ANNUAL PROJECT REPORT
AS OF DECEMBER 1985

1. PROJECT SPONSOR:

Lambda Group, Inc.
1445 Summit Street
Columbus, Ohio 43201

2. PROJECT MANAGER:

Jo Davison

TELEPHONE: (614) 294-2544

3. OCDO GRANT NO#: 6-85-140

4. PROJECT: Final Report

5. PROJECT TITLE: Microbial Desulfurization of Ohio Coal Research Plan

6. PROJECT TERM: FROM March, 1985 **TO** September, 1985

7. PROJECT	**NAME**	**COST-SHARE**
CO-SPONSORS:	OCDO	$ 3,000
	Lambda Group, Inc.	8,000
TOTAL PROJECT COST:		$11,000

I. ABSTRACT

8. OBJECTIVES

The Lambda Group, Inc. has developed a process for biological oxidation of pyrite and other coal impurities utilizing mixed cultures of algae and bacteria. The general objective of work supported through this project grant was to develop an 18-month research plan for refining and scaling-up the Lambda process. Specific objectives included the identification of steps and procedures to be followed for increasing the efficiency of the process and achieving greater volumes and mass of the cultures needed for effective scale up.

PROJECT DESCRIPTION:

The Lambda Process utilizes a biological oxidation process to remove pyrite and other coal impurities from raw coal. The agents employed included mixed cultures of naturally occurring algae and bacteria reacting with the coal in a bog-simulated process to separate inorganic and organic sulfur from the coal. Prior extensive work by the Lambda Group focused on documenting

morphological changes of the culture's action on iron, pyrite sulfur and organic compounds in coal slurries.

Under grant support from OCDO, Dr. Richard Anderson of West Virginia University and Dr. Robert Savage of Ohio University were engaged to assist the Lambda Group in preparing a research plan to guide further development of the Lambda Process. The plan includes two basic parts. First, test equipment and procedures were outlined to guide laboratory work by the Lambda Group to confirm the predicted sulfur removal from coal in a controlled and reproducible process. Work to be undertaken in this part is directed at refining the process and increasing its efficiency of sulfur removal. The second part focuses on scale-up requirements for increasing the process from one gallon test volumes up to 50 and 1500 gallon scales.

RESULTS/FINDINGS:

A final report, documenting test results to date and including research plans, was received by the OCDO in September of 1985. Part I of the research plan has been initiated by the Lambda Group at their Columbus facility. Related work, applying the cultures to acid mine drainage areas, has also recently been undertaken by the Lambda Group.