

MEMORANDUM

Geophysical Evaluation
Bass Basin, September 13, 1967

The geophysical exploration program accomplished during the past four months may be divided into two related projects, reprocessing and mapping. Key seismic lines were reprocessed to determine if better resolution of the seismic data could be gained by analog to digital conversion and deconvolution. Three new maps and three revised maps have been prepared. These incorporate new seismic control gained from the recently completed Otway survey and revisions necessary to the interpretation of the older data as a result of reprocessing.

Reprocessing - The Eastern Bass Strait Marine Seismic Survey was partially recorded using both analog and digital instruments. A six-fold C.D.P. line ES-52, and a single-fold line, ES-48, were experimentally processed digitally to compare the relative quality of the digital and analog data. The digital sections showed marked improvement over the coinciding analog sections, particularly the six-fold data.

A pilot reprocessing program was instigated to assay the advantages of digital reprocessing of analog data. Also processed were two simultaneously recorded digital lines where previously only the analog data had been used. The lines picked for this project were chosen to tie the three wells in the basin, cross the remaining untested closed structure, including the major range of the stratigraphic changes expected, and sample all the variations of recording techniques previously used.

Ten lines representing 413 miles of seismic data were reprocessed. The various types of recording techniques and instruments sampled by this project are as follows:

<u>Lines</u>	<u>Type Recording</u>	<u>Recording Instruments</u>
B-3, B-12 & B-21	Single-fold	A.M., Analog
EB-10 & EB-22	Six-fold	A.M., Analog
EK-10 & EK-27	Six-fold	F.M., Analog
ES-70	Single-fold	F.M., Analog
ES-39 & ES-80	Single-fold	Digital

The results show that in all instances digital processing produces superior seismic sections. The six-fold digitally recorded and processed data generate the best reflection resolution but the six-fold analog recorded and digital processed data are preferable to single-fold digital recorded and processed data.

Several factors contribute to the differences in reflection resolution in the various types of data. The two principal advantages that digitally recorded data have are true amplitude recovery, which makes possible a closer reproduction of the reflection amplitude produced by the different reflection coefficients, and the capability of better attenuation of water bottom multiples. Analog to digital converted data cannot be processed with true amplitude recovery. Digitally recorded data also have a better signal to noise ratio than analog data and the F.M. analog recording has a better ratio than the A.M. analog recording. The digital deconvolution filter does a better job of attenuating the water bottom multiples than any of the analog processing techniques.