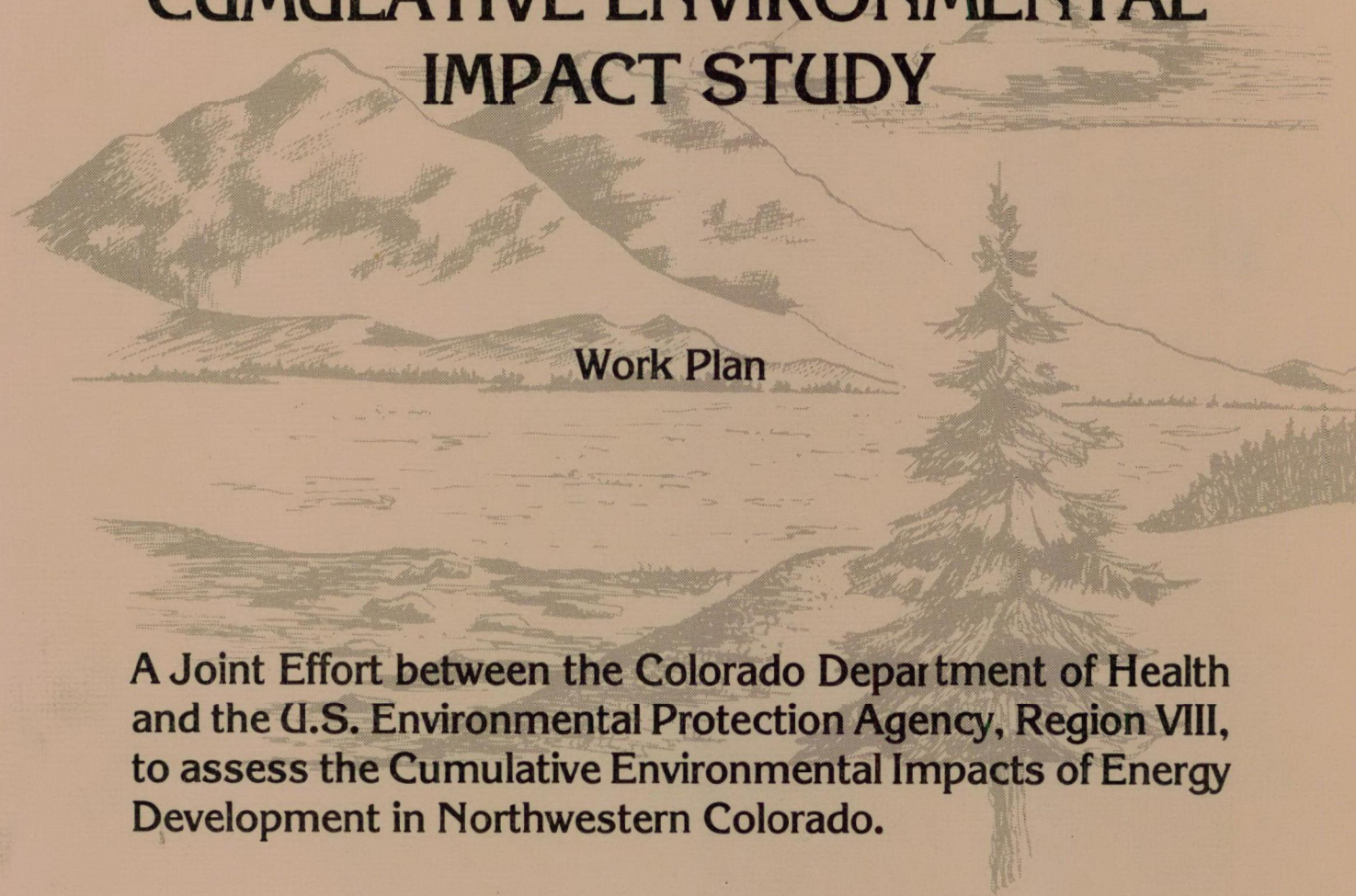


CUMULATIVE ENVIRONMENTAL IMPACT STUDY



Work Plan

**A Joint Effort between the Colorado Department of Health
and the U.S. Environmental Protection Agency, Region VIII,
to assess the Cumulative Environmental Impacts of Energy
Development in Northwestern Colorado.**

October 1981

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to Assess the Cumulative Environmental Impacts of Energy
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Colorado Department of Health
Environmental Protection Agency,
Region VIII
October 1981

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INTRODUCTION

This proposed Cumulative Environmental Impact Study is a joint effort between the Colorado Department of Health and the Environmental Protection Agency (EPA), Region VIII in cooperation with other state, federal and local agencies and industry.

The Study will be an iterative process. During the first year the following tasks are to be completed: (1) gather and assess existing environmental data; (2) identify additional data needs; (3) inventory and assess completed or ongoing studies; (4) analysis of data, studies and models; (5) develop methodology for assessing cumulative environmental impacts; (6) prepare a first-cut assessment of the cumulative impacts; and (7) define the elements of a continuing program.

Subsequent years, depending on funding and resources, will consist of gathering needed data, improve assessment techniques, including models and the publishing of cumulative environmental impact reports.

BACKGROUND

Overview

Colorado is experiencing accelerated, large-scale development of energy resources and facilities, especially in the northwestern corner of the State. Coal, oil, gas, oil shale, and uranium resources are abundant, and either are already being actively developed or are on the threshold of development.

This large-scale energy development in Colorado necessitates a joint effort of the Colorado Department of Health and the EPA-Region VIII to develop the capabilities to identify and assess the cumulative environmental effects of many individual energy projects and facilities. While the environmental effects of any single activity by itself can be assessed with relatively good accuracy, limited means are available at this time to assess the cumulative environmental effects of a number of major projects which are relatively adjacent to each other. This is a serious deficiency, since a large portion of both current and proposed energy projects in Colorado are located within relatively limited areas, resulting in significant environmental interactions and aggregate effects.

A dramatic example of this characteristic of proximity is the concentration of virtually all of Colorado's oil shale deposits in only two adjacent counties, which overlap with the three adjacent counties comprising Colorado's principal coal resources area. Within this same six-county area (Garfield, Moffat, Rio Blanco, Mesa, Routt and Delta Counties) are a major oil and gas field, and four major coal-fired power stations. This area falls entirely into the Colorado River drainage, and the Yampa and White Rivers sub-basins, a fact with significant air quality and water quality implications. Also within this area are located three sensitive environmental areas: Dinosaur National Monument, the Flat Tops and Mt. Zirkel Wilderness areas. Similar, though less dramatic, energy concentrations exist elsewhere in Colorado.

Environmental Impacts of Oil Shale Development

The environmental impact associated with commercial oil shale operations will depend upon: (1) the type of retorting operation; (2) the type of mining systems and associated resources recovery rate; (3) the magnitude of the operation; (4) the processing system employed to recover the shale oil; and (5) the type of disposal system used for the retorted shale and other wastes. The operation can be expected to: (1) produce air and water pollutants; (2) cause some degree of surface subsidence/disruption; (3) increase noise levels; (4) impact local vegetation and animal life; and (5) impact upon local population and supporting commercial activity. Thus, the development of mitigation strategies for socio-economic, land, air, and water impacts are required. The socio-economic impacts and mitigation strategies are not part of this study but are part of another State study being done by the Colorado Department of Local Affairs and the Department of Natural Resources.

OBJECTIVE

The overall objective of this study is to assess the cumulative environmental impacts of oil shale production and other energy developments in Northwestern Colorado, based on two or more production scenarios and the associated population growth.

STUDY AREA

The study area is shown on Map 1 and will include energy projects in Delta, Garfield, Mesa, Moffat, Rio Blanco and Routt Counties in Colorado and those projects in Utah that may impact Colorado environmentally.

In assessing the environmental impacts, the Study will consider areas outside the six-county region in order to assess, for example, air impacts on Class I areas, as well as water quality impacts on the lower Colorado River.

PROJECT MANAGEMENT/ORGANIZATION

Management

The project will be managed by Paul Ferraro, Colorado Department of Health. EPA's coordinator for the project is John Philbrook. The majority of the effort will be performed by the Department of Health and EPA, Region VIII.

Organization

The project organization is shown in Figure 1. Members of the Colorado Department of Health/EPA Working Group are presented in Table 1.

RESOURCES

The Colorado Department of Health plans to devote more than 2.5 FTEs to this Study and EPA 1.5 FTEs.

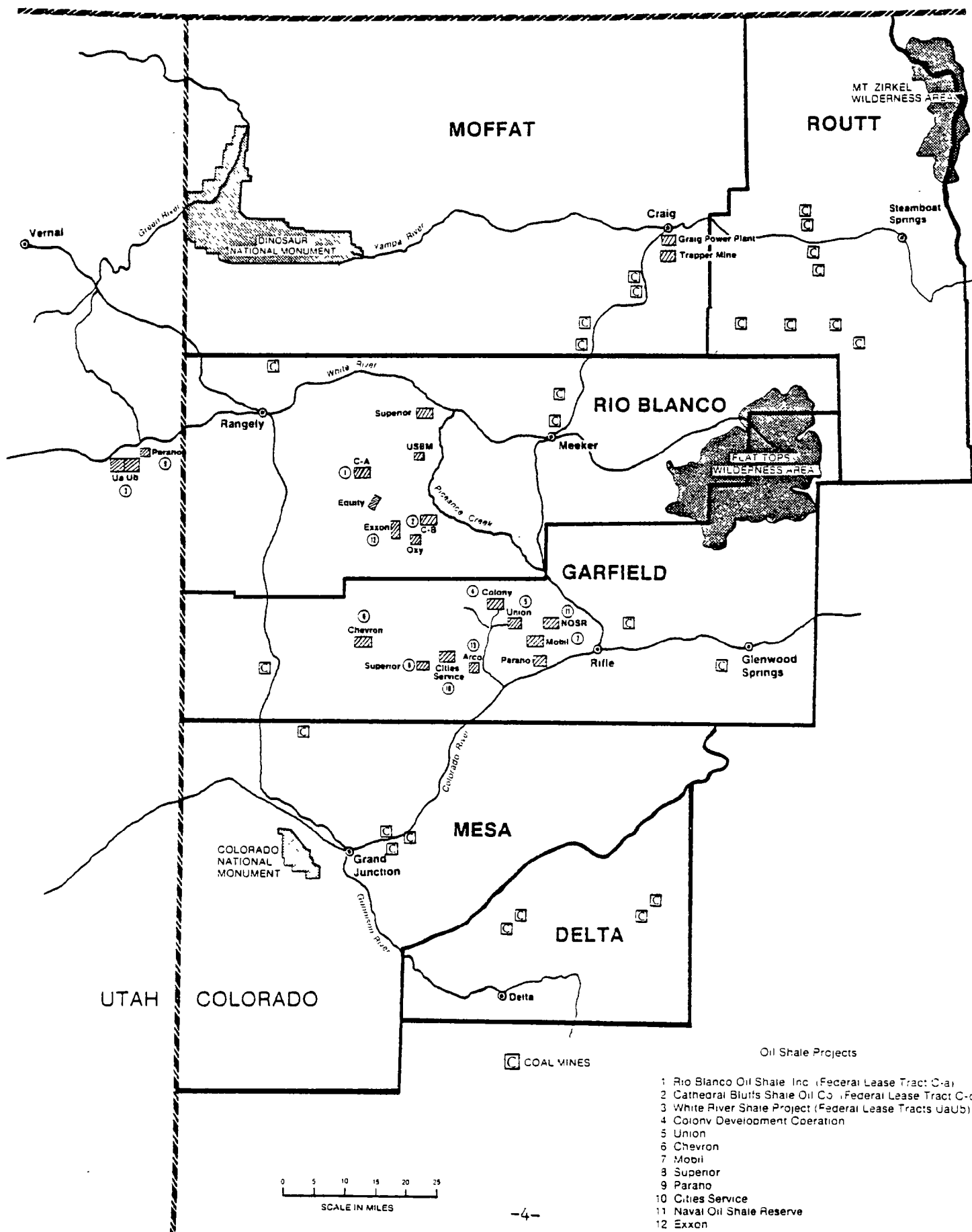


FIGURE 1

PROJECT ORGANIZATION OF CUMULATIVE ENVIRONMENTAL
IMPACT STUDY

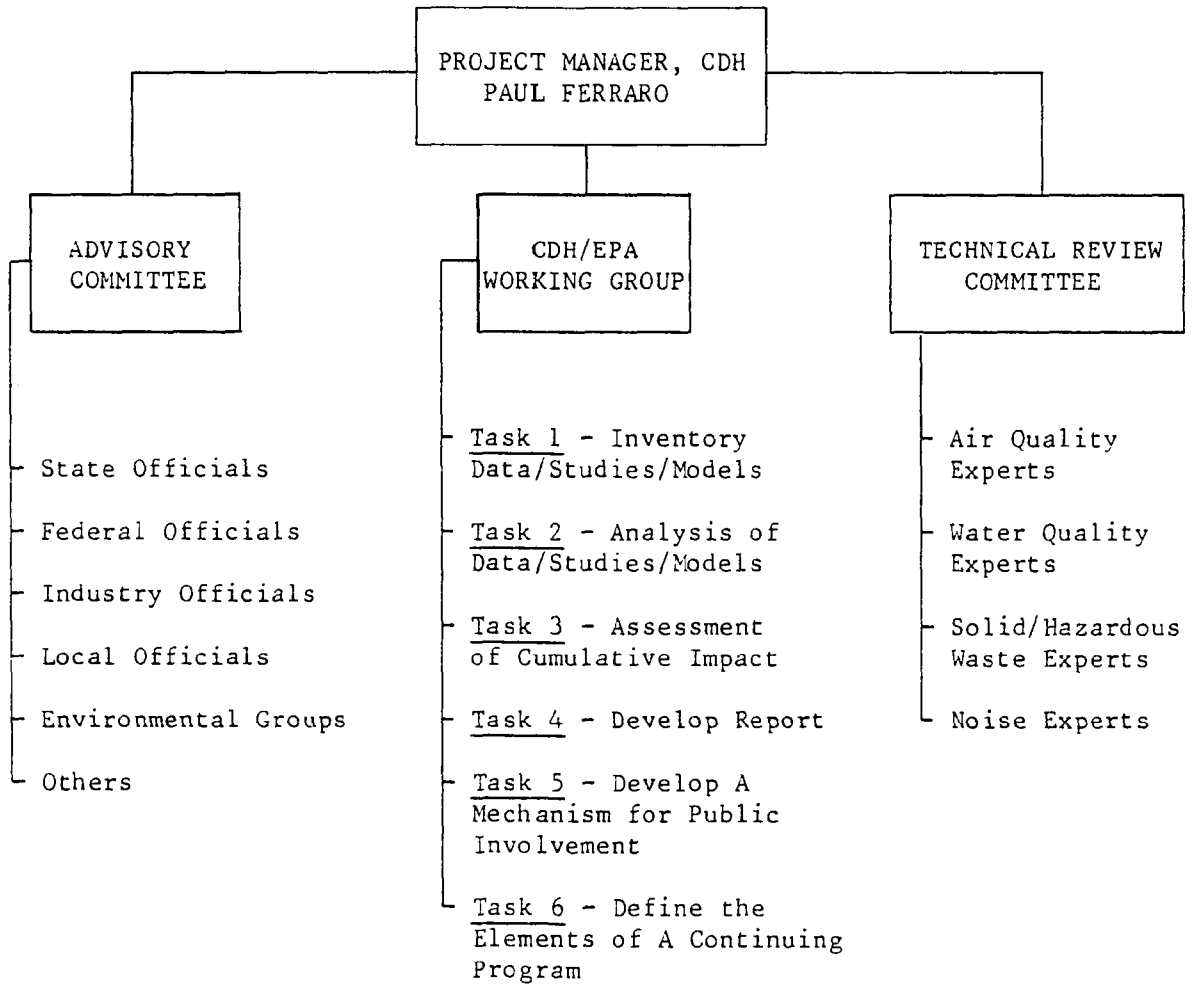


TABLE 1

CDH/EPA WORKING GROUP

PAUL FERRARO, PROJECT MANAGER, CDH

CDH MEMBERS

Paul Nazaryk	Office of Health Protection	320-8333
George Lauderdale	Air Pollution Control	320-8333
Maureen Dudley	Water Quality Control	320-8333
Greg Starkebaum	Solid Waste Control	320-8333
Bob Graves	Air Pollution Control	320-8333
Dave Gourdin	Noise Control	320-8333

EPA MEMBERS

John Philbrook	EPA, Coordinator, Energy Office	837-5914
Mike Hammer	Energy Office	837-5914
Ken Lloyd	Analytical Center	837-2351
Rick Claggett .	Water Quality	837-2721
Doug Linkhart	Air Quality	837-3471
Eliot Cooper	Air Quality	837-6131
Don Shosky	Solid Waste	837-6258
Diane Groh	Noise Control	837-4136
Wes Wilson	Environmental Evaluation	837-4831
Dean Gillam	Toxics	837-3926

KEY ACTIVITIES

Tasks to be undertaken in this study are:

1. Use (where feasible) the energy workforce/population/productions scenarios developed by the State Cumulative Impact Task Force, chaired by the Executive Director, Department of Natural Resources.
2. Gather and assess environmental information and data.
3. Inventory and assess past and ongoing studies that will provide valuable input. These include such studies as: DOE's Risk Analysis Study, SAI Air Quality Study, Four Corners Air Quality Study, etc.
4. Inventory and assess existing models and identify needed changes.
5. Develop necessary analytical tools to prepare a first cut assessment of the cumulative environmental impacts for air, water, solid waste, hazardous waste and noise.
6. Prepare and distribute a report showing the tentative cumulative environmental impacts. See Draft Report Outline, Attachment I.
7. Develop a mechanism for public involvement throughout the Study.
8. Develop a work plan that will identify the mechanism for gathering or developing needed information, data and analytical tools; and a budget and resources for continuing a cumulative environmental impact assessment program in subsequent years as information and analytical tools become more accurate.

SCHEDULE

The project schedule is shown on Table 2. The project period is from October 1, 1981 to September 30, 1982. Table 3 outlines a more detailed schedule.

OUTPUTS

1. Cumulative Environmental Impact Report
2. Appendices
 - a) Inventory of Significant Studies
 - b) Identification of Data/Research Needs

TABLE 2

SCHEDULE

TASKS	QUARTERS			
	1	2	3	4
1. Production Scenarios	—			
2. Data Inventory & Assessment	—			
3. Study Inventory & Assessment	—			
4. Model Inventory & Assessment	—			
5. Cumulative Impact Assessment		—		
6. Prepare Draft Report			—	
7. Prepare Final Report				—
8. Public Involvement	—			
9. Develop Work Plan for Future Assessments			—	

DELIVERABLES & MILESTONES	QUARTERS			
	1	2	3	4
1. Draft Inventory Reports			*	
2. Draft Cumulative Report			*	
3. Final Cumulative Report				*
4. Work Plan				*
5. Progress Reports	*	*	*	*
6. Progress Briefings	*	*	*	

TABLE 3

Cumulative Environmental Impact Study
Detailed Schedule

<u>Tasks</u>	<u>Task Leader</u>	<u>Task Member(s)</u>	<u>Due Date</u>	<u>Comments</u>	<u>Areas of Consideration</u>
1. Final Work Plan Distribution	Paul Ferraro	Mike Hammer	10/30/81	Distribute to D.D.'s, EPA, Industry, Locals others	
2. Production Scenarios	Paul Ferraro	Mike Hammer	11/30/81	Data from Industry, ROMGA, Cumulative Impact Task Force, others	Emission, water discharge, spent shale data etc.
3. Employment Projections	Paul Ferraro	Mike Hammer	11/30/81	Data from Industry and Cumulative Impact Task Force, Locals	Carpool, bus transportation information
4. Population Projections & Allocations	Paul Ferraro	Mike Hammer Judy Glazner	12/15/81	Cumulative Impact Task Force	
5. Land Impacts - Sensitive Environmental Areas	Paul Nazaryk	Wes Wilson Mike Hammer	1/30/82	Data from DNR, BLM, others	Wildlife, Wilderness, Nat/State Parks, endangered species areas, Agricultural, Recreational, Fed/Pri Lands Reservoirs, Corridors, etc.

6.	Air Quality Impacts	George Lauderdale	Doug Linkhart Eliot Cooper Ken Lloyd	3/15/82	Studies - SAI, Four Corners, EPA, Industries, others	PSD, Total Emissions, Ambient Stds., Visibi- lity, Acid Rain
7.	Water Quality Impacts	Maureen Dudley	Rick Claggett Water Divi- sion Staff	3/15/82	Area Oil Shale Office, Industry, W.Q. Studies EPA	Salinity, Groundwater Surface Stream Impacts, WWTP's
8.	Solid/Hazardous Waste Impacts	Greg Starkebaum	Don Shosky Dean Gillam	3/15/82	Industry, DNR, Locals, EPA	Spent Shale Impacts, Sanitary Landfills, Hazardous Waste
9.	Noise Impacts	Dave Gourdin	Diane Groh Paul Nazaryk	3/15/82	Data from Dept. of Highways, Wildlife, FAA and others	Industry Impacts on Wildlife/Growth Impacts on Population, Case Studies - Railroads, Highways, Airports
10.	Draft Cumulative Report	Paul Ferraro	John Philbrook Paul Nazaryk	6/15/82		
11.	Final Report	Paul Ferraro	John Philbrook Paul Nazaryk	8/30/82		
12.	Public Involvement	Paul Ferraro	Mike Hammer Paul Nazaryk	10/81-9/82	County, Advisory and Technical Committees, and Industry meetings, Briefings and Workshops	
13.	Work Plan for Future Studies	Paul Ferraro	Mike Hammer Paul Nazaryk	9/15/82		

APPENDIX

CUMULATIVE ENVIRONMENTAL IMPACT REPORT

DRAFT OUTLINE

CUMULATIVE ENVIRONMENTAL IMPACT REPORT
DRAFT OUTLINE

Executive Summary

- A. Introduction
- B. Goals and Objectives
- C. Study Methodology
- D. Summary of Related Studies
- E. Description of Area
- F. Sensitive Environmental Areas
- G. Overview/Background
 - 1. Energy Production Levels - Oil Shale, Coal, Oil and Gas, etc.
 - 2. Location, Type and Size of Facilities
 - 3. Explanation of Oil Shale Processes
 - 4. Population Projections/Allocations
 - 5. Economic Projections - Other Than Energy
 - 6. Use Two-Three Production Levels for Oil Shale
 - 7. Assume Development Pattern for each Production Scenario.
- H. Assessment of Cumulative Environmental Impacts
 - 1. Land
 - a. Direct Energy Development Impacts
 - 1) Spent Shale - Area/Quality
 - 2) Disturbed Lands - Wildlife/Agriculture; Facility/Open Pit; Recreation/Federal Lands/Private Lands
 - 3) Reservoirs
 - 4) Corridors - Utility/Pipelines

- b. Indirect Impacts - Population Related
 - 1) Residential/Commercial/Industrial
 - 2) Irrigated Lands
 - 3) Reservoirs
 - 4) Others
- 2. Air Quality
 - a. Direct Energy Development Impacts
 - 1) Emissions - Major Pollutants
 - 2) Impacts on Class I Areas, Health Standards, Visibility, Acid Rain, etc.
 - a) Overlays Showing Areas Impacted
 - b) Quantities Emitted
 - c) Comparison With Other Areas (Los Angeles, Denver)
 - b. Indirect Impacts - Population Related
 - 1) Emissions - Transportation/Space Heating
 - 2) Impact on Standards
- 3. Water Quality/Quantity
 - a. Direct Impacts - Energy Development
 - 1) Surface Waters - Quantity/Quality/Uses
 - 2) Groundwater - Water Table Level/Quality
 - 3) Salinity
 - 4) Number of Stream Segments Degraded
 - 5) Uses Impaired/Improved
 - 6) Non-Point Sources - Increase Loading
 - 7) Diversions

- b. Indirect Impacts - Population Related
 - 1) WWTP's - Quantity/Increase Pollutants; Percent Streams Impacted
 - 2) Point Sources - Problems/Impacts
 - 3) Salinity
 - 4) Diversions
 - 5) Irrigated Waters/Replaced
 - 6) Groundwater Impacts - Quality/Water Table Levels

4. Solid Waste

- a. Spent Shale Piles - Quantity/Area Impacted
- b. Solid Waste - Community
- c. Sanitary Landfills - Existing/Projected
- d. Sludge Disposal
- e. Hazardous Waste Disposal

5. Noise

- a. Impacted Areas - Near Development Sites
- b. Impacts on Communities Due to -
 - 1) Highways
 - 2) Airports
 - 3) Railroads
 - 4) Other

I. Appendices

- 1. Inventory of Significant Studies
- 2. Identification of Data/Research Needs
- 3. Data Summaries
 - b) Projects/Production Levels
 - c) Population Projections/Allocations