

ELECTROMAGNETIC WAVE PROBING  
FOR SALT DISCONTINUITIES

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CHAPTER I  
TWO PAGE SUMMARY

Chapter II discusses the results of our radar research work at Seneca Lake accomplished last summer. The most notable result was the observation of a radar signal (discontinuity) about 1300 feet ahead of the mining face but in the direction of the planned mining area (toward the lake). It would be highly advisable for us to go back and take another radar look at this signal as the mining face advances to perhaps 600 feet from this discontinuity. We don't know what the discontinuity is, but it could be very important to management's plan.

Chapter III introduces a new idea for taking radar data continuously through salt, not just at certain fixed points called radar stations, as we have done in the past. This idea opens up an exciting new concept of data gathering promising to give much more detail of structure in salt.

Chapter IV discusses the status of our sonar research (authorized eleven months ago at the Atlanta meeting) just now getting into the equipment phase. This chapter describes the Sonar 1 set we have bought and its characteristics.

Chapter V continues discussing sonar research describing a second higher frequency (and thus higher resolution) sonar set called Sonar 2 which is on order.

Chapter VI describes our approach to listening for noise generated in the salt. We do this for three reasons, one to detect where it comes from, two to determine what its predominant frequency is, and three, the rate of noise emission as a function of position. Is it noisier at the corners of a salt pillar where the stresses are greater? Can we tell

anything about impending collapse of the salt by the rate of noise it is emitting (as some Bureau of Mines data indicate)?

Appendix A is the usual corrections to the last report.

Appendix B discusses the beamwidth of the Charlie II radar antennas in salt and the circle of uncertainty that results from not having an infinitely sharp beam.

Appendix C discusses the beamwidth of the Bravo II radar antennas in salt and the difference between a duplexed radar and a nonduplexed radar.

Appendix D discusses how we improved the Bravo II radar system display by eliminating a nasty 400 Hz "hum" we had in our radar display system.

Appendix E illustrates some uses of a hand-held Hewlett Packard computer, HP-65 for salt calculations and theoretical work.

Appendix F is the usual Personnel and Budget Changes.