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Large Resource Development Projects as Markets for Passive Solar Technologies

Final Report

Regina V. Roze-Benson

Early Insights
Golden, Colorado

Prepared under Subcontract No. AD-9-8307-1 for



SERI

Solar Energy Research Institute

A Division of Midwest Research Institute

1617 Cole Boulevard
Golden, Colorado 80401

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AS MARKETS FOR PASSIVE SOLAR
TECHNOLOGIES

FINAL REPORT

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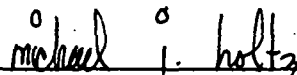
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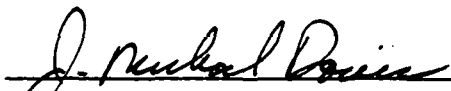
As part of the U.S. Department of Energy and Solar Energy Research Institute Passive and Hybrid Solar Manufactured Buildings Program, we have been concerned with the market demand for energy efficient buildings as well as with the manufacturer's ability to design and produce them. This concern together with the tremendous pressure to develop conventional fuels, primarily in the west, have led to an investigation of the potential building market in resource development "boom" towns. Regina V. Roze-Benson of Early Insights performed research and wrote this report under the direction of Mark McDade and with the assistance of Bruce Baccei and Sharyn Towle, all Building Systems Division staff. We are hopeful that the information contained within this report can influence energy use patterns in the new communities associated with resource development.



Michael J. Holtz, Chief
Building Systems Development Branch

Approved for

SOLAR ENERGY RESEARCH INSTITUTE



J. Michael Davis, P.E., Manager
Buildings Division

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INTRODUCTION

A basic premise of this study is that large resource development projects provide a major market opportunity for passive solar manufactured buildings. The primary objectives of the work are to document selected resource development projects and identify their potential housing needs and development schedules, to contact resource industry representatives and assess some of the processes and motivations behind their involvement in housing decisions, and to provide passive solar manufactured buildings producers with results of these steps as early initial market intelligence. The intent is to identify not only the industries, location of their planned projects, and their likely worker housing needs, but also the individuals involved in making housing-related decisions.

The 56 identified projects are located within 18 states and cover 11 types of resources. All resource projects are reported early enough in their planning stages to provide the housing manufacturers and the resource development companies ample time to plan, design, and implement worker housing needs. Although they are only a small fraction of the total number of current resource development projects, these projects do represent a market opportunity of over 85,000 housing units between 1980 and 1986. The report documents individual projects, provides projections of total worker-related housing needs, and presents overviews of resource development company involvement in the new construction market. In addition, the report profiles three organizations that expressed a strong interest in implementing the use of low-cost passive solar manufactured buildings in resource-development-related activities.

The scope of the study was limited to major, labor-intensive resource development projects—those with expected workforces of approximately 100 temporary and greater than 200 permanent workers and individual project life expectancies of more than 20 years. While the project staff originally estimated that there were about 20 such projects, the effort actually produced almost three times that number.

Most of the resource development projects were identified through personal contact with known staff in resource development industries. The information generated by these contacts was supplemented and verified by telephone and personal contact with other industry personnel, Department of Energy, Department of the Interior, and each state's resource development and siting authorities. A few ongoing projects that were still in early stages were identified through a search of recent entries in the Index of Environmental Statements.

By contacting individual resource development companies, building manufacturers can also learn about other projects, perhaps in different phases of development, which may offer additional market opportunities. Public plans for new construction can be added to the market opportunities picture by contacting the city and county government officials of adjacent communities.

Through personal contact with designated industry project operators, an assessment was made on the likely nature and timing of proposed worker housing plans. Many of these projects were not yet committed to particular housing plans or schedules and were of special interest to the project staff since they represented instances of optimum timeliness for early incorporation of passive design concepts.

Following documentation of the 56 identified resource development projects, the SERI study team selected a few groups that had indicated particular readiness to implement passive solar systems within their housing plans. Because of the unexpectedly large

number of industries involved, the study staff decided to concentrate follow-up efforts on those few industries that expressed the greatest and most immediate willingness to incorporate the use of passive solar homes.

The follow-up efforts by the study staff involved formal meetings with various land development, housing, utility management, and corporate management personnel within the individual companies. The meetings took place at the companies' offices. SERI staff provided industry representatives with an overview of the manufactured buildings programs and some description of the goals of the project at hand. The industry representatives provided SERI with a good background on each member's role within the resource development project and some insight into the needs, expectations, and limitations each had in developing specific housing plans. Most of the meetings consisted of discussions of how the industry could coordinate its own resources across departmental lines and how external participants, such as SERI, could help to expedite the process.

OVERVIEW OF RESOURCE DEVELOPMENT COMPANY INVOLVEMENT IN THE NEW CONSTRUCTION MARKET

Subsequent to several exploration stages and the decision that resource extraction and/or reutilization* are economically feasible, the resource development industry (either directly or indirectly under other corporate configurations) files its intents with federal, state, and local agencies. Rulings on the appropriateness, completeness, and legality of these intents lay the groundwork for literally hundreds of permits which the industry must secure to rezone land, move earth and equipment, build access roads, extend utilities, and perform many other necessary actions. The securing of these permits requires that the industry commit to plans which address, among other things, the needs of its temporary and permanent workforce.

Of major concern to the industry at this point are the design and cost of its operations and administrative facilities. Additionally, the industry establishes if, and to what extent, it needs to provide residential, commercial, and community facilities for its projected workforce. These decisions are normally made toward the end of the permit process, often 12 to 24 months before project operation. The options the company chooses in securing these facilities for its workforce depend on the size of the projected workforce, the expected operation's development schedule, the cost of alternatives, and the legal and political pressures exerted by the adjacent communities. The ultimate weight that each of these factors plays in an industry's decision varies from project to project, but the mix of factors tends to remain the same.

THE NEED TO PROVIDE WORKER HOUSING

If the expected workforce is relatively small and the operation's lifetime short, the industry will concentrate its efforts on encouraging adjacent communities to accommodate its workforce. The industry hopes to spend minimal effort in accomplishing this objective.

Occasionally, especially in sparsely populated rural areas, the industry will purchase or lease existing housing and place it on reserve for its workforce. If existing housing stock is limited, the industry may have its project staff encourage local small developers to build on speculation. The industry works to convince the local developers of the prospects of local growth as a consequence of the project's operation; and the developers, believing that economic growth will occur, build a few multi- or single-family units hoping to reap profits from the incoming workforce. Such industry efforts are very low profile, of small cost, and dispersed over a number of small adjacent communities. For obvious financial and political reasons an industry under such circumstances will rarely enter directly into the housing construction market. Some of the industries identified in this project that planned both small and large resource development projects expressed the hope that they could rely on existing communities to provide worker housing although this is probably unrealistic.

*The term "reutilization" refers to the recovery of residual resources in once abandoned sites.

When the projected workforce is substantial, the lifetime of the operation is long, and the nearby communities' willingness or capability to accommodate the incoming workforce is limited (as was the case with most of the resource development projects identified in this project), the array of feasible options for the industry is considerably changed. Under such circumstances, the resource industry must and does enter directly into the housing market.* From the resource industry's point of view, the nature and scope of this involvement depends on projected costs and revenues, regulatory requirements for socio-economic impact mitigation, existing housing market structure, availability of front-end financing, and the ability and willingness of local government entities to contribute funds for basic service extension. Many industries in such circumstances, either directly or under other corporate configurations, finance or guarantee the construction of Planned Unit Development which provides a mixture of temporary and permanent residential, community, commercial, and recreational facilities necessary to support the workforce within the entire community's service network. Under unique circumstances, the industry may not choose to exercise a subdivision option and will pursue a company town development, completely outside of any existing basic service network. In such instances the industry also becomes involved in securing the means by which it can provide water, sewer, and power systems. Only a very few of the resource development projects identified within this effort are likely to pursue new town developments.

TYPICAL FINANCING PROCESSES FOR NEW CONSTRUCTION IN RESOURCE DEVELOPMENT AREAS

A major workforce is anticipated and a major housing and community development effort is expected for most of the resource development projects identified within this effort. When the resource industry finds no alternative but to enter the housing construction market directly, it finances the construction of needed facilities by three primary methods. Each method has certain characteristics that make it more or less favorable to the industry or the housing developer, that require varying degrees of initial investment, and that involve varying degrees of risk-taking. For those reasons, under practical circumstances, all three methods are used at different stages of resource development. Throughout these methods the following resource industry and housing developer relationships remain in tenuous balance.

- Maximizing profits is a key consideration for both parties. The source of profit for the housing developer is the industry; for the resource industry, it is the buyer of anticipated resource production. The route to profit for the housing developer is comparatively uncomplicated and short, involving cost and procurement logistics of materials and labor, volume of construction, and standardization of design. From the resource industry's point of view, the route to profit is comparatively complicated and long and involves a maze of investors, technological hurdles, regulatory requirements, and political pressures. The profit for the developer is the hard cash at construction completion with some resulting payoffs in experience, capability, and exposure that can be used to secure other industry contracts. The form of profit for the industry is not only the many years of resource production sales but also the major resulting payoffs of worker

*The term "housing market" used in this context includes commercial, public, industrial, as well as residential facilities required to meet the needs of the workforce families.

satisfaction, public acceptance, company image-building, and political relationships that ensure the continued profits of present projects and lay the groundwork for future projects.

- The industry has a long-term view and the developer a relatively short-term view. The developer will provide housing of a type and quality that minimizes costs and satisfies the market. To the industry it is important that the housing development efforts further its project goals and satisfy company image requirements. The industry often presents the developer with housing design and quality considerations that the developer does not initially consider. From the developer's point of view, such alternative housing technology approaches threaten to increase his costs. But in many cases the resource industry has expressed a willingness to assume these increased costs if it perceives an accompanying benefit in furthering its overall goals.
- Capital investment is the definitive mark of commitment. Comparatively greater amounts of capital are available to the resource industry than to the developer and this provides the industry major leverage with housing contractors. Both parties make capital expenditures on as tenuous and incremental a basis as possible while maneuvering each other to take on greater commitments. From the developer's point of view, larger industry expenditures are necessary to provide a sufficient cash flow to meet supplier costs. From the industry's standpoint, while the developer is still a small part of its expenditure requirements, the industry will attempt to minimize all commitments. Committed money in one area diverts potential increases in others and may increase the industry's potential losses should the project not proceed on its anticipated production schedule.

Needing workforce housing and community facilities, ideally, the industry involved in large resource development would like to point out the need and opportunity for profit and watch the housing development occur. That option requires a rare developer with unlimited financing capability and unswerving confidence in the resource development project's future. Few developers could afford to risk all their assets (and fewer lending institutions would back them) to finance the front-end costs of land, design, material, and labor procurement without assurances of a profitable market. Lacking independent financing capability, the only other source of large project financing* for the developers is the resource industry itself. The industry accepts this and attempts to provide the kind of seed money and contractual assurances that will motivate the developer to proceed with construction. Industries in such a situation plan to undertake housing development financing in three forms, using them in various combinations (with several contractors) over the construction period of the entire development:

- the contracting for construction of specific housing units under cost plus fixed fee or firm bid options,
- the guarantee to purchase or lease constructed units upon completion, and
- the guarantee of a developer's finance loan with industry assets.

Under the first option, the industry requires the construction of a selected number and type of units, pays the contractor(s) only a set percentage of the construction costs at

*The Federal Government provides several programs under which developers can receive limited financing for housing projects that meet low-income criteria requirements. Such programs are not applicable to the kind of large-scale, worker-related developments considered here.

various points of the construction period, and pays the full balance upon construction completion. The industry will rarely pay over 50% of the total bid price before all construction is completed. These initial cost reimbursements by the industry provide the developer with seed money to satisfy his initial outlays with suppliers. At completion of this contract, the industry will negotiate the next development phase, not necessarily under the same terms, but almost always giving the same contractor(s) the first option to bid. A large resource development related housing project may have four to six development phases. At the completion of each phase, the industry becomes the direct owner of the units and, usually through other contracted agents, sells or leases these units out to its workforce families. In the case of community facilities, the industry will immediately dedicate them to appropriate government entities.

Under the second form, the industry guarantees itself to the developer as a buyer or lessor, should the developer not be able to sell or lease the constructed units to the incoming population. The number of units which the industry guarantees to purchase is usually somewhat fewer than are built. The price at which such units are purchased by the industry is determined by the developer's costs and the existing housing market conditions. Under a lease guarantee arrangement, the industry usually guarantees some level of occupancy, picking up the lease payments for the numbers of units which fall below that level. The main idea behind these forms of guarantee is that the developer risks his capital by completing the development with little financial support, if any, from the industry, while the industry assures the developer a means by which the costs, at least, would be recovered if the market does not materialize. The industry, through this guarantee, is able to motivate the badly needed construction at minimal projected cost to itself. It is clear that to exercise this option a developer must have access to major capital.

In instances where the potential profit is great and the assets of the developer too limited to secure a loan to cover all construction costs, the third option will be taken. The resource industry will act as guarantor of a developer's loan to a savings and loan institution. The developer retains major responsibility for loan payment, but the industry's backing helps extend the amount and/or duration of the loan. The logic behind this is that the lending agency will regard the developer's request more favorably if it can also get the industry to commit its interest there. The lenders feel more sure that they can recover their loan. Of course, in the other options the developer can and does use contacts with industry in attempts to secure short-term loans. Such dealings are strictly between the developer and the lenders. In this third option, the industry becomes a party to the loan. The exercise of such an option takes a high level of confidence in the development plans on everyone's part. If that confidence is justified, then this option requires the least expenditure on the industry's part and can produce substantial profits for the developer.

All three financing options provide varying amounts of industry leverage and require varying amounts of contractor capability. The willingness and capability of contractors to pursue one financing option over another often contributes to the success of their bids. The disposition of an industry to accept or pursue one option over another varies among projects and within one project's development phases. As a rule of thumb, the larger developers, with considerable capital and established relationships with suppliers, are able to pursue the guarantee alternatives where the commitment of initial capital may be substantial but the promise of profit is greater. The small developers, with little capital and loose supplier connections, must exercise the first option where potentially greater profits might be sacrificed for a more immediate cash intake.

From the standpoint of solar implementation in such new construction, it is clear that the industry does and can exercise considerable control over how and what kind of units are constructed. The industry's concern is not based solely on cost of units, but also on the degree to which the constructed housing reaches its larger goals of worker satisfaction, public opinion, and company image. The interest by industry in implementing solar and conservation designs within their call for bids and contractor specifications lies in the potential of these designs to impact these larger goals. This point was expressed by the industries during this study's follow-up meetings.

MOTIVATION AND READINESS OF RESOURCE DEVELOPMENT COMPANIES TO IMPLEMENT PASSIVE SOLAR TECHNOLOGIES

The motivation for resource development companies to include passive solar housing centers around three interrelated concerns: economics, worker satisfaction, and public relations.

The concern of economics is two-fold. The resource development companies are concerned that the construction of housing units is cost-conscious and that any implementation of new housing technology is cost-effective. The implementation of passive solar design, particularly in manufactured housing, promises to be competitive with conventional housing. In the past, most resource developments have relied heavily on single- and double-wide mobile homes, especially during project construction phases. Worker and community acceptance of these conventional mobile home designs has been poor and companies are making greater efforts to seek out contractors who provide innovative and aesthetic manufactured homes. Since most of these developments are in sparsely populated rural areas and typically do not have local builders that can produce low-cost, stick-built homes in the necessary volume, resource developments are prime markets for passive solar manufactured buildings. The initial cost of manufactured housing, for both the resource development company and its worker families, is also considerably less than for the stick-built home.

The second facet of the companies' economic concern with worker housing developments is the cost of housing maintenance which is ultimately passed on to the worker families. Fuel costs are one of the major recurring and escalating expenses of housing maintenance. Passive solar manufactured buildings use less fuel and use it more efficiently and thus experience lower fuel costs and a lower rate of cost increases.

Establishing high levels of worker satisfaction is a major concern for companies in stemming recruitment problems, worker turnover, absenteeism, and community relations problems. The implementation of passive solar designs provides one means by which the company can realize higher levels of worker satisfaction. Worker families are direct beneficiaries of energy-efficient homes and public and commercial facilities. The fact that worker families may have the option of purchasing energy-efficient, low-cost homes is expected to increase their real and perceived quality of life.

Establishing and maintaining favorable public relations is another area of concern that can benefit from a company's commitment to build energy-conserving housing developments. Resource development companies receive public criticism due to their actual or feared negative environmental and social impact on communities that host resource development projects. The companies go to great lengths in terms of financial and corporate commitment to mitigate those perceived impacts. That a resource development company would implement solar passive design aids the company in maintaining a favorable public image.

Virtually all of the industries contacted recognize the immediate value of implementing passive solar manufactured buildings. Many of the companies are utilities and oil companies, already active in solar-related consumer service programs, demonstration projects, and research efforts. The use of passive solar manufactured buildings within their corporate land development presents a challenge for coordinated focus. The basic conservation philosophies, material, programs, and staff have already been developed by these companies; the need is to coordinate those efforts that are presently aimed at their resource consumers with the housing needs presented in the resource-producing areas. Companies that act as resource brokers or strictly resource extractors lack this immediate receptiveness. However, even they express a strong support for using passive solar manufactured buildings for economic, worker satisfaction, and public relations benefits.

PROFILE OF SELECTED RESOURCE DEVELOPMENT PROJECTS

A total of 56 major resource development projects were identified that present potential areas for passive solar technology implementation. The projects are scattered over 18 states and cover 11 types of resources. Table 1 presents a summary of the selected resource development projects.

The majority of these development projects are located in sparsely populated rural areas. In such areas the likely impact of large incoming work forces will be to create a critical housing shortfall, necessitating the hurried construction of low-cost housing units. The 56 projects alone will generate a total housing market of over 85,000 units between 1980 and 1986.

LOCATION OF RESOURCE DEVELOPMENT PROJECTS

As Table 1 indicates, most (41) of the 56 projects are located within the Western states of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. The projects within these states are located in sparsely populated areas with adjacent communities having as few as 120 inhabitants. Within these states, as well as others, planned resource development projects are often clustered within the same general area of the state, increasing the potential magnitude of consequent housing development needs within the sparsely populated areas.

Figure 1 presents the geographic location of the 56 resource development projects.

DEVELOPMENT SCHEDULES

The resource development projects identified in this effort were projected to begin construction phases from 1979 through 1983 (see Table 2). Since permanent housing development decisions are traditionally made well within the mine/plant construction phases, but 12 to 24 months prior to anticipated operation phases, all identified projects present at least a year's lead time for market development activity.

The resource development projects typically reach their peak operation level some 6 years after project construction starts (Fig. 2) and are expected to operate for a minimum of 25 years. The construction and operation phases of mine development typically overlap some two years, during which time temporary workers and facilities are removed or replaced by permanent workers and facilities.

Unlike power plant construction, resource development activities are usually labor-intensive in their operation phases rather than in their construction phases. This is reflected directly in the total number of workers needed for each phase. As Fig. 2 illustrates, the average resource development project may reach a peak of 235 temporary workers by the second year of project construction; but by the third year of project operation, that same project may reach 680 permanent workers. In the intervening years, the total number of workers (both temporary and permanent) may drop below 100. This has direct implications for the type and timetable of housing facilities that would be planned during these phases.

Table 1. SUMMARY OF SELECTED PLANNED RESOURCE DEVELOPMENT PROJECTS: CANDIDATES FOR PASSIVE TECHNOLOGY APPLICATIONS

State	Number of Projects	Type of Resource
Alabama	3	Coal
Arizona	2	Copper, Uranium
Colorado	5	Molybdenum, Oil Shale, Uranium
Idaho	3	Phosphate
Illinois	2	Coal
Indiana	1	Coal
Montana	5	Coal
Nevada	5	Copper, Gold, Molybdenum, Tungsten
New Mexico	4	Carbon Dioxide, Uranium
North Carolina	1	Phosphate
North Dakota	2	Coal
Oregon	1	Uranium
South Dakota	1	Uranium, Vanadium
Utah	11	Coal, Oil Shale, Uranium
Virginia	1	Coal
West Virginia	2	Coal
Washington	1	Uranium
Wyoming	6	Coal, Trona, Uranium
Totals:	56	11 (Carbon Dioxide, Coal, Copper, Gold, Molybdenum, Oil Shale, Phosphate, Trona, Tungsten, Uranium, and Vanadium)

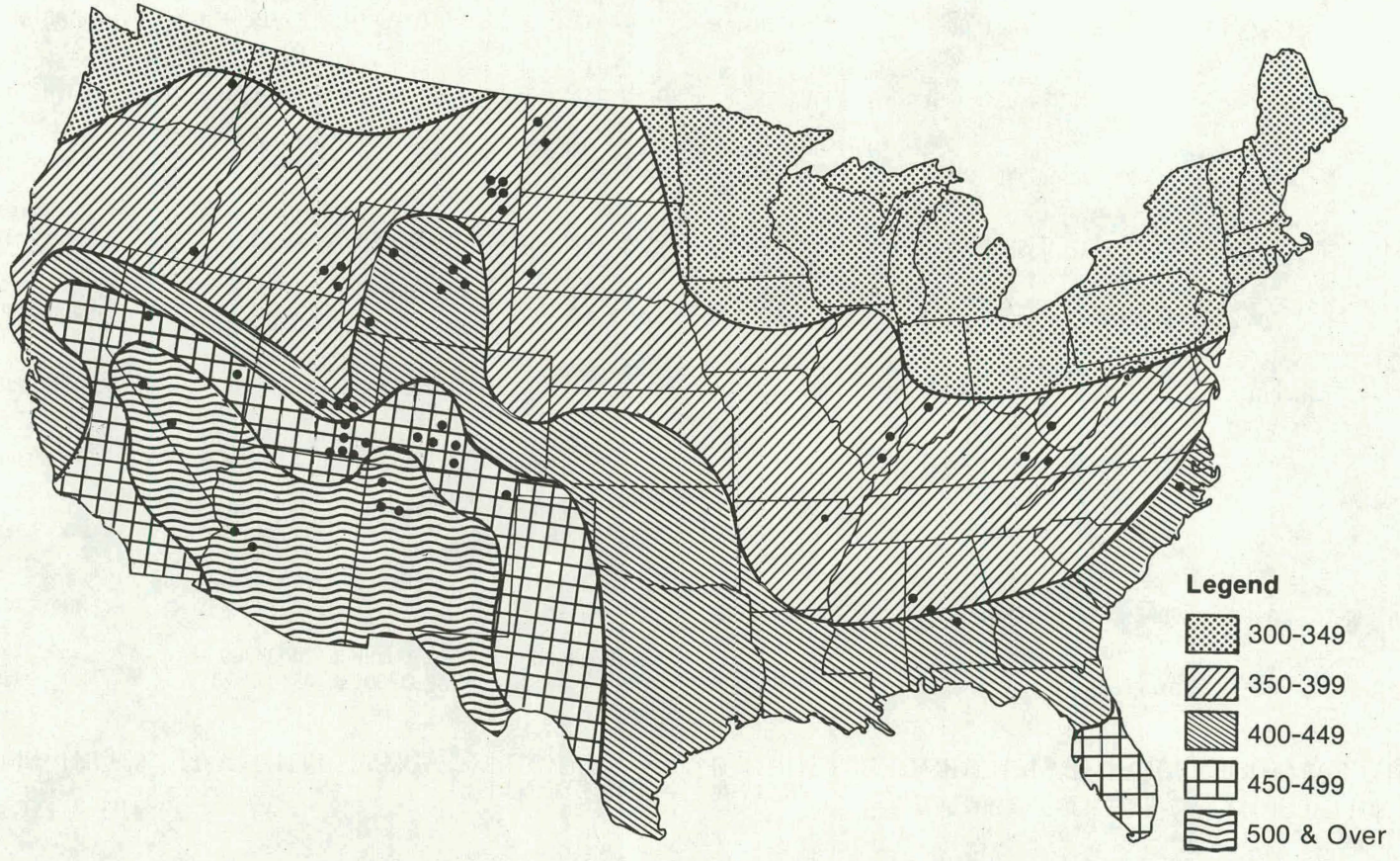


Figure 1. U.S. Mean Daily Solar Radiation, Annual (measured in Langleys)

• Location of selected major resource development projects: candidates for passive solar technology applications

Table 2. Selected Resource Development Projects: Potential Sites for Low-Cost Solar Buildings

STATE	RESOURCE TYPE AND MINING PROCESS*	DEVELOPMENT COMPANY	PROJECT SITE LOCATION	ADJACENT COMMUNITIES	DEVELOPMENT SCHEDULE		PROJECTED WORKFORCE	
					CONSTRUCTION	OPERATION	TEMPORARY	PERMANENT
ALABAMA	COAL, UM	JIM WALTER RESOURCES, INC. BROOKWOOD, ALABAMA	25 Miles NW of BROOKWOOD	BROOKWOOD	1979-1984	1979-2010	200	2,000
ALABAMA	COAL, UM	REPUBLIC STEEL CO., TUSCALOOSA, ALABAMA	15 Miles NE of FAYETTE	FAYETTE	1980-1982	1982-2005	150	500
ALABAMA	COAL, UM	U.S. STEEL CORP., BIRMINGHAM, ALABAMA	10 Miles NE of SHELBY	SHELBY	1979-1981	1981-2005	75	350
ARIZONA	COPPER, OP	NEWMONT EXPLORATION, LTD. TUSCON, ARIZONA	1 Mile W of KOHULK	CASA GRANDE	1980-1982	1982-2010	160	354
ARIZONA	URANIUM, SM	MINERALS EXPLORATION CO., TUSCON, ARIZONA	25 Miles NW of WICKENBURG	WICKENBURG	1981-1984	1984-2005	100	350
COLORADO	MOLYBDENUM, UM	AMAX, INC., LAKEWOOD, COLORADO	5 Miles W of CRESTED BUTTE	CRESTED BUTTE	1981-1986	1985-2045	500	1,400
COLORADO	OIL SHALE, MIS	OCCIDENTAL OIL SHALE, GRAND JUNCTION, CO.	20 Miles SW of MEEKER	MEEKER & RIFLE	1978-1985	1985-2030	200	1,600
COLORADO	OIL SHALE, MIS	RIO BLANCO OIL SHALE, DENVER, COLORADO	20 Miles S of RANGELY	MEEKER, RANGE- LY & DINOSAUR	1978-1985	1985-2035	100	2,000
COLORADO	OIL SHALE, SR	UNION OIL, CO., GRAND JUNCTION, CO.	12 Miles NW of GRAND VALLEY	GRAND VALLEY & RIFLE	1980-1982	1982-2030	400	250
COLORADO	URANIUM, OP	HOMESTAKE MINING CO., GUNNISON, COLORADO	SE Corner of GUNNISON N.F.	GUNNISON & SAGUACHE	1980-1984	1984-2020	75	200
IDAHO	PHOSPHATE, SM	EARTH RESOURCES, INC. GOLDEN, COLORADO	28 Miles NE of SODA SPRINGS	SODA SPRINGS	1980-1984	1984-2005	250	160

IDAHO	PHOSPHATE, OP	IMC CORPORATION, PHILADELPHIA, PA.	14 Miles NE of SODA SPRINGS	SODA SPRINGS	1981-1986	1986-2010	180	230
IDAHO	PHOSPHATE, SM & OP	MONSANTO CHEMICALS, ST. LOUIS, MO.	10 Miles N & NE of SODA SPRINGS	SODA SPRINGS	1983-1998	1985-2025	50	200
ILLINOIS	COAL, UM	INLAND STEEL CORP., DESSER, ILLINOIS	10 Miles NE of McLEANSBORO	McLEANSBORO	1980-1982	1982-2015	100	500
ILLINOIS	COAL, UM	OLD BEN COAL CO., BERTON, ILLINOIS	5 MILES E of WEST FRANKFORT	WEST FRANKFORT	1979-1982	1981-2020	200	450
INDIANA	COAL, SM	AMAX COAL CO., INDIANAPOLIS, IN.	5 Miles W of MONROE CITY	MONROE CITY	1979-1982	1982-2015	75	200
MONTANA	COAL, SM & OP	DECKER COAL CO., DECKER, WYOMING	20 Miles NE of SHERIDAN	SHERIDAN & BIRNEY	1980-1985	1984-2015	210	272
MONTANA	COAL, SM & OP	NORTHERN ENERGY RESOUR- CES, PORTLAND, ORE.	28 Miles N of SHERIDAN	SHERIDAN & DECKER	1980-1986	1983-2020	450	250
MONTANA	COAL, OP	PEABODY COAL CO., DENVER, COLORADO	10 Miles N of COAL STRIP	COAL STRIP	1981-1985	1985-2015	32	200
MONTANA	COAL, SM	SHELL OIL CO., HOUSTON, TEXAS	12 Miles N of SHERIDAN	SHERIDAN	1980-1982	1981-2020	257	2,025
MONTANA	COAL, SM	WESTMORELAND RESOURCES, BILLINGS, MONTANA	26 Miles E of HARDIN	HARDIN & HYSHAM	1980-1981	1981-2020	50	210
NEVADA	GOLD, UM	AMERICAN PHILCO CO., RENO, NEVADA	25 Miles NW of ELY	ELY	1980-1982	1982-2015	75	2,025
NEVADA	GOLD, UM	FREEPORT SULFUR CO., RENO, NEVADA	40 Miles NE of ELKO	ELKO	1980-1982	1981-2015	75	200
NEVADA	MOLYBDENUM & COPPER, UM	ANACONDA, SPARKS, NEVADA	10 Miles SW of TONOPAH	TONOPAH	1980-1984	1984-2020	100	350
NEVADA	TUNGSTEN, UM	UNION CARBIDE, GRAND JUNCTION, CO.	25 Miles E of HAWTHORNE	HAWTHORNE & MINA	1980-1984	1982-2020	72	225
NEVADA	TUNGSTEN, UM	UTAH INTERNATIONAL, IMLAY, NEVADA	30 Miles SW of WINNEMUCCA	WINNEMUCCA & MILL CITY	1980-1983	1982-2020	75	200

NEW MEXICO	CO ₂ , DP	AMOCG PRODUCTION, HOUSTON, TEXAS	10 Miles SW of MOSQUERO	MOSQUERO, CLAY- TON & NARA VISA	1980-1984	1984-2040	50	300
NEW MEXICO	URANIUM, UM	MOBIL OIL CORP., MILAN, NEW MEXICO	1 Miles E of CROWN POINT	CROWN POINT, GALLUP & THOREAU	1980-1982	1982-2015	100	370
NEW MEXICO	URANIUM, UM	NAVAHO TRIBE, WINDOW ROCK, AR.	10 Miles S of RATTLESNAKE	RATTLESNAKE	1982-1984	1983-2010	80	900
NEW MEXICO	URANIUM, UM	T.V.A., CHATANOOGA, TN.	8 Miles S of STANDING ROCK	STANDING ROCK	1980-1981	1982-2015	200	550
NORTH CAROLINA	PHOSPHATE, SrM	J.C. PHOSPHATE, WASHINGTON, N.C.	5 Miles S of PAULICO RIVER	WASHINGTON, NEW BESU & GREENVILLE	1930-1983	1984-2025	800	468
NORTH DAKOTA	COAL, SrM	CONSOLIDATION COAL, ENGLEWOOD, CO.	12 Miles NE of UNDERGROUND	UNDERWOOD & RIVERDALE	1935-1987	1987-2030	90	202
NORTH DAKOTA	COAL, SrM	DAKOTA CO., BISMARCK, N.D.	12 Miles N of GARRISON	GARRISON & EMMET	1982-1984	1984-2111	125	225
OREGON	URANIUM, UM	PLACER-AMAX SAN FRANCISCO, CALIF.	20 Miles NW of McDERMITT	McDERMITT	1930-1982	1983-2020	75	350
SOUTH DAKOTA	URANIUM, UM	T.V.A. CHATAHOOGA, TN.	15 Miles N of EGMONT	EGMONT & HOT SPRINGS	1930-1982	1982-2015	50	200
UTAH	COAL, UM	AMCA COAL LEASING, PRICE, UTAH	10 Miles NW of PRICE	PRICE & WELLINGTON	1930-1983	1983-2010	65	225
UTAH	COAL, SM	EL PASO COAL CO., EL PASO, TEXAS	28 Miles S of ESCALANTE	ESCALANTE	1930-1984	1984-2035	450	2,000
UTAH	COAL, UM	ENERGY FUELS CORP., DENVER, COLORADO	20 Miles NW of PRICE	PRICE & SCHOFIELD	1930-1982	1982-2015	75	1,015
UTAH	COAL, UM	ENERGY RESERVES GROUF, DENVER, COLORADO	1 Mile E of I- 70 & 72 junc.	SALINA	1930-1983	1983-2010	128	290
UTAH	COAL, UM	KAISER ENGINEERING, OAKLAND, CALIF.	5 Miles N of GREEN CANYON	KANOB & PAGE	1930-1981	1982-201-	700	3,400
UTAH	COAL, UM	MOUNTAIN STATES RES., SALT LAKE CITY, UTAH	9 miles S of I-70 & 72 junc.	LOA & EMERY	1980-1982	1982-2010	30	200

UTAH	COAL, UM	PACIFIC G & E, SAN FRANCISCO, CALIF.	15 Miles E & NE of PRICE	PRICE	1981-1986	1985-2020	203	1,600
UTAH	COAL, SM	UTAH INTERNATIONAL, SAN FRANCISCO, CALIF.	3 Miles E of ALTON	ALTON	1980-1986	1985-2020	85	620
UTAH	COAL, UM	VALLEY CAMP OF UTAH, HELPER, UTAH	20 Miles NW of PRICE	PRICE & CLEAR CREEK	1980-1984	1984-2010	500	1,000
UTAH	OIL SHALE, UM	STANDARD OIL OF OHIO, VERNAL, UTAH	Uinta Basin & White Basin	BONANZA & VERNAL	1980-1990	1986-2030	2,000	4,200
UTAH	URANIUM, UM	ENERGY FUELS CORP., DENVER, COLORADO	5 Miles S of BLANDING	BLANDING & MONTICELLO	1980-1981	1981-2010	85	250
VIRGINIA	COAL, UM	ILAND CREEK COAL, LEXINGTON, VA.	2 Miles N of VANSANT	VANSANT	1980-1984	1983-2010	150	500
WASHINGTON	URANIUM, OP	WESTERN NUCLEAR, WELLPINT, WASH.	In town of WELLPINT	WELLPINT	1980-1982	1982-2005	150	210
WEST VIRGINIA	COAL, UM	BETHLEHEM MINES, BRIDGEPORT, W.V.	5 Miles W of VAN	VAN	1980-1985	1984-2010	150	600
WEST VIRGINIA	COAL, UM	MONTEREY COAL CO., HUNTING, W.V.	4 Miles N of EAST LYNN	EAST LYNN	1979-1985	1982-2010	300	1,530
WYOMING	COAL, SM	CARTER MINING CO., GILLETTE, WYOMING	10 Miles NE of GILLETTE	GILLETTE	1980-1988	1986-2030	250	360
WYOMING	TROMA, ShM	TENECO OIL CO., GREEN RIVER, WYO.	10 Miles S of LITTLE AMERICA	ROCK SPRINGS & GREEN RIVER	1980-1982	1983-2025	100	500
WYOMING	URANIUM, UM	CLEVELAND CLIFFS IRON, CASPER, WYO.	60 Miles S of GILLETTE	GILLETTE, MID- REST & EDGERTON	1981-1985	1984-2030	600	400
WYOMING	URANIUM, SM	KERR-McGEE CORP., OKLAHOMA CITY, OK.	4 Miles E of GILLETTE	GILLETTE	1980-1984	1984-2030	100	242
WYOMING	URANIUM, UM & OP	KERR-McGEE CORP., OKLAHOMA CITY, OK.	35 Miles NW of DOUGLAS	DOUGLAS	1980-1983	1983-2025	50	410
WYOMING	URANIUM, OP	ROCKY MOUNTAIN ENER GY, DENVER, CO.	15 Miles W of SOSHONI	SOSHONI & THERMOPOLIS	1981-1984	1983-2025	60	350

MINING PROCESSES: UM=UNDERGROUND MINING; OP=OPEN PIT; ShM=STRIP MINING; SR=SURFACE RETORT; ShM=SHALLOW MINING; SrM=SURFACE MINING;
and MIS=MODIFIED IN-SITU.

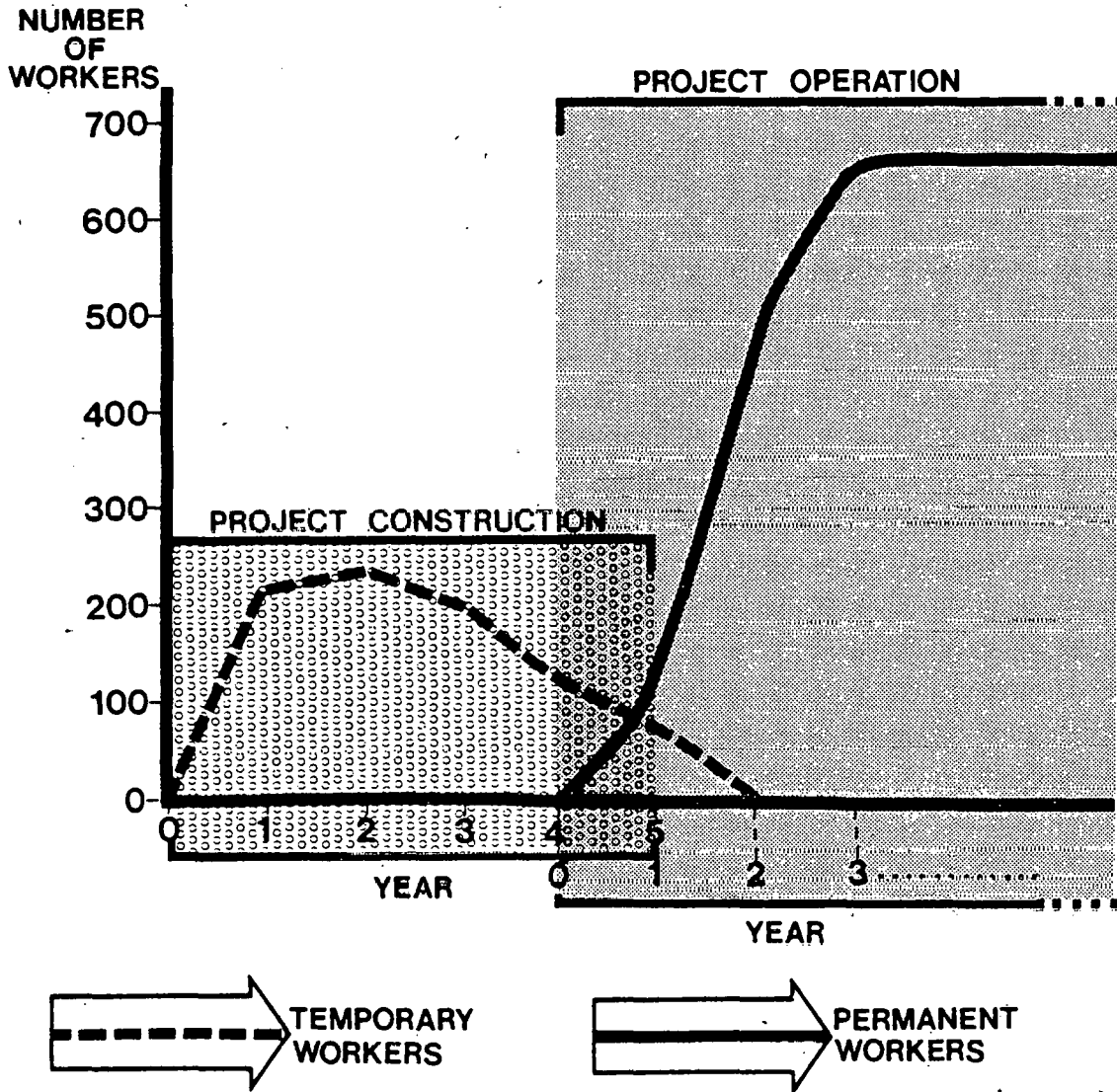


Figure 2. Mean Number of Workers on the Average Large Resource Development Project

PROJECTED HOUSING NEEDS

The basis on which worker housing needs have been projected rests primarily on the industries' statements of likely peak employment, known labor availability within resource areas, and assumed family sizes. The model used here is a simplified combination of the economic base and cohort survival models.* The economic base model is used to project total employment by utilizing growth in basic employment as direct input plus the growth in nonbasic employment computed by the use of multipliers. The cohort survival model is used to project an area's population growth given its employment growth. A basic assumption of this combined model is that migration is primarily a function of employment opportunities.

Typically, a project's housing needs start with temporary unit needs during the first few years of project construction. These needs are relatively small and are normally met by existing housing stock and/or company mobile home courts. Assuming that each additional immigrating household projected by these 56 projects will necessitate one additional housing unit, even the construction phases could generate a peak community need for over 16,000 temporary units.

The major company housing development begins with the influx of permanent workers involved in establishing and maintaining the projects' operations. At this point stick-built and/or manufactured unit developments are usually initiated; and it is this development phase that provides the best and most accessible market for passive solar implementation. With each passing year of operation, additional new units are built to keep up with the projects' increased levels of operation until they reach their anticipated peaks. The anticipated peak for permanent direct workers for the 56 resource development projects is well over 35,000. Assuming that 20% of these workers are from the existing communities and are already adequately housed, over 28,000 workers still need housing. Further assuming that 90% of these permanent direct immigrating workers have families and that each family needs its own housing unit, over 25,000 family housing units must be provided by the resource development companies. Some of the 2,869 single immigrating direct workers may live in multiunit developments. But, even then, the total direct worker housing requirements are likely to reach 28,000 units.

Public officials and the resource companies have to make plans to house support worker families in over 50,000 additional units. The communities adjacent to resource developments are likely to host over 85,000 housing units necessitated by direct employment and attendant secondary support employment by industries and services dependent on the resource development activities.

The traditional distinction between temporary and permanent workers and facilities needs mention. The facilities that have traditionally housed temporary workers, those who are employed during the construction phase of a project, are somewhat incorrectly classified as temporary. Although mobile homes have been the prime choice for housing temporary workers, this choice has been made largely as a result of the speed with which they can be sited and the relative low cost to the resource development companies. These mobile home facilities are hardly temporary, however, and become permanent housing units for operations workers and other community members when the temporary workers move on.

*For a good description and assessment of the applicabilities and limitations of 15 forecasting models when applied to resource development impact issues, see Models and Methodologies for Assessing the Impact of Energy Development, ERDA, September 1977.

For the reasons mentioned, the passive solar manufactured building provides an opportunity to impact the resource development housing market especially if the manufactured building producers coordinate their plans early enough with resource development company plans. Most of the 56 projects selected in this study provide that opportunity.

PROFILES OF THREE RESOURCE DEVELOPMENT ORGANIZATIONS READY FOR PASSIVE SOLAR ENERGY

In SERI'S follow-up of this study, three major organizations expressed a strong interest in incorporating passive solar manufactured buildings within their present planning effort. Each provided a different mix of concerns and represented differing levels of capability to implement them. These three organizations were not the only ones to express a desire to incorporate passive solar manufactured buildings, but study limitations precluded additional follow-up meetings.

PACIFIC GAS AND ELECTRIC COMPANY (PG&E)

PG&E is a large California utility headquartered in San Francisco with a long history of progressive involvement in solar energy programs. As early as 1976, PG&E's involvement in solar energy programs was recognized as the most developed of all electric utilities in the United States.* The Electric Power Research Institute (EPRI) identified it as a leader among utilities in the promotion of solar heating and cooling systems among its service population.

Through considerable interdepartmental efforts, PG&E has conducted Residential Solar Technology Demonstration programs under which nine passive and hybrid solar homes have been constructed; it has provided cash incentives to builders for the incorporation of various energy conservation measures and solar systems in new construction; and it has developed a sophisticated network of Residential Customer Assistance programs that provide information and incentives for solar retrofit, solar contractor qualifications, solar audits, etc.

PG&E's planned resource development activities in Utah were the focus of SERI/PG&E follow-up meetings. PG&E, in partnership with Kennecott Copper Corporation, is planning to develop coal reserves in Carbon County, Utah, to provide future supplies of coal for PG&E's electric generation needs. Initial permits have been secured for a large underground mine just northeast of Price, Utah. The mine was slated to begin its construction phases around 1981 and to rise to an approximate workforce of 2,000 in its operation phase by 1986.** The total mine construction period was estimated to extend some six years, with anticipated operation to begin toward the end of that time and mine production to extend well over 30 years.

SERI project staff met in several sessions with various members of PG&E's land development, solar and conservation, and customer relations departments. The need to include passive solar manufactured buildings in PG&E's worker-related housing plans in Utah was immediately recognized. During these sessions SERI project staff successfully fulfilled the role of catalyst, focusing PG&E's already developing solar involvement on an area of potential application within its own corporate activities. PG&E participants expressed a specific need for information on qualified manufacturers active in the Utah area.

*Electric Utility Solar Energy Activities, prepared by Louise D. Cleary, Electric Power Research Institute, Palo Alto, California, January 1977.

**Just prior to the printing of this report, word was received from PG&E that the construction phase has been delayed for approximately one year because of problems obtaining permits.

TENNESSEE VALLEY AUTHORITY (TVA)

TVA is a well-known, large, federally supervised conservation agency with substantial activities in the areas of energy fuels development and consumer solar applications. In addition to its extensive solar systems design, application, demonstration, and monitoring activities, TVA has also initiated a modular low-cost solar homes construction program.

The primary focus of the SERI/TVA meetings was TVA's planned uranium mining efforts in New Mexico and South Dakota. TVA has planned to develop at least three uranium mines and mills in various partnerships with other companies such as United Nuclear Corporation and Mobil Oil Corporation. Although the original development schedules for these mines have been variously affected by permit events, TVA resource development staff had already given considerable attention to the ability of builders in the New Mexico and South Dakota areas to provide sufficient, appropriate housing for their workforces.

SERI project staff served as a catalyst, focusing the attention of TVA's solar applications personnel to the housing needs generated in the western states by its fuel development activities. The energy fuels personnel identified other related areas in which they welcomed the involvement of passive and other solar technology professionals.

As a result of TVA's modular housing program, TVA personnel were familiar with most of the manufactured buildings producers in their area; however, they needed specific information on potential solar manufactured building producers that could provide sufficient, cost-competitive housing in the western areas. Bid formulation and specification to reflect energy-conscious design were cited as areas of immediate need. TVA personnel directly involved in resource development at the western sites emphasized the need to educate state and local planning agencies in incorporating energy considerations within their housing and land development plans.

AMAX, INC.

Amax, Inc. is a large diversified resource development company whose world-wide activities extend over a broad range of resources, including molybdenum, aluminum, nickel, tungsten, cobalt, copper, lead, zinc, cadmium, iron ore, precious metals, coal, agricultural chemicals, oil, and gas. Climax Molybdenum Company, a division of AMAX, presently operates a large molybdenum mine in Colorado and plans to initiate an even larger one near the small resort town of Crested Butte, Colorado.

The ore load at Crested Butte is presently valued at over \$7 billion and the proposed mine would extract 10,000 to 30,000 tons a day, seven days a week, for 25 to 30 years. To mine these tremendous quantities of ore, Amax expects to bring in approximately 3,600 workers by 1990, when mine operation is slated to begin. Local opposition to Amax's plans has required Amax to consider its role in the alleviation of housing shortages.

Because Amax had virtually no background in solar application, SERI project staff served as prime educator during the follow-up meetings. The housing consultants presently working with Amax had minimal solar knowledge, a fact that was identified as a major problem for Amax. Also apparent was the need for information about and involvement of passive manufactured buildings producers to assist both Amax and their consultants.

APPENDIX A**INDIVIDUAL RESOURCE DEVELOPMENT PROJECTS**

The following pages contain short fact sheets for each of the 56 resource development projects. The figures, estimates, agency, and industry contact points were last verified in May 1980.



STATE: ALABAMA

COUNTY(IES) OF IMPACT: Tuscaloosa & Jefferson
POPULATION CENTER(S): Brookwood
POPULATION COUNT: 350

SITE LOCATION: 25 miles Northwest of Brookwood

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 30 Years

DEVELOPMENT SCHEDULE: 1978-1984 (sequential development of six mines)
PROJECT CONSTRUCTION: 1978-1984
PROJECT OPERATION: 1979-2010

PROJECTED WORKFORCE:
TEMPORARY: 100 to 200 through 1984
PERMANENT: 2,000 by 1984

DEVELOPMENT COMPANY: Jim Walter Resources, Inc.
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: James R. Boyle (205) 758-0491
U.S. Bureau of Mines
P.O. Box 1
University of Alabama
Birmingham, Alabama 35486

DEVELOPMENT COMPANY CONTACT: Bill Carr or (205) 556-6000
Charles Hager
Jim Walter Resources, Inc.
Brookwood, Alabama

STATE: ALABAMA

COUNTY(IES) OF IMPACT: Tuscaloosa & Fayette
POPULATION CENTER(S): Fayette
POPULATION COUNT: 4,568

SITE LOCATION: 15 miles Northeast of Fayette

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 30 Years

DEVELOPMENT SCHEDULE: 1980-1982 (still undecided)
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2005

PROJECTED WORKFORCE:
TEMPORARY: 150 during first two years
PERMANENT: 500 at peak by 1985

DEVELOPMENT COMPANY: North Fork Energy Company
(Subsidiary of Republic Steel Co.)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: James R. Boyle (205) 758-0491
U.S. Bureau of Mines
P.O. Box 1
University of Alabama
Birmingham, Alabama 35486

DEVELOPMENT COMPANY CONTACT: William Sullivan, V.P. or (205) 345-1624
John Mathews, P.R.
Republic Steel Company
Tuscaloosa, Alabama

STATE: ALABAMA

COUNTY(IES) OF IMPACT: Shelby
POPULATION CENTER(S): Shelby
POPULATION COUNT: 600

SITE LOCATION: 10 Miles Northeast of Shelby

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1979-1981
PROJECT CONSTRUCTION: 1979-1981
PROJECT OPERATION: 1981-2005

PROJECTED WORKFORCE:
TEMPORARY: 75 through 1981
PERMANENT: 350 at peak by 1985

DEVELOPMENT COMPANY: U.S. Steel Corporation
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: James R. Boyle (205) 758-0491
U.S. Bureau of Mines
P.O. Box 1
University of Alabama
Birmingham, Alabama

DEVELOPMENT COMPANY CONTACT: Robert Layman (205) 783-8011
Mine Manager
U.S. Steel Corporation
(Local Office)
Birmingham, Alabama

STATE: ARIZONA

COUNTY(IES) OF IMPACT: Pina (Papago Indian Reservation area)
POPULATION CENTER(S): Casa Grande
POPULATION COUNT: 10,536

SITE LOCATION: 1 Mile West of Kohulk on Papago Reservation

RESOURCE SOUGHT: Copper
GENERAL PROCESS OF RESOURCE RETRIEVAL: Open Pit

PROJECT LIFE: 17-25 Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2010+

PROJECTED WORKFORCE:
TEMPORARY: 160 for first two years
PERMANENT: 354 by 1984

DEVELOPMENT COMPANY: Vekol Copper Mining Company
(Subsidiary of Newmont Mining Company)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: John Artichoker, Jr., or (602) 241-2305
Cyril Swanson
Area Directors
Bureau of Indian Affairs
P.O. Box 7007
Phoenix, Arizona 85001

DEVELOPMENT COMPANY CONTACT: Don Hammer (602) 297-7281
Newmont Exploration, Limited
Tucson, Arizona

STATE: ARIZONA

COUNTY(IES) OF IMPACT: Yavapai and Maricopa
POPULATION CENTER(S): Wickenburg
POPULATION COUNT: 2,698

SITE LOCATION: 25 Miles Northwest of Wickenburg

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining and Milling

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1981-1984
PROJECT CONSTRUCTION: 1981-1984
PROJECT OPERATION: 1984-2005

PROJECTED WORKFORCE:
TEMPORARY: 80 - 100 for first two years
PERMANENT: 350 - 400 by 1985

DEVELOPMENT COMPANY: Minerals Exploration Company
INDUSTRY PARTNER(S): Union Oil Company

PERMIT STATUS VERIFICATION: A. K. Doss, Manager (602) 255-4628
Minerals and Energy Section
Arizona Atomic Energy Commission
1600 W. Adams
Phoenix, Arizona 85007

DEVELOPMENT COMPANY CONTACT: Jerry Dohm, Manager (602) 624-1572 or
Minerals Exploration Co. (602) 884-8073
Tuscon, Arizona

STATE: COLORADO

COUNTY(IES) OF IMPACT: Gunnison
POPULATION CENTER(S): Crested Butte
POPULATION COUNT: 372

SITE LOCATION: 5 Miles West of Crested Butte (on Mt. Emmons)

RESOURCE SOUGHT: Molybdenum
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 60 Years

DEVELOPMENT SCHEDULE: 1981-1986
PROJECT CONSTRUCTION: 1981-1986
PROJECT OPERATION: 1985-2045

PROJECTED WORKFORCE:
TEMPORARY: 500 until 1985
PERMANENT: 1,400 at peak by 1995

DEVELOPMENT COMPANY: Amax, Inc. (Climax Molybdenum Division)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Gary Fischer (303) 839-3311
Colorado Dept. of Natural Resources
1313 Sherman
Denver, Colorado 80203

DEVELOPMENT COMPANY CONTACT: Gary Givens (303) 433-6151
Amax, Inc.
4704 Harlan
Lakewood, Colorado 80212

STATE: COLORADO

COUNTY(IES) OF IMPACT: Rio Blanco and Garfield
POPULATION CENTER(S): Meeker and Rifle
POPULATION COUNT: 1,597 2,150

SITE LOCATION: 20 Miles Southwest of Meeker

RESOURCE SOUGHT: Oil Shale
GENERAL PROCESS OF RESOURCE RETRIEVAL: Modified in situ

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1978-1985
PROJECT CONSTRUCTION: 1978-1985
PROJECT OPERATION: 1985-2030

PROJECTED WORKFORCE:
TEMPORARY: 200+ through 1985
PERMANENT: 1,100-1,600 by 1988

DEVELOPMENT COMPANY: C-B Oil Shale Development Company
INDUSTRY PARTNER(S): Occidental Oil Company; Tenneco, Inc.

PERMIT STATUS VERIFICATION: Eric Hoffman (303) 245-6700
U.S. Geological Survey
Area Oil Shale Office
131 North 6th
Grand Junction, Colorado 81501

DEVELOPMENT COMPANY CONTACT: Robert Thomasen (303) 242-8463
Occidental Oil Shale, Inc.
P.O. Box 2687
2372 G Road
Grand Junction, Colorado 81501

STATE: COLORADO

COUNTY(IES) OF IMPACT: Rio Blanco
POPULATION CENTER(S): Meeker and Rangely and Dinosaur
POPULATION COUNT: 1,597 1,591 142

SITE LOCATION: 20 Miles South of Rangely

RESOURCE SOUGHT: Oil Shale
GENERAL PROCESS OF RESOURCE RETRIEVAL: Modified in situ

PROJECT LIFE: 40+ Years

DEVELOPMENT SCHEDULE: 1978-1985
PROJECT CONSTRUCTION: 1978-1985
PROJECT OPERATION: 1985-2035

PROJECTED WORKFORCE:
TEMPORARY: 90-100 until 1982
PERMANENT: 2,000 by 1985

DEVELOPMENT COMPANY: Rio Blanco Oil Shale Company
INDUSTRY PARTNER(S): Gulf Oil Company
Standard Oil Company

PERMIT STATUS VERIFICATION: Eric Hoffman (303) 245-6700
U.S. Geological Survey
Area Oil Shale Office
131 North 6th
Grand Junction, Colorado 81501

DEVELOPMENT COMPANY CONTACT: Larry Weiner (303) 751-2030
Rio Blanco Oil Shale Company
401 Dayton Commons
9725 East Hampden
Denver, Colorado 80231

STATE: COLORADO

COUNTY(IES) OF IMPACT: Garfield
POPULATION CENTER(S): Rifle and Grand Valley
POPULATION COUNT: 2,150 270

SITE LOCATION: 12 Miles Northwest of Grand Valley

RESOURCE SOUGHT: Oil Shale
GENERAL PROCESS OF RESOURCE RETRIEVAL: Surface Retort

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2030

PROJECTED WORKFORCE:
TEMPORARY: 400+ through construction
PERMANENT: 250 after 1982

DEVELOPMENT COMPANY: Union Oil Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Eric Hoffman (303) 245-6700
U.S. Geological Survey
Area Oil Shale Office
131 North 6th
Grand Junction, Colorado 81501

DEVELOPMENT COMPANY CONTACT: Allen Randel (303) 243-0112
Union Oil Company
Valley Federal Plaza, Suite 505
Grand Junction, Colorado 81501

STATE: COLORADO

COUNTY(IES) OF IMPACT: Saguache
POPULATION CENTER(S): Gunnison and Saguache
POPULATION COUNT: 4,613 642

SITE LOCATION: Southeast corner of Gunnison National Forest

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Open Pit

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1980-1984
PROJECT CONSTRUCTION: 1980-1984
PROJECT OPERATION: 1984-2020

PROJECTED WORKFORCE:
TEMPORARY: 50-75 until 1984
PERMANENT: 200+ by 1984 and thereafter

DEVELOPMENT COMPANY: Homestake Mining Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: James R. Wilkins (303) 874-8658
U.S. Forest Service
P.O. Box 138
Delta, Colorado 81416

DEVELOPMENT COMPANY CONTACT: Joe Dannie (303) 641-3295
Homestake Mining Company
320 North Main
Gunnison, Colorado 80123

STATE: IDAHO

COUNTY(IES) OF IMPACT: Caribou
POPULATION CENTER(S): Soda Springs
POPULATION COUNT: 2,977

SITE LOCATION: 28 Miles Northeast of Soda Springs

RESOURCE SOUGHT: Phosphate
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1980-1984
PROJECT CONSTRUCTION: 1980-1984
PROJECT OPERATION: 1984-2005

PROJECTED WORKFORCE:
TEMPORARY: 250 annually until 1984
PERMANENT: 160 at peak by 1985

DEVELOPMENT COMPANY: Earth Resources, Inc.
INDUSTRY PARTNER(S): National Steel Corporation
South Wire Company, Inc.

PERMIT STATUS VERIFICATION: William Schneider (208) 236-6860
U.S. Geological Survey
250 South Fourth
Pocatello, Idaho 83201

DEVELOPMENT COMPANY CONTACT: J. Viellenave (303) 279-7641
Earth Resources, Inc.
5920 McIntyre
Golden, Colorado 80401

STATE: IDAHO

COUNTY(IES) OF IMPACT: Caribou
POPULATION CENTER(S): Soda Springs
POPULATION COUNT: 2,977

SITE LOCATION: 14 Miles Northeast of Soda Springs

RESOURCE SOUGHT: Phosphate
GENERAL PROCESS OF RESOURCE RETRIEVAL: Open Pit

PROJECT LIFE: 22-25 Years

DEVELOPMENT SCHEDULE: 1981-1986
PROJECT CONSTRUCTION: 1981-1986
PROJECT OPERATION: 1986-2010

PROJECTED WORKFORCE:
TEMPORARY: 180 annually until 1986
PERMANENT: 230 at peak in 1990

DEVELOPMENT COMPANY: FMC Corporation
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: William Schneider (208) 236-6860
U.S. Geological Survey
250 South Fourth
Pocatello, Idaho 83201

DEVELOPMENT COMPANY CONTACT: A. R. Conroy (215) 299-6000
FMC Corporation
2000 Market Street
Philadelphia, Pennsylvania 19103

STATE: IDAHO

COUNTY(IES) OF IMPACT: Caribou
POPULATION CENTER(S): Soda Springs
POPULATION COUNT: 2,977

SITE LOCATION: 4 mines planned in sequential development; all are 10-18 miles North and Northeast of Soda Springs

RESOURCE SOUGHT: Phosphate
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining and Open Pit

PROJECT LIFE: 20 - 25 Years

DEVELOPMENT SCHEDULE: 1983-1999
PROJECT CONSTRUCTION: (1) 1983-1984, (2) 1985-1994, (3) 1995-1998, (4) 1999
PROJECT OPERATION: (1) 1985-2010, (2) 1995-2020, (3) 1999-2025, (4) 2000-2025

PROJECTED WORKFORCE:
TEMPORARY: 50 annually 1983 - 1998
PERMANENT: (1) 140, (2) 200, (3) 200, (4) 200

DEVELOPMENT COMPANY: Monsanto Chemicals, Inc.
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: William Schneider (208) 236-6860
U.S. Geological Survey
250 South Fourth
Pocatello, Idaho 83201

DEVELOPMENT COMPANY CONTACT: George L. Atwood (314) 694-1000
Monsanto Chemicals Co., Inc.
800 N. Lindbergh Boulevard
St. Louis, Missouri 63166

STATE: ILLINOIS

COUNTY(IES) OF IMPACT: Hamilton
POPULATION CENTER(S): McLeansboro
POPULATION COUNT: 2,630

SITE LOCATION: 10 Miles Northeast of McLeansboro

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20 - 30 Years

DEVELOPMENT SCHEDULE: 1980-1983
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2015

PROJECTED WORKFORCE:
TEMPORARY: 100 through 1982
PERMANENT: 500 by 1982

DEVELOPMENT COMPANY: Inland Steel Corporation
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Robert Thomson (412) 621-4500
U.S. Bureau of Mines
4800 Forbes
Pittsburgh, Pennsylvania 15213.

DEVELOPMENT COMPANY CONTACT: Richard Shockley (618) 625-2041
Inland Steel Corporation
(Local Office)
P.O. Box 566
Sesser, Illinois 62884

STATE: ILLINOIS

COUNTY(IES) OF IMPACT: Franklin
POPULATION CENTER(S): West Frankfort
POPULATION COUNT: 2,325

SITE LOCATION: 5 Miles East of West Frankfort

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20 - 25 Years

DEVELOPMENT SCHEDULE: 1979-1982
PROJECT CONSTRUCTION: 1979-1982
PROJECT OPERATION: 1981-2020

PROJECTED WORKFORCE:
TEMPORARY: 200 through 1982
PERMANENT: 450 by 1982

DEVELOPMENT COMPANY: Old Ben Coal Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Robert Thomson (415) 621-4500
U.S. Bureau of Mines
4800 Forbes
Pittsburgh, Pennsylvania 15213

DEVELOPMENT COMPANY CONTACT: Lanny Rechter (618) 435-8176
Old Ben Coal Company
(Local Office)
500 West Main
Benton, Illinois 62812

STATE: INDIANA

COUNTY(IES) OF IMPACT: Knox
POPULATION CENTER(S): Monroe City
POPULATION COUNT: 603

SITE LOCATION: 5 Miles West of Monroe City

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1979-1882
PROJECT CONSTRUCTION: 1979-1982
PROJECT OPERATION: 1982-2015

PROJECTED WORKFORCE:
TEMPORARY: 75 through 1982
PERMANENT: 200 by 1982

DEVELOPMENT COMPANY: Amax Coal Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: William S. Miska (812) 339-6139
U.S. Bureau of Mines
7th & College St., Room 113
Bloomington, Indiana 47401

DEVELOPMENT COMPANY CONTACT: Vic Steverwald (317) 266-2626
Amax Coal Company
105 South Meridian
Indianapolis, Indiana 46225

STATE: MONTANA

COUNTY(IES) OF IMPACT: Big Horn
POPULATION CENTER(S): Sheridan and Birney
POPULATION COUNT: 10,856 140

SITE LOCATION: 20 Miles Northeast of Sheridan and 24 Miles Southwest of Birney

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining and Open Pit

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1980-1985
PROJECT CONSTRUCTION: 1980-1985
PROJECT OPERATION: 1984-2015

PROJECTED WORKFORCE:
TEMPORARY: 165 in 1980, 210 through 1984
PERMANENT: 200 - 272 in 1984

DEVELOPMENT COMPANY: Decker Coal Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Douglas H. Hileman (406) 657-6181
U.S. Geological Survey
P.O. Box 2550
Billings, Montana 59103

DEVELOPMENT COMPANY CONTACT: Robert Clark (307) 757-2561
Decker Coal Company
Decker, Wyoming 82801

STATE: MONTANA

COUNTY(IES) OF IMPACT: Big Horn
POPULATION CENTER(S): Sheridan and Decker
POPULATION COUNT: 10,856 · 240

SITE LOCATION: 8 Miles North of Montana/Wyoming border, 28 Miles North of Sheridan and 11 Miles North of Decker

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Open Pit and Stripping

PROJECT LIFE: 25 Years

DEVELOPMENT SCHEDULE: 1980-1986
PROJECT CONSTRUCTION: 1980-1986
PROJECT OPERATION: 1983-2020

PROJECTED WORKFORCE:
TEMPORARY: 97 in 1980, 450 by 1982
PERMANENT: 250 by 1983.

DEVELOPMENT COMPANY: Spring Creek Coal Company
(Subsidiary of Northern Energy Resources Company)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Sandi Johnson (406) 449-2074
Department of State Lands
1625 11th Street
Helena, Montana 59601

DEVELOPMENT COMPANY CONTACT: William Lyons (503) 243-4435
Northern Energy Resources Company
529 S.W. 23rd Avenue
Portland, Oregon 97204

STATE: MONTANA

COUNTY(IES) OF IMPACT: Rosebud
POPULATION CENTER(S): Coal Strip
POPULATION COUNT: 140

SITE LOCATION: 10 Miles North of Northern Cheyenne Indian Reservation

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Open Pit

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1981-1985
PROJECT CONSTRUCTION: 1981-1985
PROJECT OPERATION: 1985-2015

PROJECTED WORKFORCE:
TEMPORARY: 32 through 1985
PERMANENT: 200 by 1985

DEVELOPMENT COMPANY: Peabody Coal Company
INDUSTRY PARTNER(S): Minnesota Power and Light

PERMIT STATUS VERIFICATION: Sandi Johnson (406) 449-2174
Department of State Lands
1625 11th Street
Helena, Montana 59601

DEVELOPMENT COMPANY CONTACT: David R. Sturgess (303) 371-7990
Peabody Coal Company
Suite 203
12075 E. 45th Street
Denver, Colorado 80239

STATE: MONTANA

COUNTY(IES) OF IMPACT: Big Horn
POPULATION CENTER(S): Sheridan
POPULATION COUNT: 10,856

SITE LOCATION: 12 Miles North of Sheridan

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining

PROJECT LIFE: 27 Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1981-2020

PROJECTED WORKFORCE:
TEMPORARY: 257 through 1981
PERMANENT: 2025 through operation; start in 1981

DEVELOPMENT COMPANY: Shell Oil Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Glenn Malberg (406) 657-6711
U.S. Geological Survey
P.O. Box 1135
Billings, Montana 59103

DEVELOPMENT COMPANY CONTACT: N. Isto, Mining Manager (713) 241-6161
Shell Oil Company
Two Shell Plaza
P.O. Box 2099
Houston, Texas 77001

STATE: MONTANA

COUNTY(IES) OF IMPACT: Big Horn
POPULATION CENTER(S): Hardin and Hysham
POPULATION COUNT: 2,733 373

SITE LOCATION: 26 Miles East of Hardin at edge of Crow Indian Reservation

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining

PROJECT LIFE: 25 Years

DEVELOPMENT SCHEDULE: 1980-1981
PROJECT CONSTRUCTION: 1980-1981
PROJECT OPERATION: 1981-2020

PROJECTED WORKFORCE:
TEMPORARY: 50 through 1981
PERMANENT: 210 by 1981

DEVELOPMENT COMPANY: Westmoreland Resources, Inc.
(Subsidiary of Westmoreland Coal)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Douglas H. Hileman (406) 657-6181
U.S. Geological Survey
P.O. Box 2550
Billings, Montana 59103

DEVELOPMENT COMPANY CONTACT: C. J. Presley (406) 248-7803
Westmoreland Resources, Inc.
P.O. Box 1883
Billings, Montana 59103

STATE: NEVADA

COUNTY(IES) OF IMPACT: White Pine
POPULATION CENTER(S): Ely
POPULATION COUNT: 4,176

SITE LOCATION: 25 Miles Northwest of Ely

RESOURCE SOUGHT: Gold
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2015

PROJECTED WORKFORCE:
TEMPORARY: 75 through 1982
PERMANENT: 2025 by 1982

DEVELOPMENT COMPANY: American Philco Company
INDUSTRY PARTNER(S): Occidental Oil Company

PERMIT STATUS VERIFICATION: Joice Hall (702) 885-4368
Nevada Division of Mineral Resources
201 S. Fall Street
Carson City, Nevada 81710

DEVELOPMENT COMPANY CONTACT: Tony Taylor (702) 827-2270
American Philco Company
Suite 100
90 W. Grove Street
Reno, Nevada 89509

STATE: NEVADA

COUNTY(IES) OF IMPACT: Elko
POPULATION CENTER(S): Elko
POPULATION COUNT: 7,621

SITE LOCATION: 40 Miles Northeast of Elko

RESOURCE SOUGHT: Gold
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1981-2015

PROJECTED WORKFORCE:
TEMPORARY: 50 - 75 through 1982
PERMANENT: 200 by 1981

DEVELOPMENT COMPANY: Freeport Sulphor Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Joice Hall (702) 885-4368
Nevada Division of Mineral Resources
201 S. Fall Street
Carson City, Nevada 81710

DEVELOPMENT COMPANY CONTACT: Dell Flint (702) 323-2251
Freeport Sulphor Company
P.O. Box 1911
Reno, Nevada 89505

STATE: NEVADA

COUNTY(IES) OF IMPACT: Esmeralda
POPULATION CENTER(S): Tonopah
POPULATION COUNT: 1,716

SITE LOCATION: 10 Miles Southwest of Tonopah

RESOURCE SOUGHT: Molybdenum and Copper
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1980-1984
PROJECT CONSTRUCTION: 1980-1984
PROJECT OPERATION: 1984-2020

PROJECTED WORKFORCE:
TEMPORARY: 100 through 1984
PERMANENT: 350 by 1984

DEVELOPMENT COMPANY: Anaconda
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Larry Garside (702) 784-6691
Nevada Bureau of Mines
University of Nevada
Reno, Nevada 89557

DEVELOPMENT COMPANY CONTACT: Dana Garnes (702) 359-4941
Anaconda
850 Industrial Way
Sparks, Nevada 89431

STATE: NEVADA

COUNTY(IES) OF IMPACT: Mineral
POPULATION CENTER(S): Mina, Hawthorne
POPULATION COUNT: 425 120

SITE LOCATION: 25 Miles East of Hawthorne

RESOURCE SOUGHT: Tungsten
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mine

PROJECT LIFE: 30 Years

DEVELOPMENT SCHEDULE: 1980-1984
PROJECT CONSTRUCTION: 1980-1984
PROJECT OPERATION: 1982-2020

PROJECTED WORKFORCE:
TEMPORARY: 72 through 1984
PERMANENT: 225 by 1982

DEVELOPMENT COMPANY: Union Carbide
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Larry Garside (702) 784-6691
Nevada Bureau of Mines
University of Nevada
Reno, Nevada 89557

DEVELOPMENT COMPANY CONTACT: Grant Howey (303) 245-3700
Union Carbide
P.O. Box 1029
Grand Junction, Colorado 81501

STATE: NEVADA

COUNTY(IES) OF IMPACT: Pershing
POPULATION CENTER(S): Winnemucca, Mill City, Imlay
POPULATION COUNT: 3,587 108 170

SITE LOCATION: 30 Miles Southwest of Winnemucca

RESOURCE SOUGHT: Tungsten
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1980-1983
PROJECT CONSTRUCTION: 1980-1983
PROJECT OPERATION: 1982-2020

PROJECTED WORKFORCE:
TEMPORARY: 75 through 1983
PERMANENT: 200 by 1982

DEVELOPMENT COMPANY: Utah International, Inc.
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Larry Garside (702) 784-6691
Nevada Bureau of Mines
University of Nevada
Reno, Nevada 89557

DEVELOPMENT COMPANY CONTACT: Frank Metcalf (702) 538-7341
Utah International, Inc.
P.O. Box F
Imlay, Nevada 89418

STATE: NEW MEXICO

COUNTY(IES) OF IMPACT: Union and Harding
POPULATION CENTER(S): Mosquero, Clayton, Nara Visa
POPULATION COUNT: 244 2,931 140

SITE LOCATION: Within triangle formed by Clayton, Mosquero, and Nara Visa

RESOURCE SOUGHT: CO₂
GENERAL PROCESS OF RESOURCE RETRIEVAL: Drilling and Pumping

PROJECT LIFE: 50 Years

DEVELOPMENT SCHEDULE: 1980-1984
PROJECT CONSTRUCTION: 1980-1984
PROJECT OPERATION: 1984-2040

PROJECTED WORKFORCE:
TEMPORARY: 50 through 1984
PERMANENT: 300 by 1984

DEVELOPMENT COMPANY: Amoco Production Company (Subsidiary of Standard Oil)
INDUSTRY PARTNER(S): Gulf Oil Company
Anaconda

PERMIT STATUS VERIFICATION: Emily Miller (505) 827-2471
Department of Energy and Minerals
113 Washington Avenue
Santa Fe, New Mexico 87501

DEVELOPMENT COMPANY CONTACT: George Miga (713) 652-4368
Amoco Production Company
P.O. Box 3092
Houston, Texas 77001

STATE: NEW MEXICO

COUNTY(IES) OF IMPACT: McKinley
POPULATION CENTER(S): Crown Point, Gallup, Thoreau, and Grants-Milan
POPULATION COUNT: 900 13,779 900 12,900

SITE LOCATION: 1 Mile East of Crown Point

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2015

PROJECTED WORKFORCE:
TEMPORARY: 100 through 1982
PERMANENT: 370 by 1983

DEVELOPMENT COMPANY: Mobil Oil Corporation
INDUSTRY PARTNER(S): Tennessee Valley Authority

PERMIT STATUS VERIFICATION: Dr. Harry Moore (615) 755-3161
Department of Interior
268 401 Building
Chattanooga, Tennessee 37401

DEVELOPMENT COMPANY CONTACT: Daniel B. Hurly (505) 287-4170
Mobil Oil Corporation
P.O. Box 2248
Milan, New Mexico 87021

STATE: NEW MEXICO

COUNTY(IES) OF IMPACT: San Juan (on the Navaho Reservation)
POPULATION CENTER(S): Rattlesnake
POPULATION COUNT: 140

**SITE LOCATION: 10 Miles South of Rattlesnake, 5 Miles East of
Arizona/New Mexico border**

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 25 Years

DEVELOPMENT SCHEDULE: 1982-1984
PROJECT CONSTRUCTION: 1982-1984
PROJECT OPERATION: 1983-2010

PROJECTED WORKFORCE:
TEMPORARY: 80 through 1984
PERMANENT: 248 by 1984, 496 by 1987, 744 by 1989, 922 by 1992

DEVELOPMENT COMPANY: Navaho Exploration Company
INDUSTRY PARTNER(S): Exxon Corporation (51% partner)

PERMIT STATUS VERIFICATION: W. D. Babby (406) 657-6315
Bureau of Indian Affairs
316 North 26th Street
Billings, Montana 59101

DEVELOPMENT COMPANY CONTACT: Actor Zamon (602) 871-4941
Navaho Tribe Minerals Department
Navaho Tribal Council
Window Rock, Arizona 86515

STATE: NEW MEXICO

COUNTY(IES) OF IMPACT: McKinley (Partially on Navaho Reservation)
POPULATION CENTER(S): Standing Rock
POPULATION COUNT: 280

SITE LOCATION: 8 Miles South of Standing Rock

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 25 Years

DÉVELOPMENT SCHEDULE: 1980-1981
PROJECT CONSTRUCTION: 1980-1981
PROJECT OPERATION: 1982-2015

PROJECTED WORKFORCE:
TEMPORARY: 200 through 1981
PERMANENT: 550 by 1986

DEVELOPMENT COMPANY: United Nuclear Corporation
INDUSTRY PARTNER(S): Tennessee Valley Authority

PERMIT STATUS VERIFICATION: Dr. P. Kreuhel (615) 755-3161
Department of Interior
268 401 Building
Chattanooga, Tennessee 37401

DEVELOPMENT COMPANY CONTACT: Bob Steffey and (615) 755-2061
Allen Mullens
Tennessee Valley Authority
703 Power Building
Chattanooga, Tennessee 37401

STATE: NORTH CAROLINA**COUNTY(IES) OF IMPACT:** Beaufort**POPULATION CENTER(S):** Washington, New Besu, and Greenville**POPULATION COUNT:** 8,961 14,660 29,063**SITE LOCATION:** 5 Miles South of Paulico River, 2 Miles North of Aurora**RESOURCE SOUGHT:** Phosphate**GENERAL PROCESS OF RESOURCE RETRIEVAL:** Surface Mining**PROJECT LIFE:** 20 - 30 Years**DEVELOPMENT SCHEDULE:** 1980-1983**PROJECT CONSTRUCTION:** 1980-1983**PROJECT OPERATION:** 1984-2025**PROJECTED WORKFORCE:****TEMPORARY:** 800 during peak in 1982**PERMANENT:** 468 by 1984**DEVELOPMENT COMPANY:** North Carolina Phosphate Corporation**INDUSTRY PARTNER(S):**

PERMIT STATUS VERIFICATION: U.S. Army Corps of Engineers (919) 763-9971
P.O. Box 1890
Wilmington, North Carolina 28401

DEVELOPMENT COMPANY CONTACT: Ward Grosz or (919) 946-4181
Russell Walker
P.O. Box 1157
Washington, North Carolina 27889

STATE: NORTH DAKOTA

COUNTY(IES) OF IMPACT: McLean
POPULATION CENTER(S): Riverdale and Underwood
POPULATION COUNT: 700 781

SITE LOCATION: 12 Miles Northeast of Underwood

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Surface Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1985-1987
PROJECT CONSTRUCTION: 1985-1987
PROJECT OPERATION: 1987-2030

PROJECTED WORKFORCE:
TEMPORARY: 90 through 1987
PERMANENT: 202 by 1987

DEVELOPMENT COMPANY: Consolidation Coal Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Jim Deutsch (701) 224-2400
North Dakota Public Service Commission
Capitol Building, 12th Floor
Bismark, North Dakota 58505

DEVELOPMENT COMPANY CONTACT: Ted Hanks (303) 770-1600
Consolidation Coal Company
2 Inverness Drive - East
Englewood, Colorado 80112

STATE: NORTH DAKOTA

COUNTY(IES) OF IMPACT: McLean
POPULATION CENTER(S): Garrison and Emmet
POPULATION COUNT: 1,614 120

SITE LOCATION: 12 Miles North of Garrison

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Surface Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1982-1984
PROJECT CONSTRUCTION: 1982-1984
PROJECT OPERATION: 1984-2010

PROJECTED WORKFORCE:
TEMPORARY: 125 through 1984
PERMANENT: 225 by 1985 and through 2010

DEVELOPMENT COMPANY: Nakota Company (lease holding company,
looking for buyer)

INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Jim Deutsch (701) 224-2400
North Dakota Public Service Commission
Capitol Building, 12th Floor
Bismark, North Dakota 58505

DEVELOPMENT COMPANY CONTACT: Gaylon Anderson (701) 223-6188
Nakota Company
P.O. Box 1633
Bismark, North Dakota 58501

STATE: OREGON

COUNTY(IES) OF IMPACT: Malheur
POPULATION CENTER(S): McDermitt
POPULATION COUNT: 180

SITE LOCATION: 20 Miles Northwest of McDermitt

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1983-2020

PROJECTED WORKFORCE:
TEMPORARY: 75 through 1983
PERMANENT: 350 by 1984

DEVELOPMENT COMPANY: Placer-Amax
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Joice Hall (702) 885-4368
Nevada Division of Mineral Resources
201 South Fall Street
Carson City, Nevada 81710

DEVELOPMENT COMPANY CONTACT: Benno Patsch (415) 986-0740
Placer-Amax
California Building #1
Suite 2500
San Francisco, California 94111

STATE: SOUTH DAKOTA

COUNTY(IES) OF IMPACT: Fall River and Custer
POPULATION CENTER(S): Egmont and Hot Springs
POPULATION COUNT: 1,174 4,434

SITE LOCATION: 15 Miles North of Egmont

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2015

PROJECTED WORKFORCE:
TEMPORARY: 50 until 1982
PERMANENT: 200 by 1885

DEVELOPMENT COMPANY: Tennessee Valley Authority
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Dr. Harry Moore (615) 755-3161
Department of Interior
268 401 Building
Chattanooga, Tennessee 37401

DEVELOPMENT COMPANY CONTACT: Bob Steffey and (615) 755-2061
Allen Mullens
Tennessee Valley Authority
703 Power Building
Chattanooga, Tennessee 37401

STATE: UTAH

COUNTY(IES) OF IMPACT: Carbon
POPULATION CENTER(S): Price and Wellington
POPULATION COUNT: 6,218

SITE LOCATION: 10 Miles Northwest of Price

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1980-1983
PROJECT CONSTRUCTION: 1980-1983
PROJECT OPERATION: 1983-2010

PROJECTED WORKFORCE:
TEMPORARY: 50 - 65 until 1983
PERMANENT: 223 by 1983

DEVELOPMENT COMPANY: AMCA Coal Leasing, Inc.
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: David Schleicher (303) 234-3960
U.S. Geological Survey
P.O. Box 25046
Denver Federal Center
Denver, Colorado 80225

DEVELOPMENT COMPANY CONTACT: Sam Quigley (801) 637-5385
AMCA Coal Leasing, Inc.
P.O. Box 1027
Price, Utah 84501

STATE: UTAH

COUNTY(IES) OF IMPACT: Kane and Garfield
POPULATION CENTER(S): Escalante
POPULATION COUNT: 638

SITE LOCATION: 28 Miles South of Escalante

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining

PROJECT LIFE: 50 Years

DEVELOPMENT SCHEDULE: 1980-1984
PROJECT CONSTRUCTION: 1980-1984
PROJECT OPERATION: 1984-2035

PROJECTED WORKFORCE:
TEMPORARY: 450 through 1984
PERMANENT: 2,000 by 1986

DEVELOPMENT COMPANY: El Paso Coal Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Gordon Whitney (801) 524-4585
U.S. Geological Survey
2040 Administration Building
1745 West, 1700 South
Salt Lake City, Utah 84104

DEVELOPMENT COMPANY CONTACT: James Compton (915) 543-2600
El Paso Coal Company
P.O. Box 1492
El Paso, Texas 79978

STATE: UTAH

COUNTY(IES) OF IMPACT: Carbon
POPULATION CENTER(S): Price and Schofield
POPULATION COUNT: 6,218 150

SITE LOCATION: 20 Miles Northwest of Price

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2015

PROJECTED WORKFORCE:
TEMPORARY: 75 until 1982
PERMANENT: 1,015 by 1983

DEVELOPMENT COMPANY: Energy Fuels Corporation
(Subsidiary of Coastal States Energy Company)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: David Schleicher (303) 234-3960
U.S. Geological Survey
P.O. Box 25046, Mailstop 701
Denver Federal Center
Denver, Colorado 80225

DEVELOPMENT COMPANY CONTACT: Bill Davis (303) 623-8317
Energy Fuels Corporation
1515 Arapahoe
Denver, Colorado 80202

STATE: UTAH

COUNTY(IES) OF IMPACT: Emery and Sevin
POPULATION CENTER(S): Salina
POPULATION COUNT: 1,494

SITE LOCATION: 1 Mile East of 70 and 72 junction

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1980-1983
PROJECT CONSTRUCTION: 1980-1983
PROJECT OPERATION: 1983-2010

PROJECTED WORKFORCE:
TEMPORARY: 128 until 1982
PERMANENT: 290 by 1983

DEVELOPMENT COMPANY: Energy Reserves Group, Inc.
(Subsidiary of Clinton Oil Co.)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: David Schleicher (303) 234-3960
U.S. Geological Survey
P.O. Box 25046, Mailstop 701
Denver Federal Center
Denver, Colorado 80225

DEVELOPMENT COMPANY CONTACT: David Groves (303) 572-3323
Energy Reserves Group, Inc.
633 17th Street, Suite 32
Denver, Colorado 80201

STATE: UTAH

COUNTY(IES) OF IMPACT: Kane and Page (in Arizona)
POPULATION CENTER(S): Kanob and Page
POPULATION COUNT: 1,381 1,439

SITE LOCATION: 5 Miles North of Glen Canyon

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 30 Years

DEVELOPMENT SCHEDULE: 1980-1981
PROJECT CONSTRUCTION: 1980-1981
PROJECT OPERATION: 1982-2015

PROJECTED WORKFORCE:
TEMPORARY: 700 until 1981
PERMANENT: 3,400 by 1982

DEVELOPMENT COMPANY: Kaiser Engineering (lead agency)
INDUSTRY PARTNER(S): Resources Company (Subsidiary of Arizona PSC)
New Albion Resources Co. (Subsidiary of San Diego G&E)
Mono Power Co. (Subsidiary of S. California Edison Co.)

PERMIT STATUS VERIFICATION: Gordon Whitney (801) 524-4585
U.S. Geological Survey
2040 Administration Building
1745 West, 1700 South
Salt Lake City, Utah 84104

DEVELOPMENT COMPANY CONTACT: Charles Tillson (415) 271-4450
Kaiser Engineering
Kaiser Center
300 Lakeside Drive
Oakland, California 94666

STATE: UTAH

COUNTY(IES) OF IMPACT: Emery and Sevier
POPULATION CENTER(S): Loa and Emery
POPULATION COUNT: 324 216

SITE LOCATION: 9 Miles South of 70 and 72 junction

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2010

PROJECTED WORKFORCE:
TEMPORARY: 30 through 1982
PERMANENT: 200 by 1982

DEVELOPMENT COMPANY: Mountain States Resources Corporation
(Subsidiary of Ute Energy)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: David Schleicher (303) 234-3960
U.S. Geological Survey
P.O. Box 25046, Mailstop 701
Denver Federal Center
Denver, Colorado 80225

DEVELOPMENT COMPANY CONTACT: Jerry D. Reid and (801) 486-7425
Gene Veselka
Mountain States Resources Corporation
1399 South, 700 East
Salt Lake City, Utah 84105

STATE: UTAH

COUNTY(IES) OF IMPACT: Carbon
POPULATION CENTER(S): Price
POPULATION COUNT: 6,218

SITE LOCATION: 15 Miles East and Northeast of Price

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1981-1986
PROJECT CONSTRUCTION: 1981-1986
PROJECT OPERATION: 1985-2020

PROJECTED WORKFORCE:
TEMPORARY: 203 through 1986
PERMANENT: 1,600 by 1986

DEVELOPMENT COMPANY: Pacific Gas and Electric Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: David Schleicher (303) 234-3960
U.S. Geological Survey
P.O. Box 25046, Mailstop 701
Denver Federal Center
Denver, Colorado 80225

DEVELOPMENT COMPANY CONTACT: Bruce Benzler (415) 781-4211
Pacific Gas and Electric Company
245 Market Street
San Francisco, California 94106

STATE: UTAH

COUNTY(IES) OF IMPACT: Kane
POPULATION CENTER(S): Alton
POPULATION COUNT: 129

SITE LOCATION: 3 Miles East of Alton

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining

PROJECT LIFE: 30 Years

DEVELOPMENT SCHEDULE: 1980-1986
PROJECT CONSTRUCTION: 1980-1986
PROJECT OPERATION: 1985-2020

PROJECTED WORKFORCE:
TEMPORARY: 85 through 1984
PERMANENT: 620 by 1986

DEVELOPMENT COMPANY: Utah International, Inc.
INDUSTRY PARTNER(S): Nevada Electric Investment Company

PERMIT STATUS VERIFICATION: Gordon Whitney (801) 524-4585
U.S. Geological Survey
2040 Administration Building
1745 West, 1700 South
Salt Lake City, Utah 84104

DEVELOPMENT COMPANY CONTACT: Leroy Balzer and (415) 981-1515
Dave Roberts
Utah International, Inc.
550 California Street
San Francisco, California 94104

STATE: UTAH

COUNTY(IES) OF IMPACT: Carbon
POPULATION CENTER(S): Price, Schofield, and Clear Creek
POPULATION COUNT: 6,218 150 139

SITE LOCATION: 20 Miles Northwest of Price and 4 Miles Southwest of Schofield

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1980-1984
PROJECT CONSTRUCTION: 1980-1984
PROJECT OPERATION: 1984-2010

PROJECTED WORKFORCE:
TEMPORARY: 500 through 1984
PERMANENT: 1,000 by 1984

DEVELOPMENT COMPANY: Valley Camp of Utah, Inc.
INDUSTRY PARTNER(S): Quaker State Oil Company

PERMIT STATUS VERIFICATION: David Schleicher (303) 234-3960
U.S. Geological Survey
P.O. Box 25046, Mailstop 701
Denver Federal Center
Denver, Colorado 80225

DEVELOPMENT COMPANY CONTACT: Dan Guy and (801) 448-9420
Robert Steel
Valley Camp of Utah, Inc.
Schofield Route
Helper, Utah 84326

STATE: UTAH

COUNTY(IES) OF IMPACT: Uintah
POPULATION CENTER(S): Bonanza and Vernal
POPULATION COUNT: 150 3,908

SITE LOCATION: Two developments: one in Uinta Basin, the other in White Basin

RESOURCE SOUGHT: Oil Shale
GENERAL PROCESS OF RESOURCE RETRIEVAL: Room and Pillar

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1980-1990
PROJECT CONSTRUCTION: 1980-1990
PROJECT OPERATION: 1986-2030

PROJECTED WORKFORCE:
TEMPORARY: 250 by 1982, 2,000 by 1990
PERMANENT: 500 by 1986, 4,200 by 1995

DEVELOPMENT COMPANY: White River Oil Shale Project
INDUSTRY PARTNER(S): Standard Oil of Ohio
Phillips Petroleum
Seneco Energy Company

PERMIT STATUS VERIFICATION: Jim Hager and (303) 245-6700
Pete Rutledge
U.S. Geological Survey
Area Oil Shale Office
131 North 6th
Grand Junction, Colorado 81501

DEVELOPMENT COMPANY CONTACT: Reese Madsen (801) 789-0571
Standard Oil of Ohio
1315 West Highway 40
Vernal, Utah 84078

STATE: UTAH

COUNTY(IES) OF IMPACT: San Juan
POPULATION CENTER(S): Blanding and Monticello
POPULATION COUNT: 2,250 1,431

SITE LOCATION: 5 Miles South of Blanding

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20+ Years

DEVELOPMENT SCHEDULE: 1980-1981
PROJECT CONSTRUCTION: 1980-1981
PROJECT OPERATION: 1981-2010

PROJECTED WORKFORCE:
TEMPORARY: 85 through 1981
PERMANENT: 250 by 1981

DEVELOPMENT COMPANY: Energy Fuels Nuclear, Inc.
(Subsidiary of Coastal States Energy Company)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Gordon Whitney (801) 524-4585
U.S. Geological Survey
2040 Administration Building
1745 West, 1700 South
Salt Lake City, Utah 84104

DEVELOPMENT COMPANY CONTACT: Bill Davis (303) 623-8317
Energy Fuels Corporation
1515 Arapahoe
Denver, Colorado 80202

STATE: VIRGINIA

COUNTY(IES) OF IMPACT: Buchanan
POPULATION CENTER(S): Vansant
POPULATION COUNT: 500

SITE LOCATION: 2 Miles North of Vansant

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1980-1984
PROJECT CONSTRUCTION: 1980-1984
PROJECT OPERATION: 1983-2010

PROJECTED WORKFORCE:
TEMPORARY: 150 through 1983
PERMANENT: 500 by 1984

DEVELOPMENT COMPANY: Iland Creek Coal Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: James Gilley (304) 343-6181
U.S. Bureau of Mines
P.O. Box 428
Charleston, West Virginia 25322

DEVELOPMENT COMPANY CONTACT: Stony Barker and (606) 276-1525
Roy O. Delany
Iland Creek Coal Company
2355 Harrodsburg Road
P.O. Box 11430
Lexington, Kentucky 40511

STATE: WASHINGTON

COUNTY(IES) OF IMPACT: Stevens
POPULATION CENTER(S): Wellpint
POPULATION COUNT: 208

SITE LOCATION: Within town of Wellpint

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Open Pit

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1982-2005

PROJECTED WORKFORCE:
TEMPORARY: 150 through 1982
PERMANENT: 210 by 1984

DEVELOPMENT COMPANY: Western Nuclear, Inc.
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: James H. Stevens and (509) 258-4561
Jim LaBritt
Bureau of Indian Affairs
P.O. Box 309
Spokane, Washington 99040

DEVELOPMENT COMPANY CONTACT: Paul Blair (509) 258-4521
Western Nuclear, Inc.
Wellpint, Washington 99040

STATE: WEST VIRGINIA

COUNTY(IES) OF IMPACT: Boone
POPULATION CENTER(S): Van
POPULATION COUNT: 400

SITE LOCATION: 5 Miles West of Van

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1980-1985
PROJECT CONSTRUCTION: 1980-1985
PROJECT OPERATION: 1984-2010

PROJECTED WORKFORCE:
TEMPORARY: 150 annually through 1985
PERMANENT: 600 by 1985

DEVELOPMENT COMPANY: Bethlehem Mines Corporation
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: James Gilley (304) 343-6181
U.S. Bureau of Mines
P.O. Box 428
Charleston, West Virginia 25322

DEVELOPMENT COMPANY CONTACT: Lawrence Arch (304) 842-5471
Bethlehem Mines Corporation
P.O. Box 360
Bridgeport, West Virginia 26330

STATE: WEST VIRGINIA

COUNTY(IES) OF IMPACT: Wayne
POPULATION CENTER(S): East Lynn
POPULATION COUNT: 304

SITE LOCATION: 4 Miles North of East Lynn

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 20 Years

DEVELOPMENT SCHEDULE: 1979-1985 (3 mines in succession)
PROJECT CONSTRUCTION: 1979-1985
PROJECT OPERATION: 1982-2010

PROJECTED WORKFORCE:
TEMPORARY: 300 in succession at each mine through 1985
PERMANENT: 1,530 total for 3 mines by 1985

DEVELOPMENT COMPANY: Monterey Coal Company (Subsidiary of Exxon Corporation)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: James E. Gilley (304) 343-6181
U.S. Bureau of Mines
P.O. Box 428
Charleston, West Virginia 25322

DEVELOPMENT COMPANY CONTACT: R. A. Jarvis (304) 697-5380
Monterey Coal Company
P.O. Box 3102
Hunting, West Virginia 25702
or
Peter Ferguson (304) 849-5111
P.O. Box 158
East Lynn, West Virginia 25512

STATE: WYOMING

COUNTY(IES) OF IMPACT: Campbell
POPULATION CENTER(S): Gillette
POPULATION COUNT: 7,194

SITE LOCATION: 10 Miles Northeast of Gillette

RESOURCE SOUGHT: Coal
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining

PROJECT LIFE: 40 Years

DEVELOPMENT SCHEDULE: 1980-1988
PROJECT CONSTRUCTION: 1980-1988
PROJECT OPERATION: 1986-2030

PROJECTED WORKFORCE:
TEMPORARY: 277 by 1981, down to 86 in 1988
PERMANENT: 360 by 1988

DEVELOPMENT COMPANY: Carter Mining Company (Subsidiary of Carter Oil Co.)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Wyoming State Director's Office (307) 778-2220
Bureau of Land Management
2515 Warren Avenue
Cheyenne, Wyoming 82001

DEVELOPMENT COMPANY CONTACT: D. G. Warner (307) 686-1991
Carter Mining Company
P.O. Box 209
Gillette, Wyoming 82716

STATE: WYOMING

COUNTY(IES) OF IMPACT: Sweetwater
POPULATION CENTER(S): Rock Springs and Greenriver
POPULATION COUNT: 11,657 4,196

SITE LOCATION: 10 Miles South of Little America

RESOURCE SOUGHT: Trona
GENERAL PROCESS OF RESOURCE RETRIEVAL: Shallow Mining

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1980-1982
PROJECT CONSTRUCTION: 1980-1982
PROJECT OPERATION: 1983-2025

PROJECTED WORKFORCE:
TEMPORARY: 75 - 100 through 1983
PERMANENT: 500 by 1985

DEVELOPMENT COMPANY: Tenneco Oil Company
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Steve Bartenhagen (307) 777-7368
Wyoming Industrial Siting Administration
Boyd Building, Suite 500
1720 Carey Avenue
Cheyenne, Wyoming 82000

DEVELOPMENT COMPANY CONTACT: Ron Vosilka (307) 875-6500
Tenneco Oil Company
P.O. Box 1167
Greenriver, Wyoming 82935

STATE: WYOMING

COUNTY(IES) OF IMPACT: Natrona, Campbell
POPULATION CENTER(S): Midrest, Edgerton, Gillette
POPULATION COUNT: 825 350 7,194

SITE LOCATION: 60 Miles South of Gillette

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground Mining

PROJECT LIFE: 40+ Years

DEVELOPMENT SCHEDULE: 1981-1985
PROJECT CONSTRUCTION: 1981-1985
PROJECT OPERATION: 1984-2030

PROJECTED WORKFORCE:
TEMPORARY: 600 by 1982
PERMANENT: 400 by 1987

DEVELOPMENT COMPANY: Cleveland Cliffs Iron Company
INDUSTRY PARTNER(S): Edison Development Company

PERMIT STATUS VERIFICATION: Dale Hoffman (307) 777-7284
Wyoming Department of Economic
Planning and Development
Barrett Building
Cheyenne, Wyoming 82002

DEVELOPMENT COMPANY CONTACT: Bob Reidel (307) 234-9133
Cleveland Cliffs Iron Company
P.O. Box 3140
Casper, Wyoming 82602

STATE: WYOMING

COUNTY(IES) OF IMPACT: Campbell
POPULATION CENTER(S): Gillette
POPULATION COUNT: 7,194

SITE LOCATION: 4 Miles East and 6 Miles North of Gillette

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Strip Mining

PROJECT LIFE: 40+ Years

DEVELOPMENT SCHEDULE: 1980-1984
PROJECT CONSTRUCTION: 1980-1984
PROJECT OPERATION: 1984-2030

PROJECTED WORKFORCE:
TEMPORARY: 40 - 100 through 1984
PERMANENT: 242 by 1986

DEVELOPMENT COMPANY: Kerr-McGee Corporation
INDUSTRY PARTNER(S): Conoco Oil Company

PERMIT STATUS VERIFICATION: State Bartenhagen (307) 777-7368
Wyoming Industrial Siting Administration
Boyd Building, Suite 500
1720 Carey Avenue
Cheyenne, Wyoming 82000

DEVELOPMENT COMPANY CONTACT: J. C. Finley (405) 270-3190
Kerr-McGee Corporation
P.O. Box 55861
Oklahoma City, Oklahoma 73102

STATE: WYOMING

COUNTY(IES) OF IMPACT: Converse
POPULATION CENTER(S): Douglas
POPULATION COUNT: 2,677

SITE LOCATION: 35 Miles Northwest of Douglas

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Underground and Open Pit

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1980-1983
PROJECT CONSTRUCTION: 1980-1983
PROJECT OPERATION: 1983-2025

PROJECTED WORKFORCE:
TEMPORARY: 50 annually until 1983
PERMANENT: 410 by 1984

DEVELOPMENT COMPANY: Kerr-McGee Corporation
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Dale Hoffman (307) 777-7284
Wyoming Department of Economic
Planning and Development
Barrett Building
Cheyenne, Wyoming 82002

DEVELOPMENT COMPANY CONTACT: Darrell Coty (405) 270-3196
Kerr-McGee Corporation
P.O. Box 55861
Oklahoma City, Oklahoma 73125

STATE: WYOMING

COUNTY(IES) OF IMPACT: Fremont
POPULATION CENTER(S): Soshoni and Thermopolis
POPULATION COUNT: 562 3,063

SITE LOCATION: 15 Miles West of Soshoni

RESOURCE SOUGHT: Uranium
GENERAL PROCESS OF RESOURCE RETRIEVAL: Open Pit

PROJECT LIFE: 30+ Years

DEVELOPMENT SCHEDULE: 1981-1984
PROJECT CONSTRUCTION: 1981-1984
PROJECT OPERATION: 1983-2025

PROJECTED WORKFORCE:
TEMPORARY: 60 until 1984
PERMANENT: 350 by 1984

DEVELOPMENT COMPANY: Rocky Mountain Energy Company
(Subsidiary of Union Pacific)
INDUSTRY PARTNER(S):

PERMIT STATUS VERIFICATION: Dale Hoffman (307) 777-7284
Wyoming Department of Economic
Planning and Development
Barrett Building
Cheyenne, Wyoming 82002

DEVELOPMENT COMPANY CONTACT: Ned Davis (303) 433-6841
Rocky Mountain Energy Company
4704 Harlan
Denver, Colorado 80212

for more information...organizations

Manufacturers, builders, architects and designers have already begun to incorporate passive design concepts in manufactured homes and commercial buildings. To help potential buyers and other housing producers locate the technical and marketing information necessary, various organizations at local, state and regional levels offer referral and information services.

Solar professionals involved in design and manufacture may be located through local or state chapters of the American Institute of Architects (AIA), National Association of Housing Manufacturers, National Association of Home Builders, the Western Manufactured Housing Institute, the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE), or other trade and professional organizations.

79 Solar energy associations have been established in more than half of our states; some cover multi-state areas. Practically all provide referral services and many hold seminars, workshops, or meetings. Find them in the telephone book, through the National Solar Heating and Cooling Information Center, or from any state energy office, another good source of free solar energy and energy conservation information.

The U.S. Department of Energy and other Federal organizations are supporting the increased use of passive design for heating and cooling in manufactured homes and buildings and for commercial, institutional and agricultural uses. Work being carried out at laboratories and other research centers around the country covers varied facets of passive design, from development of design tools, materials and analysis methods through actual construction of demonstration buildings. Additional emphasis is being placed on the areas of communications and marketing, and on efforts to generate passive design among manufacturers and consumers.

The following government or government-funded organizations are sources of additional information on passive design. Each may provide different information and technical assistance services; all can make referrals to solar energy organizations, state energy offices, or other local resources.

Solar Energy Research Institute (SERI)

1617 Cole Blvd.
Golden, CO 80401 (303) 231-1415

Northeast Solar Energy Center (NESEC)

470 Atlantic Ave.
Boston, MA 02110 (617) 661-3500

Mid-American Solar Energy Complex (MASEC)

8140 26th Ave. South
Bloomington, MN 55420 (612) 452-5300

Southern Solar Energy Center (SSEC)

61 Perimeter Park
Atlanta, GA 30341 (404) 458-8765

Western Solar Utilization Network (WSUN)

Pioneer Park Bldg., 715 S.W. Morrison
Portland, OR 97205 (503) 241-1222

Tennessee Valley Authority (TVA)

Solar Applications Branch
240 Chestnut St. Towers II
Chattanooga, TN 37401 (615) 755-6741

National Solar Heating and Cooling Information Center (NSHCIC)

P.O. Box 1607
Rockville, MD 20850
Toll-Free (800) 523-2929 (800) 523-2929
From Pennsylvania (800) 462-4983
From Alaska, Hawaii (800) 523-4700



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16. Abstract (Limit: 200 words) A basic premise of this study is that large resource development projects provide a major market opportunity for passive solar manufactured buildings. The primary objectives of the work are to document selected resource development projects and identify their potential housing needs and development schedules, to contact resource industry representatives and assess some of the processes and motivations behind their involvement in housing decisions, and to provide passive solar manufactured buildings producers with results of these steps as early initial market intelligence. The intent is to identify not only the industries, location of their planned projects, and their likely worker housing needs, but also the individuals involved in making housing-related decisions. The 56 identified projects are located within 18 states and cover 11 types of resources. The report documents individual projects, provides projections of total worker-related housing needs, and presents overviews of resource development company involvement in the new construction market. In addition, the report profiles three organizations that expressed a strong interest in implementing the use of low-cost passive solar manufactured buildings in resource-development-related activities.			
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