

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The findings, conclusions, and recommendations resulting from a study of mine drainage abatement measures for the Tioga River watershed may be summarized as follows:

- 1 . The Tioga River in the vicinity of the proposed Tioga-Hammond Lake is normally alkaline during high flows but becomes acid during low flows.
2. The acid load in this reach of the river is due to acid mine drainage (AMD) discharges located in the watersheds of Morris Run, Coal Creek, and Bear Creek.
3. The U. S. Corps of Engineers has established the reductions of acid loads from the Study Area at certain flows that are necessary to achieve an alkaline pool in the proposed Tioga-Hammond Lake.

4. The abatement of AMD at various flow conditions in the Tioga River must achieve an acid load reduction as summarized below:

<u>Design Condition</u>	<u>Total Acid Load Reduction Required (Lbs./Day)</u>
Low	13,900
Average	21,000
Wet Weather	28,600
Maximum	28,600

5. The abatement measures used singly or in combination in developing an abatement plan are as follows:

Preventive measures:

- Reconstruct stream channels
- Construct surface water diversion ditches
- Restore strip mines
- Move refuse into strip mines
- Excavate and restore subsidence areas

Treatment measure: Chemically neutralize, oxidize, and settle mine drainage in treatment facilities

6. Because the degree of accuracy in predicting its effectiveness is poor due to the unavailability of mine maps, the abatement of AMD by inundating deep mine workings was not considered.

7. The objectives of the Corps of Engineers cannot be achieved by implementation of an abatement plan comprised solely of preventive measures.

8. The abatement plan selected to achieve the Corps' objectives is basically the same as the one recommended in the FWPCA Report, except that it has been modified to reflect the construction of the preventive measures that were funded by the EPA demonstration project, and to reflect changes in surface and subsurface conditions that have occurred since the FWPCA Report was published.

9. The recommended plan includes the construction of preventive measures, followed by the construction of treatment measures consisting of two treatment plants.

10. Sixteen AMD discharges exist in the Study Area. The recommended preventive measures will eliminate mine drainage at eight points and reduce mine drainage at the remaining eight points. The remaining mine drainage will be treated at two locations during flows of less than design average in order to achieve the Corps' objectives.

11. The recommended abatement plan is based upon continued surface restoration of active strip mines in a manner that is currently practiced and that is similar to recommended restoration procedures.

12. The costs associated with the recommended abatement plan are summarized in Table 5, page 24.