

ALVIN REVIEW COMMITTEE

Summary Report of the
April 24-25, 1980 Meeting

Carriage House
Woods Hole Oceanographic Institution
Woods Hole, Mass.

CONTENTS

Minutes of Meeting	1
--------------------	---

APPENDICES

I. Draft Agenda	4
II. Participants	5
III. Summary of 1979 & 1980 Dive Seasons	6
IV. Proposal Summary for Review Committee Meeting	15
V. Tentative Recommended 1981 Schedule	17
VI. Summary Dive Log	

JUNE 1980



ALVIN REVIEW COMMITTEE

Minutes of Meeting

April 24-25, 1980

Woods Hole Oceanographic Institution, Carriage House
Woods Hole, Massachusetts

GENERAL: The meeting was brought to order at 0910 by R. Corell, Chairman. T. Stetson reviewed the agenda item by item. The numbered paragraphs below are keyed to the agenda items. It is included here as Appendix I.

As was the case last year, the panel used individual packets of flash cards to signal their ranking of the proposals before them when the vote was called for. This avoided members being prejudiced by previous voters as could be the case when votes were conducted verbally.

Members of the Review Committee and others present are listed in Appendix II.

1. REPORT ON PREVIOUS YEAR'S SEASON: ALVIN's Operations Manager, J. Donnelly gave an illustrated account of the 1979 and 1980 (to date) season. His viewgraphs and text are found in Appendix III and include a cost summary.

The group gave Donnelly a vote of thanks for a job well done.

2. REVIEW OF PROPOSALS: The UNOLS Office had previously circulated a packet of proposals to each Committee member well prior to the meeting. Consideration of these consumed most of the two-day period and a summary of them, with a brief note on Committee action, appears as Appendix IV.

During the meeting J. Donnelly prepared three possible 1981 schedules taking into account the Committee's recommendations, weather, logistics, transit time, etc. The tentative schedule appearing in Appendix V is a distillation of the above three, subject to the same constraints, and attempts to give supporting agencies approximately the same number of days they traditionally support in any one dive season. It is emphasized that it does not have approval of the funding agencies and indicates "use days" which do not necessarily guarantee an identical number of dives. In some cases the Committee recommended fewer dives than were requested.

3. SUBMERSIBLE SCIENCE STUDY: T. Stetson recounted some history as to how the study came about; it stemmed partly from the previous ALVIN Review Committee's feeling it did not have the expertise to conduct such a study. W. Ryan, project leader for this study, gave a progress report. This past summer he admitted they had been deflected from the purpose of assessing the short and long term future of the ALVIN/LULU system by a look at requirements for a shallow system. A portion of the panel, headed by R. Cooper, may file a minority report on the necessity for a shallow submersible.

He said the final report would probably be available sometime later this year and that ARC would see it. He asked for ARC's consideration of the question as to whether the report should address shallow depth needs (<1000m) or be restricted to deep ocean, the mode traditionally supported by NSF and ONR.

4. FUNDING AGREEMENT: 1980 marks the final year of the three-year agreement by NOAA, NSF and ONR funding ALVIN/LULU. K. Kaulum said a new document was being drawn up with basically the same features as before.

However, an evaluation of the program is called for and as a part of that a summary of the salient features of the past three years was called for. Woods Hole, as operators, appeared to be the best source for such a summary.

5. PREVIOUS MEETING REPORT: The secretary had incorporated all comments received and the report of the April 1979 meeting was voted accepted.

6. REVIEW COMMITTEE TERMS: The terms of Drs. Corliss and Turner expire this June. A. Maxwell observed the Committee was largely comprised of ALVIN users and that maybe non-users should be sought. Four candidates for each position were proposed to replace the disciplines being lost by the retirees. The groups were each voted on and the secretary requested to contact the person receiving the most votes to see if he was willing and able to serve.

These names would then be voted on by the membership at the Annual Meeting.

7. ALVIN FLYER: The Committee was asked to review the text of the most recent flyer which advertises ALVIN's projected whereabouts and instructs the potential user how to apply for time on her.

The secretary distributed an updated mockup which was discussed. Slight modification was made to some text and the conditions under which an escort vessel is required were emphasized.

8. OTHER:

a. Foreign cruise obligations were briefly discussed by R. Dinsmore. The default by any investigator to meet his post-cruise obligations could jeopardize all subsequent cruises by other scientists. The Chairman and Committee agreed to back the operators in their quest for prompt submission of cruise reports and other data.

b. Mention was made of the new National Geographic Society film "Dive to the Edge of Creation" made at the Galapagos Rift area and East Pacific Rise at 21°N which shows the spectacular "black smokers" issuing from the vents.

c. D. Rhoads was elected chairman pro tem for the second day as C. Corell had to testify in Washington on behalf of Sea Grant. M. Wimbush sailed on KNORR so he was unavailable the second day.

d. The secretary wishes to thank J. Corliss and R. Turner, whose terms will soon expire, for their valued service to the Committee.

Adjourned 1445
April 25, 1980

Thomas Stetson
Executive Secretary
UNOLS

UNIVERSITY - NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

An association of Institutions
for the coordination and support
of university oceanographic facilities

UNOLS Office
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts 02543

ALVIN REVIEW COMMITTEE MEETING

24-25 April 1980, W.H.O.I. Carriage House
0900 on 24th

DRAFT AGENDA

Report On Last Year's Season

A brief report will be given by J. Donnelly

Review of Proposals, 1980, '81, '82

The bulk are for 1981, Committee discussion

The Submersible Science Study

A progress report by Dr. Wm. Ryan, Project Leader

The Third Year of the Three Year Funding Grant

*The Agreement calls for an evaluation by the supporting agencies,
UNOLS, W.H.O.I.*

Acceptance of the April 1979 Meeting Report

The Secretary has incorporated all comments received

Two ARC Members' Terms Expire in June

*The Nominating Committee welcomes suggestions of names, present
incumbents are eligible for reelection*

The Committee Should Review Text of ALVIN Flyer

This will inform potential ALVIN users of its likely whereabouts

Other

PARTICIPANTS

The following were present for all or part of the meeting.

ARC Members (with terms)

R.W. Corell, Ch., UNH	7/76-6/82
R.N. Anderson, L-DGO	7/79-6/82
J.B. Corliss, OSU	7/77-6/80
J.M. Edmond, MIT	7/78-6/81
K.C. Macdonald, UCSB	7/78-6/81
D.C. Rhoads, Yale	7/78-6/81
R.D. Turner	7/77-6/80
M. Wimbush	7/79-6/82
A.E. Maxwell, <i>ex-officio</i> , WHOI	2/75-6/80

OBSERVERS

D.C. Beaumariage	NOAA/MUS&T	B.B. Walden, W.H.O.I.
M.J. Umbach	NOAA/MUS&T	J.D. Donnelly, W.H.O.I.
K.W. Kaulum	ONR Det.	R.P. Dinsmore, W.H.O.I.
F.R. Alexander	NSF/OCE	T.R. Stetson, UNOLS
B.T. Malfait	NSF/OCE	
R.S. Carney	NSF/OCE	
J.G. McMillan	NSF/OCE	
M.G. Gross	NSF/OCE	
W.B.F. Ryan	L-DGO (present for his report only)	

The year 1979 opened with ALVIN and LULU moored at Roosevelt Roads, Puerto Rico in a stand-down status for the holidays. The ALVIN crew rejoined in Panama for the start of diving operations.

Negotiations to gain diplomatic clearance from Ecuador for work within 190 miles of the Galapagos Islands were unsuccessful. The scientific effort was constrained to stay within international waters and port visits were rescheduled to avoid Ecuadorian territory. Thus, the three legs to the Galapagos Rift Zone were staged from Panama with the expense of additional transit time to the site. The scientific product of these expeditions was well outlined in "Dive To The Edge of Creation" a National Geographic television special which has had world wide distribution.

After transit from Panama to Mexico, two expeditions to the East Pacific Rise at 21° North were devoted to geophysical measurements. These dives utilized magnetometer, gravimeter and an impact sound source. It was during these legs that the very hot (350°C) vents were discovered and photographed.

Due to potentially severe weather along the Central American Coast in summer, the period from May to October was spent along the coast of California. A three week stand-down included Independence Day and provided time for

personnel to come home and relax after six months of intensive operations.

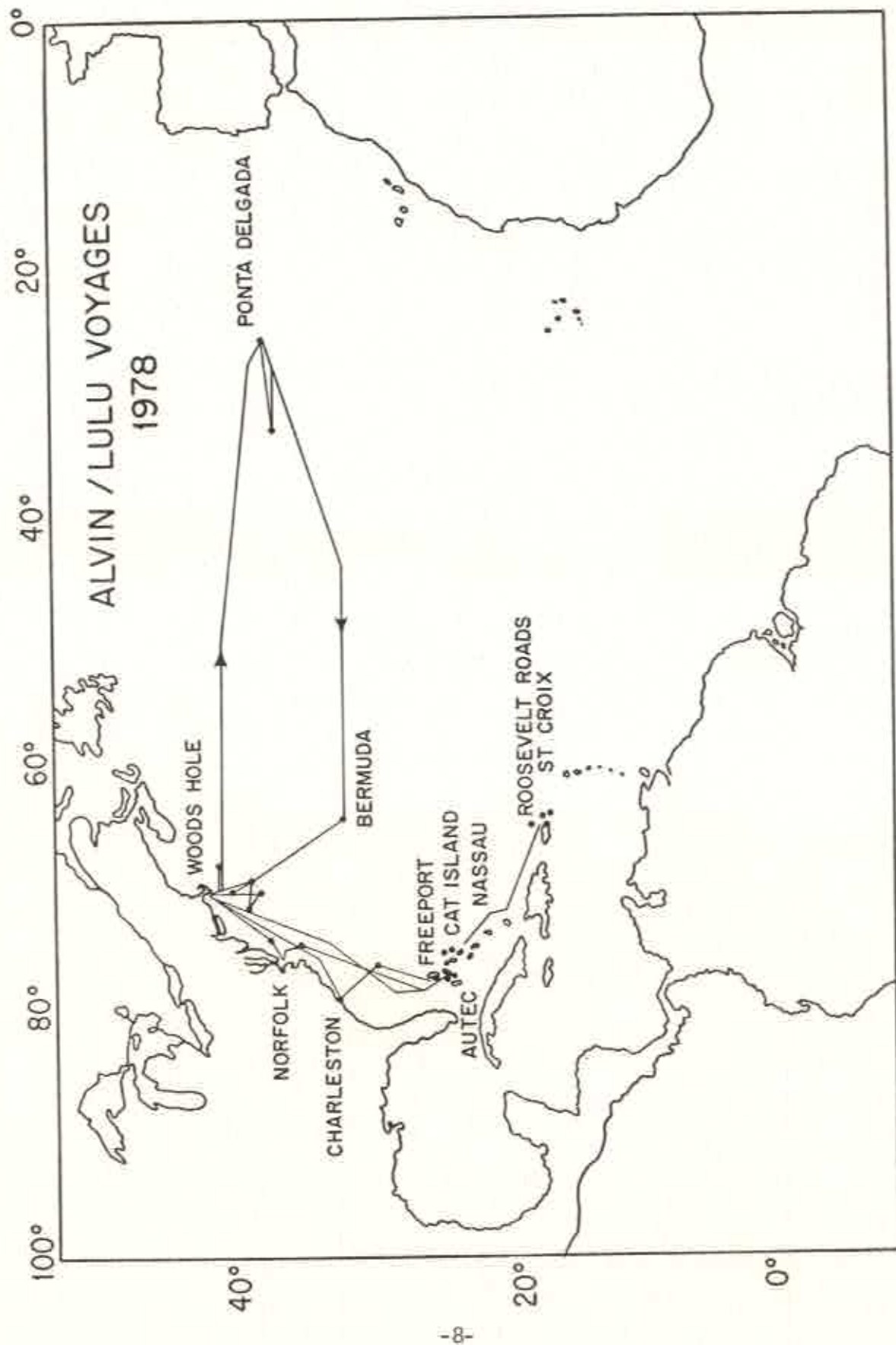
The five summer expeditions along the California coast were devoted to biology, geology and the DOMES project. LULU was dry-docked in Long Beach for routine underwater work, and some minor improvements, in September. ALVIN remained in San Diego for programmed maintenance.

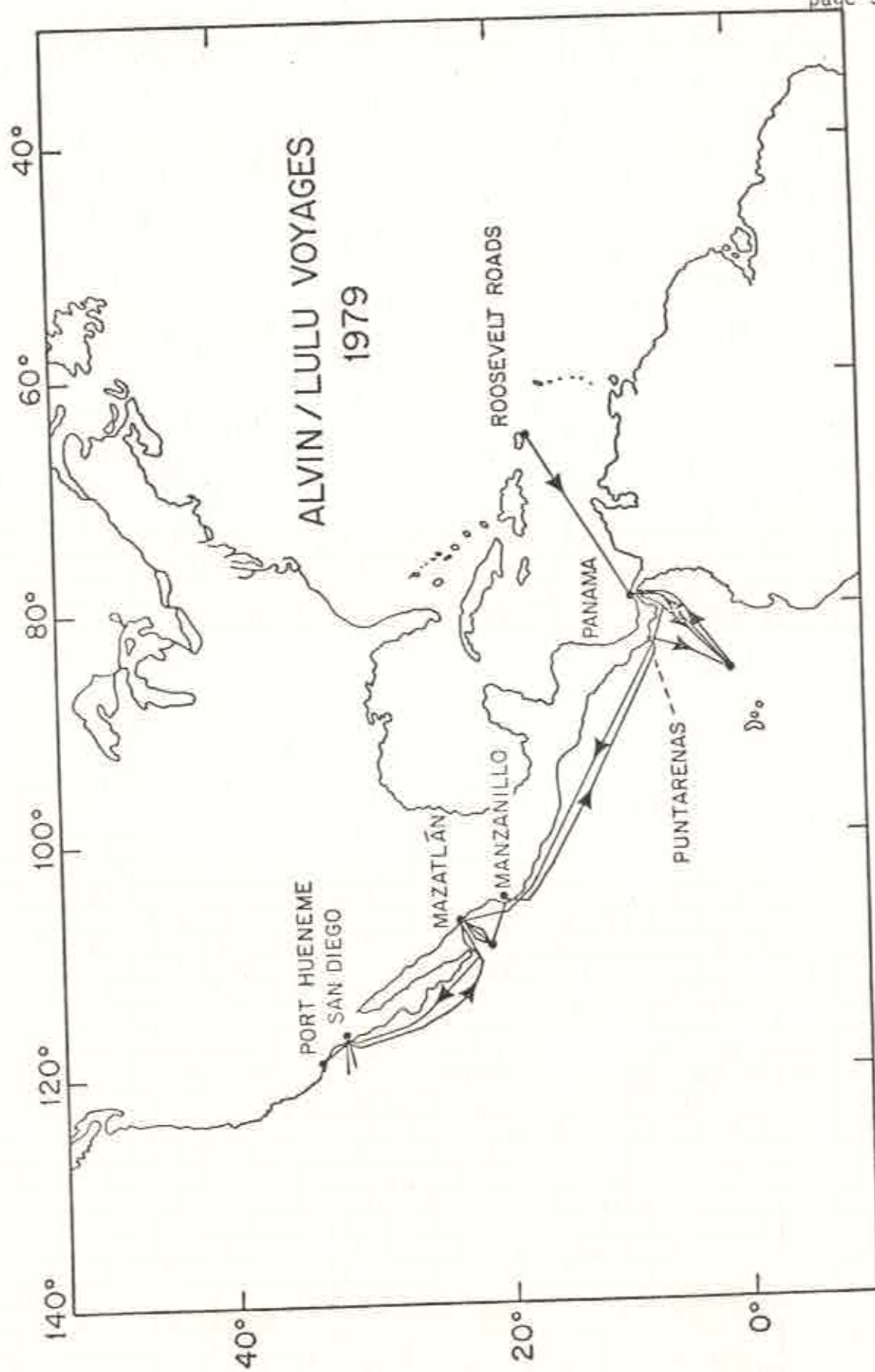
The return trip to the U.S. east coast started on October 12. A geological expedition at the Tomayo Fracture Zone was followed by a five day series of dives in the hot vent area. These dives were for the purpose of evaluating equipment for sampling the high temperature mineral-rich water.

The final expedition of the year was a return to the Galapagos Rift Zone and was staged from Punta Arenas, Costa Rica to Panama.

ALVIN and LULU remained at the U.S. Naval Base, Rodman in Panama during the 1979-80 holiday season.

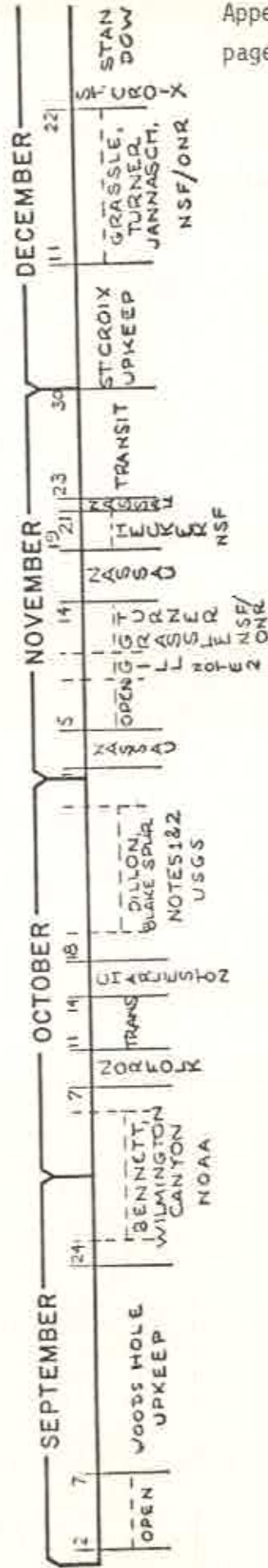
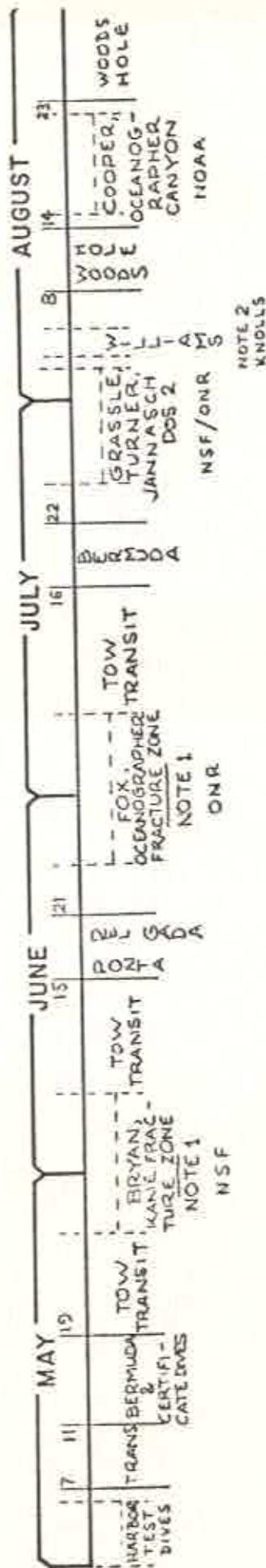
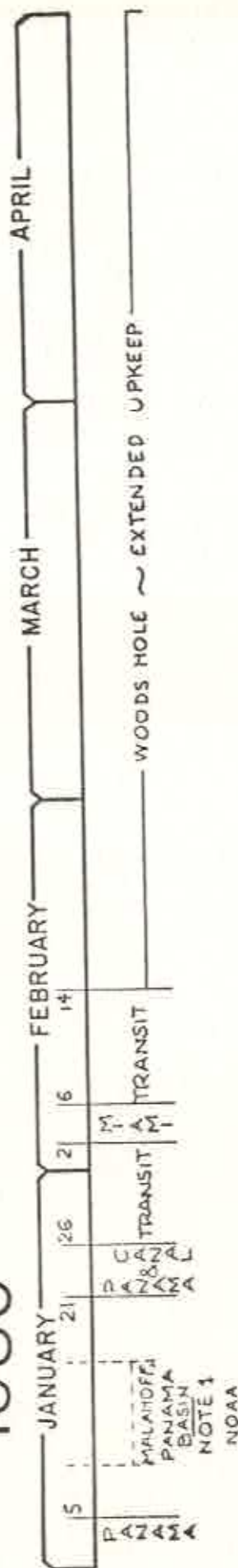
There follows a map of 1978 ALVIN/LULU Voyages, the Schedule as of September 1979, and a map of that year's voyages, a 1980 ALVIN/LULU Operations Schedule and map, as well as three-year operations and cost summaries.



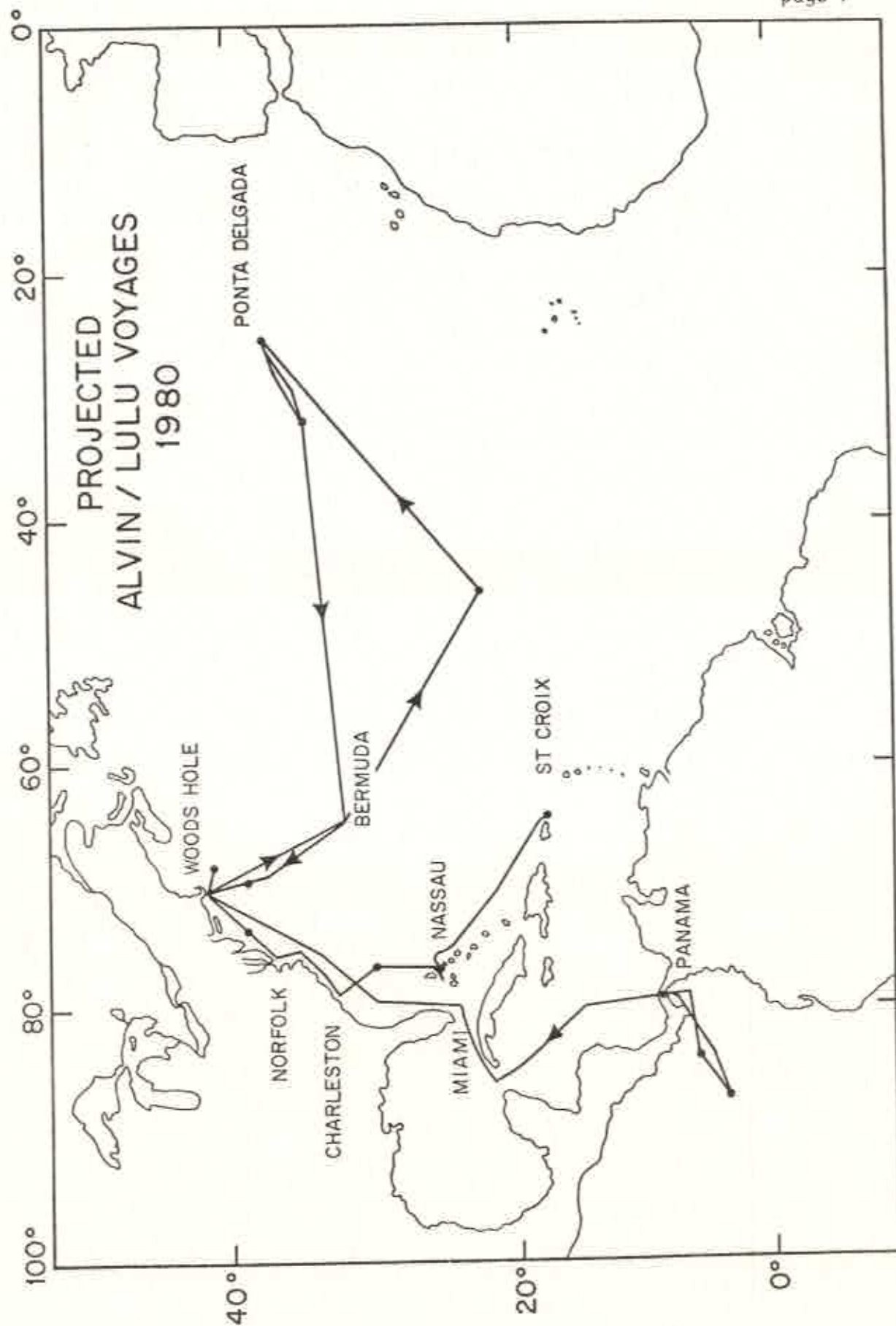


1980

ALVIN - LULU OPERATIONS



- NOTES:
1. ESCORT REQUIRED.
 2. FUNDED INDEPENDENT OF JOINT AGREEMENT.
 3. SPACE BETWEEN DASHED LINES IS TIME ON STATION.



ALVIN/LULU
OPERATIONS SUMMARY

	<u>1978</u>	<u>1979</u>	<u>Projected 1980</u>
<u>Purpose</u>			
BIOLOGY	20	54	
CHEMISTRY		14	
GEOLOGY	48	27	
GEOPHYSICS		20	
TEST & TRAINING	6	2	
SEARCH	<u>7</u>		
TOTAL DIVES	81	117	100
 <u>User</u>			
NSF	88	114	56
ONR	23	35	37
NOAA	35	16	41
USGS		2	15
CALIF.		4	
NGS		5	
EPA	8		
NAVY	<u>1</u>		
KNOLLS ATOMIC			3
M. GILL			2
OPEN			<u>10</u>
TOTAL USE DAYS	155	176	164
 <u>Activity</u>			
TRANSIT	78	56	63
ON STATION	<u>77</u>	<u>120</u>	<u>101</u>
USE DAYS	155	176	164
NON USE DAYS	<u>32</u>	<u>52</u>	<u>30</u>
DAYS AT SEA	187	228	194
OP DAYS IN PORT	<u>13</u>	<u>73</u>	<u>47</u>
OPERATING DAYS	200	301	241
NON OPERATING	<u>165</u>	<u>64</u>	<u>125</u>
TOTAL DAYS	365	365	366

COST SUMMARY

	<u>1978</u>	<u>1979</u>	<u>PROJECTED</u> <u>1980</u>
COSTS	\$1,722,700	\$1,753,800	\$1,935,200
OPERATING DAYS	200	301	241
\$/OP DAY	\$ 8,613	\$ 5,827	\$ 8,030
USE DAYS	155	176	164
\$/USE DAYS	\$ 11,114	\$ 9,965	\$ 11,800
DIVES	81	117	100
\$/DIVE	\$ 21,267	\$ 14,990	\$ 19,352

ARC Meeting, W.H.O.I.
24-25 April 1980

INVESTIGATOR	ASSOCIATES	AREA	PURPOSE	SPONSOR	DATE	ALTERNATE	ESCORT*	DIVES	COMMITTEE ACTION
1. COOPER, R NOAA/NMFS	Schlee, J Valentine, P Uzmann, J	Oceanographer Canyon	Sediments, processes	NOAA	early AU82	late AU82		8	%
2. FLOOD, R L-DGO		Blake Outer Ridge	Abyssal studies	ONR-1	Summer 81,82	Spring, Fall 81,82	CONRAD	6/yr	#
3. GRASSLE, F JANNASCH, H TURNER, R WHOI MCZ		DOS 182 TOTO St. Croix	Benthic biology	NSF & ONR	1982	see p.3 of prop.	none	3 10d cruises	%
4. HECKER, B L-DGO		NE Prov. Channel	Benthic recolonization	NSF-2	Spring 81	1981		5	%
5. ROHA, P NOAA/AOML	Ballard, R Bryan, W et al	MAR	Hydrothermal processes	NOAA	JN82	JL82	RESEARCHER	12	X
6. SUCHAREK, T W.I. Lab DILL, R	Hubbard, D Oyden, J Hubbard, D	St. Croix	Sediment transfer	NSF-1	JAB1	DE80	SARIMA	7	%
7. HOKUO, S GRASSLE, F WHOI	Takahashi, T Turner, R	Panama Basin	Deep stratigraphy	NSF-1	JAB1	DE80	SARIMA		
8. MALAHOFF, A NOS	Embley, R Forhani, D et al	Panama Basin	BBL studies	NSF-3	JAB1		KNORR	12	X
9. BALLARD, R WHOI	Craig, H Edmond, J et al	Galapagos Rift/ East Pacific Rise	Study rift	NOAA	FEB1		KNORR ?	12	X
10. BENDER, M URI	Von Herzen, R Grassie, F	Galapagos	Crustal processes	NSF-1	FEB1/ SE81	JA/ -		12/15	#
11. HEATH, R DSU	Weiss, R Bender, M et al	Galapagos	Geochemical, geophysical, biological	NSF-1	Fall 81		yes	11	#
		Salboa, Mazatlan, Acapulco	Mn nodules	NSF-1	Fall 81			10	#

Sponsor Code:

1. Proposal will be submitted
2. Proposal submitted
3. Funded

Sponsor Code:

1. Tentatively allocated time
2. Not recommended to be scheduled
3. Pending agency determination

* This column indicates escort indicated or preferred by P.I.

INVESTIGATOR	ASSOCIATES	AREA	PURPOSE	SPONSOR	DATE	ALTERNATE	ESCORT*	DIVES	COMMITTEE ACTION
12. FOX, P SUNY	Fornari, D Macdonald, K et al	Tamayo Transform	Geological studies	NSF-3	0C81	AP81		12	#
13. LONSDALE, P SIO	Moore, J Simkin, T et al	E. Pacific Rise	Vulcanology	ONR-1	Spring & Fall 81	open	NEW HORIZON	4/6	#
14. SMITH, K SIO	Childress, J Grassle, F et al	E. Pacific Rise 21°N	Hydrothermal vents	NSF-1	0C81	Fall 81	MELVILLE	20	#
15. ALLDREGE, A UCSB	Silver, S	CA Coast	Marine snow	NSF-1	JN-JL 81	Late summer, early Fall 81	none	6	#
16. ROBSON, E Tiburou	Lenarz, W Chess, J	Cent. CA	Study rockfish	NOAA-3	SE81	SE-OC 81	none	12	%
17. SMITH, C SIO	Hessler, R et al	Off San Diego	Organic falls	NSF-1	SE81	Summer, Fall 81	none	4	#
18. SMITH, K SIO	Azan, F Carlucci, A et al	Santa Catalina Basin Patton Escarp.	BBL studies	NSF-3	JN81	JL81	none	20	X
19. ANDERSON, R L-DGO	Edmond, J Craig, H et al	N. of Guam	Geothermal fluids	NSF-2	1983	1984	yes	15	No vote

Sponsor Code:

1. Proposal will be submitted
2. Proposal submitted
3. Funded

Sponsor Code:

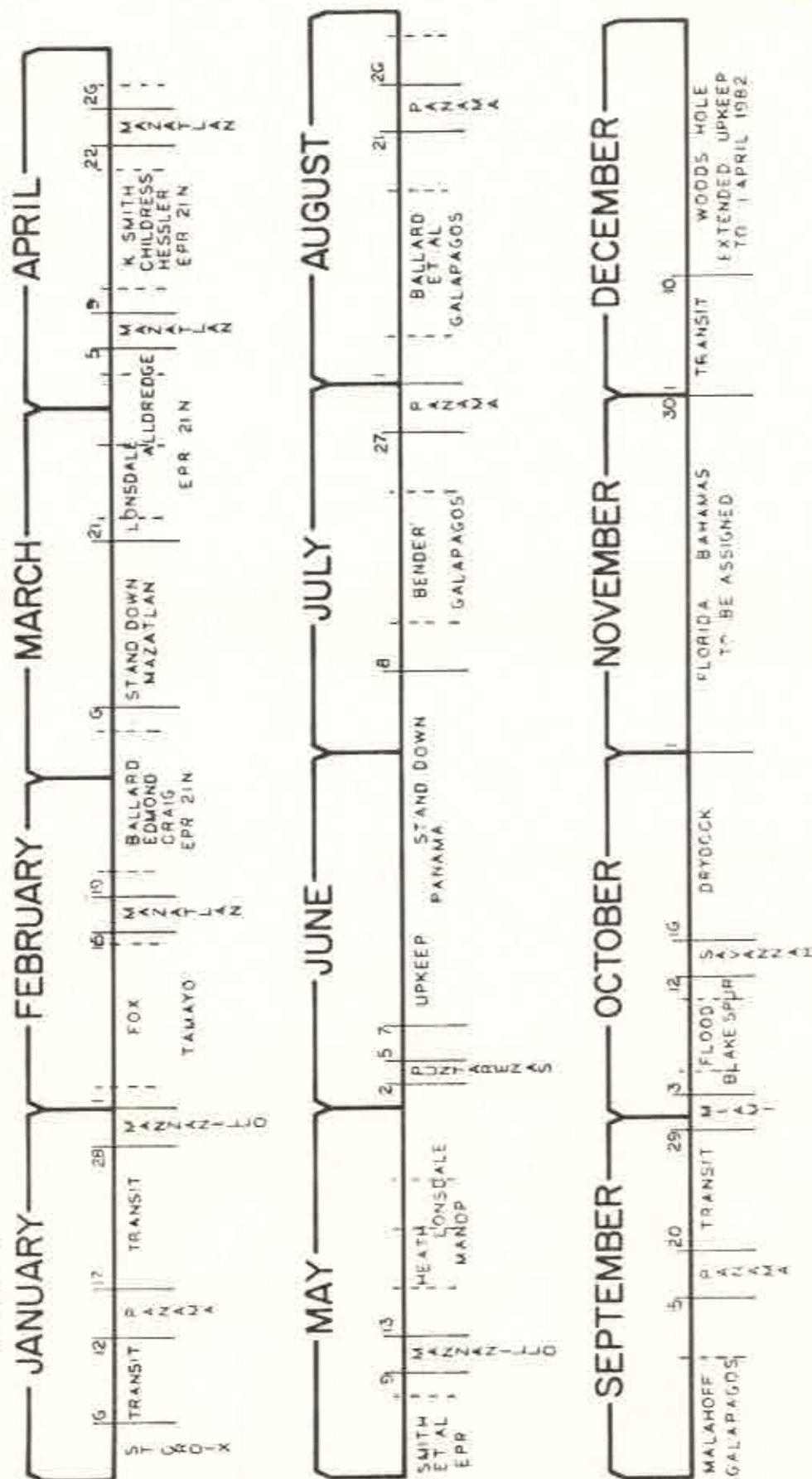
- # Tentatively allocated time
- % Not recommended to be scheduled
- X Pending agency determination

* This column indicates escort indicated or preferred by P.I.

TENTATIVE ALVIN-LULU OPERATIONS

PROPOSED
1981

4 JUNE 1980



LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
102	1/18/79	877	00-35.6N 86-06.31W	Joint Agreement Biology	R. Hollis	F. Grassle H. Sanders	1238	1739	5-01	2725m	
"	1/19/79	878	00-47.92N 86-13.5W	Joint Agreement Biology	D. Foster	J. Childress D. Karl	1103	1657	5-54	2478m	
"	1/20/79	879	00-48.18N 86-04.1W	Joint Agreement Biology	G. Ellis	R. Ballard H. Jannasch	1014	1855	8-41	2495m	
"	1/21/79	880	00-47.6N 86-06.4W	Joint Agreement Biology	R. Hollis	R. Hessler S. Williams	1011	1829	8-18	2493m	
"	1/22/79	881	00-47.33N 86-03.45W	Joint Agreement Biology	D. Foster	F. Grassle A. Giddings	1109	1341	2-32	1675m	oil warni light can on dive aborted
"	1/23/79	882	00-48.3N 86-06W	Joint Agreement Biology	G. Ellis	R. Turner K. Smith	1108	1932	8-24	2491m	
"	1/24/79	883	00-47.0N 86-08W	Joint Agreement Biology	R. Hollis	R. Hessler H. Sanders	0955	1936	9-41	2493m	
"	1/25/79	884	00-48.1N 86-07W	Joint Agreement Biology	D. Foster	F. Grassle A. Giddings	0946	1802	8-16	2482m	
102	1/26/79	885	00-48.9N 86-08.1W	Joint Agreement Biology	G. Ellis	K. Smith R. Hessler	1018	1922	9-04	2489m	
"	2/11/79	886	00-48.3N 86-08.8W	Joint Agreement Biology	D. Foster	F. Grassle A. Giddings	1036	1309	2-33	2100m	Abort due hyd. leak
"	2/12/79	887	00-48.5N 86-09.1W	Joint Agreement Biology	D. Foster	F. Grassle A. Giddings	1050	1955	9-05	2488m	
"	2/13/79	888	00-47.1N 86-08.5W	NCS Photography	R. Hollis	R. Ballard A. Giddings	1200	2003	8-03	2483m	
"	2/14/79	889	00-48.7N 86-12.7W	Joint Agreement Geology	G. Ellis	J. van Andel R. Holcomb	0950	1921	8-31	2458m	
"	2/15/79	890	00-48.9N 86-13.3W	Joint Agreement Geology	D. Foster	E. Kristof K. Crane	0906	1633	7-27	2447m	
"	2/16/79	891	00-48.3N 86-13.4W	Joint Agreement Biology	R. Hollis	R. Hessler K. Crane	1057	1751	6-54	2488m	
"	2/17/79	892	00-48.3N 86-13.8W	NCS Photography	R. Hollis	R. Ballard A. Giddings	1058	1850	7-52	2454m	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
102	2/18/79	893	00-46.8N 86-01.9W	Joint Agreement Geology	G. Ellis	R. Ballard R. Holcomb	0938	2008	10-30	2576 ^m	
"	2/19/79	894	00-48.2N 86-14.9W	NGS Photography	D. Foster	E. Kristof A. Giddings	0937	2007	10-30	2457 ^m	
"	2/20/79	895	00-47.9N 86-09.3W	Joint Agreement Biology	G. Ellis	F. Grassle R. Holcomb	1005	2014	10-09	2482 ^m	
"	2/21/79	896	00-48.2N 86-13.6W	NGS Photography	J. Donnelly D. Foster	A. Giddings	0926	1727	8-01	2460 ^m	Donnelly Certificatio Dive
"	3/7/79	897	00-47.9N 86-08.6W	Joint Agreement Geochemistry	R. Hollis	J. Edmond C. Measures	1447	1930	4-43	2486 ^m	
"	3/8/79	898	00-47.8N 86-09.2W	Joint Agreement Geochemistry	G. Ellis	J. Edmond L. Gordon	1212	1941	7-29	2490 ^m	
"	3/9/79	899	00-48.3N 86-13.9W	Joint Agreement Geochemistry	D. Foster	C. Measures J. Corliss	0853	1912	10-19	2452 ^m	
"	3/10/79	900	00-48.0N 86-13.6W	Joint Agreement Geochemistry	R. Hollis	J. Edmond R. McDuff	0918	1730	8-12	2458 ^m	
102	3/11/79	901	00-47.7N 86-01.4W	Joint Agreement Geochemistry	G. Ellis	C. Measures L. Gordon	0845	1858	10-13	2516 ^m	
"	3/12/79	902	00-47.5N 86-09.4W	Joint Agreement Geochemistry	D. Foster	J. Edmond S. Husted	0917	1724	8-07	2481 ^m	
"	3/13/79	903	00-48.5N 86-13.9W	Joint Agreement Geochemistry	R. Hollis	J. Edmond B. Grant	1035	1735	7-00	2458 ^m	
"	3/14/79	904	00-47.6N 86-08.5W	Joint Agreement Geochemistry	G. Ellis	C. Measures J. Corliss	0852	1914	10-22	2485 ^m	
"	3/15/79	905	00-47.8N 86-12.4W	Joint Agreement Geochemistry	D. Foster	J. Edmond J. Corliss	0848	1645	7-57	2453 ^m	
"	4/12/79	906	20-52.6N 109-05.3W	Joint Agreement Geology	R. Hollis	B. Luyendyk J. Hawkins	0925	1940	10-15	2626 ^m	
"	4/13/79	907	20-52.2N 109-05.4W	Joint Agreement Geology	G. Ellis	F. Spiess W. Normark	0930	1945	10-15	2680 ^m	
"	4/14/79	908	20-52N 109-04W	Joint Agreement Geology	D. Foster	K. Macdonald J. Orcutt	0927	1907	9-40	2622 ^m	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
102	4/15/79	909	20-51.9N 109-04.4W	Joint Agreement Geology	R. Hollis	B. Luyendyk J. Fran- cheteau	0922	1858	9-36	2645m	
"	4/16/79	910	20-52.5N 109-05W	Joint Agreement Geology	G. Ellis	K. Macdonald V. Dias Garcia	1152	2029	8-37	2601m	
"	4/17/79	911	20-51N 109-03W	Joint Agreement Geology	D. Foster	B. Luyendyk R. Larson	1111	2000	8-49	2646m	
"	4/18/79	912	20-52.0N 109-09W	Joint Agreement Geology	R. Hollis	J. Orcutt T. Juteau	0934	1948	10-14	2645m	
"	4/19/79	913	20-52N 109-04W	Joint Agreement Geology	G. Ellis	K. Macdonald R. Larson	0918	2014	10-56	2640m	
"	4/21/79	914	20-50.1N 109-04.8W	Joint Agreement Geology	D. Foster	W. Normark T. Juteau	0940	1948	10-08	2603m	
"	4/22/79	915	20-51N 109-04.9W	Joint Agreement Geology	R. Hollis	R. Ballard J. Fran- cheteau	0954	1723	7-29	2595m	
"	4/23/79	916	20-50.3N 109-05.4W	Joint Agreement Geology	G. Ellis	D. Macdougall A. Carranza	0923	2006	10-43	2608	
102	4/24/79	917	20-49.9N 109-04.8W	Joint Agreement Geology	D. Foster	R. Ballard J. Orcutt	0901	1920	10-19	2602m	
"	4/25/79	918	20-51N 109-04.5W	Joint Agreement Geology	R. Hollis	F. Spiess W. Normark	0851	1844	9-53	2620m	
"	5/4/79	919	20-57.3N 109-16.2W	Joint Agreement Geology	G. Ellis	K. Macdonald B. Luyendyk	0855	1809	9-14	2869m	
"	5/5/79	920	20-57.9N 109-17.2W	Joint Agreement Geology	D. Foster	T. Atwater D. Cordoba	0854	1813	9-19	2800m	
"	5/6/79	921	20-50N 109-06W	Joint Agreement Geology	R. Hollis	J. Fran- cheteau C. Rangin	0900	1742	8-42	2598m	
"	5/7/79	922	20-57.9N 109-19.1W	Joint Agreement Geology	G. Ellis	K. Macdonald B. Luyendyk	0908	1904	9-56	2865m	
"	5/8/79	923	20-49.1N 109-07.3W	Joint Agreement Geology	G. Ellis	J. Fran- cheteau C. Rangin	0852	1858	10-06	2602m	
"	5/10/79	924	20-57.8N 109-18.4W	Joint Agreement Geology	R. Hollis	T. Atwater J. Guerrero	0954	1653	6-59	2756m	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
102	5/11/79	925	20-58.4N 109-18.5W	Joint Agreement Geology	G. Ellis	B. Luyendyk K. Macdonald	0840	1731	8-51	2770 ^m	
"	6/13/79	926	33-04.9N 118-15.3W	Joint Agreement Biology	R. Hollis	A. Carlucchi C. Smith	0939	1429	4-50	1127 ^m	
"	6/17/79	927	33-17.1N 118-35.5W	Joint Agreement Biology	G. Ellis	A. White J. Trent	1333	1952	6-19	1294 ^m	
"	6/18/79	928	33-18N 118-35W	Joint Agreement Biology	R. Hollis	M. Laver T. Matsui	0920	1620	7-00	1306 ^m	
"	6/19/79	929	33-18N 118-35.6W	Joint Agreement Biology	G. Ellis	K. Smith J. Trent	0914	1535	6-21	1308 ^m	
"	6/20/79	930	33-18N 118-35.8W	Joint Agreement Biology	R. Hollis	F. Azam S. Horrigan	0859	1539	6-40	1311 ^m	
"	6/21/79	931	33-17.5N 118-35.9W	Joint Agreement Biology	G. Ellis	B. Wells C. Smith	0923	1824	9-01	1305 ^m	
102	6/22/79	932	33-17.9N 118-35.8W	Joint Agreement Biology	R. Hollis	K. Smith K. Sullivan	0851	1637	7-46	1310 ^m	
"	6/23/79	933	33-18.2N 118-36.2W	Joint Agreement Biology	G. Ellis	T. Matsui P. Williams	0922	1644	7-22	1311 ^m	
"	6/24/79	934	33-18.6N 118-36.2W	Joint Agreement Biology	R. Hollis	G. Wilson S. Bates	0923	1535	6-12	1307 ^m	
"	6/25/79	935	33-18.8N 118-36.3W	Joint Agreement Biology	G. Ellis	P. Williams A. Shanks	0850	1815	9-25	1297 ^m	
"	6/26/79	936	33-18.9N 118-36.1W	Joint Agreement Biology	G. Ellis	G. Wilson K. Grady	0918	1611	6-53	1303 ^m	
"	6/27/79	937	33-17.7N 118-35.3W	Joint Agreement Biology	R. Hollis	F. Azam C. Smith	0913	1707	7-54	1302 ^m	
"	6/28/79	938	33-17.8N 118-35.4W	Joint Agreement Biology	G. Ellis	R. Wilson J. Bennett	1021	1636	6-15	1302	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
102	6/29/79	939	33-17.7N 118-35.4W	Joint Agreement Biology	R. Hollis	K. Hills T. Rubel	0817	1034	2-17	1301 ^m	
"	7/24/79	940	32-47N 117-36W	Joint Agreement Training	J. Donnelly G. Ellis	R. Brown	1200	1358	1-58	978 ^m	
"	7/27/79	941	33-05N 117-23W	Joint Agreement Geology	R. Hollis	M. Kennedy S. Clarke	1242	1834	5-52	294 ^m	
"	7/28/79	942	32-45N 117-28W	Joint Agreement Geology	J. Donnelly	M. Kennedy P. Lonsdale	0903	1656	7-53	735 ^m	
"	7/29/79	943	33-06N 117-46W	Joint Agreement Geology	G. Ellis	G. Greene S. Clarke	0953	1847	8-54	840 ^m	
"	7/30/79	944	32-52N 118-21W	Joint Agreement Geology	R. Hollis	G. Greene P. Lonsdale	0831	1215	3-44	876 ^m	
"	7/30/79	945	32-51N 118-21W	Joint Agreement Geology	R. Hollis	G. Greene P. Lonsdale	1305	1552	2-47	771 ^m	
102	8/1/79	946	34-25 'N 120-20 'W	Joint Agreement Geology	G. Ellis	G. Greene J. Davis	0950	1829	8-39	164 ^m	
"	8/2/79	947	34-20 'N 119-50 'W	Joint Agreement Geology	R. Hollis	S. Clarke D. McCulloch	1031	1704	6-33	263 ^m	
"	8/8/79	948	32-23 'N 118-41 'W	Joint Agreement Biology	G. Ellis	T. Takahashi R. Brown	0846	1142	2-56	1713 ^m	
"	8/8/79	949	32-23 'N 118-41 'W	Joint Agreement Biology	G. Ellis	J. Childress D. Gluck	1323	1657	3-34	706 ^m	
"	8/9/79	950	32-13 'N 118-18 'W	Joint Agreement Biology	R. Hollis	J. Childress A. Alldredge	0858	1600	7-02	1880 ^m	
"	8/10/79	951	32-13 'N 118-18 'W	Joint Agreement Biology	G. Ellis	R. Carney B. Robison	0904	1721	8-17	1877 ^m	
"	8/11/79	952	32-31 'N 118-03 'W	Joint Agreement Biology	R. Hollis	J. Childress D. Gluck	0844	1633	7-49	1945 ^m	
"	8/12/79	953	32-31 'N 118-03 'W	Joint Agreement Biology	G. Ellis	B. Robison P. Adams	0921	1623	7-02	1940 ^m	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
102	8/13/79	954	32-26'N 118-07'W	Joint Agreement Biology	R. Hollis	T. Takahashi R. Carney	0855	1532	6-37	2022 ^m	
"	8/14/79	955	32-33'N 118-09'W	Joint Agreement Biology	G. Ellis	J. Childress A. Alldredge	1121	1140	-19	230 ^m	
"	8/22/79	956	32-11'N 120-05'W	Joint Agreement Geology	R. Hollis	S. Swift G. Keller	0919	1622	7-03	3592 ^m	
"	8/27/79	957	32-25.8'N 118-41'W	Joint Agreement Geology	G. Ellis	P. Johnson O. Steffin	1206	1648	4-42	1470 ^m	
"	8/28/79	958	32-16'N 117-58'W	Joint Agreement Geology,	R. Hollis	S. Swift P. Johnson	0947	1559	6-12	1780 ^m	
"	8/29/79	959	32-10'N 118 W	Joint Agreement Geology	G. Ellis	G. Keller R. Brown	0916	1344	4-28	1945 ^m	
"	8/30/79	960	32-02'N 118-10'W	Joint Agreement Geology	R. Hollis	P. Johnson O. Steffin	0833	1414	5-41	805 ^m	
"	9/5/79	961	32-14'N 117-22'W	Joint Agreement Biology	G. Ellis	L. Madin R. Harbison	1249	1648	3-59	833 ^m	
102	9/6/79	962	32-48'N 118-44'W	Joint Agreement Biology	R. Hollis	N. Swanberg V. McAlister	0831	1213	3-42	582 ^m	
"	9/6/79	963	32-50'N 118-44'W	Joint Agreement Biology	R. Hollis	L. Madin J. Purcell	1339	1637	2-58	644 ^m	
"	9/7/79	964	32-57'N 118-17'W	Joint Agreement Biology	G. Ellis	R. Harbison V. McAlister	0843	1203	3-20	749 ^m	
"	9/7/79	965	32-57'N 118-19'W	Joint Agreement Biology	G. Ellis	L. Madin N. Swanberg	1316	1510	1-54	814 ^m	
"	9/8/79	966	33-04'N 118-16'W	Joint Agreement Biology	R. Hollis	L. Madin R. Harbison	0851	1210	3-19	747 ^m	
"	9/8/79	967	33-04'N 118-16'W	Joint Agreement Biology	R. Hollis R. Brown	N. Swanberg	1327	1518	1-51	463 ^m	
"	9/9/79	968	32-32'N 117-54'W	Joint Agreement Biology	G. Ellis	J. Purcell V. McAlister	0836	1219	3-43	1227 ^m	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Vr.	Remarks
							Dive	Surf	Sub.		
102	9/9/79	969	32-31'N 117-52'W	Joint Agreement Biology	G. Ellis	R. Harbison L. Madin	1328	1547	2-19	1433m	
103	10/14/79	970	30-12'N 116-06'W	Maintenance Test	R. Hollis R. Brown	D. Landry	1424	1549	1-25	305m	
"	10/21/79	971	22-56'N 108-06'W	Joint Agreement Geology	G. Ellis	J. Fox J. Karson	0857	1752	8-55	1450m	
"	10/22/79	972	22-56'N 108-06'W	Joint Agreement Geology	R. Hollis	K. Crane W. Kidd	0855	1634	7-39	3443m	
"	10/23/79	973	22-56'N 108-06'W	Joint Agreement Geology	G. Ellis	J. Karson P. Choukroune	1112	1558	4-46	3359m	
"	10/24/79	974	22-57'N 108-06'W	Joint Agreement Geology	J. Donnelly	K. Macdonald M. Siguret	1026	1726	7-00	3378m	
"	10/25/79	975	22-56'N 108-05'W	Joint Agreement Geology	R. Hollis R. Brown	J. Karson	0851	1800	9-09	3245m	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Dive	Surf	Sub.	Depth M/Vr.	Remarks
103	10/26/79	976	22-57'N 108-08'W	Joint Agreement Geology	G. Ellis	P. Choukroune D. Gallo	0848	1809	9-21	3394m	
"	10/27/79	977	22-57'N 108-08'W	Joint Agreement Geology	J. Donnelly	K. Kastens W. Kidd	0830	1641	8-11	3351m	
"	11/2/79	978	20-50'N 109-06'W	Joint Agreement Geology	R. Hollis	J. Edmond H. Holland	0833	1725	8-52	2622m	
"	11/3/79	979	20-50'N 109-06'W	Joint Agreement Geology	G. Ellis	J. Edmond H. Craig	0914	1731	8-17	2626m	
"	11/4/79	980	20-50'N 109-06'W	Joint Agreement Geology	R. Hollis	C. Measures L. Gordon	0918	1710	7-52	2630m	
"	11/5/79	981	20-50'N 109-06'W	Joint Agreement Geology	G. Ellis	J. Edmond R. Hekinian	0813	1728	9-15	2615m	
"	11/6/79	982	20-50'N 109-06'W	Joint Agreement Geology	R. Hollis	R. McDuff C. Winget	0812	1549	7-37	2615m	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
103	11/30/79	983	0-48'N 86-13'W	Joint Agreement Biology	G. Ellis	R. Hessler D. Cohen	0845	1559	7-14	2457 ^m	
"	12/1/79	984	0-48'N 86-13'W	Joint Agreement Biology	R. Hollis	R. Turner C. Wirsen	0843	1642	7-59	2451 ^m	
"	12/2/79	985	0-49'N 86-08'W	Joint Agreement Biology	G. Ellis	R. Hessler D. Cohen	0834	1710	8-36	2510 ^m	
"	12/3/79	986	0-47'N 86-09'W	Joint Agreement Biology	R. Hollis	R. Lutz H. Sanders	0825	1535	7-10	2494 ^m	
"	12/4/79	987	0-48'N 86-09'W	Joint Agreement Biology	G. Ellis R. Brown	K. Smith	1007	1707	7-00	2489 ^m	
"	12/5/79	988	0-48'N 86-13'W	Joint Agreement Biology	R. Hollis	F. Grassle J. Childress	1013	1704	6-51	2450 ^m	
"	12/6/79	989	0-48'N 86-09'W	Joint Agreement Biology	G. Ellis	K. Smith C. Berg	0910	1627	7-17	2482 ^m	
"	12/7/79	990	0-48'N 86-13'W	Joint Agreement Biology	R. Hollis	M. Jones J. Tuttle	0850	1530	6-40	2451 ^m	
103	12/8/79	991	0-48'N 86-09'W	Joint Agreement Biology	G. Ellis	F. Grassle H. Sanders	0828	1655	8-27	2490 ^m	
"	12/9/79	992	0-35'N 86-7'W	Joint Agreement Biology	R. Hollis R. Brown	H. Sanders	0837	1723	8-46	2714 ^m	
"	12/10/79	993	0-47'N 86-08'W	Joint Agreement Biology	G. Ellis	R. Hessler D. Cohen	0834	1628	7-54	2518 ^m	
"	1/9/80	994	0-41'N 85-28'W	Joint Agreement Geology	R. Hollis	A. Malahoff D. Fornari	0855	1708	8-13	2768 ^m	
"	1/10/80	995	0-42'N 85-24'W	Joint Agreement Geology	G. Ellis	A. Malahoff R. Embley	0854	1708	8-14	2869 ^m	
"	1/11/80	996	0-44'N 85-22'W	Joint Agreement Geology	R. Hollis	D. Fornari R. Embley	0837	1700	8-23	2585 ^m	
"	1/12/80	997	0-45'N 85-20'W	Joint Agreement Geology	G. Ellis	A. Malahoff D. Fornari	0859	1717	8-18	3168 ^m	
"	1/13/80	998	0-47'N 85-58'W	Joint Agreement Geology	R. Hollis	A. Malahoff R. Embley	0840	1640	8-00	2571 ^m	

LULU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
103	1/14/80	999	0-44'N 85-50'W	Joint Agreement Geology	G. Ellis	D. Fornari R. Embley	0831	1706	8-35	2629 ^m	
"	1/15/80	1000	0-47'N 86-06'W	Joint Agreement Geology	R. Hollis	A. Malahoff G. Broderson	0834	1625	7-51	2500 ^m	
"	1/16/80	1001	0-45'N 85-50'W	Joint Agreement Geology	G. Ellis	A. Malahoff W. Ryan	0845	1707	8-22	2641 ^m	
"	1/17/80	1002	0-45'N 85-50'W	Joint Agreement Geology	R. Hollis	A. Malahoff R. Embley	0828	1636	8-08	2607 ^m	
"	2/4/80	1003	25-47'N 80-14'W	Joint Agreement Training	J. Donnelly	R. Brown R. Dinsmore	1152	1202	-10	2 ^m	
	5/13/80	1004	Woods Hole Dock	Tethered Trim Dive	G. Ellis R. Brown	A. Mac- whinney	1425	1542	1-17	3 ^m	
104	5/24/80	1005	32-23'N 64-33'W	Certifica- tion	R. Hollis R. Brown	D. Nachtman	1121	1127	-06	60 ^m	Aborted hy- draulic probl
"	5/25/80	1006	32-18'N 64-17'W	Certifica- tion	G. Ellis R. Brown	D. Johnson	1358	1722	3-24	3067 ^m	Aborted elect problem
104	6/2/80	1007	23-40'N 45-33'W	Test	R. Hollis R. Brown	J. Paczosa	1502	1722	2-20	1978 ^m	
"	6/3/80	1008	23-30'N 45-00'W	Joint Agreement Geology & Certification	G. Ellis	H. Dick J. Karson	0913	1745	8-32	4014 ^m	
"	6/4/80	1009	23-35'N 45-01'W	Joint Agreement Geology	R. Hollis	J. Thompson H. Dick	0848	0918	-30	445 ^m	
"	6/4/80	1010	23-35'N 45-00'W	Joint Agreement Geology	R. Hollis	J. Thompson H. Dick	1133	1802	6-29	3670 ^m	
"	6/5/80	1011	23-35'N 45-00'W	Joint Agreement Geology	G. Ellis	J. Karson M. Mottl	0830	1645	8-15	3115 ^m	
"	6/6/80	1012	23-32'N 45-04'W	Joint Agreement Geology	R. Hollis	J. Thompson J. Delaney	0821	1622	8-01	3024 ^m	
"	6/7/80	1013	23-35'N 45-00'W	Joint Agreement Geology	G. Ellis R. Brown	J. Karson	1010	1806	7-56	4008 ^m	
"	6/8/80	1014	23-32'N 45-01'W	Joint Agreement Geology	R. Hollis	M. Mottl J. Delaney	0833	1655	8-22	2912 ^m	

IHLU Cr. No.	Date	Dive No.	Location	Sponsor/ Purpose	PIC/CP	Obs.	Time			Depth M/Ft.	Remarks
							Dive	Surf	Sub.		
104	6/9/80	1015	23-31'N 44-58'W	Joint Agreement Geology	G. Ellis	J. Thompson J. Karson	0823	1717	8-54	4012 ^m	
"	6/30/80	1016	35-07'N 34-57'W	Joint Agreement Geology	R. Hollis	K. Crane J. Karson	0817	1404	5-57	3731 ^m	
"	7/1/80	1017	35-07'N 35-33'W	Joint Agreement Geology	G. Ellis	W. Kidd E. Bonatti	0749	1713	9-24	3176 ^m	
"	7/3/80	1018	35-04'N 35-31'W	Joint Agreement Geology	R. Brown	J. Fox J. Karson	1012	1643	8-31	2627 ^m	
"	7/4/80	1019	35-10'N 35-31'W	Joint Agreement Geology	R. Hollis	W. Kidd R. Moody	0742	1558	8-16	3048 ^m	
"	7/5/80	1020	35-07'N 35-00'W	Joint Agreement Geology	G. Ellis	J. Karson E. Bonatti	0805	1727	9-22	3788 ^m	
"	7/6/80	1021	35-07'N 34-57'W	Joint Agreement Geology	R. Brown	K. Crane R. Goodlett	0738	1723	9-43	3524 ^m	
"	7/7/80	1022	35-02'N 35-07'W	Joint Agreement Geology	R. Hollis	J. Fox P. Hamlin	0721	1643	9-22	3461 ^m	
104	7/8/80	1023	35-07'N 34-56'W	Joint Agreement Geology	G. Ellis	K. Crane D. Elthon	0915	1822	9-07	3732 ^m	
"	7/9/80	1024	35-07'N 34-58'W	Joint Agreement Geology	R. Brown	W. Kidd J. Stroup	0740	1617	8-37	3636 ^m	
"	7/10/80	1025	35-06'N 35-03'W	Joint Agreement Geology	R. Hollis	J. Karson J. Casey	0626	1426	8-00	3834 ^m	
"	7/27/80	1026	38-18'N 69-36'W	Joint Agreement Biology	G. Ellis	P. Grassle R. Turner	0955	1855	9-00	3644 ^m	
"	7/28/80	1027	38-18'N 69-36'W	Joint Agreement Biology	R. Brown	S. Williams J. Losee	0842	1839	9-57	3644 ^m	
"	7/29/80	1028	38-18'N 69-36'W	Joint Agreement Biology	R. Hollis	P. Grassle C. Hannan	0833	1700	8-27	3646 ^m	
"	7/31/80	1029	38-18'N 69-36'W	Joint Agreement Biology	G. Ellis	R. Turner J. Losee	0844	1821	9-37	3647 ^m	
"	8/1/80	1030	38-18'N 69-36'W	Joint Agreement Biology	R. Brown	R. Turner T. Rubel	0836	1900	10-24	3647 ^m	

