JOIDES LITHOSPHERE PANEL
MINUTES OF 18-20 MARCH 1992 MEETING
DAVIS, CALIFORNIA

EXECUTIVE SUMMARY

3.0 STATUS OF ENGINEERING DEVELOPMENTS

3.1 Results of Engineering Tests on Leg 142 - East Pacific Rise (B. Harding)

LITHP is concerned that this Engineering Leg not be viewed as total failure of the concept of DCS drilling. Although this system has been linked most strongly to drilling highly fractured zero-age basalts and Leg 142 tested it in that environment, there are other lithologies of interest that can be successfully drilled only with DCS (e.g. alternating chert/chalk sequences). Given the limited drilling and coring time that has been achieved with the DCS, a fundamental question still remains concerning whether the system can core successfully from a drilling ship through any lithology, or whether the nature of zero-age crust is such that drilling and coring through it is beyond the capabilities of any currently available drilling techniques.

LITHP still strongly supports continuation of the development of the Diamond Coring System as the most likely method for drilling a number of formations that are beyond the capabilities of the drilling techniques currently available on the *JOIDES Resolution*.

3.2 Plans for the FY'93 Engineering Leg - Leg 148

The results from Leg 142 suggest that it is highly unlikely that the ODP Engineers will be ready to test the DCS again by Leg 148.

LITHP strongly endorses PCOM's recommendation that, if Leg 148 is not an Engineering Leg, a return to Hole 504B be scheduled. This Hole represents an extraordinary opportunity to further deepen the only continuous crustal section so far obtained, and LITHP has given it the highest position in the global rankings. In addition, LITHP is not in favor of incorporating APC coring in the Santa Barbara Basin into a return to 504B.

If Leg 148 becomes a return to Hole 504B, LITHP nominates the following as potential Co-Chief Scientists:

Jeff Alt
Jose Honnorez
Matt Salisbury

On the basis of logistical considerations, the desire to test the DCS in an environment less hostile than zero-age crust, and the need to maximize coring and drilling time, LITHP recommends that, if Leg 148 is an Engineering Leg, the DCS be tested at the Vema transverse ridge site. The second choice of LITHP would be a test at the Galapagos extinct hydrothermal mound.

If Leg 148 is an Engineering Leg at the Vema transverse ridge, LITHP recommends the following for the position of Chief Scientist:

Enrico Bonatti
Kim Kastens
Matt Salisbury

3.3 Update on the Status of Deep Drilling (B. Harding)

LITHP again reiterates the importance of the deep drilling feasibility study for its future planning, and needs to determine whether the goal of a continuous section through the oceanic crust is realistic in terms of time, technology and cost.

5.0 GLOBAL RANKING OF PROPOSALS

5.1 Global Ranking

LITHP identified twenty-seven programs (with associated proposals) that address high priority objectives of the Panel, which were reduced to fifteen for the ranking procedure. The results of the ranking procedure are listed below together with an assessment of each program's drillability in FY'94. Caveats and explanatory notes can be found in the Minutes:

Rank	No.	Proposal	Members Voting	Score	Drill in FY'94
1	410	Return to 504B	12	14.3	Yes
2	375	Hess Deep	13	13.0	Yes
3	369	MARK Area	12	12.9	Yes
4	361	TAG	12	11.2	(Yes)
5	300	Hole 735B, AII FZ	13	9.6	Yes
5	DPG	Sedimented Ridge II	12	9.6	(Yes)
7	DPG	EPR II	11	8.0	No
8	376/382	Vema FZ	13	7.8	Yes
9	DPG	NARM Volcanic	12	7.5	Yes

10	319	Galapagos	13	6.7	Yes
11	407	15° 20'N FZ	13	5.8	(Yes)
11	414	Reykjanes Ridge	13	5.8	No
13	325	Endeavor Ridge	12	4.8	(Yes)
14	368	Return to 801C	13	4.7	Yes
15	374	Oceanographer FZ	13	3.5	No

5.3 Other thematic interests

LITHP's interests extend beyond the themes that are currently indicated by the rankings. As noted above, some areas of interest are currently poorly represented in terms of numbers of drilling proposals (e.g hot spots). In particular, three prospective programs or areas of drilling were discussed:

- Lithosphere Characterization - The concept of a program of drilling to examine the scales of variation in oceanic crust has been discussed several times previously by LITHP. Such a program might involve two-three closely spaced holes; however, the spacing needs to be carefully considered and justified for the particular problem to be addressed and experiment to be conducted.

LITHP endorses DMP's efforts to use the drillship in an experimental mode and is prepared to issue a joint RFP on the subject of lithosphere characterization.

- Large Igneous Provinces (LIPs) - LITHP is interested in seeing proposals for drilling deep holes in LIPs. It is concerned that the Panel's membership does not reflect this broader interest, so will attempt to bring in some expertise in the field during the regular rotation of panel members.

- Red Sea Drilling - About a year ago, LITHP requested information on the current status of gaining research clearance for the Red Sea. The correspondence related to this are attached as Appendix III. It now appears that drilling in this area might be a possibility; consequently, LITHP is interested in again seeing proposals addressing thematic objectives that request drilling in the Red Sea.

5.3 Watchdogs

LITHP has set up watchdogs for each of the proposals that continue to be active and are of potential interest to the Panel. The responsibilities of these watchdogs are:

(i) to keep track of developments affecting the status of the proposal for LITHP;
(ii) to proactively assist the proponents in providing information on improvements necessary, what additional work needs to be done, and whether it is worth resubmission of a revised proposal;
(iii) to make sure proponents know of SSP requirements.

6.0 NON-ENGINEERING NEEDS

The list of non-engineering needs that was compiled by the Panel Chairs was considered for prioritization.

LITHP reemphasizes that the Pressure Core Sampler and Transfer Manifold are extremely important to the Panel's objectives.

LITHP ranked only their four top priorities:

1 Sidewall Coring Tool
2 Computer Hardware and Software for Core-Log Integration
3 In-situ Fluid Sampling and Measurement of Pore-Water Pressure and Permeability
4 CatScan or X-Radiography of the Whole Core

7.0 OTHER ITEMS

7.1 Nomination of Chief Scientists for Leg 152

LITHP nominates the following individuals for Co-Chief Scientists on Leg 152:

Hans-Christian Larsen
Mike Coffin
Bob White
Olaf Eldholm
Andy Saunders

7.2 Panel Membership

The panel membership was reviewed for disciplinary balance as well as representation of a number of tectonic environments of interest to the Panel.

A number of LITHP members are rotating off the Panel. G. Smith, J. Erzinger, S. Cloetingh and J. Franklin have all provided a great deal of help and

devoted considerable time to ODP activities; LITHP thanks them all for their dedicated service.

T. Brocher and J. McClain will both rotate off after the fall meeting, which means LITHP will be lacking in seismics expertise.

There is currently no-one with expertise in Large Igneous Provinces (LIPs) on the Panel. This need must be addressed in one of the replacements.

For Jason Phipps-Morgan, LITHP nominates the following (in order):
- D. Wilson (UCSB)
- D. Forsyth (Brown)
- R. Buck (LDGO)

For Guy Smith, LITHP nominates the following :
- J. Tarduno (Scripps)
- R. Karlin (U. Nevada, Reno)
- B. Clement (Florida International)
- P. Rochett (France)

In addition, LITHP would like to add a LIPs expert to the Panel, and nominates the following:
- M. Coffin (U. Texas)
- J. Mahoney (U. Hawaii)
- R. White (U.K.)

7.3 Liaisons to Other Panels

The current status of liaisons to other Panels is as follows:

SGPP - R. Zierenberg
TECP - M. Cannat(?)
OHP - To Be Appointed
DMP - J. McClain (D. Moos from 9/92)
TEDCOM - D. Moos

OD-WG - S. Bloomer

7.4 Next Meeting

The next LITHP meeting is scheduled for 14-16 October 1992. The venue is not yet determined, but M. Cannat will be asked whether she would be willing to host it in France, either in Brest or Paris.

7.5 LITHP White Paper

In light of recent engineering developments, it is appropriate for LITHP to begin work on updating its White Paper to better reflect its short-term and long-term objectives. Although these have not changed substantially, there is likely to be a change in the emphasis of the goals for the next few years. The current White Paper will be distributed to Panel with these Minutes in order to include discussion of changes on the fall meeting agenda. It is planned that the White Paper will be updated over the winter.

In conjunction with this activity, LITHP will issue an RFP for drilling proposals addressing the Panel's high priority thematic objectives in any oceans, including the Red Sea.

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Attending: J. Bender, S. Bloomer, T. Brocher, J. Erzinger, J. Francheteau (alternate for M. Cannat), T. Hasenaka (alternate for Y. Tatsumi), J. Hertogen (alternate to S. Cloetingh), S. Humphris, P. Kempton, J. Malpas (alternate to J. Franklin), J. McClain, D. Moos, R. Zierenberg

Liaisons and Guests: J. Alt (SGPP), B. Ambos (NSF), J. Austin (PCOM), B. Harding (ODP)

Regrets: G. Smith

WELCOMING REMARKS

J. McClain welcomed the Panel to Davis and discussed meeting logistics. As there were so many alternates who were new to LITHP, members introduced themselves, and the Panel welcomed Beth Ambos and Barry Harding as guests.

1.0 LIAISON REPORTS

1.1 PCOM (J. Austin)

The major item of business at the December meeting of PCOM in Austin was to establish a schedule for drilling between November 1992 and November 1993 based on the thematic panel rankings of the programs presented in the Atlantic Prospectus. PCOM approved the following drilling schedule for FY'93 (assuming 56 day legs and 5 port calls):

147	Hess Deep	26 Nov. 1992 - 21 Jan. 1993
148	Engineering - DCS Phase IIB (Back-up: Hole 504B)	26 Jan. 1993 - 23 Mar. 1993
149	NARM non-volcanic, Leg 1	28 Mar. 1993 - 23 May 1993
150	New Jersey / Middle Atlantic Transect	28 May 1993 - 23 July 1993
151	NAAG, Leg 1	28 July 1993 - 22 Sept.1993
152	NARM volcanic, Leg 1	27 Sept 1993 - 22 Nov.1993

(Note: lengths of Legs may vary, but ports are unlikely to change.)

Two issues have been raised since this schedule was put together:

(i) Leg 148 - it is highly likely that the engineers will not be ready for this to be an Engineering Leg. A review of Leg 142 and the DCS will be held on 6 April at Texas A&M. In this case, the back-up will be Hole 504B.

(ii) Leg 149 - PCOM adopted the NARM-DPG strategy for drilling the first non-volcanic leg.

(ii) Leg 150 - it is possible that drilling on the New Jersey Margin may encounter a significant safety problem related to gas trapped in shallow sands. Rescheduling may be necessary in order for a pre-drilling engineering study to be completed. There are some old lease track data that might be helpful in assessing the problem, and the Co-Chief Scientists will synthesize this new information.

Chief Scientists have been selected for the following cruises:

Leg 149 R. Whitmarsh and D. Sawyer
Leg 150 K. Miller and G. Mountain

In terms of short-term planning (i.e. FY'92), PCOM made the following decisions:

East Pacific Rise

PCOM supported TEDCOM's recommendation that coring time with DCS IIB be paramount during Leg 142.

Atolls and Guyots

Logging at Hole 801C will remain as an alternate activity if time is available after the following conditions are met (or attempted) as part of the prospectus program (in order of precedence):

1) that MIT-1 is maintained as a basement penetration site;

2) that Seiko-1, basement site, be retained to provide required latitudinal spread in basement sites;

3) that Harrie-2 be included to provide paired sites on Limalok (Harrie) to accomplish sea level/paleoceanographic (dipstick) objectives.

4) that Syl-4 be an alternate to Syl-2A to maintain the paired pelagic cap site philosophy and to optimize recovery for those objectives.

The PCOM chair has drafted a letter to the four A&G co-chiefs detailing the impact of this motion (i.e., emphasis on sea-level history).

North Pacific Transect

Because of its impact on Leg 145 drilling, PCOM declined the request to include OSN-2 in the FY 92 program plan. PCOM continues, however, to endorse the concept of dedicated holes for ocean floor seismic observatories

and looks forward to receiving from FDSN a global plan for prioritized testing and implementation.

Cascadia

PCOM endorsed the plan to dedicate no more than 1.5 days during Leg 146 to replace the sensor string in Hole 857D. PCOM has requested that the Co-Chiefs of Leg 146 provide information on the impact of this on the scientific plan for Leg 146, for PCOM to evaluate at its April 1992 meeting.

The issue of technical support staff on board the *JOIDES Resolution* was discussed and PCOM endorsed SMP's recommendation to increase technical support staff by up to 2 personnel/leg. PCOM requested that ODP-TAMU provide BCOM information by January 1992 on the continuing costs of hiring and staffing the ship with these additions, with commensurate reductions in scientific participation, to evaluate its impact on the FY'93 budget. ODP-TAMU has responded by: (1) reorganizing their computer services group to provide two full-time systems managers, and (2) increasing the total technical complement by ~1/leg, about 50% of PCOM's has request. PCOM will continue to discuss this issue in April.

PCOM confirmed the necessity of carrying out feasibility studies for deep drilling as soon as possible. PCOM asked ODP-TAMU to draft a RFP, in consultation with the PCOM chair, for the hiring of one or more consultants, to carry out such studies, using candidate sites recommended by thematic panels as a basis. The draft RFP has been prepared and will be reviewed by TEDCOM at its next meeting in May 1992.

PCOM authorized the formation of a steering group for *in-situ* fluid sampling, to be constituted as a subset of DMP effective at its January 1992 meeting. PCOM approved the mandate and membership of the group as described in DMP recommendation 91/17. The formation of this group was discussed at the DMP meeting in January, and plans were finalized to have the group meet for the first time in College Station sometime in early April. After that first meeting, the group will probably meet in conjunction with future DMP meetings.

A Data-Handling Working Group, which was endorsed by PCOM, met in early March in Toronto under the chairmanship of Ian Gibson. A report is expected at the April PCOM meeting regarding: (1) a new database structure for ODP to cope with the rapidly-expanding needs of the project, and particularly to facilitate core/log data integration; (2) an appropriate hardware/software environment for ODP in the 1990's, compatible with 1).

There have been several other significant developments. The four-year (FY'93-FY'96) program plan was submitted by the subcontractors to JOI, Inc. for assembly in early March. It was officially submitted to NSF on 17 March,

and will be reviewed internally by NSF, then submitted for final EXCOM/ODP Council approval in June. In terms of renewal, the United Kingdom has committed to the program, and Australia has committed for three years, although no decision has been made in Canada. The National Academy of Sciences has also just completed a primarily positive review of the program; the results of their evaluation have just been published.

In terms of the recommendations from the OPCOM meeting last year, NSF has not yet committed any funds, citing "insufficient detail and justification" in the advisory structure/JOI, Inc. proposals to date. With regard to DCS, the results from Leg 142 must be incorporated into planning for the future, including assignment of Leg 148. As discussed above, PCOM authorized a feasibility study for development of fluid sampling capabilities; however, NSF does not yet understand how feasibility becomes reality in the future. A proposal submitted to investigate additional drilling platforms was reviewed and received mixed results. The plan at present is to examine a couple of specific FY' 92 alternatives (i.e., case studies: MIT Guyot and New Jersey margin) with SEDCO/ODP-TAMU, then perhaps have Zaremba look at "independent" (i.e., drilling capability not specifically tied to the *JOIDES Resolution*) options (more cheaply!) for the FY'93-FY'96 time frame. However, NSF is concerned that funds for the use of additional platforms have not (yet) been budgeted for in the FY'93-FY'96 Program Plan, although this will probably not prevent the activities detailed above from proceeding.

1.2 NSF (B. Ambos)

Plans are proceeding for the establishment of an IRIS-JOI Planning Office for seismic network activities. Final budget negotiations are underway for the construction of a borehole seismometer. Additional proposals for OSN pilot experiments are expected in November 1992.

1993 site survey field programs that have been funded are:

Vema Transform Fault	LDGO/Kastens	Seamarc (with French)
Woodlark Basin	U. Hawaii/Taylor	Magnetics, Gravity, SCS
Cascadia Margin	Lehigh/Carson	*Alvin*, Fluid Sampling

A review of the program is mandated by NSF every two years, and the third of these has just been completed. The recommendations include the following:

(i) Publications - Part A remains a useful summary of the drilling; however, Part B (the scientific results volume) should be substituted by

peer-reviewed journal publications. These can be collected into volumes as appropriate.

(ii) Advisory Structure - The entire structure needs to be reviewed. EXCOM will create a blue ribbon panel to evaluate the scientific advisory structure. In addition, the existing structure needs to be more proactive in designing programs to use the drillship.

1.3 PANCHM (S. Humphris)

The PANCHM Meeting was held in December the day before the PCOM Meeting. A number of issues were discussed that related particularly to proposal submission and review procedures, and to improving the exchange of information between service and thematic Panels in a timely fashion.

PANCHM felt there was still a need to be able to accommodate "less than a leg" proposals in the program even though supplemental science proposals have been discontinued. Incorporation of highly ranked "less than a leg" proposals into a drilling leg will be accomplished by the thematic panels prior to their inclusion in a prospectus for the fall rankings. Due to the problems of shipboard staffing, the PANCHM recommended that any drilling efforts that are combined into a single drilling leg form an integrated program.

PANCHM discussed the dichotomy they face in their roles of actively accomplishing a set of scientific objectives - which may involve them in writing proposals - and their other task of reviewing proposals; this situation can be viewed as a potential source of conflict of interest. However, actions such as excluding proponents totally from the voting and ranking process can result in an imbalance of discipline expertise in areas critical to the discussion. Consequently, the PANCHM recommended that, during the voting and ranking of proposals, all proponents be clearly identified and not be permitted to vote for their own proposals. They should be permitted to participate in the discussions; however, Panel Chairs must prevent any lobbying activities, and the presence of proponents is at the discretion of the Chairperson.

PANCHM recommended that the numbers be removed from the ranking boxes on the proposal review forms in order to avoid them being interpreted as a "poor" to "excellent" rating. In addition, PANCHM agreed to standardize their voting procedures for the fall rankings with a system of voting that allows correction for the varying numbers of panel members permitted to vote for each proposal. In addition, a new schedule of meetings was set up to allow feedback between service panels and thematic panels at the appropriate times:

	SPRING	FALL
Thematic Panels	Late Feb/Early March	Mid-October
SSP	Early April	September
PCOM	Mid-Late April	Late Nov/Early Dec
Activity	Global Ranking/ Drillability Assessment	Prospectus Ranking/ SSP Input from Data

Thematic panels will attempt to assess the drillability of their highly ranked global programs to assist SSP in investigating the appropriate proposals for available site survey data at their spring meeting. SSP will impose a 1 August deadline on site survey data for all proposals to be included in the fall prospectus and will then meet in September to assess the status of those programs in order to provide feedback to the thematic panels prior to their fall ranking procedures.

PANCHM also recommended new deadlines for the submission of proposals -- January 1 and August 1 -- to ensure timely submission to panels for review. This recommendation has been adopted and will be enforced for the 1 August 1992 deadline.

PANCHM endorsed the efforts of SMP, DMP and IHP to produce an action plan to permit cross-correlation of core and log data routinely on board the ship. In addition, PANCHM agreed to produce a combined prioritized shortlist of non-engineering needs to be presented for discussion at the April PCOM meeting.

1.4 Ocean History Panel (written report from G. Smith)

The Ocean History Panel met in early March in St. Petersburg, Florida. In terms of the new proposals that were reviewed, the recommendations for Proposal 409 (APC coring in the Santa Barbara Basin) should be considered by LITHP. OHP would like this program incorporated into the proposed return to Hole 504B that seems to be a likely response to the results of the DCS testing on Leg 142. However, there are several concerns that need to be addressed. While there is general agreement on the importance of this area, the siting of holes may not be well-constrained. Apparently, the seismic lines used to plan the holes came from oil company sources who purchased them from a private firm. The oil company only purchased basin margin lines, on which there was some concern about slumping. Lines exist in the center of the basin but they might have to be purchased directly from the private company. A second factor is that this site is also incorporated in the larger California Current proposal, which is of substantial interest to OHP but still requires some additional work to be drillable. It seems likely that it will be drilled in the next few years; proposal 409 could be incorporated into that

program. Finally, there are some logistical problems. Proposal 409 is attractive with a San Diego port call as it would add only 2-3 days to the leg; however, a return to 504B following Hess Deep would probably have both port calls in Panama City.

The K-T proposals were met with interest and a degree of skepticism as to what information the proposed drilling would actually provide. OHP felt the general concept is sound, but more work is needed on the siting of holes. OHP has proposed a DPG to try to incorporate these and other Caribbean proposals into a coherent plan.

Although related primarily to the high-latitude drilling aspects of the Arctic Gateways program, there has been a promising test of the possibility of using an icebreaker in combination with the *JOIDES Resolution* to drill in the marginal ice zone rather than requiring clear water. The test used the *Polar Stern* towed by an icebreaker. The icebreaker is wide enough that it shelters the towed ship and is capable of holding position against ice pressure. This capability, if proven, may allow drilling at much higher latitudes than the current "clear water" standard permits.

OHP continues to support further development of DCS. They are willing to accommodate additional engineering legs if necessary to develop and test the system. Their primary concern is chert-chalk environments and recovery of black shales. There is significant interest in lower Paleogene/Mesozoic problems, some of which require DCS capability (e.g. Shatsky Rise). OHP also supports continued investigation of deep drilling, with the Somali deep stratigraphic test hole as their type example.

OHP compiled the following global rankings:

388 & 388-Add	Ceara Rise	1
NAAG-DPG	North Atlantic-Arctic	2
415 & 403-Rev	Caribbean K-T Boundary	3
354-Rev	Angola-Namibia Upwelling	4
253-Rev.	Ancestral Pacific Organic Carbon	5
386-Rev	California Current	6
404/406	Blake Plateau/NW Atlantic	7
412	Bahamas Transect	8
CEPAC & 390	Bering Sea/Shirshov	9
337	Exxon Sea Level Curve	10
347	S. Equatorial Atlantic	11
363-Add	NR1-NR3 Paleo.	12
345 & 345-Add	West Florida	13
338	Sea Level, Marion Plateau	14

Most of the highly ranked proposals still need some site survey work before they are drillable, although there are several cruises planned by Fall for this purpose.

OHP also prioritized the items for a non-engineering "wish" list. The "stratal geometry" item is software to allow study of stratal geometry during drilling of such sites as the New Jersey transect, which is heavily involved with sequence stratigraphy problems:

Core-core and core-log integration software	1
Core barrel magnetometer	2
High resolution magnetic susceptibility logging tool	3
Micropaleontological reference collection	4
MST upgrade for natural gamma core logging	5
Resistivity equipment for discrete core measurements	6
Carbonate autosampler and replacement coulometer	7
MST color scanning capabilities	8
High resolution geochemical tool	9
Synthetic seismology software	9
Sidewall coring tool	11
Stratal geometry seismic software	12

1.5 Sedimentary and Geochemical Processes Panel (R. Zierenberg)

SGPP has met twice since the last LITHP meeting: first last November in Zürich, Switzerland, and most recently, in early March in Miami, Florida.

At the November 1991 meeting, Erwin Suess was replaced as panel chair by Judith McKenzie. Erwin was thanked for his extensive contributions to the difficult job of defining the role of a new thematic panel and to the production of the SGPP white paper. The prime order of business was review of proposals and ranking of the North Atlantic Prospectus proposals which resulted in the following:

1	348	New Jersey Margin	12.2
2	391	Mediterranean Sapropels	9.7
3	405	Amazon Deep-Sea Fan	9.5
4	330	Mediterranean Ridge	8.4
5	361	TAG Hydrothermalism	8.0
6	388	Ceara Rise	7.4
7	323	Alboran Basin	7.0
8	380	VICAP Gran Canaria	6.4
9	NAGG	N. Atlantic Arctic Gateways	5.7
10	NARM	N. Atlantic Volcanic Rifted Margins	5.3
11	OD-WG	MAR Offset Drilling	3.6

12	346	Eq. Atlantic Transect	3.5
13	NARM	N. Atl. Non-Volcanic Rifted Margins	3.4

There was considerable discussion of the previous two global rankings by SGPP and the dismissal of the most recent ranking by PCOM. PCOM Minutes implied that the Barbados proposal moved up dramatically between the two rankings because E. Suess (SGGP-chair) was a proponent. E. Suess was not a proponent, either in fact or covertly, on any Barbados drilling. The panel as a whole was unhappy that its ranking was not considered and discussed the reasons for the poor communication between SGPP and PCOM.

SGPP strongly endorsed the joint LITHP/TECP motion regarding the importance of *in situ* sampling of formation fluids and determination of the temperature, pressure, and permeability. SGPP recommended that solutions to these problems should be a high priority for OPCOM funding, and endorsed the recommendation of the In Situ Pore Fluid Sampling Working Group to continue development of the Geoprops tool and to evaluate Schlumberger's Top Hat device for use on the *JOIDES Resolution*.

SGPP supported PCOM's decision to discontinue supplemental science proposals, but favored retaining the flexibility to address high priority or "emergency" proposals of short duration when appropriate. In this regard, strong support was given to reinstrumenting Hole 857D (Leg 139) and drilling in Santa Barbara Basin, although in the latter case, it was supported only if it did not detract from Cascadia drilling.

The primary duties at the March 1992 SGPP meeting were review of new proposals and global ranking of all active proposals of high thematic interest to SGPP in the following order:

1		Generic Gas Hydrate	Non-drillable
2	414	Barbados Fluid Sampling	Drillable
3	405	Amazon Deep-Sea Fan	Drillable
4	391	Mediterranean Sapropels	Drillable
5	59/R3	Madeira Abyssal Plain	Drillable
6	409	Santa Barbara Basin	Drillable
7	330	Mediterranean Ridge	Drillable
8	388	Ceara Rise	Drillable
9	354	Benguela Current	Drillable
10	SRDPG	Sedimented Ridges II	Non-drillable
11	404	North Atlantic Drifts	Drillable
12	361	TAG Hydrothermal	Non-drillable
13	412	Bahamas Sea Level	Non-drillable
14	DPG	Cascadia II	Non-drillable
15	337	New Zealand Sea Level	Non-drillable
16	360	Valu Fa Ridge	Non-drillable

Priorities for "non-engineering" equipment purchases were discussed, although there was some confusion about what constituted "non-engineering" equipment. The top priorities were to build two additional pressure core systems (PCS) for leg 146, obtain a functional vibrapercussive coring system for leg 150, and to support the development of a formation fluid sampler. Recommended items for shipboard use were to purchase an X-radiography or CatScan system capable of producing real-time core images that could be incorporated into the multi-sensor track system, and production of detailed methodology and improved data handling for the shipboard XRD unit, including increased technician training.

Part of one afternoon was set aside for discussion of scientific topics of interest to SGPP. K. Kvenvolden and C. Paull led a discussion on the nature and importance of gas hydrates and the rationale for a dedicated leg to investigate their formation. M. Cita, PCOM liaison to SGPP, presented a discussion on the occurrence of Mediterranean sapropels and assured the panel that a detailed proposal for drilling Mediterranean sapropels would be submitted by the Aug. 1 deadline and should be considered "drillable" for the 1994 prospectus, even though the sites have not been chosen and the site survey work is scheduled for this summer. D. Stow and R. Flood led a discussion of bottom current and contourite sediment drift deposits. The next meeting had been set for September in Kiel, Germany, to accommodate a joint meeting with OHP; however, OHP has scheduled their next meeting in France.

1.6 Tectonics Panel (summary from the October minutes)

Part of TECP's last meeting in October was held jointly with LITHP; however, a number of issues were addressed in a separate session. Ranking of the proposals in the Atlantic Prospectus resulted in the following prioritization:

1	NARM-DPG	Non-volcanic rifted margin - Leg 1	7.4
2	NARM-DPG	Volcanic rifted margin - Leg 1	6.1
3	346-Rev2	Ivory Coast Ghana Transform Margin	5.7
4	323-Rev	Alboran Sea (Comas et al)	4.8
5	403	K/T Boundary, Gulf of Mexico	4.0
6	376	Layer 2/3 Boundary, Vema FZ	3.2
7	369-Rev	MARK Area	2.5
8	399	Alboran Sea (Watts)	2.3

TECP also set up watchdogs on various thematic issues in order to enhance communication between the panel and the proposal proponents.

1.7 Downhole Measurements Panel (J. McClain)

Two meetings of DMP have been held since the last LITHP meeting, and included a number of issues of interest to LITHP:

1. During the Fall meeting, DMP was informed that the Geoprops tool was being abandoned by the subcontractor and that TAMU would take over the development of the tool, with Bob Carson taking the lead. Given the stated importance of Geoprops for the Cascadia leg, it was hoped that sufficient progress could be made to allow a test deployment of the tool two or more legs prior to Cascadia. However, at the winter meeting, it was reported that, while progress has been made, no deployment prior to Cascadia would be possible.

2. Given the recent history of third-party tools, DMP is initiating an effort to firm up requirements (deadlines, testing criteria, monitoring of progress etc.) for such logging tools.
   A particular change recommended by DMP is that no ODP leg be scheduled if its scientific goals are critically dependent upon a third party tool that has not completed its full testing (including at sea) and development schedule.

3. DMP was reminded that at the 9/89 joint meeting with LITHP, the highest priorities for high-temperature tool development were temperature and pressure logging, electrical resistivity and fluid sampling. A new temperature-pressure tool, rated to 500°C, and a logging cable rated to 350°C have been delivered to the logging subcontractor. A subcontract to Camborne School of Mines (U.K.) has been issued for the construction of a high-temperature resistivity tool. Progress for fluid sampling has not been great, but a working group has been formed to develop strategies for the recovery of fluid samples with no or minimal contamination.
   It was suggested that LITHP and DMP should consider new priorities as these tools come on line. One item discussed in 1989 was a high-temperature natural gamma tool.

4. DMP discussed the the old idea of lithospheric *characterization*. The goal of such an experiment would ultimately be to tie core properties (very small scale), downhole measurements (small scale), and surface geophysics (large scale) together. The conceptual experiment would be to place two or more closely spaced holes into oceanic crust and conduct a full range of experiments, including cross-hole measurements (e.g. cross-hole seismic tomography).
   As an example of such an experiment Jill Karsten (U.H.) presented a program being planned for the Pacific by a working group formed by the Office of Naval Research. Their plan, for two holes, 0.5 km deep and

separated by 1 km, is to be submitted for consideration by the August deadline.

5. Worthington suggested that given items 3 and 4 above, perhaps LITHP and DMP should consider another joint meeting. The next time when the two panels are scheduled to meet at roughly the same time is fall of 1992. Unfortunately, the DMP meeting is already scheduled for September. LITHP, on the other hand, is pushing its meeting to later (mid-October) because of the needs of the program and the changes to the meeting schedule discussed by the PANCHM. Therefore, such a joint meeting is probably not feasible at this time.

6. Brief presentations on new logging technologies were presented. One was the substantial progress being made by industry on borehole gravimetry. Available tools are too large for present ODP holes (unless ODP develops a "top-hat" fluid sampling capability). Additional problems are heave difficulties, which may be solved by using a gravity gradiometer.

1.8 TEDCOM (D. Moos)

TEDCOM has not met since the last LITHP meeting, but is scheduled to meet in May. At that time, TEDCOM will review the RFP for deep drilling feasibility studies that has been put together by ODP.

1.9 Offset Drilling Working Group (S. Bloomer)

This second meeting of the Offset Drilling Working Group focussed on detailed presentations of target areas and a discussion of strategy and prioritization of goals. The PCOM representative reiterated that the group was to function as a working group, not a detailed planning group.

The liaison reports, particularly those from LITHP and PCOM, generated a great deal of discussion. LITHP had ranked a generic offset drilling proposal as their third priority at the fall meeting. As a consequence, offset drilling was not included in the FY'93 plan, although a possibility does exist for drilling an offset drilling-related target on the Engineering leg scheduled for Leg 148. Factors contributing to the lower ranking of offset drilling were discussed at length. One factor was clearly timing. The offset drilling proposals reviewed in Cyprus were generated in a short period of time between the end of the first OD-WG meeting and the fall LITHP meeting. As a result, the proposals were incomplete and hastily prepared; the exclusion of proponents who might have aided in the discussion of individual proposals may have contributed to the lower ranking of some proposals. More importantly, it was perceived that there is a misunderstanding about what most of the group considered offset drilling to be.

The working group proposed a revised definition of offset drilling as:

"offset drilling is a strategy to deal with a complex, laterally heterogeneous ocean crust and shallow mantle by drilling key, partial sections in tectonic windows into crustal and mantle rocks".

OD-WG considered dropping the term "offset drilling" in favor of "composite section drilling" to emphasize the point that the crustal sections may have to be drilled in several different parts of the ocean basins. The group decided that since they were designated as an "offset drilling" working group, they should retain the title. However, the revised definition of offset drilling emphasizes three points:

1) a place exists in the strategy for legs devoted to single holes in crustal units or in unit transitions;
2) long sections through gabbro and mantle sections are as essential to the completion of composite sections as are sections through the major unit transitions;
3) such long sections address important hydrothermal, structural, and metamorphic objectives as much as they do petrologic and geochemical objectives.

The working group endorsed its general definition of four classes of objectives (Figure in Appendix I):

1 sections through the dike/gabbro transition
2 long sections of gabbroic crust
3 sections through the gabbro/mantle transition
4 long sections of upper mantle.

An 11- or 12-leg program could produce composite sections of slow and fast spread crust, and could also address some tectonic objectives, such as the nature of the master faults in median valley.

Potential target areas generally fall into three categories of tectonic windows: median valley exposures (on low-angle detachments?), rifted older crust, and transverse ridges (and associated fracture zone exposures). Those places reviewed in detail, and deemed to be promising for offset drilling were:

Type	Site	Objectives	Fast	Slow	Plume	Non-Plume
Rifted Crust:	Hess Deep	1, 2, 3, 4	x			x
	Pito Deep	2	x			x
	Endeavor Deep	?	x			x
	King's Trough	1, 2, 4?		x	x	

Median	MARK	2, 4	x		x
Valley	15°20'N	3?, 4	x	x	
Fracture	Atlantis II	2, 3?, 4	x		x
Zone	Vema	1, 2, 3, 4	x		x
	Oceanographer	2, 4	x	x	

Of these sites, Vema, Atlantis II, MARK, and Hess were deemed to be mature enough that they could be productively drilled now.

OD-WG produced the following recommendations and comments:

1) The highest priority for drilling should be the completion of a global composite section. This may require a number of single sites in appropriate locations. The sampling of the ocean crust to date has been extremely limited (Figure in Appendix I) and the first objective must be the recovery of all of the major units comprising oceanic crust.

2) The second priority should be the assembly of composite sections from fast and slow spread crust.

3) It would be preferable to develop these composite sections in small geographic areas. However, this may not be possible given the available exposures. *This should not be a deterrent to completing composite sections based on holes from various geographic sites which address one of the objectives 1 through 4.*

4) The most likely candidates (and existing sections) to meet objectives 1 through 4 presently include:

1. Dike/gabbro transition: Deepening Hole 504B clearly presents the best opportunity to drill this transition *in situ.*
2. Long sections of gabbro: A small section of gabbro exists from the Atlantis II fracture zone (735B). The Atlantis II, MARK area, and Vema could all provide sites for long gabbroic sections. Drilling at Hess Deep may also produce some gabbroic section.
3. Gabbro/mantle transition: This is the most problematic of the four objectives. There is presently no site in the ocean basins where this transition is unambiguously exposed. Many apparent juxtapositions of gabbroic and ultramafic rocks may be tectonic. Detailed 3-dimensional controls are needed to define a site at which this transition is likely to be *in situ,* and not tectonic. The Atlantis II, Vema, and Hess Deep all offer places where this transition may be exposed.
4. Long mantle sections: No such samples presently exist. Hess Deep drilling may contribute sections to this objective. The Atlantis II,

MARK, and 15°20'N (with some development) sites are all promising for recovery of long mantle sections.

OD-WG discussed revision of site survey recommendations for offset drilling sites. Kim Kastens (liaison from the Site Survey Panel) stated that their main concern was that a site could be placed in a geologic context within a regional perspective and related to a class of global problem. The Working Group endorsed the following guidelines:

Required of any site:	Detailed bathymetry Near bottom visual observations Surface magnetics Precise geologic sampling and description Analysis and synthesis of data
Recommended data:	Site specific geophysics: MCS, refraction Regional surface side scan Surface gravity Near bottom side scan
Potentially useful:	OBS seismics Near bottom observations or geophysics, as technically feasible.

Finally, the OD-WG endorsed the platform carbonate site on the transverse ridge at the Vema Fracture Zone for drilling on Leg 148 (an Engineering leg). The shallow water offers a logistic advantage and the site provides an opportunity to constrain the vertical history of a transverse ridge and could recover uplifted lower crustal rocks.

2.0 REPORTS ON RECENT SCIENTIFIC LEGS

2.1 Preliminary Results of Leg 140 - Return to Hole 504B (J. Erzinger/J. Alt)

Leg 140 was the seventh leg of DSDP/ODP to occupy Hole 504B, and has now established the most complete reference section to date through the upper oceanic crust by deepening the hole to a total depth of 2000.4 mbsf. Before drilling could commence, fishing operations were required to recover a core barrel lost at the bottom of the hole during Leg 137. This took ten days, and success was finally achieved using a fishing tool designed and fabricated on board the *JOIDES Resolution* during the cruise.

A temperature log run in the hole prior to the commencement of any operations showed a downhole flow of seawater into the basement below 288 mbsf. This had been seen in previous records, but it appeared to have decayed considerably since Leg 137. The linear temperature gradient in the deeper hole is still 61°/km, which extrapolates to a temperature of 195°C at 2000 mbsf.

Coring was straightforward, although penetration rates of less than 2 m/hr and recovery of 13% were low. Hole 504B was left open and clean, and there was negligible evidence of hole ellipticity.

The diabases that were recovered were divided into 59 lithological units. Although there was not a systematic increase in grain size with depth, coarser grained diabases became more common, and glassy chilled margins virtually disappeared, consistent with the emplacement of dikes at higher temperatures. The cyclicity in grain size is probably related to the sequence of dike injection. In the lower section, amphiboles were more pleochroic, epidote was observed replacing some plagioclase, and Mg-rich chlorite was more abundant -- all suggestive of higher temperatures. Zn concentrations decreased systematically from an average of 70 ppm at 1500 mbsf to 30 ppm at 2000 mbsf, which may be indicative of proximity to the reaction zone.

All of the rocks exhibited mineralogical and chemical alteration with pervasive background alteration. Penetration by hydrothermal fluids resulted in heterogeneous veining, with epidote-quartz veins forming relatively late. The weak seismic reflector that was observed between 1660 and 1860 mbsf during a VSP experiment conducted on Leg 111 was clearly not the transition from the dike complex into the gabbros as predicted. It may be possible that this reflector was the result of the observed changes in the intensity of alteration and in physical rock properties in this interval.

Two problems arose that need to be addressed. Some improvements could be made to the design of the guide fingers of the drilling bits and of the core catcher that might help improve the recovery. ODP will work on this prior to the return to Hole 504B. Second, the LDGO logging group needs to include some engineering expertise as well as scientific expertise. There was no-one on board who was familiar with the flow meter tool (a third party tool), and the logging program was not well done.

Overall, Leg 140 was highly successful and the changes in alteration mineralogy, average grain size and geochemistry all indicate that drilling may have reached the lower part of the sheeted dike section.

2.2 Preliminary Results of Leg 141 - Chile Triple Junction (B. Harding)

Drilling on Leg 141 was designed to study the processes related to the subduction of a mid-ocean ridge spreading center. The Chile Trench is the site of collision between the Chile Ridge spreading center and the Chile Trench subduction zone. Five sites with thirteen holes were drilled, and three developmental systems were put into operation: the motor-driven core barrel, the pressure core sampler and the sonic core monitor. In addition, several new tools were deployed, including the hard-rock orientation tool; this will be tested again on Leg 143.

Four sites (Sites 859, 860, 861 and 863) were drilled in the forearc. Sites 859 and 863 were located in the base of the trench slope 0 and 30 km from the subducting ridge, and documented the transition from subduction accretion to subduction erosion. Sites 860 and 861 were located in the middle and upper slope region of the Chile Trench forearc and recovered records of complex depositional patterns and tectonic uplift prior to subduction.

All four sites showed traces of hydrocarbon gases. No solid hydrates were recovered, even though three prominent bottom-simulating reflectors were penetrated. However, geochemical anomalies in interstitial fluids from the sediments indicated that gas hydrates were present before drilling.

Site 862 was located on the Taitao Ridge, hypothesized to be an offshore extension of the Taitao ophiolite onshore. Recovery of andesites from this site and the inferred age of 3-4 Ma indicate that its origin and evolution are more complex and may be related to off-ridge volcanism.

3.0 STATUS OF ENGINEERING DEVELOPMENTS

3.1 Results of Engineering Tests on Leg 142 - East Pacific Rise (B. Harding)

Results from Leg 142 were disappointing in terms of the amount of time that was spent actually drilling and coring with the Diamond Coring System (DCS). Only 3.3 rotating days of DCS drilling were accomplished; this was partly due to technical difficulties, but was also a function of the 10' pipestand system and the long transit time. Although some rubble was cored and recovered, none of the rock was cored *in situ*. The new three-leg, hexagonal hard-rock guidebase (HRB) with a gimballed reentry cone was successfully deployed, and appeared to function as designed providing a stable base from which to initiate drilling. Two HRBs were left on site; one of them has junk in it, but both could be made operational.

The first attempt at DCS coring was hampered by the inability to maintain a constant cuttings discharge path. The fine-grained volcanic material tended

to plug off the primary circulation paths necessitating taking cuttings back to the ship. This technique worked very well and, it should be noted, may represent an interesting opportunity (at the KTB site, cuttings are routinely returned to the surface and analyzed to allow determination of the formation geochemistry as it is being drilled). The major problem encountered was the inability to maintain constant weight on bit. Occasionally, the cuttings would break out at the seafloor causing an instantaneous drop in circulating pressure. This major pressure change caused the secondary compensator computer to sense an erroneous DCS tubing string weight, resulting in inaccurate WOB control or excessive weight applied to the slimhole diamond bit causing immediate bit failure.

It is not clear at the present time how extensive the problems with the secondary heave compensation system are. The systems worked much better on Leg 132 when the geologic conditions were not as severe. A meeting will be held on April 6 at ODP to review the operations and to try to determine whether refinements of the hardware and/or software can solve the problems or whether the drilling environment of zero-age crust is beyond our capabilities.

The Diamond Core Barrel (DCB) was also deployed towards the end of the Leg and was able to drill 7m in 8 hours.

Other problems encountered on the Leg included the loss of bit cones and carbide inserts during the deployment of the first stages of the deployment of the drill-in BHA, and the fragile nature of the diamond bits.

LITHP is concerned that this test not be viewed as total failure of the concept of DCS drilling. Although this system has been linked most strongly to drilling highly fractured zero-age basalts and Leg 142 tested it in that environment, there are other lithologies of interest that can be successfully drilled only with DCS (e.g. alternating chert/chalk sequences). Given the limited drilling and coring time that has been achieved with the DCS, a fundamental question still remains concerning whether the system can core successfully from a drilling ship through any lithology, or whether the nature of zero-age crust is such that drilling and coring through it is beyond the capabilities of any currently available drilling techniques.

It is clear that ODP is not in a position to put into DCS development the level of support that is common in the industry, i.e. a major investment upfront to concentrate all efforts on making the system operational. Consequently, progress and testing will proceed much slower. It also appears that development is currently <u>not</u> being held up by lack of shiptime for testing purposes, so any studies of the feasibility of using another vessel are premature.

The upgrade to DCS Phase III, which will bring the platform down to the rig floor will now be delayed. There has been so little coring time with the Phase II system that it is still not possible to evaluate coring operations on the ship. Phase III cannot proceed until successful coring, and more experience in coring, have been gained with DCS Phase II.

In spite of all these difficulties, **LITHP still strongly supports continuation of the development of the Diamond Coring System as the most likely method for drilling a number of formations that are beyond the capabilities of the drilling techniques currently available on the *JOIDES Resolution*.**

3.2 Plans for the FY'93 Engineering Leg - Leg 148

The results from Leg 142 suggest that it is highly unlikely that the ODP Engineers will be ready to test the DCS again by Leg 148; consequently, PCOM will make a decision on whether the back-up leg (Return to Hole 504B) should be scheduled at its April meeting.

LITHP strongly endorses PCOM's recommendation that, if Leg 148 is not an Engineering Leg, a return to Hole 504B be scheduled. This Hole represents an extraordinary opportunity to further deepen the only continuous crustal section so far obtained, and LITHP has given it the highest position in the global rankings. In addition, LITHP is not in favor of incorporating APC coring in the Santa Barbara Basin into a return to 504B.

If Leg 148 becomes a return to Hole 504B, LITHP nominates the following as potential Co-Chief Scientists:

Jeff Alt
Jose Honnorez
Matt Salisbury

If Leg 148 remains an Engineering Leg then LITHP recommends that:

- the DCS be tested in an environment less hostile than zero-age crust;
- a site be chosen that will maximize drilling and coring time.

There are a number of sites for such a test that would address scientific objectives of high priority to LITHP and could be considered candidates for drilling:

Middle Valley	- fossil hydrothermal deposit
Galapagos	- extinct hydrothermal deposit
TAG	- one of the relict mounds
Vema	- site on the transverse ridge with a limestone cap (recommended by the OD-WG)

Due to logistical considerations and the desire to meet the recommendations stated above, the two most feasible alternatives appear to be Vema and the Galapagos. The Vema transverse ridge site is attractive as an Engineering Leg for the following reasons:

1) the shallow water depth will provide the most drilling and coring time (even though the transit time is long for this Leg);
2) it requires only a small diversion from the proposed track of this Leg (Panama to Lisbon);
3) scientifically, it may be possible to constrain the vertical tectonics of the transverse ridge by understanding its subsidence and uplift history.

The Galapagos extinct hydrothermal mound (proposal 319) also provides an environment in which the DCS could improve recovery. This particular site is attractive because:

1) it is reasonably close to Panama - the starting point of Leg 148;
2) faulting has exposed the section of altered crust beneath the mound so the lithologies to be drilled are known and the hole could be carefully located;
3) scientifically, it may be possible to investigate the link between the highly-evolved nature of the basalts and the hydrothermal activity.

On the basis of logistical considerations, the desire to test the DCS in an environment less hostile than zero-age crust, and the need to maximize coring and drilling time, LITHP recommends that, if Leg 148 is an Engineering Leg, the DCS be tested at the Vema transverse ridge site. The second choice of LITHP would be a test at the Galapagos extinct hydrothermal mound.

If Leg 148 is an Engineering Leg at the Vema transverse ridge, LITHP recommends the following for the position of Chief Scientist:

Enrico Bonatti
Kim Kastens
Matt Salisbury

3.3 Update on the Status of Deep Drilling (B. Harding)

A request for proposals (RFP) has been drafted and will be reviewed by TEDCOM at their May meeting. It will most likely be sent to three consulting firms, and the proposals will be reviewed by a small group of people before the funds are dedicated.

There are a number of levels of deep drilling that need to be investigated. First, it is important that the capabilities of the *JOIDES Resolution* be maximized; this would satisfy the needs of some of the Panels. At the other

end of the spectrum is LITHP's desire to drill a 6 km hole to obtain a complete section through the oceanic crust. The ODP definition of a "Deep Hole" is: "any scientific hole that takes more than 1 leg of *JOIDES Resolution* time to complete".

The RFP includes a spectrum of sites submitted by the Panels:

LITHP:	generic ocean crust site (derived from information gained from 504B and 735B) to be drilled to 6 km.
TECP:	the Galicia Margin and the Iberia Abyssal Plain, and the
SGPP:	Northern Somali Basin.

LITHP again reiterates the importance of the deep drilling feasibility study for its future planning, and needs to determine whether the goal of a continuous section through the oceanic crust is realistic in terms of time, technology and cost.

4.0 PROPOSAL REVIEWS

(**Note:** Panel members were excluded from the meeting for the review and discussion of the proposals for which they were proponents).

The following proposals were presented for evaluation and were deemed to not fall within the mandate of the Lithosphere Panel:

Proposal 412:	The Bahamas Transect: Neogene/Quaternary Sea-Level Fluctuations and Fluid Flow in a Carbonate Platform (G.P Eberli, D.F. McNeill and P.K. Swart)
Proposal 354-Rev:	Neogene History of the Benguela Current and Angola/Namibia Upwelling System (G. Wefer, W.H. Berger, L. Diester-Haass, W.W. Hay, P.A. Meyers and H. Oberhansli)

4.1 Proposal 409

High Resolution Late Quaternary Paleoclimatic and Sedimentary Record, Santa Barbara Basin, California (J.P. Kennett)

The main objective of this proposal does not address high priority objectives of the Lithosphere Panel. LITHP is interested in the possibility that the anoxic basin sediments may record episodes of fluid discharge into the basin. Expulsion of metal-transporting fluids, most likely along basin-bounding faults, into an anoxic basin can result in precipitation of metal sulfide minerals. Many sediment-hosted ore deposits are postulated to have formed by this process. Active fluid expulsion south of the Santa Barbara Basin along the San Clemente Fault supports chemosynthetic vent communities on

mounds of hydrothermal barite. Hydrothermal barite has also been recovered from the San Clemente fault along the southern border of the Santa Barbara Basin. If drilling occurs in the Santa Barbara Basin, a geochemical investigation of the sediments for evidence of fluid venting to the basin should be included. It should also be noted that there might be significant safety problems related to the presence of active hydrocarbon seeps. The proponents need to obtain additional seismic data in the basin and address these safety problems.

Although this proposal is generally outside of the area of thematic interest of LITHP, it clearly represents an opportunity for obtaining a lot of interesting science for a very modest investment of ship time and resources.

4.2 Proposal 410

A Proposal for Deepening Hole 504B to Core and Log the Dike/Gabbro, Layer 2/3 Boundary (J. Erzinger, J. Alt and K. Becker)

Deepening Hole 504B is of extremely high priority to LITHP. The hole is clean, coring proceeded smoothly during Leg 140 with a reasonable penetration rate. The hole provides the best prospect for obtaining a continuous section through the crust, and has been cited by the Offset Drilling Working Group as a prime target to drill the dike/gabbro boundary. LITHP urges publication and critical evaluation of the VSP data collected during Leg 111, and stresses the need to tie all available seismic data to the drilled hole. Drilling through reflectors is extremely important in order to relate ocean crust structure and lithologies to seismic interpretations, and the available data suggest a major velocity discontinuity may be reached with one more leg of drilling.

LITHP is somewhat concerned about the poor recovery which could result in the loss of critical transition zones at the bottom of the sheeted dike complex. Although recovery may improve with grain size increases downhole, LITHP encourages further development of the bit and core catcher designs to enhance core recovery.

LITHP ranks the program very highly and is excited at the possibility that the next Leg may drill through the dike/gabbro transition.

4.3 Proposal 361-Add

Site Survey, TAG Hydrothermal Field, MAR 26°N (G. Thompson)

The site survey work proposed in 361-Add is exactly the type of study needed, both to select the best targets for drilling at TAG and to maximize the scientific return from drilling. Bottom source OBS surveys and detailed

gravity and magnetics would also help constrain TAG drilling results. LITHP enthusiastically supports the proposed survey and hopes that funding will be available in a timely fashion.

There is still a lot of detailed submersible mapping, and survey work that have not been incorporated into either this site survey report or the original TAG drilling proposal. LITHP is disappointed that this information has not been presented to strengthen the case for scheduling the initial leg of TAG drilling in 1994. In order for TAG to be highly ranked for 1994 drilling, a detailed proposal with justification for site selection and scientific goals that are achievable with non-Diamond Core System technology is needed by the August 1 proposal deadline.

4.4 Proposal 411

Proposal for Drilling the Caribbean Basalt Province - an Oceanic Basalt Plateau (T.W. Donnelly, R. Duncan and C. Sinton)

Oceanic Large Igneous Provinces (LIPs), such as the Caribbean, Ontong-Java, and Kerguelan plateaus, are prominent large-scale bathymetric features of the ocean crust. However, in spite of their large size and obvious role in oceanic crustal formation, we still have a rather limited understanding of the tectonic and petrogenetic processes which created these features. LITHP clearly recognizes that our knowledge of oceanic LIP formation can only be enhanced by a systematic drilling initiative. LITHP fully agrees that such a drilling program needs to include sampling of the thick (0.5-1.5 km) sedimentary units which cap these plateaus. The sedimentary record will not only constrain the age of the LIP, but also can provide valuable insight into the subsidence history of these plateaus.

Evolution of the mantle source region(s) and the nature and extent of the "plume" component at any given LIP site will require extensive geochemical study of basaltic units obtained from numerous drillholes that penetrate basement to depths of at least 100-200m. In addition, one or two really deep (0.5-1.5 km) holes will also be required.

While LITHP heartily endorses LIP investigations and the proposed drilling strategy it cannot, however, enthusiastically endorse this particular drilling initiative for the following reasons:

1) Most of the margins of the Caribbean Cretaceous Basalt Province (CCBP) are either absent due to subduction, or are deeply buried beneath sediment. While it is recognized that there are pieces of obducted oceanic crust on land nearby, the geologic relationships of these materials to the submerged plateaus are still uncertain. This inherent feature of the CCBP prevents any access to normal oceanic crust adjacent to the plateau. Without the ability to

site "reference holes", it will be impossible to characterize the age and composition of the oceanic crust on which the plateau was built. The lack of any extrusive edge is a serious deficiency. Without at least one normal crustal reference hole, the interpretation of the petrogenetic history of the CCBP will not be very well constrained.

2) There is a lack of sufficient geochemical and geophysical data to adequately support a "megaplume and tail" model for the origin of the CCBP. What is the geologic evidence to support the idea that the CCBP and the present-day Galapagos hotspot are genetically linked? The relation between them cannot be based solely on a Sr- and Nd- isotope diagram. Furthermore, the geochemical affinities and the proposed spatial variation of the CCBP lithologies illustrated in Fig. 23 are extremely conjectural. The drilling strategy for this region, which is based on this hypothetical cross section, is highly questionable.

LITHP clearly recognizes the expertise of the proponents; however, this particular program at this point in time, is unsuitable for ODP drilling. It may be possible to get some preliminary information about the basement by collaboration with proponents of proposals to drill through the K/T boundary.

4.5 Proposal 059-Rev3
Continental Margin Sediment Instability: Global Sealevel History and Basinal Analysis through Drilling Abyssal Plains (P.P.E. Weaver, R.B. Kidd, J. Thompson, S. Colley, I. Jarvis, R.T.E. Schuttenhelm, G. de Lange, R.E. Cranston and D.E. Buckley)

This is an excellent proposal which does not, however, address issues of high priority interest to LITHP. Two issues of secondary importance to the Panel include:
(1) early sediment diagenesis and the "progressive oxidation front", and
(2) the study of processes occurring on the Canary Islands and Madeira (hotspot volcanism) through analysis of materials shed from the islands.

As a general comment, it would be valuable for these proponents to communicate with the VICAP proponents with the goal of possibly integrating these two proposals. However, this proposal shares with the VICAP proposal several shortcomings which make it unlikely that future versions would be ranked highly by this panel:
(1) there may be difficulty dating the deposits, because of dilution due to their distal nature; and
(2) it will be difficult to identify which island is the specific source of materials shed from the Canaries, and thus to generate useful information about temporal changes and hotspot evolution based on those materials.

4.6 Proposal 413

Magmatic and Tectonic Evolution of Oceanic Crust: Reykjanes Ridge (J. Cann, C. German, B.J. Murton, L,M, Parson, R.C. Searle, M. Sinha and S. Spencer)

This is an interesting and imaginative proposal that addresses high priorities of the LITHP. There is particular interest in the "Type" section hole for Layer 2 and the approach to investigating states of stress in the lithosphere. The proposal is clearly immature, and the panel has a number of recommendations for the proponents to consider in revising the proposal.

First, the case needs to be made more strongly as to why drilling is needed to address all of these problems. In particular, many of the questions about AVR evolution, and geochemical and petrological variations along and across the ridges, could be constrained by near-bottom observations and detailed sampling. LITHP appreciates the value of studying the Reykjanes Ridge, but feels it is premature to identify the specific problems that demand drilling. The upcoming PETROS cruise should contribute to a redefinition of the drilling problems.

The proponents' ideas on stress measurements were applauded. However, they should be aware that experience in the program to date has shown that at least 500m of basement penetration is needed to produce reliable stress measurements from breakouts. Shallow holes simply do not reliably represent the state of stress in the lithosphere. Only a few of the proposed holes could be used for stress measurements; that part of the program needs to be redefined.

This is logistically an ambitious program clearly requiring multiple legs of work. The ship can carry two guidebases, so, at most, two bare rock sites can be accomplished per leg. Given the current state of DCS development, the zero-age sites are unlikely to be drillable for a few years.

The proponents have some very intriguing ideas. They are encouraged to rethink and reformat the proposal when they have digested the results from upcoming sampling and mapping cruises. Some thought should be given to reorganizing the work into "leg" size packages with a well-described phased implementation plan - or the proponents should think about reducing the proposed work to a one-leg package. Part of this rethinking should include the technological limits of guidebases and DCS. Information on technical and time requirements for each type of drilling can be obtained from JOI. There are a number of sites in the proposal which do not require DCS; the proponents may want to think about how to group these sites in their revised plans.

4.7 Proposal 414

Rates, Effects and Episodicity of Structural and Fluid Processes, Northern Barbados Ridge Accretionary Prism (J.C. Moore, B. Carson, M. Kastner, X. Le Pichon, G. Moore and G. Westbrook)

This is a well-conceived, mature proposal. LITHP recognizes the scientific importance of long-term monitoring of active fluid flow using instrumented boreholes.

As presently implemented, the proposal is tangential to LITHP's main interests. However, the LITHP has a strong interest in the diagenetic history of subducted crustal material. This aspect could be better addressed by :

(1) deepening proposed Holes NBR1 and NBR2 to significant basement penetration (>100m);
(2) high recovery coring of decollement zone for in-depth geochemical studies on-shore;
(3) long-term monitoring of fluid composition along fractures in the basement.

Hole stability is likely to be a problem and the need to case the hole should be assessed from previous drilling. If swelling clays could inhibit logging, it may be necessary to plan the use of drill-in casing through those sections of the hole. Another problem that needs to be considered in the possibility of stress-induced borehole failure, particularly at the depths of the decollement and below.

4.8 Proposal 415

Proposal for Drilling the Cretaceous-Tertiary Boundary in the Caribbean Sea (H. Sigurdsson, S.Carey and S.D'Hondt)

The principal objectives of this proposal are not within the mandate of this panel. However, LITHP reviewed this proposal because:
(a) its objectives could result in exciting, high-profile science, and
(b) recovery of Caribbean Plateau basalts could be of interest, if this aspect could be developed further, scientifically.

LITHP thought the emphasis on the consequences of bolide impact (e.g. paleoclimate), as opposed to simply documenting the impact structure, was a major strength of this proposal. However, there were several concerns about implementation of some of the objectives:

1) Can the ejecta dispersal mechanism be deciphered in light of the poor understanding of plate tectonics in the area? It is important to understand

the regional tectonics in order to reconstruct the radial effects.

2) Why are there no sites located in the Gulf of Mexico where the tectonics are simpler?
3) Is recovery using APC going to be good enough to answer the questions on paleoclimate, i.e. is the time resolution going to be adequate?

LITHP felt that the proposal could be strengthened by involving someone with expertise in Caribbean tectonics in order to resolve the problems of ejecta dispersal. In addition, LITHP also encourages closer scrutiny of site selection to determine whether drilling could accommodate more basement objectives in addition to the K-T boundary aspects, particularly if these could be packaged as 1 or possibly 2 legs.

Furthermore, LITHP encourages the proponents to discuss scientific and drilling strategies for this area with proponents of proposal #403 (Drilling the K-T boundary, Gulf of Mexico Basin; Alvarez et al) and proposal #411 (Drilling the Caribbean Basalt Province, an Oceanic Basalt Plateau; Donnelly et al).

4.9 Proposal 403-Rev

Proposal to Drill the KT Boundary in the Gulf of Mexico (W. Alvarez, J. Smit, E.M. Shoemaker, A. Montanari and R.T. Buffler)

This proposal does not address high priority goals of LITHP; however, the Panel recognizes the importance of bolide impacts in the geological and biological record. This proposal, one of two with similar objectives, is exciting, topical and a role for ODP in this important research is appropriate.

LITHP has several recommendations:

1. A more carefully drawn discussion of what ocean drilling will accomplish complementary to, or instead of, the potential on-land research is needed.
2. The proposal is driven by the desire to find the "smoking gun". In addition to this fascinating problem, LITHP notes that the question of the geological consequences of an impact on a coastal margin is of great interest.
3. We feel that this proposal would be greatly strengthened if the Alvarez group could coordinate their research effort with that of the Sigurdsson group (proposal # 415) to develop a leg by leg scenario of drilling that would address issues of impact effects including crustal disruption, volcanism (if any, which would be of particular interest to this panel), and ejecta geometry.
4. This proposal, and the other, should address the distorting effects of tectonics and sedimentary processes occurring in the 65 million years after the impact. We note that this proposal is concerned with the Gulf of Mexico, where tectonic disruption is probably far less than that in the Caribbean to the south.

5. The Alvarez-Sigurdsson proposals could address important LITHP themes if they could combine their goals with those of the Donnelly et al. proposal (#411) which is targeted on the Caribbean Basalt Province. However, we do not feel that crucial KT work should be sacrificed for such a combination.

4.10 Proposal 332-Rev3
Florida Escarpment Drilling Transect (C.K. Paull, M. Kastner and D. Twichell)

Although this proposal is not within the mandate of LITHP, the Panel discussed it in terms of its interest in the fluid flow. An aspect of the proposal that requires further development is whether the proposed drilling will test the hydrological model and can determine the direction of fluid flow, i.e. through the platform or through the hemipelagics. If the fluid flow is from the carbonate platform then there is no source of metals for the formation of Mississippi Valley type deposits briefly mentioned in the proposal. However, if dewatering of the hemipelagics is occurring in that environment, then formation of such deposits might be possible.

4.11 Proposal 333-Add
Update to: Tectonic and Magmatic Evolution of a Pull-Apart Basin: A Drilling Transect across the Cayman Trough, Caribbean Sea (P. Mann)

LITHP appreciates the update on the status of site surveys that were requested by LITHP and TECP, and is pleased to learn of the completion of the aeromagnetic survey of the Cayman Trough. The objectives of CAY-4, 5, and 6 address high priority objectives of direct interest to LITHP.

LITHP notes that two of their major concerns remain unaddressed by the currently planned site surveys:

1) better characterization and documentation of the petrology and geochemistry of the Cayman Trough

2) the relatively poor constraint on crustal thickness.

As stated in the earlier LITHP review of this proposal, higher quality seismic refraction data than are currently available must be obtained to determine whether the crust is really as thin as proposed and to verify that Layer 2 is only about 200 m as is asserted in the proposal. Until this information is provided, LITHP regards this as an interesting proposal but one that it cannot rank highly due to the absence of this fundamental information.

5.0 GLOBAL RANKING OF PROPOSALS

5.1 Global Ranking

In response to the concern over the potential influence of proponents on panel rankings, LITHP notes the following proponents of proposals under consideration:

J. Alt	East Pacific Rise Drilling - proponent
(liaison from	Galapagos Hydrothermal System - proponent
SGPP)	Return to 504B - proponent
J. Austin	NARM - proponent (not on the NARM-DPG)
J. Bender	East Pacific Rise Drilling - proponent and DPG member
J. Erzinger	Valu Fa Hydrothermal System - proponent
	Return to 504B - proponent
J. Francheteau	East Pacific Rise Drilling - proponent and DPG member
J. Hertogen	Sedimented Ridges - not a proponent but a DPG member
	NARM - not a proponent but a DPG member
S. Humphris	TAG - proponent
R. Zierenberg	Sedimented Ridges - proponent

LITHP identified twenty-seven programs (with associated proposals) that address high priority objectives of the Panel. These are listed in Appendix II, grouped according to themes or topics. No topic was included for which a proposal did not exist; however, three prospective programs were discussed as having potential interest to LITHP:

- Lithosphere Characterization
- Deep hole in a Large Igneous Province (LIP)
- Red Sea Drilling

Although not included in the ranking, specific comments concerning these initiatives follow this discussion.

Since the purpose of this spring ranking procedure is to provide PCOM with priorities for drilling over the next 4-year time scale, LITHP then went through the list and eliminated all those proposals that would be unlikely to rank in the top fifteen. LITHP also decided that, in order to stress the need to schedule some offset drilling legs for FY'94, it would rank each of the proposals separately on their individual merits. This represents a change from the method used in the fall 1991 rankings when, in order not to preempt the findings of the OD-WG, LITHP grouped them together as an Offset Drilling I leg. However, the urgent need to achieve some of LITHP's objectives precludes waiting for, but by no means invalidates, the OD-WG report, which will provide a strategy for a long-term, multi-leg drilling effort.

Once a shortlist of fifteen was identified, each proposal that had not been previously discussed as part of the Proposal Review (section 4.0) was given to

a panel member to present and lead the discussion. During this time, proponents were permitted to remain in the room, but could provide information only.

Ranking was done by written votes, which were tallied by the SGPP Liaison. All voting sheets were signed and have been kept as part of the meeting records. The results of this global ranking procedure are listed below. In addition, an assessment of each program's drillability in FY'94 was made and is included in the table with explanatory notes below.

Rank	No.	Proposal	Members Voting	Score (± 1σ)	Drill in FY'94
1	410	Return to 504B	12	14.3 (± 0.9)	Yes
2	375	Hess Deep	13	13.0 (± 1.5)	Yes
3	369	MARK Area	12	12.9 (± 1.4)	Yes
4	361	TAG	12	11.2 (± 2.6)	(Yes)
5	300	Hole 735B, AII FZ	13	9.6 (± 3.2)	Yes
5	DPG	Sedimented Ridge II	12	9.6 (± 3.8)	(Yes)
7	DPG	EPR II	11	8.0 (± 4.3)	No
8	376/382	Vema FZ	13	7.8 (± 3.4)	Yes
9	DPG	NARM Volcanic	12	7.5 (± 1.8)	Yes
10	319	Galapagos	13	6.7 (± 3.0)	Yes
11	407	15° 20'N FZ	13	5.8 (± 2.5)	(Yes)
11	414	Reykjanes Ridge	13	5.8 (± 2.9)	No
13	325	Endeavor Ridge	12	4.8 (± 2.7)	(Yes)
14	368	Return to 801C	13	4.7 (± 3.5)	Yes
15	374	Oceanographer FZ	13	3.5 (± 1.5)	No

The following caveats on these rankings should be noted:

Hess Deep: its high ranking is based on the assumption that Leg 147 is successful in reaching its objectives. It is theoretically drillable in FY'94; however, if it is to become the site of an offset drilling strategy then additional site survey information is required in order to understand the regional context.
Additional work known to be planned in the area:
Dorman and Hildebrand - near-bottom refraction
Hinz et al - MCS cruise may be diverted from study of the W. Coast of Mexico.

MARK: one of the best known regions of the sea floor. Sufficient data exist now to drill in this area; the proponents will be encouraged to synthesize the existing data and include a discussion of the tectonics in a revised proposal. Delaney/Karson cruise just completed.

TAG: proponents will be advised that a revised proposal needs to reevaluate the objectives and drilling targets in light of the Leg 142 results.
Additional work being proposed in the area:
Thompson and Kleinrock - side scan survey of the mound
Purdy, Collins et al - NOBEL and OBS experiment
von Herzen - heat flow and electromagnetics on the mound

Hole 735B: drillable in terms of reoccupying the same site. Currently, the proposal to return has expired, but a new one is expected for the 1 August deadline.

Sedimented Ridges II: the DPG report needs to be rewritten in light of the Leg 142 results for consideration of non-DCS drilling.

Vema Fracture Zone: sufficient data exist to carry out an Engineering leg on the top of the transverse ridge so that site is drillable. However, there is not enough data for drilling on the slopes.
Additional work known to be planned:
Kastens et al - side scan survey in Feb. 1993.

15°20'N Fracture Zone: a lot of new data will be available within the next year, which may make this location drillable in FY'94:
Needham et al - completed a SIMRAD survey
Bougault et al - cruise with *Nautile* currently underway
Dick, Thompson et al - proposed *Alvin* cruise for 1993.

Reykjanes Ridge: not presently drillable as more site survey information is needed and five sites require bare-rock drilling The PETROS cruise should provide additional sampling in the area.

Endeavor Ridge: the current proposal is not considered drillable at the present time; however, a revised proposal is expected by the 1 August deadline that contains additional new data.

5.2 General Comments Concerning Changes in Rankings from Previous Years:

Most of the rankings are not considerably different from previous years and reflect LITHP's continued interest in obtaining sections of oceanic crust. The bulk of active proposals that fall within LITHP's mandate currently address either drilling sections of the crust and upper mantle or hydrothermal

systems; hence, in the rankings, these two themes tend to dominate. Other areas of potential interest (e.g. hot spots, large igneous provinces) are poorly represented in terms of numbers of proposals.

Several major changes in the rankings deserve comment:

1) The large number of offset drilling proposals that currently rank in the top ten is a direct reflection of the activity of the OD-WG and LITHP's acknowledgement that the Leg 142 results suggest that a change in emphasis from a continuous section through the crust to a number of sections within different layers and across the transitions may be a more effective short-term strategy. This has resulted in the MARK proposal (which LITHP believes could be scheduled for drilling) moving from 7th in 1991 to 3rd in this ranking. It is now the highest ranked Atlantic drilling proposal.

2) Continued drilling at Hole 735B has moved up from 12th to 5th. Apart from the reasons stated above, the results from this drilling have proved to be scientifically important and a considerable amount has been learned from the petrology and stratigraphy. In addition, the general approach of obtaining sections - not necessarily all from one location -- has now been endorsed by the OD-WG and, with an open hole in a shallow water depth, this option is now more attractive.

3) EPRII has dropped from 3rd to 7th. This is due to the results from Leg 142 and LITHP's sense of urgency to accomplish some successful lithosphere drilling in the near future. It does <u>not</u> reflect any decrease in support for the continuation of the development of DCS. In addition, it should be noted that all the proposals now ranked above it are either new or have ranked above it in the previous global rankings.

4) NARM volcanic margins drilling has dropped from 4th to 9th as a direct result of the Panel's decision to rank individual offset drilling proposals rather than combine them into an Offset Drilling I leg.

5) Galapagos drilling has moved up from 24th to 10th mostly as a response to its potential as an Engineering site. In addition, it is now of more interest in that drilling could be accomplished without DCS because the extinct mound will be indurated, and the underlying basalt is exposed and known to be highly altered.

5.3 <u>Other thematic interests</u>

LITHP's interests extend beyond the themes that are currently indicated by the rankings. As noted above, some areas of interest are currently poorly

represented in terms of numbers of drilling proposals (e.g hot spots). In particular, three prospective programs or areas of drilling were discussed:

- Lithosphere Characterization - The concept of a program of drilling to examine the scales of variation in oceanic crust has been discussed several times previously by LITHP. Such a program might involve two or three closely spaced holes; however, the spacing needs to be carefully considered and justified for the particular problem to be addressed and experiment to be conducted.

LITHP endorses DMP's efforts to use the drillship in an experimental mode and is prepared to issue a joint RFP on the subject of lithosphere characterization.

- Large Igneous Provinces (LIPs) - LITHP is interested in seeing proposals for drilling deep holes in LIPs. It is concerned that the Panel's membership does not reflect this broader interest, so will attempt to bring in some expertise in the field during the regular rotation of panel members.

- Red Sea Drilling - About a year ago, LITHP requested information on the current status of gaining research clearance for the Red Sea. The correspondence related to this are attached as Appendix III. It now appears that drilling in this area might be a possibility; consequently, LITHP is interested in again seeing proposals addressing thematic objectives that request drilling in the Red Sea.

5.3 Watchdogs

LITHP has set up watchdogs for each of the proposals that continue to be active and are of potential interest to the Panel. The responsibilities of these watchdogs are:

(i) to keep track of developments affecting the status of the proposal for LITHP;
(ii) to proactively assist the proponents in providing information on improvements necessary, what additional work needs to be done, and whether it is worth resubmission of a revised proposal;
(iii) to make sure proponents know of SSP requirements.

The watchdogs are listed below; these appointments will be reviewed at each meeting:

Hess Deep	- S. Humphris	Hole 735B	- S. Bloomer
Reykjanes	- P. Kempton	Oceanographer	- S. Bloomer
Hole 504B	- T. Brocher	Mathematician	- S. Bloomer
Hole 801C	- T. Brocher	EPRII	- J. Erzinger

15°20'N	- J. Bender	Sed. Ridges II	- J. McClain
MARK	- J. Bender	Vema	- J. McClain
TAG	- R. Zierenberg	K/T+CCB	- J. McClain
Endeavor	- R. Zierenberg	Tyrrhenian Sea	- M. Cannat
Galapagos	- R. Zierenberg	Valu Fa	- M. Cannat
Cayman	- S. Cloetingh	Eq. Transform	- Y. Tatsumi
Alboran	- S. Cloetingh	Site 505	- D. Moos
VICAP	- J. Erzinger	NARM Volcanic	- J. Franklin
Aegir Sea	- J. Erzinger		

6.0 NON-ENGINEERING NEEDS

The list of non-engineering needs that was compiled by the Panel Chairs is included in Appendix IV, and was considered for prioritization. Prioritization by SGPP and OHP were also available and the following additional items had been added to the list by those Panels:

- Sidewall coring tool
- CatScan or X-ray radiography of the whole core
- Review of X-ray lab procedures
- Synthetic seismology software
- Stratal geometry software

The top two items on the original list - Pressure Core Sampler and Unstable Strata Coring Equipment - were not included in the procedure, since they had already been prioritized by PCOM under Engineering Developments. However,
LITHP reemphasizes that the Pressure Core Sampler and Transfer Manifold are extremely important to the Panel's objectives.
The transfer chamber is a third-party tool currently under development by Kastner and Brass.

LITHP ranked only their four top priorities:

1 Sidewall Coring Tool
2 Computer Hardware and Software for Core-Log Integration
3 In-situ Fluid Sampling and Measurement of Pore-Water Pressure and Permeability
4 CatScan or X-Radiography of the Whole Core

Specific comments on individual items follow:

a) <u>Sidewall Coring Tool</u>
These are currently available in the industry and, given the current status of geochemical tools, LITHP believes that, at the present time,

analysis of hard rock samples, may be a better approach. LITHP gives high priority to renting one of these and taking it to sea as a trial prior to purchase.

b) High Resolution Geochemical Tool

The high-resolution geochemical tool uses a germanium detector, and is able to detect many elements that are currently not available using the standard tool. This is a result of the sharper spectral peaks and significantly lower detection limits that can be achieved. The disadvantages of this tool are that it needs to be cryogenically cooled and the detector is not as sensitive requiring longer counting times, which in practice, means that it is necessary to integrate over longer time and core intervals. In addition, the accuracy and precision are not significantly improved. This tool is currently being used experimentally at the KTB site. It is important to note that use of this tool adds another logging run to every hole.

This tool is of potentially very high interest to LITHP, but it is important to understand the relation of geochemical logs to the chemistry of the rocks before its true value can be assessed. This correlation requires the capability to integrate core and log data.

c) CatScan or X-Radiography of Whole Core

This capability would be extremely useful for showing structure in cores prior to their being cut open. It would be particularly important for hydrothermal deposits, volcanoclastic sedimentary sequences at convergent margins, and for showing layering in gabbros. The procedure is commonly done in Europe and could be integrated directly into the standard core-handling procedures at sea.

d) High Temperature Resistivity Tool

LITHP did not include this tool in its rankings because considerable progress has been made in this area, as reported by the DMP liaison. LITHP endorses DMP's efforts to bring high temperature tools on line; these will be needed for future drilling of deep holes.

e) Borehole Gravimeter

LITHP is very interested in being able to measure formation density because of its relation to seismic velocities. Because it produces a gravity measurement for the formation, it would be particularly useful for sites where the drilling process has caused the formation to change in the immediate vicinity of the hole. However, LITHP acknowledges that this instrumentation is still in the developmental stages and consequently did not included in the present prioritized wish list.

7.0 OTHER ITEMS

7.1 Nomination of Chief Scientists for Leg 152

LITHP nominates the following individuals for Co-Chief Scientists on Leg 152:

Hans-Christian Larsen
Mike Coffin
Bob White
Olaf Eldholm
Andy Saunders

7.2 Panel Membership

The panel membership was reviewed for disciplinary balance as well as representation of a number of tectonic environments of interest to the Panel. Marc Parmentier declined to join LITHP, so a replacement for Jason Phipps-Morgan still needs to be nominated.

The current makeup of the Panel is as follows:

Name	Field of Expertise	Region	Rotation
J. Bender	Igneous Petrology; Trace Element Geochemistry	EPR, MAR	1/94
S. Bloomer	Igneous Petrology; Geochemistry	W. Pacific, Indian	9/94
T. Brocher	Seismic Reflection/Refraction	Not Specific	9/92
M. Cannat	Structure; Ultramafics; Ophiolites	MAR, Indian	F
P. Herzig	Hydrothermal	W. Pacific, MAR, Indian	G
S. Humphris	Basalt Geochemistry; Alteration	MAR, EPR	9/93
P. Kempton	Igneous Petrology; Geochemistry; Isotopes	Not Specific	UK
J. McClain	Marine Geophysics; Seismics	EPR, Juan de Fuca	9/92
D. Moos	Physical Properties; Shallow Structure	Not Specific	7/93
G. Smith	Magnetics	Not Specific	9/91
Y. Tatsumi	Igneous & Experimental Petrology; Geochemistry	Not Specific	J
A. Tsvetkov	?	?	R
R. Zierenberg	Hydrothermal; Fluid-Rock Interaction	N. Pacific; Red Sea	1/93

(Note: neither the ESF or the Canadian/Australian member is included in this list as the replacements for S. Cloetingh and J. Franklin are not yet known).

A number of LITHP members are rotating off the Panel. G. Smith, J. Erzinger, S. Cloetingh and J. Franklin have all provided a great deal of help and devoted considerable time to ODP activities; LITHP thanks them all for their dedicated service.

T. Brocher and J. McClain will both rotate off after the fall meeting, which means LITHP will be lacking in seismics expertise.

There is currently no-one with expertise in Large Igneous Provinces (LIPs) on the Panel. This need must be addressed in one of the replacements.

Two replacements need to be nominated at this meeting (for J. Phipps-Morgan and G. Smith):

For Jason Phipps-Morgan, LITHP nominates the following (in order):
- Doug Wilson (UCSB)
- Don Forsyth (Brown)
- Roger Buck (LDGO)

For Guy Smith, LITHP nominates the following :
- John Tarduno (Scripps)
- Bob Karlin (U. Nevada, Reno)
- Brad Clement (Florida International)
- Pierre Rochett (France)

In addition, LITHP would like to add a LIPs expert to the Panel, and nominates the following:
- Mike Coffin (U. Texas)
- John Mahoney (U. Hawaii)
- Bob White (U.K.)

S. Humphris will contact the top candidates to determine their willingness to serve if selected.

The Chair, S. Humphris, will also rotate off LITHP in 9/93, so will serve for only two more meetings. LITHP will nominate a replacement at the fall meeting.

7.3 Liaisons to Other Panels

New Panel liaisons will be need for TECP and for OHP. M. Cannat has been nominated for TECP liaison (she is at sea, so has not formally been asked). OHP liaison designation will wait until the replacement for G. Smith is determined.

In the fall, a new DMP liaison will be needed in place of J. McClain. D. Moos will take over, and LITHP requests that both individuals attend the fall DMP meeting to ensure a smooth transition.

The current status of liaisons to other Panels is as follows:

SGPP - R. Zierenberg
TECP - M. Cannat(?)
OHP - To Be Appointed
DMP - J. McClain (D. Moos from 9/92)
TEDCOM - D. Moos

OD-WG - S. Bloomer

7.4 Next Meeting

The next LITHP meeting is scheduled for 14-16 October 1992. The venue is not yet determined, but M. Cannat will be asked whether she would be willing to host it in France, either in Brest or Paris. An alternative option is Hobart, Tasmania.

7.5 LITHP White Paper

In light of recent engineering developments, it is appropriate for LITHP to begin work on updating its White Paper to better reflect its short-term and long-term objectives. Although these have not changed substantially, there is likely to be a change in the emphasis of the goals for the next few years. The current White Paper will be distributed to the Panel with these Minutes in order to include discussion of changes on the fall meeting agenda. It is planned that the White Paper will be updated over the winter.

In conjunction with this activity, LITHP will issue an RFP for drilling proposals addressing the Panel's high priority thematic objectives in any oceans, including the Red Sea.

7.6 PEC Recommendation (J. Austin)

One of the recommendations of the recent evaluation of ODP was that the advisory structure be evaluated. Although the process by which this will take place is not yet determined, the Panels might be involved at some level.

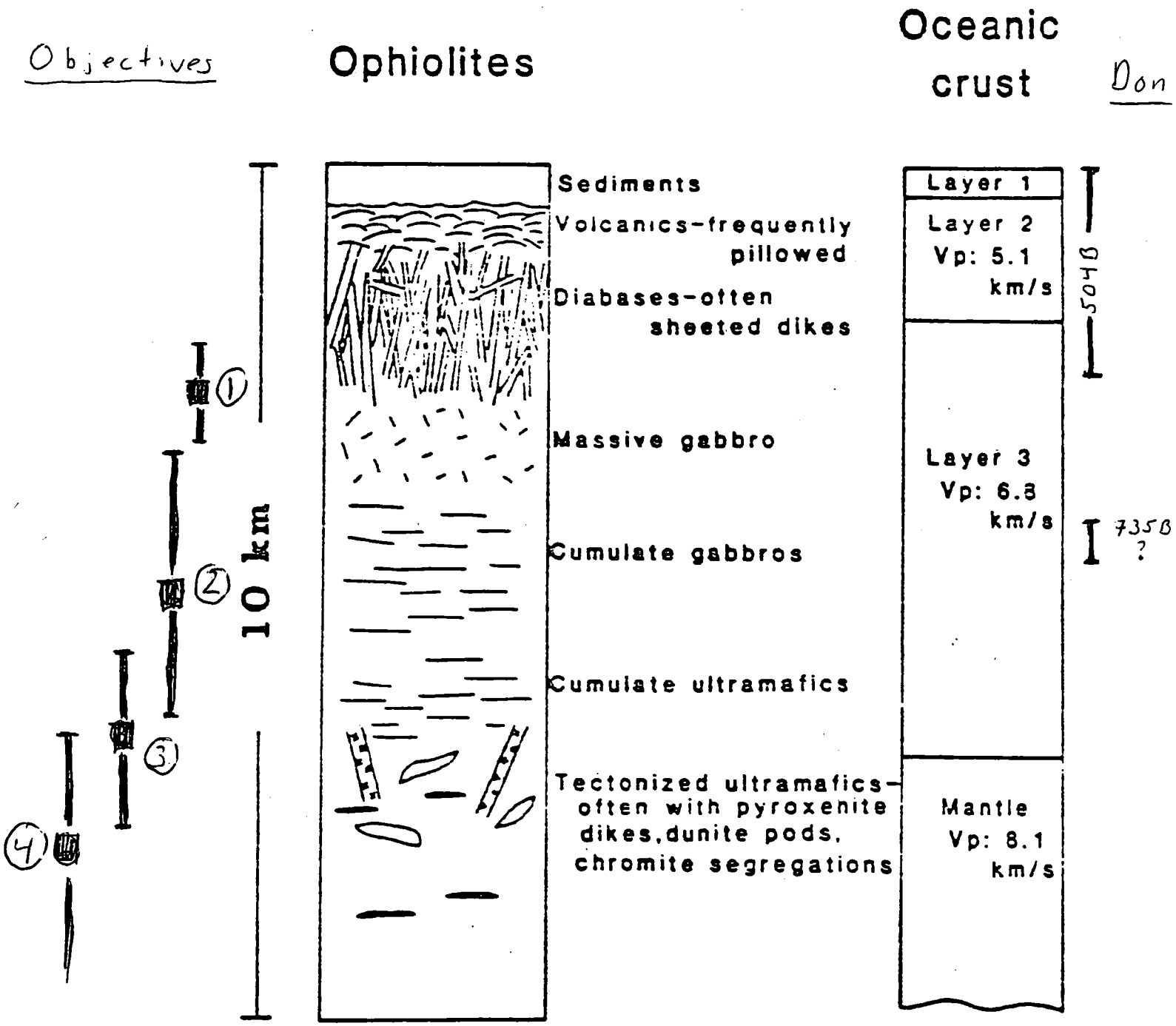
7.7 LITHP Annual Report to PCOM

The Annual Report given by the LITHP Chair to PCOM at the Annual Meeting in December 1991 is attached as Appendix V.

7.8 Vote of Thanks

LITHP thanked J. McClain for all his work in hosting the meeting. In addition, all of those who attended the "geological field trip" along the South Fork of the American River greatly appreciated the opportunity - and learned a lot!

Appendix I


Objectives
Ophiolites
Oceanic crust
Don
10 km
1
2
3
4
Sediments
Volcanics-frequently pillowed
Diabases-often sheeted dikes
Massive gabbro
Cumulate gabbros
Cumulate ultramafics
Tectonized ultramafics-often with pyroxenite dikes, dunite pods, chromite segregations
Layer 1
Layer 2
Vp: 5.1 km/s
Layer 3
Vp: 6.8 km/s
Mantle
Vp: 8.1 km/s
5048
7358 ?

Appendix II. Proposals Considered in the 1992 Global Rankings

Program/Theme	Proposal #	Area	Rank 1991	Rank 1990
DEEP DRILLING				
Layer 2/3 and other Sites	375-Rev	Hess Deep	1	1
Upper mantle	369/A	MARK Area, MAR	7	2
Layer 2/3, Layer 3/Mantle	376A, 382/A	Vema FZ	5	5
Upper Mantle	374/A	Ocenographer FZ	13	21
Layer 3	352/E	Mathematician Ridge	26	22
Layer 3/Mantle - extinct ridge	300/B	Site 735B, AII FZ	12	17
Mantle - back arc basin	379/B	Tyrrhenian Sea	17	-
Layer 2/3	410	Hole 504B, EPR	-	-
Gabbro section	407	15°20'N	-	-
RIDGE CREST/HYDROTHERMAL PROCESSES				
Zero-age ridge crest	EPR-DPG	9°30'N, EPR	3	2
Sedimented Ridges II	SR-DPG	Escanaba Trough	5	5
Hydrothermal - slow	361/A	TAG, MAR	2	4
Hydrothermal medium	325/E	Endeavor Ridge	9	12
Extinct spreading ridge	331/A	Aegir Ridge	21	-
Hydrothermal, back-arc	360/D	Valu Fa Ridge	19	17
Extinct hydrothermal	319/E. Rev	Galapagos	24	-
Transform-dominated ridge	333	Cayman Trough	28	24
Axial valley ridge	413	Reykjanes Ridge	-	-
OLD OCEAN CRUST				
Jurassic crust	368E	Hole 801C	11	9
Cretaceous Volcanism	343/E, 411	Caribbean Sea	29	-

HOT SPOT/SEAMOUNT				
VICAP	280/A.Rev	Canary Islands	21	-
CONVERGENT MARGINS				
Back-arc tectonics	390	Shirshov Ridge	26	-
DYNAMICS OF RIFTING				
Volcanic Rifted Margins	NARM-DPG	N. Atlantic	4	11
Non-volcanic Rifted Margins	NARM-DPG	N. Atlantic	8	11
Dynamics of Early Rifting	323-Rev.	Alboran Basin	18	-
State of Stress	373/E	Site 505	19	19
OEANIC PLATEAUS				
Oceanic Plateau	142/E.Rev.	Ontong-JavaPlateau	10	-

Appendix III

July 22, 1991

Dr. William Erb
Director
Office of Marine Science and
Technology Affairs
U.S. Department of State
Washington, DC 20520

Dear Bill:

It was a pleasure to meet you on board the *JOIDES Resolution* at the San Diego port call earlier this month. Perhaps you could help me with the following query which came up at the last Planning Committee: What are the prospects for getting clearance to operate in the Red Sea? Has Operation Desert Storm changed things?

You may recall that early on in the life of ODP, the Planning Committee was hoping to schedule a drilling leg in the Red Sea. If the clearance situation had been very good, the leg would have happened in mid-1987. But the advice we were given was not encouraging, so it never got into the program.

The scientific interest in Red Sea drilling remains strong. If given encouragement, a Red Sea leg might get into the program in 1994 or '95. Should we encourage the scientific community in this quest?

Yours sincerely,

Tim Francis

Timothy J.G. Francis
Deputy Director

TJGF:hk

Ocean Drilling Program
Office of the Director
Texas A&M University Research Park
1000 Discovery Drive
College Station, Texas 77845-9547 USA
845-8480
Number: 62760290
FAX Number: (409) 845-4857

United States Department of State

Bureau of Oceans and International
Environmental and Scientific Affairs

Washington, D.C. 20520

July 31, 1991

Timothy J.G. Francis
Deputy Director
Ocean Drilling Program
Texas A&M University
College Station, Texas 77845-9547

Dear Tim:

I believe the answer to your query on Red Sea drilling is yes. Prospects there are imporved since 1987 especially with regard to Saudi Arabia. Egypt is likely to cooperate as I believe they were in 1987. Of course, all could change by 1995 but if you begin laying the groundwork now you could establish support within the countries.

I enjoyed meeting you as well and appreciate the kind hospitality aboard the vessel.

Best regards,

William Erb

Appendix IV

NON-ENGINEERING WISH LIST - UNPRIORITIZED
(For Discussion at Panel Meetings)
(Prepared: 3 March 1992)

I. ITEMS PRIORITIZED BY PCOM FOR ENGINEERING DEVELOPMENT AT APRIL 1991 MEETING

1 Pressure Core Sampler, including a manifold for extracting free and hydrated gases, a "harpoon" for extracting pore waters and an exchangeable pressure chamber.

2 Coring equipment for unstable strata to facilitate the recovery of unconsolidated sand/rubble without extensive loss or damage to cores.

II. ITEMS FOR DOWNHOLE MEASUREMENTS AND SAMPLING

	ITEM	STATUS
3	Acquisition of borehole gravimeter to determine formation density.	Current technology reviewed at last DMP Meeting
4	High temperature resistivity tool with fluid resistivity and temperature capabilities.	Development now under 1 year contract in U.K.
5	High resolution geochemical tool.	(Note: Panels need to define what they mean by high resolution)
6	High resolution downhole logging tool for magnetic susceptibility.	(Note: Panels need to define "high resolution")
7	Downhole device with appropriate packer for multiple in-situ sampling of free-flowing water in hard rock formations and measurement of pore-water pressure and permeability.	Steering Committee set up by PCOM in December

III. ITEMS FOR SHIPBOARD LAB

	ITEM	STATUS
8	Natural gamma data acquisition on the core on board in real-time.	At the RFP stage
9	MST (Multi-Sensor Track System) upgrade for natural gamma core logging device (and possibly spectral gamma as well).	The next step beyond Item 8
10	Resistivity equipment for discrete core measurements.	New instrument for continuous measurements on board
11	Sediment color scanner and necessary hardware and software for efficient shipboard data handling.	Non-ODP system used on Leg 138
12	Core barrel magnetometer for measuring/ monitoring the field in core barrel (checking success of demagnetization).	New one tested on last Leg
13	Carbonate autosampler, replacement coulometer.	SMP to review lab at next meeting

IV. COMPUTING IMPROVEMENTS

	ITEM	STATUS
14	New database structure to deal with expansion and to facilitate core-log data integration.	Data Handling Working Group to meet in March
15	New hardware/software to complete Item 14.	As above

V. OTHER ITEMS

	ITEM	STATUS
16	Generation of a composite index for the first 30 Legs of ODP.	ODP CD-ROM being produced
17	Micropaleontology reference slide collections (forams, diatoms, radiolarians). Minimum of two sets, with at least one set shipboard.	Not known

Appendix V

LITHOSPHERE PANEL ANNUAL REPORT
December 1991
Austin, Texas

LITHP met twice in the last year: once in March in La Jolla, CA, and then in October in Nicosia, Cyprus, where we held a joint session with TECP.

1. Planning Activities

Last year I reported that two approaches are necessary to begin to address the LITHP's long-term goals presented in our 1988 White Paper: one is to continue planning towards developing the capacity to drill deep so that we can obtain a complete crustal section, and the second is to begin a program of offset drilling. Some progress has been made in both areas:

a. Deep Drilling - LITHP believes that it is ultimately critical to drill deep holes at a number of sites in order to understand lithospheric processes. It is likely that deep holes in fast and slow-spreading environments, together with a deep off-axis hole tied to a moderately deep on-axis site to study changes due to alteration will be necessary.

In order to push technological developments towards deeper capabilities, at the spring meeting we decided that LITHP's **short-term strategy** will include drilling a scientifically sound program of intermediate (2-2.5 km) depth holes to maximize the present vessel's capabilities, to advance the technology, and to increase knowledge of the challenges to be faced in very deep drilling.

We are now seeing proposals and programs that are being considered for drilling in the near future that begin to answer this need (eg. some of the rifted margin sites and some of the offset drilling proposals).

At the same time as adopting this short term strategy, we continue to work towards the goal of deep (4-6 km) drilling. At the spring meeting, at the request of the Chairman of TEDCOM, we took our original six "example" sites and narrowed them to a single "ocean crust" site using information from Holes 504B and 735B. This site was submitted to TEDCOM.

LITHP is also pleased that some OPCOM funds have been designated for a feasibility study of deep drilling. For our planning purposes, it is critical to know whether a goal of a continuous section through the oceanic crust is realistic in terms of time, technology and cost.

LITHP is interested in seeing this study evaluate the time, technology and cost of drilling: i) a 4 km hole, ii) a 6 km hole in oceanic crust. We have also designated one panel member--Dan Moos--to act as our liaison and to be available to assist in answering questions or providing information to the consultants whenever required.

b. Offset Drilling - at the last annual meeting, LITHP urgently requested that PCOM establish a working group to prioritize the scientific objectives that can be realized by offset drilling, and to determine a drilling program to meet those goals. The Panel was very disappointed that PCOM chose to delay formation of this group until its spring meeting. The WG has now met once and will meet twice more. The consequence of this delay is that the WG has only just begun its deliberations at a time when Atlantic drilling is being scheduled, whereas other programs involving Atlantic drilling have been given considerable attention.

In light of this, LITHP has recommended that the OD-WG be specifically charged with developing an initial drilling strategy for the Atlantic and laying out a provisional schedule for Atlantic drilling at its next meeting. This may require both an extra day of meetings, plus involvement of those proponents with interests specifically in the Atlantic. This in some ways turns the WG more into DPG, but we feel that, rather than form an additional group, this need can be addressed under the WG's mandate.

LITHP is pleased that development of the DCS system is the top priority for OPCOM funds, as the system is urgently needed in order to accomplish many of LITHP objectives, in particular drilling through the upper layers of the crust. However, it is now clear from the success of Leg 139 that some of our objectives, in this case initial exploration of hydrothermal systems, can be attained with standard drilling procedures. We look forward to drilling at Hess Deep as an opportunity to demonstrate that drilling in the lower layers can also be accomplished.

2. Supplemental Science

LITHP has strong interests in two of the supplemental science proposals. PCOM specifically charged us to delineate the drilling we would give up in order to accomplish these objectives.

In the case of logging 801C--LITHP supports its inclusion in Leg 144 and is willing to give up 3.5 days of basement drilling to accomplish the logging program. However, the Panel does not want to give up planned basement drilling at MIT-1 because of our interest in getting enough inclination data to average out secular variations and also recovering a number of flows to define geochemical composition and variations. I now understand that the Co-Chiefs have made some changes to the drilling program which includes reducing basement penetration by 100 m at MIT-1. I do not believe there are now 3.5 days left of basement drilling. However, LITHP believes the basement objectives at MIT-1 are important and at least 200 m of penetration needs to be planned.

In the case of OSN-2--LITHP has as one of its goals the establishment of global seismic arrays and has stated that installation of new observations needs to be an integral part of the implementation plan for the ODP Long Range Plan.

In reviewing this proposal, we have been plagued by varying time estimates--when we first reviewed it the estimate was 4 days; when we discussed it at our fall meeting it was up to ten days; it is now back down to 5.7 days.

In answer to PCOM's specific question--LITHP is willing to give up lithospheric objectives of Leg 145 in order to drill OSN-2.

However, there is not enough drilling of LITHP interest to give up 10 days, and our willingness to accommodate OSN-2 is due to the fact that Leg 145 does not address high priority objectives. The Panel also strongly felt that it is unacceptable to devastate Leg 145 by removing so much time from its schedule (and even with the revised time estimate, it is still more than the original guidelines for supplemental science). Needless to say, LITHP is pleased that the issue of supplemental science proposals is now dead.

3. Membership

There have been a number of changes in the last year to the Panel as U.S. members have rotated off and non-U.S. scientists have been changed. New British and French representatives began their terms in March, and we have replaced three U.S. panel members.

At the fall meeting, both Jason Phipps-Morgan and Guy Smith were scheduled to rotate off the Panel. Guy has agreed to serve for one more meeting and we have submitted nominations for Jason's replacement to fill our need for an individual with expertise in modeling. Our top candidate has been contacted and is almost certain he would agree to serve if invited.

PCOM had requested that LITHP discuss with TECP whether tectonics interests were covered sufficiently on LITHP. This we did in our joint session, and both panels felt their interests are well represented and the liaisons are appropriate.

A final personal issue that I would like to make you aware of is that I shall be leaving my current position with SEA and moving back to WHOI in a full-time capacity to work with Bob Detrick in coordinating the RIDGE Office. I plan to continue my term as Chair of LITHP, but if any PCOM members have concerns, I would be glad to discuss them.

ODP Proposal Review Form **059-Rev3**

Proposal received at the JOIDES Office: 01/30/92

Title: **Continental Margin Sediment Instability: Global Sealevel History and Basinal Analysis Through Drilling Abyssal Plains**

Proponent(s): P.P.E. Weaver, R.B. Kidd, J. Thompson, S. Colley, I. Jarvis, R.T.E. Schuttenhelm, G. de Lange, R.E. Cranston and D.E. Buckley

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

- ☐ 1) Proposal objectives are not within the mandate of this panel (as listed on back).
- ☒ 2) Does not address high-priority thematic objectives (as detailed in Long Range Plan).
- ☐ 3) Is of secondary interest to this panel if it is of high priority to some other panel.
- ☐ 4) Addresses high-priority objectives, but with deficiencies, as noted below.
- ☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

This is an excellent proposal which does not, however, address issues of high priority interest to LITHP. Two issues of secondary importance to the Panel include:
(1) early sediment diagenesis and the "progressive oxidation front", and
(2) the study of processes occurring on the Canary Islands and Madeira (hotspot volcanism) through analysis of materials shed from the islands.

As a general comment, it would be valuable for these proponents to communicate with the VICAP proponents with the goal of possibly integrating these two proposals. However, this proposal shares with the VICAP proposal several shortcomings which make it unlikely that future versions would be ranked highly by this panel:
(1) there may be difficulty dating the deposits, because of dilution due to their distal nature; and
(2) it will be difficult to identify which island is the specific source of materials shed from the Canaries, and thus to generate useful information about temporal changes and hotspot evolution based on those materials.

Date returned to :

RECEIVED APR 21 1992

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. Philip P.E. Weaver
Institute of Oceanographic Sciences
Deacon Laboratory
Brook Rd., Wormley, Godalming
Surrey GU8 5UB

ODP Proposal Review Form

332-Rev3

Proposal received at the JOIDES Office: 02/04/92

Title: Florida Escarpment Drilling Transect

Proponent(s): C.K. Paull, M. Kastner and D.Twichell

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
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For safety guidelines see JOIDES Journal special issue referenced on the back page.

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- ☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

Although this proposal is not within the mandate of LITHP, the Panel discussed it in terms of its interest in the fluid flow. An aspect of the proposal that requires further development is whether the proposed drilling will test the hydrological model and can determine the direction of fluid flow, i.e. through the platform or through the hemipelagics. If the fluid flow is from the carbonate platform then there is no source of metals for the formation of Mississippi Valley type deposits briefly mentioned in the proposal. However, if dewatering of the hemipelagics is occurring in that environment, then formation of such deposits might be possible.

Date returned to :

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent:

Dr. Charles K. Paull
Department of Geology
University of North Carolina
213 Mitchell Hall
Chapel Hill, NC 27599-3315

ODP Proposal Review Form **333-Add**

Proposal received at the JOIDES Office: 02/04/92

Title: Update to: Tectonic and Magmatic Evolution of a Pull-Apart Basin: A Drilling Transect across the Cayman Trough, Caribbean Sea

Proponent(s): P. Mann

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

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- ☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

LITHP appreciates the update on the status of site surveys that were requested by LITHP and TECP, and is pleased to learn of the completion of the aeromagnetic survey of the Cayman Trough. The objectives of CAY-4, 5, and 6 address high priority objectives of direct interest to LITHP.

LITHP notes that two of their major concerns remain unaddressed by the currently planned site surveys:

1) better characterization and documentation of the petrology and geochemistry of the Cayman Trough

2) the relatively poor constraint on crustal thickness.

As stated in the earlier LITHP review of this proposal, higher quality seismic refraction data than are currently available must be obtained to determine whether the crust is really as thin as proposed and to verify that Layer 2 is only about 200 m as is asserted in the proposal. Until this information is provided, LITHP regards this as an interesting proposal but one that it cannot rank highly due to the absence of this fundamental information.

Date returned to :

RECEIVED APR 21 1992

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. Paul Mann
Institute for Geophysics
University of Texas at Austin
8701 Mopac Boulevard
Austin, TX 78759

ODP Proposal Review Form

354-Rev

Proposal received at the JOIDES Office: 01/30/92

Title: Neogene History of the Bengueala Current and Angola/Namibia Upwelling System

Proponent(s): G. Wefer, W.H. Berger, L. Diester-Haass, W.W. Hay, P.A.Meyers and H. Oberhänsli

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

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Comments if within mandate of this panel (points 2-5):

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. Gerold Wefer
Fachbereich Geowissenschaften
Universität Bremen
Bibliothekstrasse
D-2800 Bremen 33

ODP Proposal Review Form **361-Add**

Proposal received at the JOIDES Office: 10/25/91

Title: Site Survey, TAG Hydrothermal Field, MAR 26°N

Proponent(s): G. Thompson

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

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- ☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

The site survey work proposed in 361-Add is exactly the type of study needed, both to select the best targets for drilling at TAG and to maximize the scientific return from drilling. Bottom source OBS surveys and detailed gravity and magnetics would also help constrain TAG drilling results. LITHP enthusiastically supports the proposed survey and hopes that funding will be available in a timely fashion.

There is still a lot of detailed submersible mapping, and survey work that have not been incorporated into either this site survey report or the original TAG drilling proposal. LITHP is disappointed that this information has not been presented to strengthen the case for scheduling the initial leg of TAG drilling in 1994. In order for TAG to be highly ranked for 1994 drilling, a detailed proposal with justification for site selection and scientific goals that are achievable with non-Diamond Core System technology is needed by the August 1 proposal deadline.

Date returned to :

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. Geoff Thompson
Department of Chemistry
Woods Hole Oceanographic Institution
Woods Hole, MA 02543

ODP Proposal Review Form **403-Rev**

Proposal received at the JOIDES Office: 02/03/92

Title: Revised Proposal to Drill the KT Boundary, Gulf of Mexico Basin

Proponent(s): W. Alvarez, J. Smit, E.M. Shoemaker, A. Montanari, R.T. Buffler, A.R. Hildebrand, S.V. Margolis, and Mexican proponent(s)

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

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☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

This proposal does not address high priority goals of LITHP; however, the Panel recognizes the importance of bolide impacts in the geological and biological record. This proposal, one of two with similar objectives, is exciting, topical and a role for ODP in this important research is appropriate.

LITHP has several recommendations:

1. A more carefully drawn discussion of what ocean drilling will accomplish complementary to, or instead of, the potential on-land research is needed.
2. The proposal is driven by the desire to find the "smoking gun". In addition to this fascinating problem, LITHP notes that the question of the geological consequences of an impact on a coastal margin is of great interest.
3. We feel that this proposal would be greatly strengthened if the Alvarez group could coordinate their research effort with that of the Sigurdsson group (proposal # 415) to develop a leg by leg scenario of drilling that would address issues of impact effects including crustal disruption, volcanism (if any, which would be of particular interest to this panel), and ejecta geometry.
4. This proposal, and the other, should address the distorting effects of tectonics and sedimentary processes occurring in the 65 million years after the impact. We note that this proposal is concerned with the Gulf of Mexico, where tectonic disruption is probably far less than that in the Caribbean to the south.
5. The Alvarez-Sigurdsson proposals could address important LITHP themes if they could combine their goals with those of the Donnelly et al. proposal (#411) which is targeted on the Caribbean Basalt Province. However, we do not feel that crucial KT work should be sacrificed for such a combination.

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. Walter Alvarez
Department of Geology and Geophysics
University of California
Berkeley, CA 94720

ODP Proposal Review Form

409----

Proposal received at the JOIDES Office: 10/04/91

Title: High Resolution Late Quaternary Paleoclimatic and Sedimentary Record, Santa Barbara Basin, California

Proponent(s): J.P. Kennett

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
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Comments if within mandate of this panel (points 2-5):

The main objective of this proposal does not address high priority objectives of the Lithosphere Panel. LITHP is interested in the possibility that the anoxic basin sediments may record episodes of fluid discharge into the basin. Expulsion of metal-transporting fluids, most likely along basin-bounding faults, into an anoxic basin can result in precipitation of metal sulfide minerals. Many sediment-hosted ore deposits are postulated to have formed by this process. Active fluid expulsion south of the Santa Barbara Basin along the San Clemente Fault supports chemosynthetic vent communities on mounds of hydrothermal barite. Hydrothermal barite has also been recovered from the San Clemente fault along the southern border of the Santa Barbara Basin. If drilling occurs in the Santa Barbara Basin, a geochemical investigation of the sediments for evidence of fluid venting to the basin should be included. It should also be noted that there might be significant safety problems related to the presence of active hydrocarbon seeps. The proponents need to obtain additional seismic data in the basin and address these safety problems.

Although this proposal is generally outside of the area of thematic interest of LITHP, it clearly represents an opportunity for obtaining a lot of interesting science for a very modest investment of ship time and resources.

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RECEIVED APR 21 1992

JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. James P. Kennett
Marine Science Institute
University of California, Santa Barbara
Santa Barbara, CA 93106

ODP Proposal Review Form

410----

Proposal received at the JOIDES Office: 12/02/91

Title: A Proposal for deepening Hole 504B to core and log the dike/gabbro, layer 2/3 boundary

Proponent(s): J. Erzinger, J. Alt, and K. Becker

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
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- ☒ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

Deepening Hole 504B is of extremely high priority to LITHP. The hole is clean, coring proceeded smoothly during Leg 140 with a reasonable penetration rate. The hole provides the best prospect for obtaining a continuous section through the crust, and has been cited by the Offset Drilling Working Group as a prime target to drill the dike/gabbro boundary. LITHP urges publication and critical evaluation of the VSP data collected during Leg 111, and stresses the need to tie all available seismic data to the drilled hole. Drilling through reflectors is extremely important in order to relate ocean crust structure and lithologies to seismic interpretations, and the available data suggest a major velocity discontinuity may be reached with one more leg of drilling.

LITHP is somewhat concerned about the poor recovery which could result in the loss of critical transition zones at the bottom of the sheeted dike complex. Although recovery may improve with grain size increases downhole, LITHP encourages further development of the bit and core catcher designs to enhance core recovery.

LITHP ranks the program very highly and is excited at the possibility that the next Leg may drill through the dike/gabbro transition.

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. Jörg Erzinger
Inst. f. Geowiss. und Lithosphärenforschung
Universität Giessen
Senckenbergstrasse 13
D-6300 Giessen

ODP Proposal Review Form

411----

Proposal received at the JOIDES Office: 12/09/91

Title: Proposal for drilling the Caribbean Basalt Province - an oceanic basalt plateau

Proponent(s): T.W. Donnelly, R. Duncan and C. Sinton

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

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- ☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

Oceanic Large Igneous Provinces (LIPs), such as the Caribbean, Ontong-Java, and Kerguelan plateaus, are prominent large-scale bathymetric features of the ocean crust. However, in spite of their large size and obvious role in oceanic crustal formation, we still have a rather limited understanding of the tectonic and petrogenetic processes which created these features. LITHP clearly recognizes that our knowledge of oceanic LIP formation can only be enhanced by a systematic drilling initiative. LITHP fully agrees that such a drilling program needs to include sampling of the thick (0.5-1.5 km) sedimentary units which cap these plateaus. The sedimentary record will not only constrain the age of the LIP, but also can provide valuable insight into the subsidence history of these plateaus.

Evolution of the mantle source region(s) and the nature and extent of the "plume" component at any given LIP site will require extensive geochemical study of basaltic units obtained from numerous drillholes that penetrate basement to depths of at least 100-200m. In addition, one or two really deep (0.5-1.5 km) holes will also be required.

While LITHP heartily endorses LIP investigations and the proposed drilling strategy it cannot, however, enthusiastically endorse this particular drilling initiative for the following reasons:

1) Most of the margins of the Caribbean Cretaceous Basalt Province (CCBP) are either absent due to subduction, or are deeply buried beneath sediment. While it is recognized that there are pieces of obducted oceanic crust on land nearby, the geologic relationships of these materials to the submerged plateaus are still uncertain. This

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. Thomas W. Donnelly
Dept. of Geological Sciences
State University of New York
Binghampton, NY 13902-6000

inherent feature of the CCBP prevents any access to normal oceanic crust adjacent to the plateau. Without the ability to site "reference holes", it will be impossible to characterize the age and composition of the oceanic crust on which the plateau was built. The lack of any extrusive edge is a serious deficiency. Without at least one normal crustal reference hole, the interpretation of the petrogenetic history of the CCBP will not be very well constrained.

2) There is a lack of sufficient geochemical and geophysical data to adequately support a "megaplume and tail" model for the origin of the CCBP. What is the geologic evidence to support the idea that the CCBP and the present-day Galapagos hotspot are genetically linked? The relation between them cannot be based solely on a Sr- and Nd- isotope diagram. Furthermore, the geochemical affinities and the proposed spatial variation of the CCBP lithologies illustrated in Fig. 23 are extremely conjectural. The drilling strategy for this region, which is based on this hypothetical cross section, is highly questionable.

LITHP clearly recognizes the expertise of the proponents; however, this particular program at this point in time, is unsuitable for ODP drilling. It may be possible to get some preliminary information about the basement by collaboration with proponents of proposals to drill through the K/T boundary.

ODP Proposal Review Form

412----

Proposal received at the JOIDES Office: 01/28/92

Title: The Bahamas Transect: Neogene/Quaternary Sea-Level Fluctuations and Fluid Flow in a Carbonate Platform

Proponent(s): G.P. Eberli, D.F. McNeill and P.K. Swart

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

- ☒ 1) Proposal objectives are not within the mandate of this panel (as listed on back).
- ☐ 2) Does not address high-priority thematic objectives (as detailed in Long Range Plan).
- ☐ 3) Is of secondary interest to this panel if it is of high priority to some other panel.
- ☐ 4) Addresses high-priority objectives, but with deficiencies, as noted below.
- ☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. Gregor P. Eberli
Rosenstiel School of Marine & Atm. Sci.
University of Miami
4600 Rickenbacker Causeway
Miami, FL 33149

ODP Proposal Review Form

413----

Proposal received at the JOIDES Office: 02/03/92

Title: Magmatic and Tectonic Evolution of Oceanic Crust: the Reykjanes Ridge

Proponent(s): J. Cann, C. German, B.J. Murton, L.M. Parson, R.C. Searle, M. Sinha and S. Spencer

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
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- ☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

This is an interesting and imaginative proposal that addresses high priorities of the LITHP. There is particular interest in the "Type" section hole for Layer 2 and the approach to investigating states of stress in the lithosphere. The proposal is clearly immature, and the panel has a number of recommendations for the proponents to consider in revising the proposal.

First, the case needs to be made more strongly as to why drilling is needed to address all of these problems. In particular, many of the questions about AVR evolution, and geochemical and petrological variations along and across the ridges, could be constrained by near-bottom observations and detailed sampling. LITHP appreciates the value of studying the Reykjanes Ridge, but feels it is premature to identify the specific problems that demand drilling. The upcoming PETROS cruise should contribute to a redefinition of the drilling problems.

The proponents' ideas on stress measurements were applauded. However, they should be aware that experience in the program to date has shown that at least 500m of basement penetration is needed to produce reliable stress measurements from breakouts. Shallow holes simply do not reliably represent the state of stress in the lithosphere. Only a few of the proposed holes could be used for stress measurements; that part of the program needs to be redefined.

This is logistically an ambitious program clearly requiring multiple legs of work. The ship can carry two guidebases, so, at most, two bare rock sites can be accomplished per leg. Given the current state of DCS development, the zero-age sites are unlikely to be drillable for a few years.

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. B.J. Murton
Institute of Oceanographic Sciences
Deacon Laboratory
Brook Road, Wormley, Godalming
Surrey, GU8 5UB

The proponents have some very intriguing ideas. They are encouraged to rethink and reformat the proposal when they have digested the results from upcoming sampling and mapping cruises. Some thought should be given to reorganizing the work into "leg" size packages with a well-described phased implementation plan - or the proponents should think about reducing the proposed work to a one-leg package. Part of this rethinking should include the technological limits of guidebases and DCS. Information on technical and time requirements for each type of drilling can be obtained from JOI. There are a number of sites in the proposal which do not require DCS; the proponents may want to think about how to group these sites in their revised plans.

ODP Proposal Review Form

414----

Proposal received at the JOIDES Office: 02/03/92

Title: Rates, Effects, and Episodicity of Structural and Fluid Processes, Northern Barbados Ridge Accretionary Prism

Proponent(s): J.C. Moore, B. Carson, M. Kastner, X. Le Pichon, G. Moore and G. Westbrook

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

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- ☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

This is a well-conceived, mature proposal. LITHP recognizes the scientific importance of long-term monitoring of active fluid flow using instrumented boreholes.

As presently implemented, the proposal is tangential to LITHP's main interests. However, the LITHP has a strong interest in the diagenetic history of subducted crustal material. This aspect could be better addressed by :

(1) deepening proposed Holes NBR1 and NBR2 to significant basement penetration (>100m);
(2) high recovery coring of decollement zone for in-depth geochemical studies on-shore;
(3) long-term monitoring of fluid composition along fractures in the basement.

Hole stability is likely to be a problem and the need to case the hole should be assessed from previous drilling. If swelling clays could inhibit logging, it may be necessary to plan the use of drill-in casing through those sections of the hole. Another problem that needs to be considered in the possibility of stress-induced borehole failure, particularly at the depths of the decollement and below.

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. J. Casey Moore
Earth Sciences Board of Studies
University of California, Santa Cruz
Santa Cruz, CA 95064

ODP Proposal Review Form

415----

Proposal received at the JOIDES Office: 02/03/92

Title: Proposal for Drilling the Cretaceous-Tertiary Boundary in the Caribbean Sea

Proponent(s): H. Sigurdsson, S. Carey and S. D'Hondt

Evaluation by: ☒ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

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- ☐ 5) Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

The principal objectives of this proposal are not within the mandate of this panel. However, LITHP reviewed this proposal because:
(a) its objectives could result in exciting, high-profile science, and
(b) recovery of Caribbean Plateau basalts could be of interest, if this aspect could be developed further, scientifically.

LITHP thought the emphasis on the consequences of bolide impact (e.g. paleoclimate), as opposed to simply documenting the impact structure, was a major strength of this proposal. However, there were several concerns about implementation of some of the objectives:

1) Can the ejecta dispersal mechanism be deciphered in light of the poor understanding of plate tectonics in the area? It is important to understand the regional tectonics in order to reconstruct the radial effects.
2) Why are there no sites located in the Gulf of Mexico where the tectonics are simpler?
3) Is recovery using APC going to be good enough to answer the questions on paleoclimate, i.e. is the time resolution going to be adequate?

LITHP felt that the proposal could be strengthened by involving someone with expertise in Caribbean tectonics in order to resolve the problems of ejecta dispersal. In addition, LITHP also encourages closer scrutiny of site selection to determine whether drilling could accommodate more basement objectives in addition to the

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JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent: Dr. H. Sigurdsson
Graduate School of Oceanography
University of Rhode Island
Narragansett, RI 02882

K-T boundary aspects, particularly if these could be packaged as 1 or possibly 2 legs.

Furthermore, LITHP encourages the proponents to discuss scientific and drilling strategies for this area with proponents of proposal #403 (Drilling the K-T boundary, Gulf of Mexico Basin; Alvarez et al) and proposal #411 (Drilling the Caribbean Basalt Province, an Oceanic Basalt Plateau; Donnelly et al).