 1834.124' +.73 / +.094

S-5 EL = 7350⁸²⁵ (10/10/87 = 7250⁸²⁵) ⊙ 008

D	90°	34'	29.6"		
R	269°	25'	36.1"		
S			0.7" ✓		
* ⊙	90°	34'	24.3" ✓		

24 ⊙^{A1} SUB TO -S5
89° 26' 137.5"

825
721
+ .094

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8/26/88
B.F. ALLEN
RT. JAZAWILLO

BAZZ CANYON
SUBSIDENCE NET

AUGUST 1988

MONITOR'D Δ S-06

$\&$ Δ S-07

(EARTHQUAKES)

T-2'S $\&$ TOPCON

EMD.

DBL. Z'S

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OIL BASIN 1988

	ROWING	OSCAR	S-06	T. 252
HZ 1	0	08	07.7	B 221"
Z	33	55	31.0	FRM 78
1	215	55	48.7	
Z	180	08	28.6	
S			02.8 ✓	
@	33	47	24.7 ✓	
ADT.	33	47	22.0	
1		07	11.4	
Z	326	19	51.3	
1	146	20	08.1	
Z	180	07	24.2	
S			04.0 ✓	
@	326	12	41.9 ✓	
ADT.	326	12	38	
360°			+06.6 ✓	
	OSCAR	TO	S-06	HI HS
ZD	96	04	51.2	493 527
R	263	55	15.4	
S			06.6 ✓	
@	96	04	47.9 ✓	
ZAM	(96	04	21.7)	
SD	5,795.140		W/RET. SIG. 16	
H2D			N 4.725.44 5.60	
GRDD	5,162.778		E 51,007.09 6.93	
S06 EL	7283.595		(6/7/88 = 7283.670)	
			(+0.075)	
OSCAR EL	7896.320			
		S-06 TO OSCAR		
@	83	56	04.5	

	ROWING	OSCAR	S-07
HZ 1	0	05	49.3
Z	35	33	56.4
1	215	34	15.9
Z	180	06	68.1
S			00.7 ✓
@	35	28	07.5 ✓
ADT.	35	28	01.6
1			04.25.3
Z	324	36	10.8
1	144	36	10.8
Z	180	04	39.5
S			10.2 ✓
@	324	31	50.7 ✓
ADT.	324	31	51.7
360°			-0.8
	OSCAR	TO	S-07
ZD	95-02-11.6		493 535
R	264-57-54.9		
S			06.5 ✓
@	95-02-08.4		
ZAM	(95-01-37.3)		
SD	6,386.370		W/RET. SIG. 12
H2D			
GRD	6,361.962		N 65.124.73 4.49
			E 2.148.02 6.08
S07 EL	7337.108		(6/7/88 = 7327.063)
			(+0.045)
		S-07 TO OSCAR	
@	84-58-52.9		

SEP 09 1988

OIL & GAS

Document Information Form

Mine Number: C1007/007

File Name: Incoming
Sunnyside

To: Rick Smith

From:

Person W.P. Balaz

Company Kaiser

Date Received: 9-9-88

Explanation: Map - Plate III 1, 2 of 3

cc: