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M-X Environmental Technical Report.

**ALTERNATIVE POTENTIAL
OPERATING BASE LOCATIONS:
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Prepared for

**United States Air Force
Ballistic Missile Office
Norton Air Force Base
California**

By

**Henningson, Durham & Richardson
Santa Barbara, California**

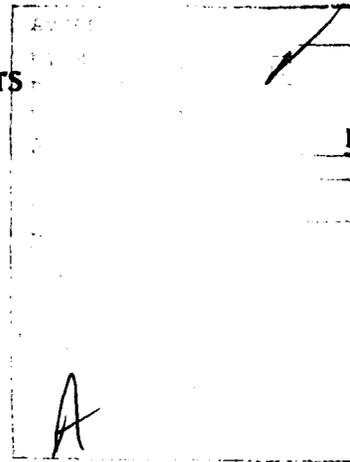
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1.0 ELY AND VICINITY COMMUNITY ENVIRONMENT

The area of analysis (AOA) for the Ely operating base option includes White Pine County and is located in the north central section of the designated region of influence (ROI) as shown in Figure 1.0-1. Ely, McGill, and Ruth are the major settlements in the AOA. This section details important environmental characteristics of Ely and vicinity.

1.1 HUMAN ENVIRONMENT

Economic Activity (1.1.1)

Once a part of Lander County, White Pine County was organized separately on April 1, 1869. This was a result of the rapid population growth in the Hamilton area due to a rich mining discovery on Treasure Hill. Hamilton became the county seat in the same year, but by 1885 the town had declined to the point where the county seat was moved to Ely. This decline resulted from the mine becoming uneconomical to work--the eventual fate of several other towns in the county.

Around 1906, the Kennecott Copper Corporation began mining operations in Ely and has since been the major supporting industry for Ely, McGill, and Ruth. Until recently, Ely was one of the largest copper producing areas in the country.

Although the tourist-related sector is the most important as regards personal income in the state of Nevada, it is the mining and related manufacturing sector which is of primary importance in White Pine County. While White Pine County contributes only about 1 percent to total state income, it was the source of over 20 percent of income produced from the mining sector statewide. This income originates from the copper mining industry of which the Kennecott Copper Corporation is the major producer in White Pine County.

Employment

The county has recently experienced a sizable economic downturn as a result of reductions in copper mining and smelting. Two major copper mining plants ceased operations in mid-1978, which eliminated a total of about 1,000 jobs in White Pine and Lyon counties. In August 1979, the smelter operation at the McGill plant

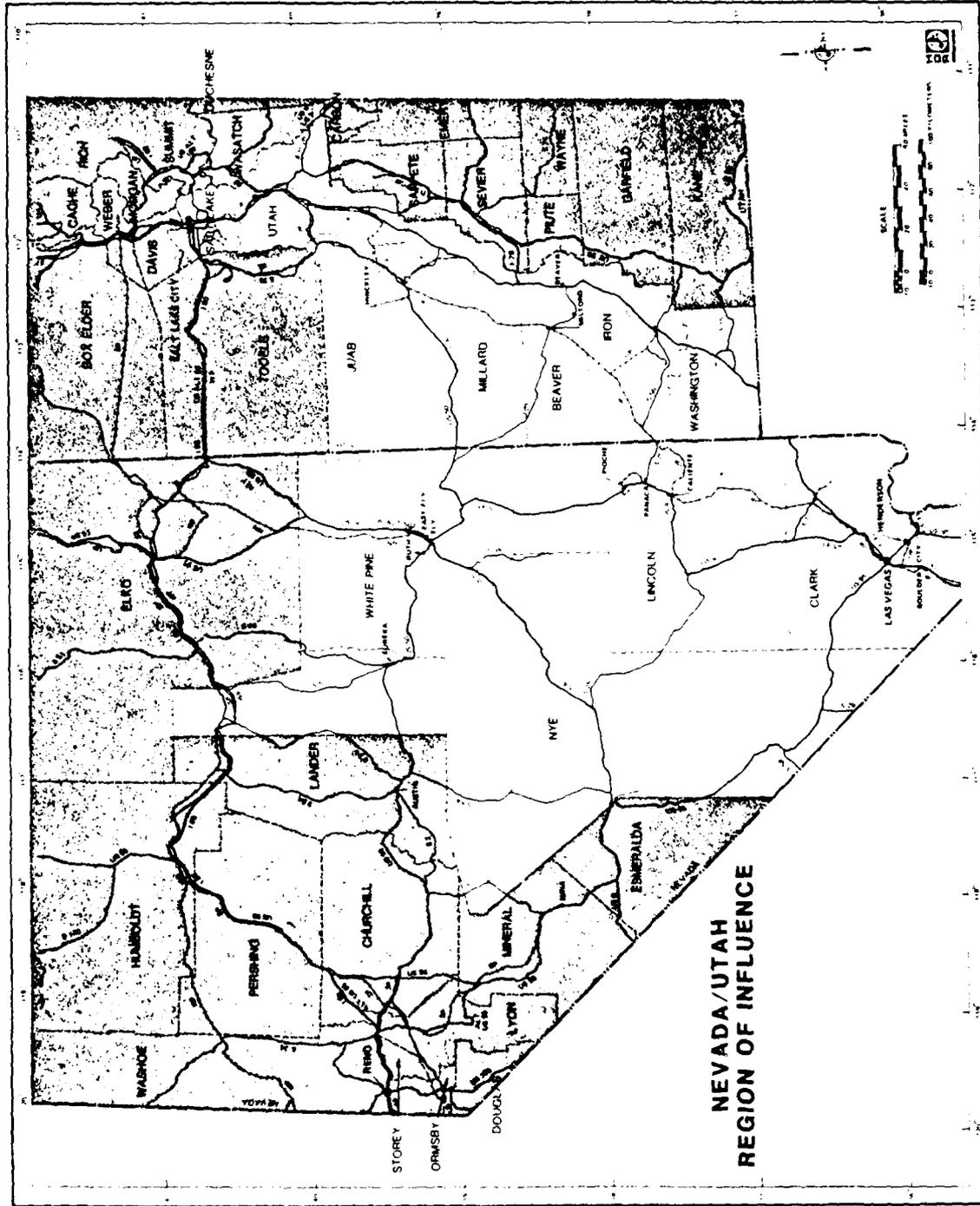


Figure 1.0-1. Location of Ely OB in the Nevada/Utah Region of Influence (ROI).

in White Pine County resumed operations, but only to give the company a chance to meet EPA emission standards. About 130 individuals returned to work with an additional 100 to be recalled in the near future (Nevada Area Labor Review Balance of State, 1979).

Tables 1.1.1-1 and 1.1.1-2 highlight detailed employment characteristics of White Pine County. The former table indicates the relative dependence of the county's economy on only two sectors--government, comprising 24 percent of total employment in 1977, and mining, the source of 17 percent of 1977 county employment. Other sectors, notably manufacturing and services, traditionally dominate a well-balanced economic base; in White Pine County, manufacturing, particularly, has a very small employment share and the 1977 share of services employment in the county was less than half that for the state; it was below the national average.

Table 1.1.1-2 presents 10-year employment growth figures and indicates that White Pine County has grown very little; employment only increased by about 500 jobs between 1967-1977. Disclosure rules prevent complete analysis, but available data indicate only the government sector has grown appreciably, posting an average annual growth of 4.2 percent over the 1967-1977 period. Other sectors have been less well insulated from recent price and production downturns in the mining industry, historically the dominant force in the White Pine County economy.

Income and Earnings

Total earnings have exhibited little growth over the 1967-1977 period. Table 1.1.1-3 highlights White Pine County earnings by major industrial sectors relative to the other counties in Nevada. It indicates that the county's 1977 total earnings of \$44.95 million were only about 1 percent of the state's total. Further, White Pine County earnings growth was less than one-half that for Nevada over the 1967-1977 period. Disaggregating earnings by industry, the same pattern of negligible growth is observed.

Table 1.1.1-4 highlights per capita income and earnings shares by major industry in White Pine County. The county's 1977 per capita income of \$6,608 was roughly 80 percent that of Nevada's, but 94 percent of U.S. per capita income. By industrial source, mining contributed almost one-third of White Pine County's total 1977 earnings, well above what employment in this industry would have indicated. This implies that mining had earnings levels well above those in other industries. The same was true, but to a lesser extent, for the manufacturing sector. It is characteristic for workers in these two industries to receive relatively higher compensation than in agriculture or government sectors, for example.

PUBLIC FINANCE (1.1.2)

Residents of Ely and vicinity are provided services by the county of White Pine, White Pine County School District, and the city of Ely. The revenue structures, expenditure patterns, and fiscal capacities vary widely between each jurisdiction. While property tax revenues account for approximately one third of the total general fund revenues of the county and of the city of Ely, intergovernmental transfers (principally in the form of redistributed cigarette, liquor, and motor vehicle privilege taxes, and federal revenue sharing monies) account for a signifi-

Table 1.1.1-1. Total employment and percent share by major economic sectors for counties in Nevada, 1977.

COUNTY	TOTAL EMPLOYMENT 1977	COUNTY PERCENT OF TOTAL EMPLOYMENT	AGRICULTURE SHARE (%)	MINING SHARE (%)	CONSTRUCTION SHARE (%)	MANUFACTURE SHARE (%)	SERVICES SHARE (%)	GOVERNMENT SHARE (%)
Carson City	14,313	4.1	0.2	0.2	6.7	6.6	17.3	43.3
Churchill	5,131	1.5	13.7	(D)	7.7	2.9	12.4	41.8
Clark	185,198	53.1	1.7	(D)	5.6	3.0	41.4	17.5
Douglas	13,365	3.8	2.1	(D)	4.1	5.5	68.4	5.5
Elko	8,300	3.4	9.9	2.9	4.0	8.7	27.1	21.1
Esmeralda	368	0.1	16.0	(D)	(D)	N.L.	N.L.	36.1
Eureka	620	0.2	70.2	93.7	(D)	(D)	(D)	21.3
Humboldt	3,905	1.1	14.2	(D)	3.3	4.7	18.3	18.9
Lander	1,521	0.4	10.0	39.8	(D)	(D)	3.7	19.5
Lincoln	1,213	0.3	13.7	12.4	(D)	(D)	(D)	36.1
Lyon	3,327	1.0	16.2	16.0	2.6	8.6	7.9	21.8
Mineral	2,555	0.7	1.5	0.6	2.3	(L)	16.5	60.2
Nye	5,861	1.6	3.1	10.4	1.2	0.8	59.5	13.1
Pershing	1,303	0.4	21.9	(D)	0.8	3.1	(D)	22.9
Storey	309	0.1	N.L.	(D)	(D)	2.4	7.5	17.7
Washoe	97,254	27.9	0.3	5.7	7.3	7.0	33.7	15.2
White Pine	3,952	1.1	5.1	17.2	(D)	7.5	12.4	24.0
Total State*	348,495	100.0	1.4	1.2	5.7	4.3	37.1	18.4
United States	97,848,874		4.2	0.8	4.0	20.1	17.4	18.2

*State = study area.

N.L. = Not listed

Source: Dept. of Commerce, April 1979.

059-1

Table 1.1.1-2. Nevada employment growth by sector, study area counties, 1967-1977.

COUNTY	TOTAL		AGRICULTURE		MINING		CONSTRUCTION		MANUFACTURING		SERVICES		GOVERNMENT						
	1967	1977	A ¹	1967	1977	A	1967	1977	A	1967	1977	A	1967	1977					
Churchill	3,930	5,111	2.7	642	704	0.9	(n) ²	132	141	0.7	66	151	8.6	115	634	7.2	1,611	2,144	2.9
Clark	97,051	185,198	5.6	189	312	0.8	260	3,910	10,280	10.1	3,661	5,593	4.3	40,023	76,582	6.7	18,611	32,184	5.7
Elko	6,027	8,100	3.3	755	824	0.9	93	200	335	5.3	62	72	1.5	1,469	2,246	4.1	1,135	1,753	4.4
Humboldt	318	368	1.5	45	59	2.7	(n)	(n)	(n)	(n)	(n)	0	(n)	(n)	0	(n)	72	131	6.3
Lincoln	538	620	1.4	120	125	0.4	195	271	1.3	(n)	0	(n)	(n)	(n)	(n)	(n)	91	135	4.0
Washoe	3,048	3,905	2.5	400	554	1.3	254	81	127	4.6	(n)	184	(n)	495	714	3.7	638	737	1.5
Yampano	1,086	1,521	3.4	123	152	2.1	(n)	(n)	(n)	(n)	0	(n)	(n)	49	57	1.5	204	296	3.8
White Pine	862	1,213	1.5	146	166	1.3	94	(n)	(n)	(n)	(n)	(n)	(n)	30	(n)	(n)	287	440	4.4
Region Total	2,965	2,555	-1.5	36	39	0.8	63	14	59	15.5	(n)	(n)	(n)	360	421	1.6	1,980	1,538	-2.5
State Total	8,919	5,661	-4.4	233	175	-2.8	370	586	4.7	(n)	23	43	6.5	7,256	(n)	(n)	700	3,368	17.0
U.S. Total (Millions)	1,154	1,303	1.2	274	286	0.4	98	18	11	-4.8	(n)	40	(n)	90	(n)	(n)	222	299	1.0
White Pine	3,514	3,952	1.2	183	302	5.1	(n)	61	(n)	(n)	(n)	295	(n)	460	492	0.7	626	989	4.2
Region Total	112,870	198,165	5.8	1,094	1,232	1.1	865	2,292	2.2	3,973	10,349	10.0	3,684	47,818	77,131	5.7	20,519	37,572	6.2
State Total	200,226	348,495	5.7	4,318	4,748	1.0	3,500	4,333	2.2	8,164	19,837	9.0 ³	6,719	74,007	129,352	5.7	38,514	64,032	5.2
U.S. Total (Millions)	82.5	97.8	1.7	4.6	4.2	-1.2	.6	.8	3.0	3.3	3.9	1.6	19.5	12.7	17.0	1.0	13.4	67.8	2.5

062-1

¹A - Average annual growth rate.

²(n) not shown to avoid disclosure of confidential information

³(U) less than 10 wage and salary jobs.

⁴Rate in doubt because of large number of data points withheld by disclosure rules.

Source: BLS, April, 1979.

Table 1.1.1-3. Earnings by economic sector, Nevada counties, 1967-1977 (in millions of dollars).

COUNTY	TOTAL EARNINGS			AGRICULTURE			MINING			CONSTRUCTION		
	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE
Carson City	66.15	159.16	8.9	.076	.069	-1.0	.881	.37	-6.6	3.015	15.862	16.1
Churchill	34.3	49.9	3.5	3.5	4.83	3.3	.16	.09	-2.5	.5	1.9	1.5
Clark	1230.1	2262.5	6.3	3.37	3.72	1.0	4.69	9	-15.1	76.26	196.57	9.9
Douglas	80.09	133.47	5.2	1.52	2.12	3.4	(D)	-6.27	(D)	3.53	11.4	12.4
Elko	65.22	83.13	2.5	10.9	3.23	-21.5	.3	.3	6.7	3.51	6.1	5.4
Emeralda	2.77	3.62	2.7	-1.0	.388	3.3	(D)	(D)	(D)	(D)	(D)	(D)
Eureka	7.44	7.33	-0.2	1.91	.70	-9.6	3.27	4.56	3.4	(D)	.064	(D)
Humboldt	31.21	37.38	1.8	3.77	4.61	2.1	3.55		-25.0	1.23	1.012	5.1
Lander	12.86	18.38	3.6	1.37	.89	-4.2	(D)	10.118	(D)	(D)	(D)	(D)
Lincoln	6.9	12.35	6.0	.18	.81	16.1	1.35	1.29	5.4	(D)	(D)	(D)
Lyon	30.74	34.65	1.2	3.52	4.65	2.6	(D)	6.49	(D)	3.61	1.67	-7.6
Mineral	32.19	26.93	-1.9	.002	.212	59.4	.99	-306	-49.6	.11	1.31	20.3
Nye	166.8	92.67	-5.8	.927	.724	-2.5	5.34	9.63	6.3	(D)	1.23	(D)
Pershing	11.29	13.99	2.2	2.31	4.06	5.6	1.47	(D)	(D)	36	325	-1.0
Storey	3.02	5.24	5.7	.067	(D)	-20.1	(D)	(D)	(D)	(D)	(D)	(D)
Washoe	646.76	1162.9	5.9	-1.423	1.975	37.4	3.36	6.11	9.1	17.17	144.11	9.4
White Pine	37.13	44.95	1.9	1.27	.663	-6.3	(D)	13.65	(D)	.691	(D)	(D)
State	2469.0	4148.6	5.3	34.14	33.67	-0.2	54.64	67.196	1.6	159.1	386.27	6.3
U.S.	922.344	1,164.755	2.4	31.9507	26.163	-13.1	91.7156	16.115	6.4	54.7301	69.617	2.4

COUNTY	MANUFACTURING			SERVICES			GOVERNMENT		
	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE	1967	1977	GROWTH RATE
Carson City	.937	11.44	26.4	10.06	27.774	1.7	36.56	73.11	6.6
Churchill	.83	2.1	9.7	1.69	6.69	9.3	16.45	27.01	3.0
Clark	59.18	87.16	3.9	54.28	97.114	6.1	227.93	369.8	5.0
Douglas	1.8	10.06	16.8	61.09	87.31	3.1	3.5	6.91	7.1
Elko	.76	.9	1.7	14.95	23.1	4.4	11.64	18.66	3.8
Emeralda	(D)	(D)	(D)	(D)	(D)	(D)	.31	.803	2.1
Eureka	(D)	(D)	(D)	(D)	(D)	(D)	.86	1.302	4.0
Humboldt	(D)	1.85	(D)	5.09	6.514	1.5	6.48	7.788	1.9
Lander	(D)	(D)	(D)	.67	.64	-0.5	1.33	3.37	3.8
Lincoln	(D)	(D)	(D)	.25	.6	4.1	2.7	4.44	5.1
Lyon	2.28	4.17	6.2	(D)	2.69	(D)	4.26	6.26	3.9
Mineral	.11	.129	1.6	3.3	3.3	0.0	23.79	16.15	-2.7
Nye	.48	.423	-1.3	145.3	64.4	-7.5	6.99	7.76	-1.4
Pershing	(D)	.4	(D)	.91	(D)	(D)	1.1	1.65	2.4
Storey	(D)	.11	(D)	.36	.458	2.4	.45	.956	7.8
Washoe	31.33	92.13	11.4	224.09	356.36	4.7	48.82	177.77	6.0
White Pine	(D)	5.67	(D)	3.44	4.05	1.6	6.53	9.43	3.7
State	102.45	216.73	7.8	1016.8	1557.6	4.4	456.43	731.26	4.6
U.S.	269.024	305.747	3.3	135.753	193.741	3.6	151.707	199.470	2.8

Source: Bureau of Economic Analysis, 1979.

Table 1.1.1-4. Per capita income and earnings shares by economic sector, Nevada counties, 1977.

COUNTY	1977 PER CAPITA INCOME	TOTAL 1977 EARNINGS (\$000s)	COUNTY % OF TOTAL	AGRI- CUL- TURE SHARE (%)	MIN- ING SHARE (%)	CON- STRUC- TION SHARE (%)	MANU- FACT- URING SHARE (%)	SERV- ICES SHARE (%)	GOVERN- MENT SHARE (%)
Carson City	\$7,234	\$ 159,163	3.8	0.1	0.2	10.0	7.2	17.5	45.9
Churchill	6,066	49,916	1.2	9.7	0.2*	5.9	4.1	13.4	44.1
Clark	7,735	2,262,502	54.5	0.2	0.1*	8.7	3.9	42.9	16.3
Douglas	9,030	133,472	3.2	1.6	0.5	8.5	7.5	65.4	5.2
Elko	7,464	83,132	2.0	3.9	3.6	7.2	1.1	27.8	22.4
Esmeralda	5,543	3,623	0.1	10.7	(D)	(D)	(NL)	0.0	22.2
Eureka	6,149	7,334	0.2	9.5	62.4	0.1	(D)	(D)	17.8
Humboldt	6,168	37,379	0.9	12.4	0.5*	5.4	4.9	17.4	20.8
Lander	6,059	18,378	0.4	4.9	55.1	(D)	0.0	3.5	18.4
Linchon	5,943	12,348	0.3	6.6	18.5	(D)	1.3*	4.9*	35.9
Lyon	6,017	34,651	0.8	13.4	24.5	4.8	12.0	7.8	18.1
Mineral	6,568	26,929	0.6	0.8	1.1	5.0	0.5	12.3	67.4
Nye	5,801	93,673	2.2	0.8	10.6	1.3	0.5	71.7	8.4
Pershing	6,437	13,985	0.3	29.2	(D)	2.3	2.9	(D)	19.0
Storey	5,585	5,240	0.1	0.0	(D)	1.0*	2.1	8.7	18.2
Washoe	9,368	1,162,907	28.1	0.2	0.7	12.4	7.9	30.6	15.3
White Pine	6,608	44,954	1.1	1.5	30.4	1.8*	12.6	9.0	21.0
State Total	\$7,980	\$4,148,586	100.0	0.8	1.6	9.3	5.2	37.5	17.6
United States	\$7,026	\$1,164,755 ¹		2.2	1.6	6.0	26.2	16.6	17.1

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*Estimated.

1 = Data not provided because of disclosure rules.

NL = No listing.

¹(\$millions)

Source: BEA, April 1979

cantly larger share of total general fund revenues for the city than for the county (46.0 percent versus 34.7 percent) (Table 1.1.2-1 and Table 1.1.2-2).

Assessed valuations for the local jurisdictions in White Pine County are presented in Table 1.1.2-3. All jurisdictions have much of their total bonding capacity available. However, because of the relatively low tax bases within each jurisdiction, the reserve bonding capacities also are relatively low, ranging from \$5.3 million in the city of Ely to \$7.9 million in White Pine County School District. As property values increase over time, the local tax base will also increase and thus increase the reserve bonding capacities of each jurisdiction. However, recently imposed property tax rate limitation (S.B. 204), from a combined maximum of \$5.00 per \$100 assessed valuation to \$3.64 per \$100, and sales tax exemptions for food purchases will significantly affect future revenues available to local governments. None of the governmental units in the county are currently experiencing fiscal problems to the extent that direct subsidies or relief from the federal government and/or the state are necessary.

Principal expenditures in the county and the city are for public safety outlays (fire, police, and civil defense outlays), ranging from 26.0 percent of total general fund outlays in the county to 45.9 percent in the city. Future expenditure will also be affected by passage of S.B. 204 through expenditure caps tied to base year per capita expenditure rates and increases in the Consumer Price Index.

School district revenues and expenditure figures are presented in Table 1.1.2-4 and Table 1.1.2-5. Principal sources of revenue to the school district are from the state and the county of White Pine. Monies from the state come principally from the distributive school fund, and along with other minor sources, it contributes 53.9 percent of the districts' total general fund revenues. The county contributes another 40.2 percent (over one half accounted for by property taxes), while the federal government and the school district itself contributes very little (less than 10 percent combined). Principal expenditures are for instructional services (salaries and supplies) and operation and maintenance of the physical plant, accounting for over 74 percent of total operation and maintenance outlays. With most of the area's population centered around the Ely area, transportation costs do not figure substantially into the total cost picture (5.6 percent of total outlays).

In summary, the governmental units in the Ely area have sufficient resources to adequately provide for increased services associated with low to moderate growth. However, to the extent that each government unit depends on outside aid, and that local sources of revenue are becoming less available as a budget-balancing instrument, local governments in the Ely area are ill-equipped to deal with large-scale rapid growth.

POPULATION AND COMMUNITIES (1.1.3)

White Pine County, Nevada, the area of analysis for a second operating base proposed near Ely in Alternatives 3 and 5, had an estimated population of 8,776 in 1977, a decline of 13.5 percent since 1970 (Table 1.1.3-1). According to preliminary 1980 census data, the county's population had further declined to 8,184 by April 1, 1980. The population of the sparsely settled county, which has a density of less than one person per sq mi, is concentrated in the city of Ely, with smaller concentration in the communities of Ruth and McGill. Preliminary 1980 census data indicated that

Table 1.1.2-1. General fund revenue and expenditures,
White Pine County, select years.

REVENUES	1975-76	1976-77	1977-78
Revenues			
Property Taxes	366,847	430,820	537,134
Licenses and Permits	13,628	13,574	14,205
Fines and Fees	73,017	67,618	90,031
Intergovernment Revenues	255,499	345,660	554,928
Other	215,773	165,042	219,089
Subtotal	924,764	1,022,714	1,415,387
Opening Balance	129,747	92,902	141,475
Transfers-In	43,018	26,013	20,100
Total Resources	1,097,529	1,141,629	1,576,962
Expenditures			
Administration	220,622	237,139	255,012
Judicial	174,124	149,386	205,417
Public Safety	234,886	244,839	339,872
Other	391,245	368,790	412,768
Subtotal	1,020,877	1,000,154	1,213,069
Transfers-Out	—	—	—
Total Expenditures	1,020,877	1,000,154	1,306,569
Ending Balance	76,652	141,475	268,744

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Source: White Pine County, County General Fund, Statement of Revenues and Expenditures, Fiscal Years, 1975-76 to 1977-78.

Table 1.1.2-2. Summary of general fund revenues and expenditures, City of Ely, 1978-1979.

REVENUE/ EXPENDITURE	FIGURE
Resources	
Property Taxes	\$235,403
Licenses and Permits	51,995
Fines and Fees	21,511
Intergovernmental Transfers	325,852
Other	23,573
Subtotal	658,334
Transfers In	49,686
Opening Balance	146,510
Total Resources	854,530
Expenditures	
Administration	81,929
Public Safety	334,504
Public Works	136,463
Health and Sanitation	49,870
Parks and Recreation	20,819
Other	100,508
Transfers Out	5,000
Total Expenditures	729,093
Ending Balance	125,437

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Source: Ely Daily Times, September 28, 1979. "Ely City Quarterly Report, Fourth Quarter, 1978-1979."

Table 1.1.2-3. Assessed valuation, indebtedness limitations, and reserve bonding capacities, 1978-1979.

JURISDICTION	ASSESSED VALUE	INDEBTED- NESS LIMITATION	OUTSTANDING G. C. BONDS	RESERVE BONDING CAPACITY
White Pine County	\$53,147,724	\$5,314,772	\$305,000	\$5,009,772
School District	53,147,724	7,972,159	0	7,972,159
City of Ely	17,794,278	5,338,283	0	5,338,283

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Table 1.1.2-4. Summary of receipts, White Pine County School District, school year 1977-1978.

FUND	WHITE PINE
General Fund	
State	1,640,216
Distributive School Fund	1,634,399
Other	5,817
County	1,221,720
Property Taxes	725,975
Other	495,745
School District	28,115
Federal	131,347
Transfers	19,364
Total General Fund	3,040,762
Other Funds	
State	35,692
County	36,829
Property Taxes	19,355
Sale of Bond	0
Other	17,474
School District	1,593
Federal	161,061
Total Other Funds	235,175
Total All Funds	3,275,937

056-1

Source: Nevada Superintendent of Public Instruction, undated. *Biennial Report of Selected Data*, July 1, 1976 to June 30, 1978.

Table 1.1.2-5. Summary of expenditures by function, White Pine County School District, school year 1977-1978.

EXPENDITURE	WHITE PINE
Administration	89,691
Instruction	2,093,505
Auxiliary Services	16,228
Transportation	180,741
Operation of Plant	244,545
Maintenance of Plant	77,522
Fixed Charges	402,569
Other	138,737
Subtotal	3,243,538
Capital Outlay	120,036
Debt Service	36,648
Total Expenditures	3,400,222

499-1

Source: Nevada Superintendent of Public Instruction, undated. *Biennial Report of Selected Data.*

Table 1.1.3-1. Selected population characteristics
in the Nevada/Utah impact region.
(Page 1 of 2)

STATE/ COUNTY	POPULATION				POPULATION DENSITY (1975) PERSONS 'MI ²
	1960	1970	1975	1977	
Nevada					
Clark	127,016	273,288	330,714	361,095	42
Eureka	767	948	1,072	1,119	<1
Lincoln	2,431	2,557	2,647	2,857	<1
Nye	4,374	5,599	5,591	6,113	<1
White Pine	9,808	10,150	10,221	8,776	1
Utah					
Beaver	4,331	3,800	4,086	4,079	2
Iron	10,795	12,177	14,609	15,444	4
Juab	4,597	4,574	4,947	5,156	1
Millard	7,866	6,988	7,878	8,297	1
Salt Lake	383,035	458,607	512,130	540,533	670
Utah	106,991	137,776	165,745	177,106	82
Washing- ton	10,271	13,669	18,127	19,809	7
Nevada	285,278	488,738	590,268	636,962	5
Utah	890,627	1,059,273	1,202,672	1,270,005	15

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Table 1.1.3-1. Selected population characteristics in the Nevada/Utah impact region. (Page 2 of 2)

STATE COUNTY	RURAL - URBAN DISTRIBUTION (1970)			AGE DISTRIBUTION (1970)				MEDIAN AGE IN YEARS
	PERCENT RURAL FARM	PERCENT RURAL NON-FARM	PERCENT URBAN	PERCENT UNDER 5	PERCENT 5-17	PERCENT 18-64	PERCENT 65+	
Nevada								
Clark	0.4	5.1	94.5	9.5	26.4	59.0	5.1	27.7
Eureka	30.1	69.9	0	11.4	22.9	60.1	5.0	30.7
Lincoln	12.7	87.3	0	9.7	32.4	47.7	10.2	27.7
Nye	5.0	95.0	0	8.3	24.2	60.4	7.1	30.1
White Pine	2.2	56.7	41.1	10.0	28.2	53.9	7.9	29.3
Utah								
Beaver	8.4	91.6	0	8.4	28.7	51.3	11.6	29.7
Iron	3.9	21.5	74.7	10.5	25.9	56.0	7.6	22.4
Juab	2.0	27.9	69.4	10.2	28.3	49.3	12.2	27.5
Millard	15.0	85.0	0	9.3	31.4	46.8	12.5	27.9
Salt Lake	6.8	4.2	89.0	10.6	29.1	52.7	7.6	23.9
Utah	2.0	9.9	87.7	10.9	26.8	56.3	0.0	21.7
Washing- ton	2.0	45.4	51.8	10.2	29.3	48.2	12.3	22.4
Nevada	2.1	17.0	80.9	8.9	26.0	58.8	6.3	27.9
Utah	3.1	16.3	80.6	10.6	29.6	52.5	7.3	23.0

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Sources: U.S. Bureau of the Census, 1975 County and City Data Book, 1977 Population Estimates for Counties and Incorporated Places (Nos. 841 and 857), and 1970 Census of Population.

4,897 persons, about 60 percent of the county's population, resided within the municipality of Ely, a 20.5 percent decline from its population of 6,168 in 1970. Data for 1970 on the spatial distribution and age composition of White Pine County's population, presented in Table 1.1.3-1, indicate a large share of the residents lived in rural areas, although not on farms, and an age structure which was younger than for the state as a whole. About 28.2 percent of the county's population in 1970 was of school age, compared to 26 percent for the state, while the median age was 26.3 years in the county and 27.9 in Nevada.

Components of population change including net migration and natural increase (or excess of births over deaths) are shown in Table 1.1.3-2 for the periods 1960 to 1970 and 1970 to 1976. For the past two decades the county has experienced net out-migration, and since 1970 out-migration has exceeded the natural increase, resulting in population losses for the county. This experience is in marked contrast to that of the state of Nevada as a whole which has undergone large-scale population growth due to both natural increases and a very high rate of net in-migration. The Census Bureau has estimated that White Pine County experienced net out-migration of 7.9 percent of its 1970 population by 1976, while Nevada as a whole experienced net in-migration of 18.5 percent, the highest rate of any state.

Projections of future population in White Pine County, as shown in Table 1.1.3-3 and Figure 1.1.3-1, suggest a reversal of the recent trend of population losses, with modest growth projected through 1994 when the county's population is projected to reach about 10,250. Population expansion associated with several proposed large-scale projects such as Kennecott Copper and the White Pine Power Project would substantially increase the county's population over the trend-growth projection. With those projects the county population is projected to grow by almost 9.5 percent each year during the five years from 1980 through 1985, although thereafter growth rates would fall below those projected for the state of Nevada (Table 1.1.3-4). The population growth due to those projects would increase the White Pine County population to almost 13,000 in 1985 and to just over 15,000 by 1994.

LAND USE (1.1.4)

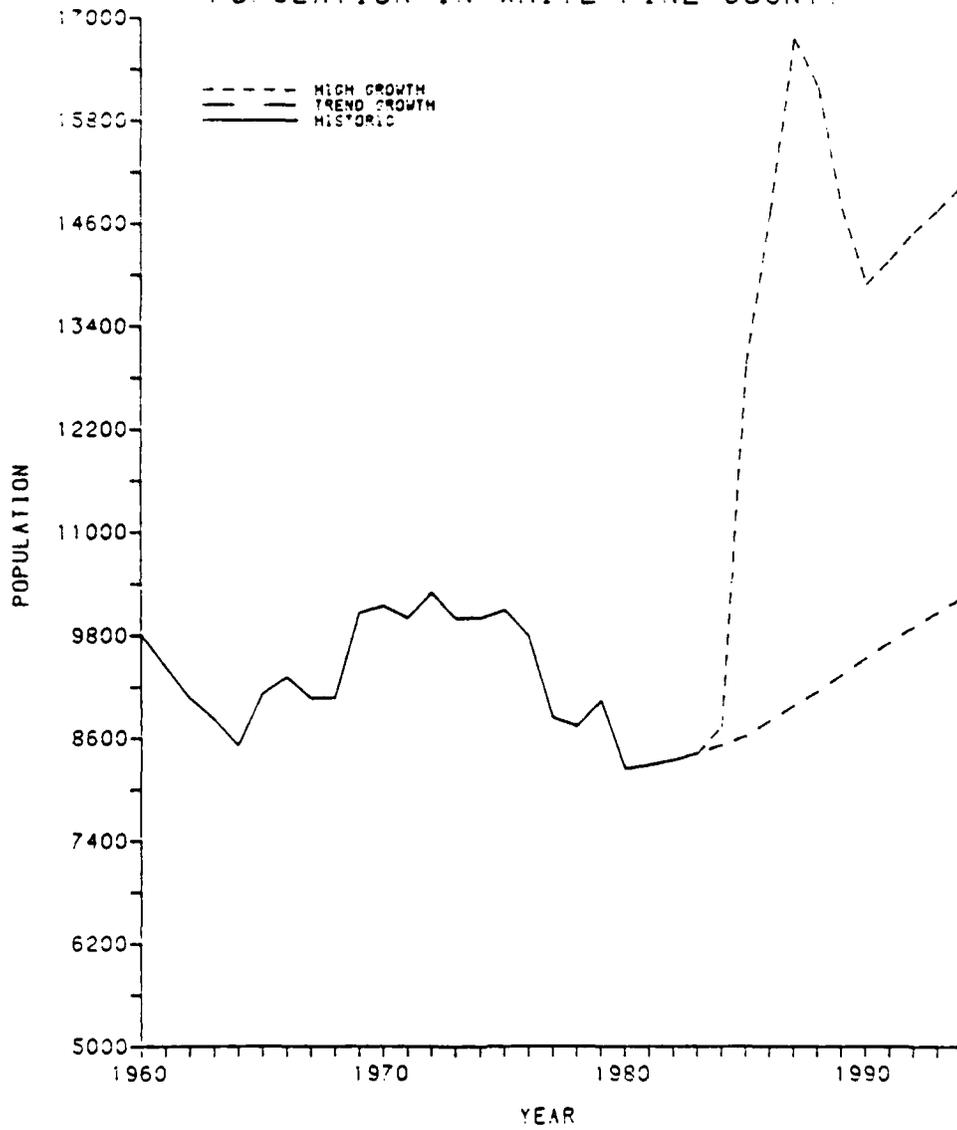
Community Land Use

Ely is located within the boundaries of White Pine County in Steptoe Valley, in central-eastern Nevada. Ely-East Ely and McGill are the major settlements with populations of 5,626 and 1,629. The White Pine Planning Commission directs the local planning activities. The plans that guide the growth in these communities include: (1) "General Plan for White Pine County and City of Ely, Nevada," which was the updated comprehensive plan prepared by Thomas Conger of Sharp, Krater, and Associates in 1976; and (2) "Nevada Rural Communities Water and Waste Water Plan," prepared by Walters Engineering of Reno in 1972.

Existing Land Use

The first general plan for White Pine County was prepared in 1970. It was updated in 1976 and is expected to be updated again in the near future. The most current land use data for the White Pine County communities was collected as part of the 1976 general plan effort. The acreages of developed and vacant land by land

HISTORIC AND PROJECTED BASELINE POPULATION IN WHITE PINE COUNTY



CA-0048-A

Figure 1.1.3-1. Historic and projected baseline population in White Pine County.

Table 1.1.3-2. Population change and components of change 1960 to 1970 and estimated 1970 to 1976, by county, in the Nevada/Utah impact region. (Page 1 of 2)

STATE/ COUNTY	ACTUAL POPULATION 1970	POPULATION CHANGE 1960-1970					
		COMPONENTS OF CHANGE				TOTAL CHANGE	
		NATURAL INCREASE		NET MIGRATION		NO.	PERCENT
		NO.	PERCENT	NO.	PERCENT		
Nevada							
Clark	273,288		29.8		85.4		115.2
Eureka	948		-2.5		26.1		23.6
Lincoln	2,557		4.6		0.6		5.2
Nye	5,599		8.1		19.9		28.0
White Pine	10,150		11.6		-8.1		3.5
Utah							
Beaver	3,800		9.3		-21.6		-12.3
Iron	12,177		16.4		-3.6		12.8
Juab	4,574		7.7		-8.2		-0.5
Millard	6,988		9.4		-20.6		-11.2
Salt Lake	458,607		18.8		0.9		19.7
Utah	137,776		23.1		5.7		28.8
Washing- ton	13,669		16.8		16.3		33.1
Nevada	488,738		20.9		50.4		71.3
Utah	1,059,273		20.1		-1.2		18.9

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Table 1.1.3-2. Population change and components of change 1960 to 1970 and estimated 1970 to 1976, by county, in the Nevada/Utah impact region. (Page 2 of 2)

STATE/ COUNTY	ESTIMATED POPULATION 1976	POPULATION CHANGE 1970-1976					
		COMPONENTS OF CHANGE				TOTAL CHANGE	
		NATURAL INCREASE		NET MIGRATION		NO.	PERCENT
		NO.	PERCENT	NO.	PERCENT		
Nevada							
Clark	343,400	21,200	7.7	48,900	17.9	70,100	25.6
Eureka	1,200	(2)	1.3	300	26.9	300	28.2
Lincoln	2,800	100	2.6	100	5.5	200	8.1
Nye	5,900	100	1.4	200	4.3	300	5.7
White Pine	10,000	700	6.6	-800	-7.9	-100	-1.3
Utah							
Beaver	4,100	400	8.7	(2)	-1.2	300	7.5
Iron	14,700	1,700	14.0	800	7.0	2,600	21.0
Juab	4,900	400	8.5	-100	-1.2	300	7.3
Millard	8,200	700	9.4	500	7.5	1,200	16.9
Salt Lake	524,700	53,100	11.6	13,000	2.8	66,100	14.4
Utah	170,300	27,200	19.7	5,300	3.9	32,600	23.6
Washington	18,700	1,900	13.9	3,200	23.2	5,100	37.1
Nevada	610,000	31,000	6.3	90,000	18.5	121,000	24.8
Utah	1,228,000	134,000	12.6	35,000	3.3	169,000	15.9

4029

Source: U.S. Bureau of the Census.

Table 1.1.3-3. Projected population by county, assuming trend growth and assuming growth related to energy and mineral development projects in some counties, Nevada/Utah impact region, 1980 to 1994. (Page 1 of 2)

STATE/ COUNTY	ESTIMATED POPULATION 1977 ¹	PROJECTED POPULATION ²			
		1980		1985	
		TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH
Nevada					
Clark	361,095	453,881	453,952	543,857	544,830
Eureka	1,119	1,089	1,089	1,169	1,169
Lincoln	2,857	3,657	3,658	4,043	4,049
Nye	6,113	8,207	8,268	10,799	10,804
White Pine	8,776	8,246	8,247	8,630	12,975
5-County Total	379,960	475,140	475,214	568,498	573,827
Utah					
Beaver	4,079	4,455	4,776	5,051	10,993
Iron	15,444	17,449	17,460	20,348	20,500
Juab	5,156	5,544	5,613	6,888	9,274
Millard	8,297	8,915	10,459	10,940	18,746
Salt Lake/ Utah	717,639	822,238	822,793	980,701	987,123
Washington	19,809	22,150	22,150	27,200	27,200
7-County Total	770,424	880,751	882,951	1,051,128	1,073,836
Deployment Region Total	1,150,384	1,355,891	1,358,165	1,619,626	1,647,663

4030

Table 1.1.3-3. Projected population by county, assuming trend growth and assuming growth related to energy and mineral development projects in some counties, Nevada/Utah impact region, 1980 to 1994. (Page 2 of 2)

STATE/ COUNTY	PROJECTED POPULATION ²			
	1990		1994	
	TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH
Nevada				
Clark	623,794	624,539	686,699	687,585
Eureka	1,278	1,278	1,368	1,368
Lincoln	4,424	4,429	4,715	4,720
Nye	11,971	11,974	12,901	12,906
White Pine	9,545	13,902	10,238	15,050
5-County Total	651,012	656,122	715,921	721,629
Utah				
Beaver	5,297	9,965	5,516	10,566
Iron	22,895	23,006	24,556	24,677
Juab	7,650	8,364	8,077	8,849
Millard	12,179	14,920	12,528	15,504
Salt Lake/ Utah	1,079,131	1,083,344	1,144,685	1,149,699
Washington	31,150	31,150	33,802	33,802
7-County Total	1,158,302	1,170,749	1,229,164	1,243,097
Deployment Region Total	1,809,314	1,826,871	1,945,085	1,964,726

¹U. S. Bureau of the Census, 1977 Population Estimates for Counties and Incorporated Places, Series P-25, No. 841 (Nevada) and No. 857 (Utah), November 1979.

²Bureau of Economic and Business Research, University of Utah, 1980.

Table 1.1.3-4. Projected annual compound growth rates by county, assuming trend growth and high growth associated with energy and mineral development projects, Nevada/Utah impact region.

STATE/COUNTY	PROJECTED ANNUAL COMPOUND RATES OF POPULATION CHANGE							
	1977-1980		1980-1985		1985-1990		1990-1994	
	TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH	TREND GROWTH	HIGH GROWTH
Nevada								
Clark	7.92	7.93	3.68	3.72	2.78	2.77	2.43	2.43
Eureka	-0.90	-0.90	1.43	1.43	1.80	1.80	1.72	1.72
Lincoln	8.58	8.58	2.02	2.02	1.79	1.79	1.61	1.61
Nye	10.59	10.59	5.49	5.49	2.08	2.08	1.89	1.89
White Pine	-2.06	-2.06	0.91	9.49	2.04	1.39	1.77	2.00
5-County Total	7.74	7.74	3.65	3.84	2.75	2.72	2.40	2.41
Utah								
Beaver	2.96	5.40	2.54	18.14	0.96	-1.94	1.02	1.47
Iron	4.15	4.17	3.12	3.26	2.39	2.33	1.77	1.77
Juab	2.45	2.87	4.44	10.56	2.12	-2.04	1.37	1.42
Millard	2.42	8.02	4.18	12.38	2.17	-4.46	0.71	0.96
Salt Lake/Utah	4.64	4.66	3.59	3.71	1.93	1.88	1.49	1.50
Washington	3.79	3.79	4.19	4.19	2.75	2.75	2.06	2.06
7-County Total	4.56	4.65	3.60	3.99	1.96	1.74	1.50	1.51
Deployment Region Total	5.63	5.69	3.62	3.94	2.24	2.09	1.83	1.84

4031

Source: HDR Sciences, based on projections by the Bureau of Economic and Business Research, University of Utah, 1980.

use category are shown in Table 1.1.4-1. The amount of land in each community is shown in terms of acres and as a percent of the total land area. Ely is incorporated and the land inside the corporate limits can accurately be measured. McGill and Ruth, being unincorporated, have no corporate boundary, but rather have been measured in terms of the land included in the original townsite plot as it was laid out and recorded. Of the almost 900 vacant urban acres in the county, Ely provides the largest proportion. In addition of the undeveloped land there are varying amounts of land adjacent to each community that could also be developed. In the area around Ely, additional land area could be annexed into the city and the city limits may be expanded by action of the city council. Figures 1.1.4-1 through 1.1.4-3 show the existing land use patterns for Ely, McGill, and Ruth, respectively.

Land Use Plans and Zoning

The 1976 general plan also sets forth goals and policies for the purpose of guiding development in the county. These goals are not inviolable since a county is not required to follow its own plan. The major policy statements included in the general plan that impact the anticipated land use changes brought about by M-X development are outlined as follows:

- o Growth should be limited to a level within which public facilities and services can be efficiently provided.
- o Growth should be controlled to enhance and preserve the "small town" rural way of life enjoyed by the residents.
- o "Leap-frog" or scattered development should be discouraged. Growth should be concentrated at Ruth, McGill, Ely, Preston-Lund, and Baker, only.
- o The importance of mobile homes should be acknowledged and suitable sites and standards should be provided for them. They should be restricted to specific mobile home areas. Adequate housing should be provided for all residents in the county and substandard units should be replaced.
- o The majority of the land in the county should remain in an open space classification. Except for possible "new town" developments, growth should take place in existing communities. New town development must make provision for providing all needed urban services.
- o Development of free-standing commercial structures in linear "strips" along major highways should be curtailed.
- o Agricultural land should be preserved and protected.
- o Additional "clean air" industrial development should be encouraged and located in a well-planned industrial park.

The land use elements of the 1976 general plan for White Pine County, Ely, McGill, and Ruth are displayed in Figures 1.1.4-4 through 1.1.4-7, respectively.

Table 1.1.4-1. Existing land use—Ely, McGill, and Ruth, Nevada.

LAND USE CATEGORIES	ELY		MCGILL		RUTH		COUNTY TOTAL	
	ACRES	PERCENT	ACRES	PERCENT	ACRES	PERCENT	ACRES	PERCENT
Single Family Residential	436.8	21.0	170.9	37.0	71.4	32.0	679	24.0
Mobile Home Residential	41.6	2.0	13.9	3.0	13.4	6.0	69	2.5
Multiple Family Residential	26.8	1.3	9.2	2.0	0	0	36	1.3
Commercial	83.2	4.0	9.1	2.0	2.2	1.0	95	3.4
Industrial	41.6	2.0	13.9	3.0	0	0	56	2.0
Public and Quasi-Public	187.2	9.0	55.4	12.0	46.8	21.0	289	10.3
Streets and Railroad	499.2	24.0	110.8	24.0	44.6	20.0	655	23.7
Undeveloped and Open Space	769.6	37.0	78.0	17.0	44.6	20.0	893	32.3
Total	2,086	100	461	100	221	100	2,768	100

3980

Source: White Pine County 1970 General Plan and White Pine County and City of Ely HDR Sciences.

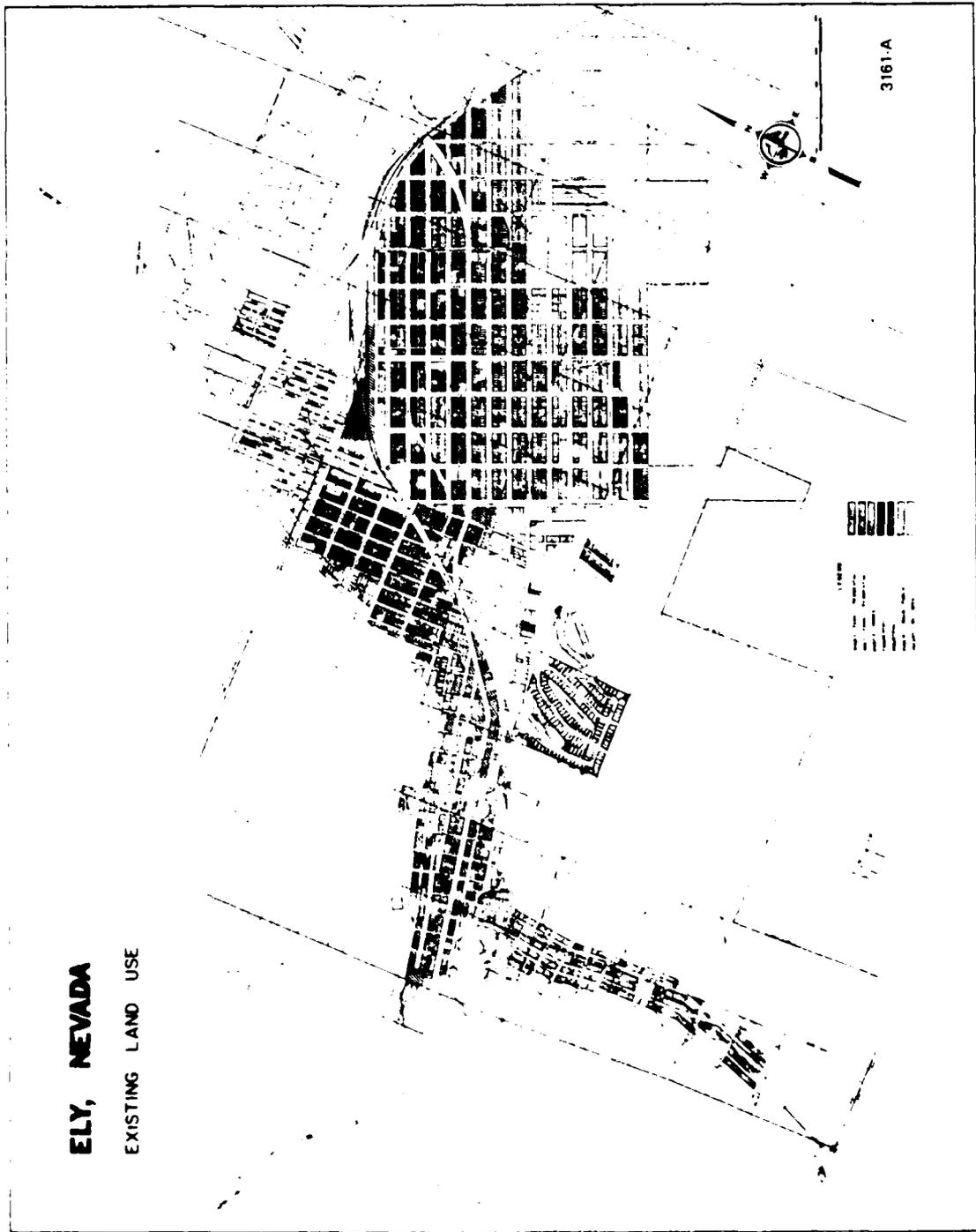
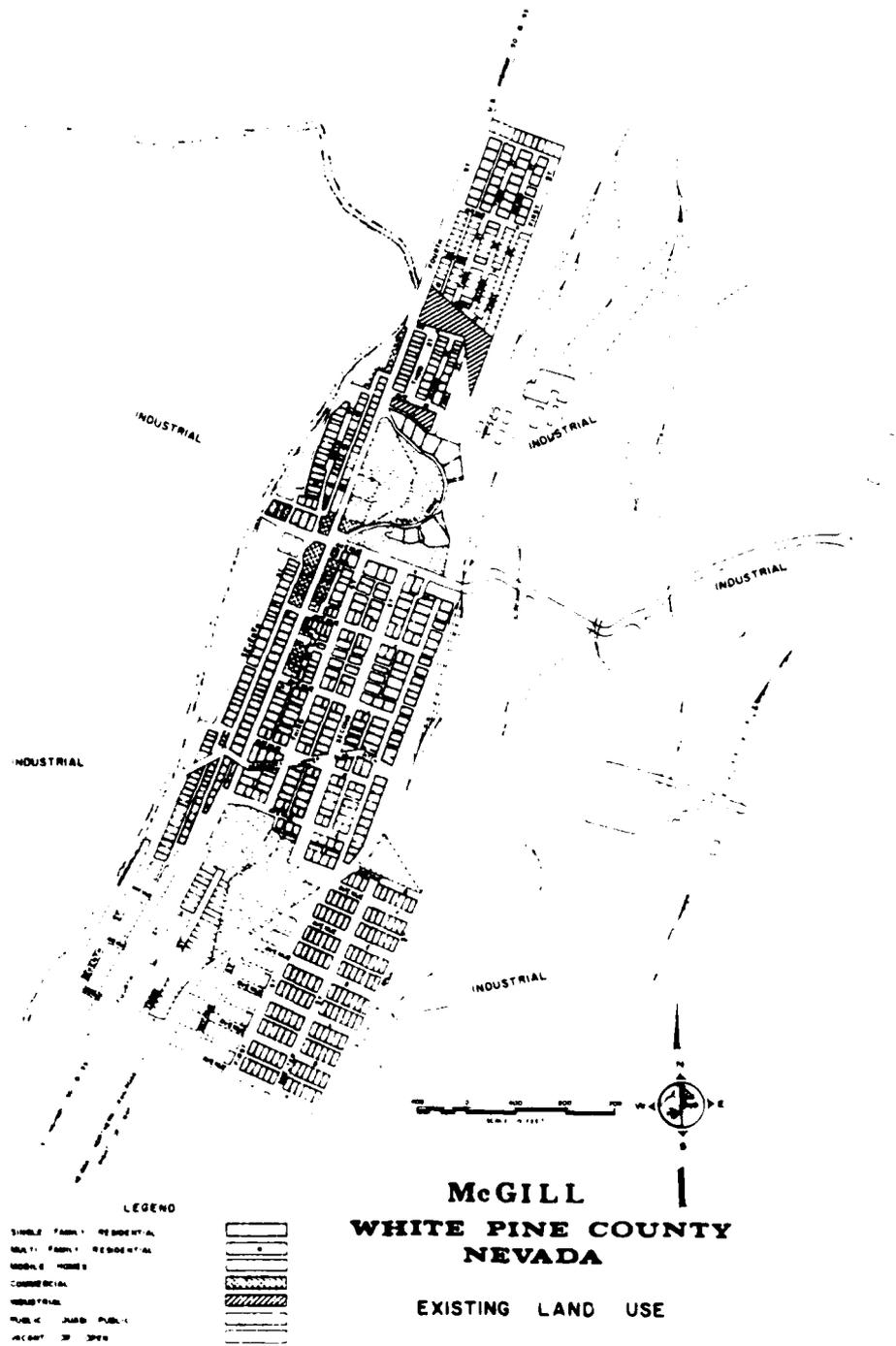


Figure 1.1.4-1. Existing land use—Ely, Nevada. (White Pine County, 1976, "General Plan for White Pine County and City of Ely.")



3159 A

Figure 1.1.4-2. Existing land use—McGill, Nevada.
 (White Pine County, 1976, "General
 Plan for White Pine County and City
 of Ely.")

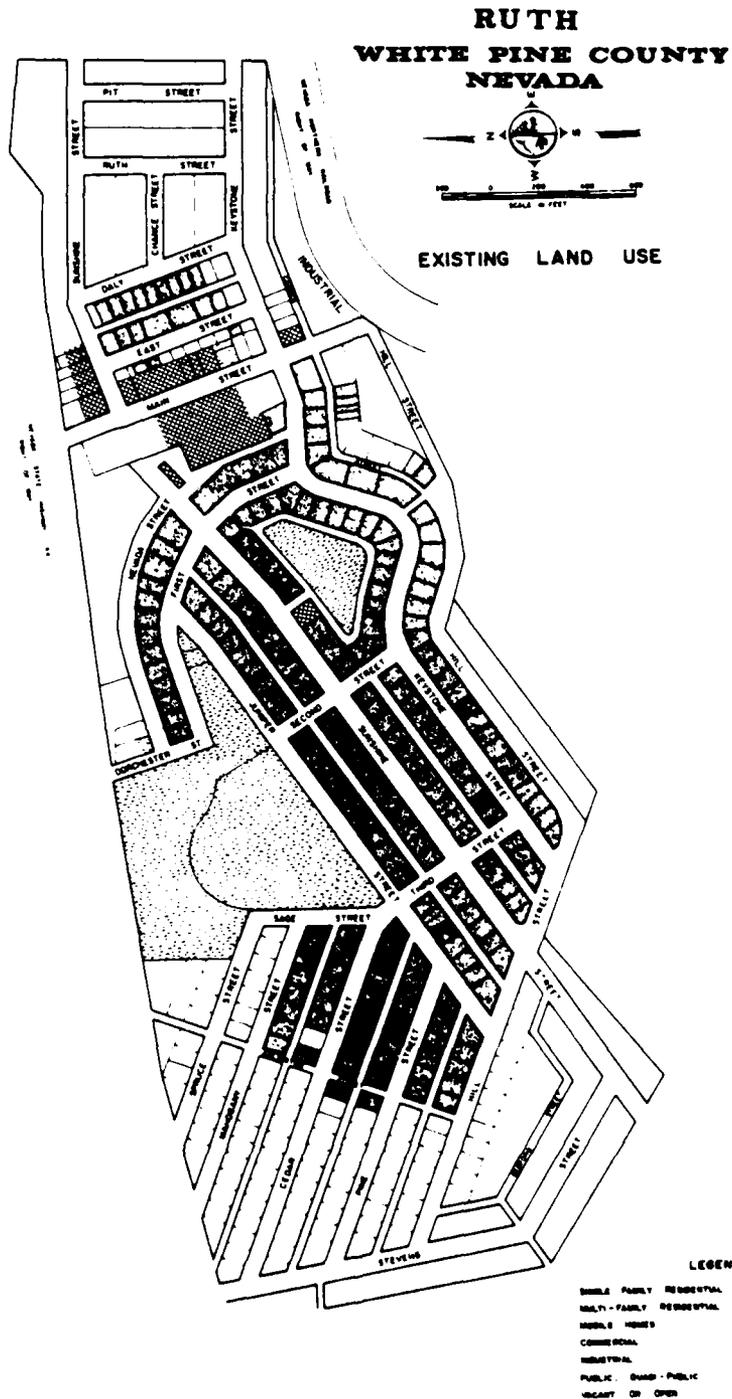
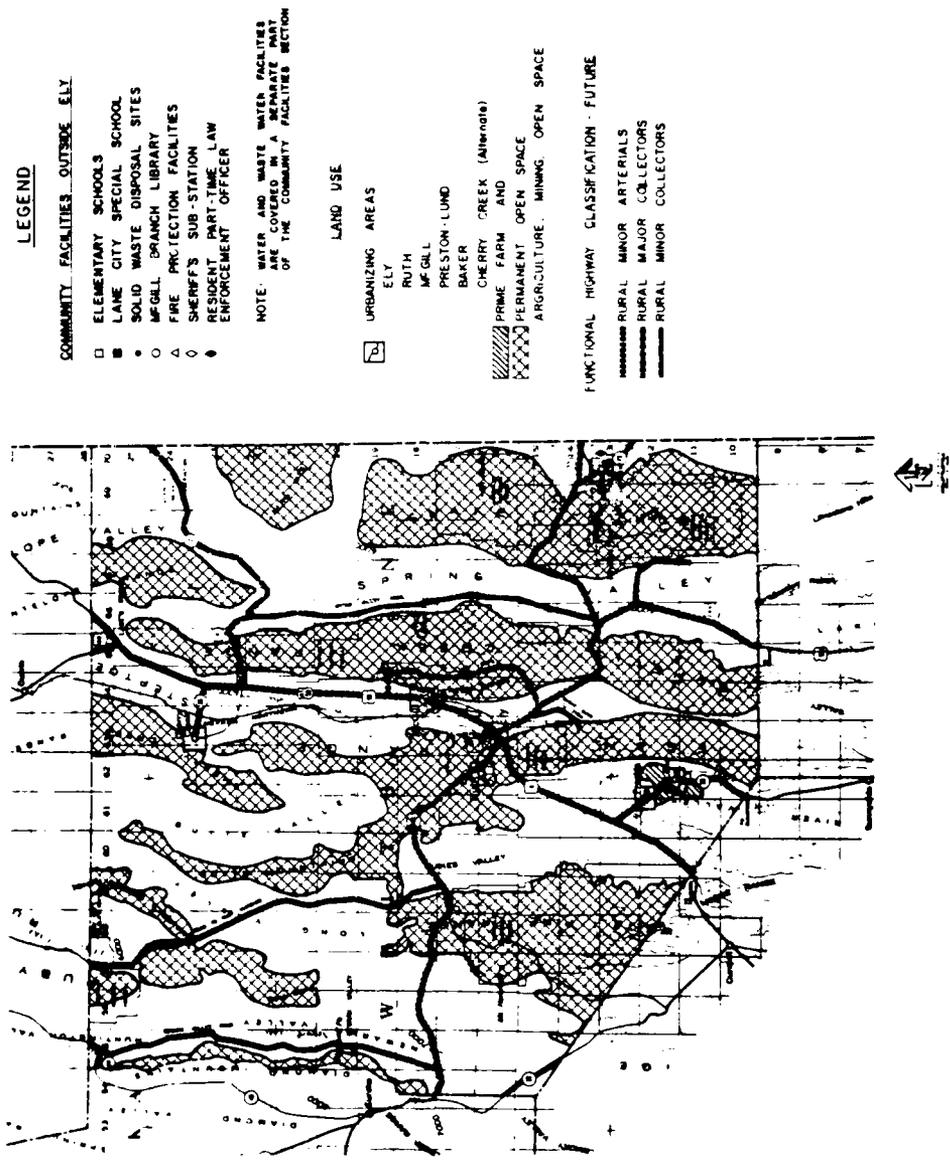


Figure 1.1.4-3. Existing land use—Ruth, Nevada. (White Pine County, 1976. "General Plan for White Pine County and City of Ely.")

WHITE PINE COUNTY, NEVADA GENERAL PLAN



LEGEND

COMMUNITY FACILITIES - OUTSIDE ELY

- ELEMENTARY SCHOOLS
- LANE CITY SPECIAL SCHOOL
- SOLID WASTE DISPOSAL SITES
- MFGILL BRANCH LIBRARY
- △ FIRE PROTECTION FACILITIES
- ◇ SHERIFF'S SUB-STATION
- ◊ RESIDENT PART-TIME LAW ENFORCEMENT OFFICER

NOTE: WATER AND WASTE WATER FACILITIES ARE COVERED IN A SEPARATE SECTION OF THE COMMUNITY FACILITIES SECTION

LAND USE

URBANIZING AREAS

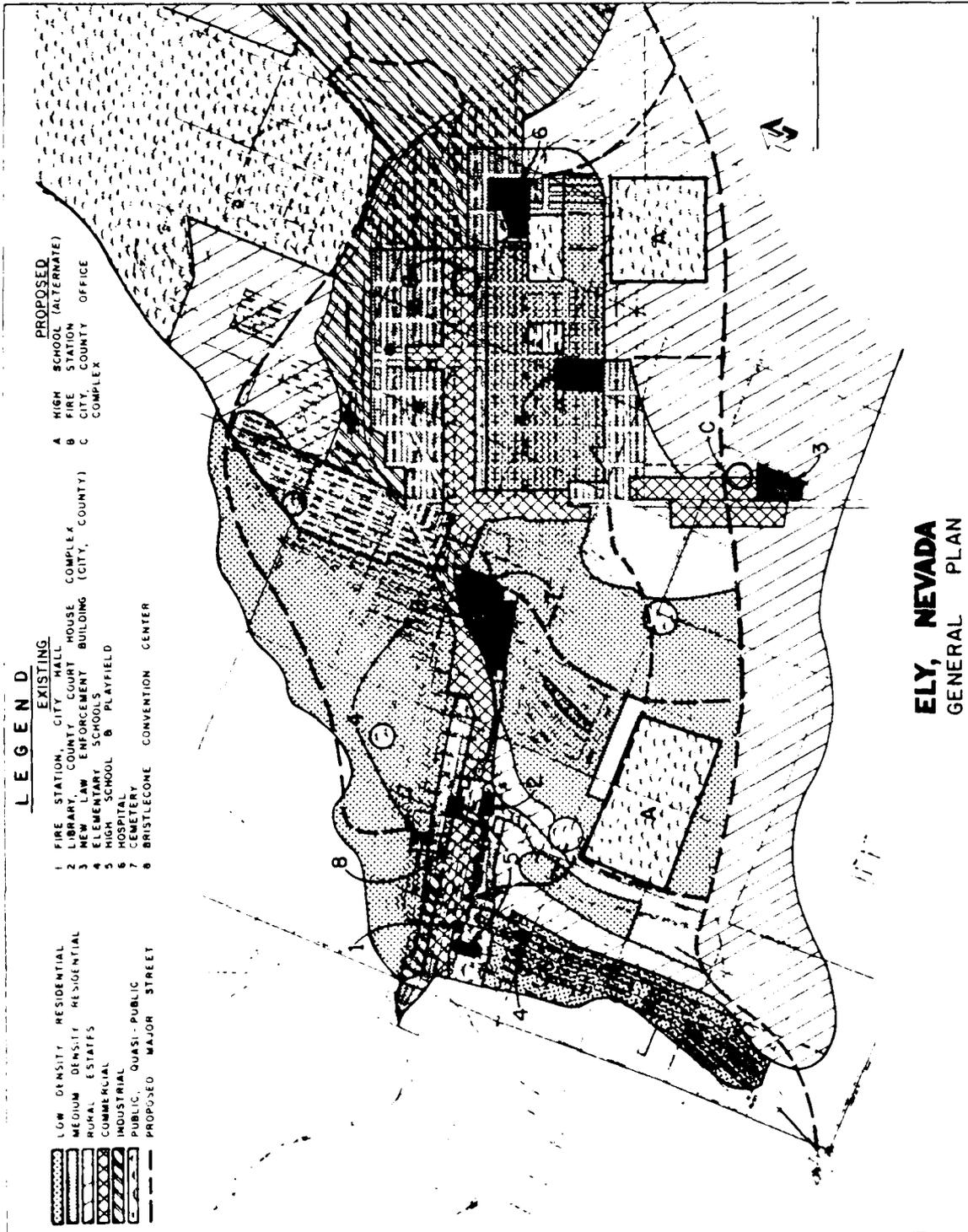
- ELY
- RUTH
- MFGILL
- PRESTON-LUND
- BAKER
- CHERRY CREEK (MINOR)
- PRIME FARM AND ORCHARD
- PERMANENT OPEN SPACE
- AGRICULTURE, MINING, OPEN SPACE

FUNCTIONAL HIGHWAY CLASSIFICATION - FUTURE

- RURAL MINOR ARTERIALS
- RURAL MAJOR COLLECTORS
- RURAL MINOR COLLECTORS

2085 A

Figure 1.1.4-4. General Plan—White Pine County, Nevada. (White Pine County, 1976, "General Plan for White Pine County and City of Ely.")



ELY, NEVADA
GENERAL PLAN

2079 A

Figure 1.1.4-5. General Plan—Ely, Nevada. (White Pine County, 1976, "General Plan for White Pine County and City of Ely.")

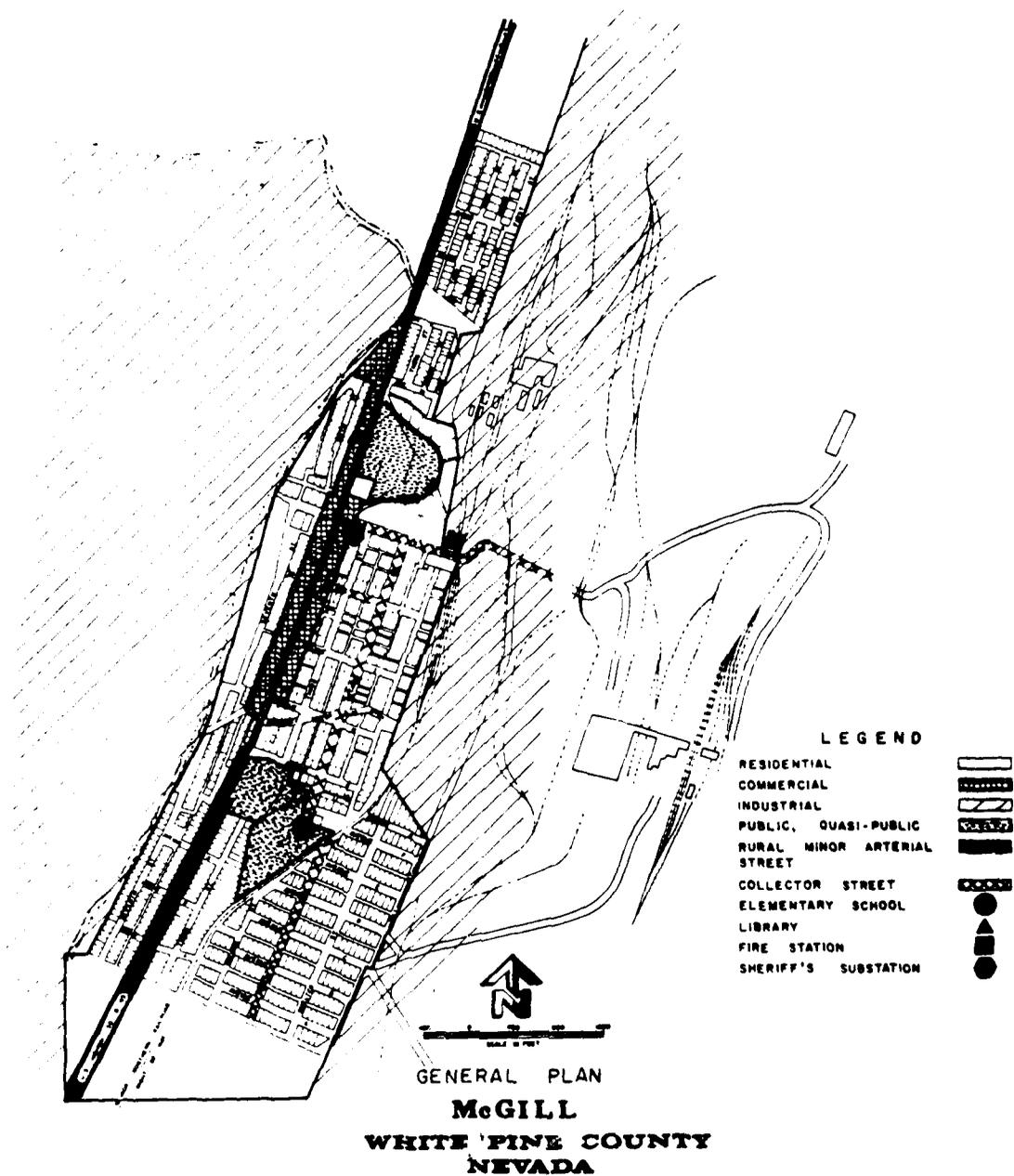


Figure 1.1.4-6. General Plan—McGill, Nevada.
 (White Pine County, 1976, "General Plan for White Pine County and City of Ely.")

GENERAL PLAN
RUTH
WHITE PINE COUNTY
NEVADA

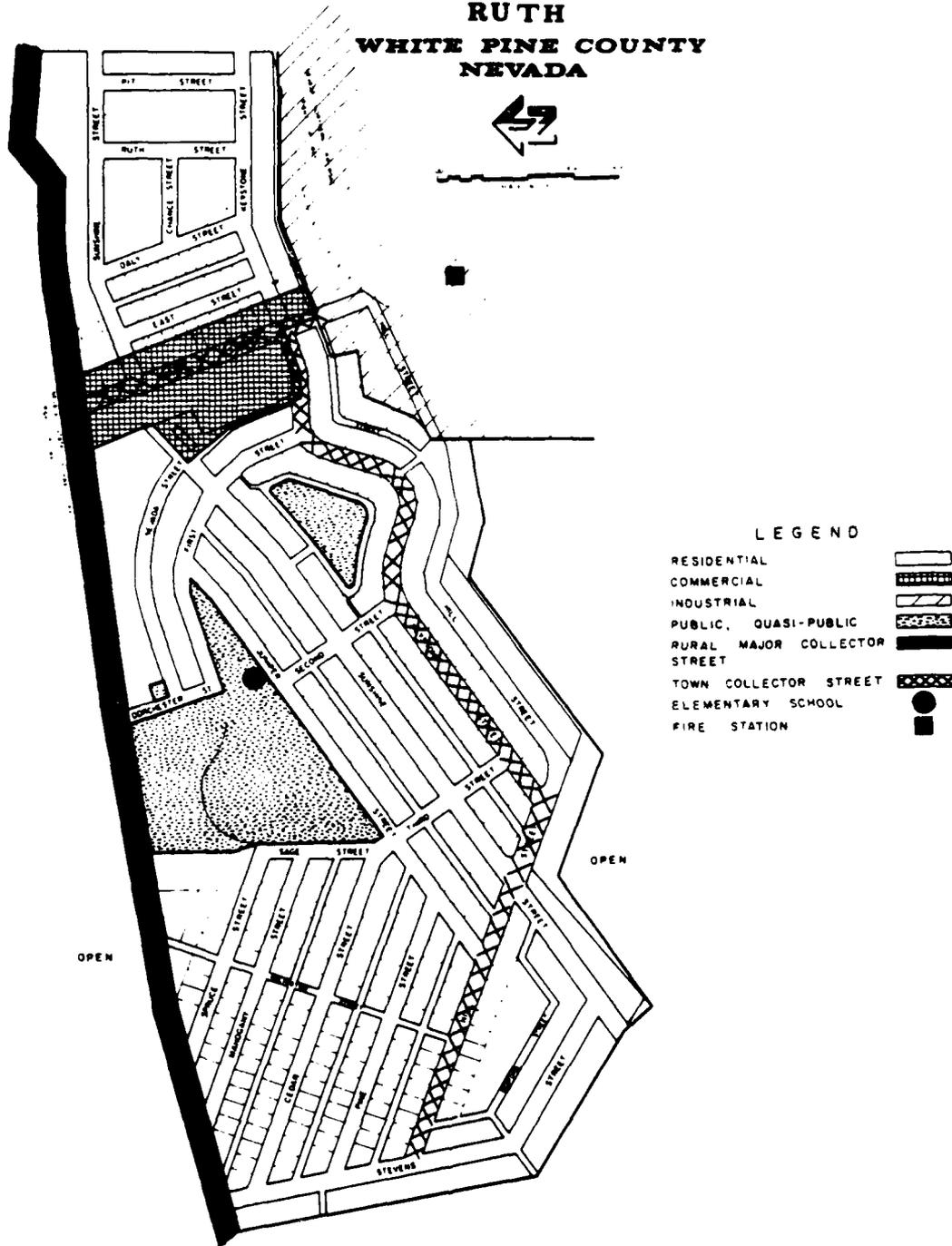


Figure 1.1.4-7. General Plan—Ruth, Nevada. (White Pine County, 1976, "General Plan for White Pine County and City of Ely.")

White Pine County has adopted a zoning ordinance and a subdivision ordinance. These ordinances provide implementation for the County General Plan. The zoning ordinance provides for the classification of county land into various use categories and sets forth the standards and requirements for each type of development. The ordinance was recently amended to provide an industrial park zone to permit the development of the County Industrial Park. The subdivision ordinance was developed in accordance with the enabling legislature of the Nevada State Agency for subdivision of land.

Both of the above ordinances are administered by the White Pine Regional Planning Commission for the county as a whole and for the city of Ely within the county. A major updating of the County General Plan, zoning ordinance, and subdivision ordinance is planned in White Pine County and Ely in the immediate future.

RURAL LAND USE

Agriculture

No irrigated croplands are located proximate to the proposed OB facilities at Ely, Nevada, which lie in the northern portion of the BLM Horse and Cattle Camp Planning Unit. The predominant land use in the vicinity of the OB facilities is grazing.

Recreation

No fishing or concentrated recreation sites are located in the vicinity of the proposed OB site. This area, entirely in public domain, is subject to recreational vehicle use, small game hunting, dispersed recreation, and collecting activities.

Mining

The Ely OB site is about 4 mi to the 480-acre Ward mining district and is completely covered with mining claims and oil and gas leases. Claims in the western portion are owned by Silver King Mines, which has a producing operation west of the site. Placer claims dominate the eastern portion of the site. No known oil and gas exploration has been performed in this area.

LAND OWNERSHIP (1.1.5)

Project siting south of Ely could avoid all private and state land. Figure 1.1.5-1 presents the generalized distribution of federal, state, and privately owned lands. However, much of the BLM-administered land in the Ely area is utilized for cattle grazing, and conflicts over land uses with area cattle ranchers could result. The site is located between a portion of the Humboldt National Forest immediately to the west, and approximately 5,400 acres of private land about 5 mi to the east and northeast in Steptoe Valley. There are also four parcels of private land between 4 and 5 mi to the south and southwest, which comprise 1,500 acres.

HOUSING (1.1.6)

White Pine County has experienced very little growth in housing over the last two decades. Indeed, from 1960 to 1970, the county had a negative annual growth

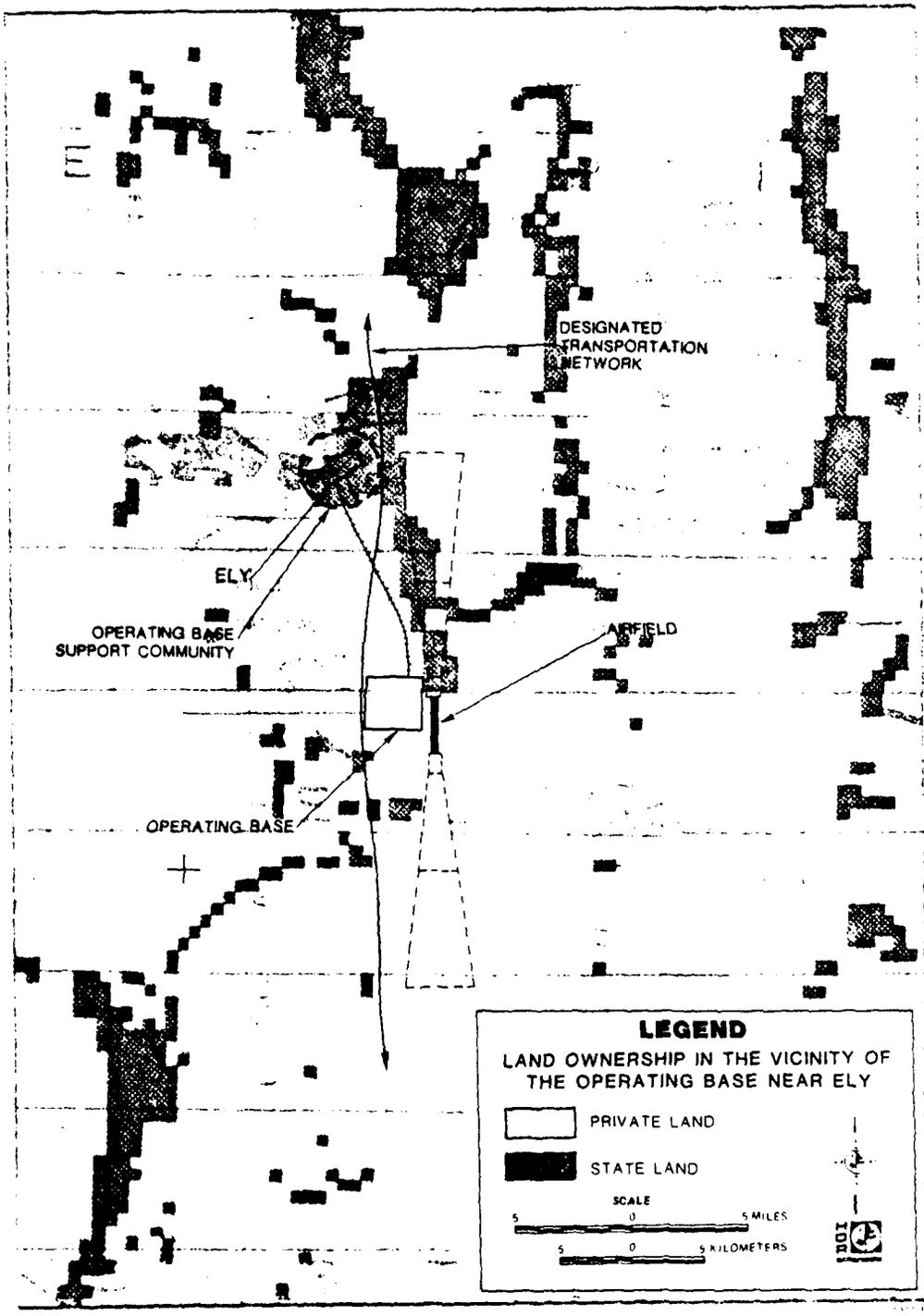


Figure 1.1.5-1. Land ownership in the vicinity of Ely, Nevada.

rate in housing of 0.6 percent when the housing stock dropped from 3,492 to 3,289 units (U.S. Bureau of the Census, Census of Housing, 1970). From 1970 to 1976 housing recovered slightly, growing at an annual rate of 0.9 percent, to reach 3,470 units by 1976. The proportion of the county's housing stock in single-family units decreased a little from 77.4 percent in 1970 to 76.6 percent in 1976, as did the proportion of multi-family units (10.5 percent to 10.3 percent). Mobile homes' share increased to 13.2 percent in 1976, from 12.1 percent in 1970. It is estimated that over the period 1970 to 1979, an average of 12 conventionally-built housing units were added each year, as indicated from annual permits authorizing residential construction. The same data show a maximum of 29 units being provided in 1970 (U.S. Bureau of the Census, Construction Reports). From 1970 to 1976, estimated annual mobile home deliveries averaged only eight. In 1970, about 73 percent of the housing units were owner-occupied. In the same year, almost 45 percent of the housing was located in one community, Ely.

COMMUNITY INFRASTRUCTURE (1.1.7)

Organization

Ely, a general law city, is managed by a mayor/council government including an appointed City Clerk, City Attorney and municipal judge. The mayor is elected in the general election. A three-member commission, with two members elected every two years, heads the County government.

A regional planning commission considers planning requests for all of White Pine County. To promote industrial development, the County organized a non-profit County Redevelopment Corporation. Recently, a county Economic Development Committee was organized to recommend, review and solicit funding for economic development projects in the county.

In White Pine County, Ely is the only incorporated city. Other population centers include McGill, Ruth, Preston, Lund and Baker. The majority of the residents, however, live at Ely.

Education

During the first month in 1979, there was a total enrollment of 1,664 students in the seven schools which comprise the White Pine County School District. There were 122 enrollments in the kindergarten level; 652 enrollments in elementary grades; 791 enrollments in secondary grades and 119 enrollments in special education courses. Table 1.1.7-1 summarizes educational data for all counties in which a potential operating base may be located. Approximately 91 teachers work in the White Pine School District. The facilities of the system currently have an excess capacity of approximately 1,000 pupils.

Health Care

Medical facilities in White Pine County include the William B. Rivie Hospital in East Ely; the White Pine Care Center in Ely; a rural clinic community mental health center; and the Eastern Nevada Medical Center, which serves as an out-patient facility for the county's four physicians.

Table 1.1.7-1. Summary of educational statistics for study area locations.

SCHOOL	NO. PUPILS	EXCESS CAPACITY	TEACHERS	PUPIL TEACHER RATIO	FUTURE PLANS
Alamo	1,082	1,000	51	18.3	Not available
Alamo	3,017	1,111	3,730	23.1	Development occurring
Alamo	4,002	40	191	21.2	School bond passed to build new elementary school
Alamo	1,026	850	53	19.4	Not available
Alamo	2,170	134	88	24.7	Remodeling occurring
Alamo	1,806	100	102	15.7	Available land for future expansion
Alamo	7,850	1,875	417	18.8	Expansion of classrooms in all levels is planned
Alamo	411	170	54	16.9	Not available

1347-2

New Mexico Department of Education, 1979-80. Enrollment and Certified Personnel Information. Vol. 22. Research Bulletin. New Mexico Department of Education.

Lincoln County School District, 20 May 1980. J. Morris, School Superintendent. Telephone communication.

Wilcox County School District, 20 May 1980. L. Haslam, School Superintendent. Telephone communication.

Williams County School District, 20 May 1980. Ken Topham, School Superintendent. Telephone communication.

Doornick Independent School District, 22 May 1980. D. Williams, School Superintendent. Telephone communication.

Lincoln Air Force Base Environmental Coordinator, 1975. Tab A-1. Environmental Narrative. Lincoln, New Mexico.

Department of the Interior, BLM. Social-Economic Profile, Lincoln County, July 1976.

The William B. Rivie Hospital holds 43 acute care beds, but is utilized at a rate of only 28 percent. The White Pine Care Center contains 99 skilled nursing beds, eight intermediate care beds, and 13 adult-group care beds. White Pine County is served by 19 registered nurses, three dentists and six mental health professionals. Table 1.1.7-2 describes health services and facilities in the study area communities where a potential operating base may be located.

Police Protection

White Pine County Sheriff's Department presently has one sheriff, one undersheriff, and 11 full-time and two part-time deputies. The Ely Police Department is comprised of one chief, one assistant chief, and 12 patrolmen. The Nevada Highway Patrol stations three officers in the county. Table 1.1.7-3 presents police protection information for all study area communities in which a potential operating base may be located.

Fire Protection

The Ely Fire Department is manned by one fire chief, five firemen, and 45 volunteers. Four fire-fighting vehicles and two rescue trucks operate out of the one existing station (Table 1.1.7-4). Its fire insurance rating is five on a scale of 10, with one being superior. McGill has four firemen, 11 volunteers, and two vehicles. Its fire insurance rating is seven. Ruth has an all-volunteer fire department and only one vehicle. Its fire insurance rating is eight, representing a low level of fire protection service. Currently there are no plans to build additional facilities.

Water Supply And Distribution

The city of Ely owns and operates its municipal water system. The city's source of supply includes two wells which are used to supplement a surface source, Murry Springs, which supplies off-peak demand. The two wells, which are presently used only during the summer, have capacity of 1,000 gpm and 950 gpm for a total of 1,950 gpm. Water rights held by the city total 7,940 gpm. Flow from Murry Springs has decreased from about 4,600 gpm in 1970 to 2,100 gpm in 1979. Current use averages 350 gpm and totals 2.1 MGD. Available supply totals 5.8 MGD including 3.0 MGD from Murry Springs and 2.8 MGD from the two wells.

A 16-in water main extends from the collector at Murry Springs to the Murry Booster Station. A 12-in. main serves East Ely and the balance of the distribution system consists of 31 mi of main varying in size from 10 in. to 4 in. The city has a class 5 fire rating and is actively following a program to upgrade the water system. System storage capacity includes five tanks with a total capacity of 6.05 million gallons. Plans call for adding 1.5 MGD and retiring 0.05 MGD which will bring total storage capacity to 7.5 million gallons.

Wastewater Collection and Treatment

The collection system in Ely consists of 6- and 8-in. PVC pipe. East Ely was sewerred in 1954, while the balance of the system was constructed over a period of 75 years and experiences considerable inflow and infiltration through deteriorated bituminous joints and from cross connections with the storm water system. Infiltration, wet weather flow, and three flush tanks in the collection system

Table 1.1.7-2. Health services and facilities in study area locations.

COUNTY/ COMMUNITY	HOSPITAL FACILITIES	PHYSICIANS	RN, LVN, LPN	DENTISTS	MENTAL HEALTH WORKERS	COMMENTS
White Pine County/ Ely ¹	43 Acute 99 Skilled Nursing	4	19 RN 10 LPN 46 Aids	3	6	Nursing home under construction; 99-bed capacity
Clark County/ Coyote Springs ² Area	1,778 Acute 919 Long- Term	508 (78 ¹)	1,412 RN 594 LPN	163	N/A	
Iron County/Beryl and Vicinity ³	73 Acute	15	35 Nurses	10	2	Community has excess capacity in hospital. Present utilization rate is less than 50 percent.
Beaver County/ Milford and Vicinity ⁴	12 Acute 20 Long-Term	1	6 RN 2 LPN	1 Part-time	0	
Millard County/ Delta and Vicinity ⁵	18 Acute 18 Long-Term	5	7 RN 6 LPN	4	2	
Dallam and Hartley Counties/Dalhart and Vicinity ⁶	67 Acute 80 Long-Term	5	10 RN 20 LVN	4	N/A	Expansion plans are in process to double the number of doctors and hospital beds in area.
Curry County/Clovis and Vicinity ⁷	106 Acute 100 beds at Cannon AFB 10 Acute 9 Skilled Nursing	22	110 Nurses	18	12	Hospital utilized at 65 percent.
Lincoln County/ Panaca, Pioche, Caliente and Vicinity ⁸		2	6 RN	1	N/A	

1348-2

¹Nevada Bureau of Business and Economic Research, July 1977. Socioeconomic Analysis of the White Pine Power Project. Reno, Nevada.

²Clark County Health District, 6 June 1980- A. Dague, Health Planner, Telephone Communication.

³Bureau of Economic and Business Research, 1979. Community Economic Facts—Cedar City.

⁴Millard Valley Memorial Hospital, 6 June 1980. J. Williams, Director of Nursing, Telephone Communication.

⁵Architects/Planners Alliance, Inc., 1979. Socioeconomic Analysis—Lynnndyl Alternative Site, Salt Lake City.

⁶Dalhart Hospital, 6 June 1980. A. Peterson, Director of Nursing, Telephone Communication.

⁷Clovis High Plains Hospital, 6 June 1980. S. Grigsby, Director of Nursing, Telephone Communication.

⁸U.S. Department of Interior (BIM). Social-Economic Profile. Lincoln County, July 1976.

Table 1.1.7-3. Police protection characteristics in study area locations.

COUNTY/COMMUNITY	POLICE OFFICERS	SHERIFF	HIGHWAY PATROL
White Pine County ¹ Ely and vicinity	14	15	
Clark County ² Coyote Springs area	38	Serves Area	Serves Area
Iron County ³ Beryl and vicinity	15	Serves Area	Serves Area
Beaver County ⁴ Milford and vicinity	2	Serves Area	Serves Area
Millard County ⁵ Delta and vicinity	3	4	6
Dallam, Hartley Counties ⁶ Dalhart and Vicinity	7 (Dallam) 9 (Hartley)	14 (Dallam) 2 (Hartley)	4 (Dallam) 3 (Hartley)
Curry County ⁷ Clovis and Vicinity	72	Serves Area	Serves Area
Lincoln County ⁸ Panaca, Pioche, Caliente	6	7	1

134-1

¹White Pine County Sheriff's Department, 5 June, 1980. M. Burns, Deputy, telephone conversation.

²Las Vegas Police Department, 5 June 1980. Officer Bottomly, Personnel Officer, telephone conversation.

³Bureau of Economic and Business Research, 1979, *Community Economic Facts—Cedar City*.

⁴Five County Association of Governments, 1976, *Planning for Growth in Beaver County*, Beaver County Planning and Development Agency.

⁵Architects Planners Alliance Inc. 1979. *Socioeconomic Analysis—Lynndyl Alternative Site*, Salt Lake City.

⁶Panhandle Regional Planning Commission, 22 May 1980. M. Kenderdine, Planner, telephone conversation.

⁷Clovis Police Department, 5 June 1980, Y. Garcia, Secretary I, telephone conversation.

⁸U.S. Department of Interior (BLM), *Social-Economic Profile, Lincoln County*, July 1976.

Table 1.1.7-4. Fire protection characteristics in study area localities.

COUNTY COMPANY	FULLTIME FFD DEPARTMENT	VOLUNTEER FFD DEPARTMENT	FIRE DEPARTMENT RATING	PROPERTY PROTECTION CHARACTERISTICS
White Pine County, NV	5 paid staff	43 Volunteers	5	One engine pump, 2000 gallon capacity Two gallon capacity pumps, 2000 gallon capacity
Clark County, Las Vegas	250 Fire Fighters	-	3 (will move into 2nd rating soon)	4 Fire trucks and 2 tanker trucks
Iron County, Cedar City	3 paid staff	92 Volunteers	5	4 pumper trucks (1 250 and 200 gallon) 2 brush trucks 1 crash truck at airport 1 engine truck several ambulances several pumps trucks
Beaver County, Mt. Hood	-	High School Students act as Volunteer Fireman 25 Volunteer	7	3 pumper trucks (500, 750, and 1000 gallon)
Willard County, Delta	-	30 Volunteers	7	2 pumper trucks (500, 750, and 1000 gallon)
Fillmore	-	30 Volunteers	7	Two 1,500 gallon pumper trucks One 250 gallon water pump One backup pumper truck Five 4-wheel drive vehicles
Ballou and Hartley ballard	1 paid staff	30 Volunteers	2 1/2 Key Rating Rating Range From 3 (Excellent) to \$1.00 (poor)	Eight 1,500-gallon pumps Two shock units One crash truck and several ambulances
Curry County, Clatsop	75 Firemen (180 trained)	-	6 (will move into a 7)	One 250-gallon pumper Four 500 gallon pumps One 150 gallon pump Two 125 gallon clip on units
Lincoln County, Panama, Pioche, Caldwell	-	55-60 Volunteers	7 Pioche, Caldwell, 8 Panama	

1980

ELY Fire Department, 5 June 1980. E. Bickler, Dispatcher, telephone conversation

Las Vegas Fire Department, 5 June 1980. R. Borrocks, Chief Secretary, telephone conversation

Redar City Fire Department, 6 June 1980. C. Neilson, Fire Marshall, telephone conversation

Five County Association of Governments, 1976. Planning for growth in Beaver County, Beaver County, Planning and Development Council.

Architects/Planners Alliance, Inc., 1979. Socioeconomic Analysis of Supply Alternatives, Salt Lake City.

Madhart Fire Department, 10 June 1980. M. Stapp, Fire Chief, telephone conversation

Clatsop Fire Department, 30 June 1980. A. Carter, Fire Chief, telephone conversation

U.S. Department of Interior (BIA), Social Economic Profile, Lincoln County, July 1976.

contribute significant hydraulic loading to the treatment facility. If inflow and infiltration were eliminated, the treatment facility would have capacity two to three times greater than current use. Treatment consists of extended aeration followed by oxidation ponds with 14 acres of surface area. There is no active discharge to Murry Creek although it is permitted and the city holds a permit for discharge.

Solid Waste

Only one sanitary landfill serves the county, and it is located in Ely. The site now passes approximately 45 acres, five of which have been used. It is estimated that this landfill which began operation in 1976 can serve a population of 15,000 persons until the year 2005.

Parks and Recreation

The city of Ely possesses several recreational areas including: a county park with swimming pool, six neighborhood parks, five elementary school playgrounds, a high school playfield, and others. Regional recreational facilities within a 60 mi (96 km) radius include: East Creek, Bird Creek, Timber Creek, Berry Creek, Cleve Creek, Ward Mt., White River, Currant Creek, Lehman Creek, Baker Creek, Wheeler Peak, and Snake Creek, all of which are U.S. Forest Service Sites. Also nearby are Cave Lake, Ward Charcoal Ovens, and Lehman Caves National Monument.

QUALITY OF LIFE (1.1.8)

Physical quality of life indicators are employed to reveal the extent to which attributes and amenities typical of modern society are distributed throughout study area counties. Variables related to health, safety, economic, social disorganization, etc., give us a means for describing the amenities available to the citizens of study area counties compared to national and state averages, prior to the impacts of the M-X system's deployment. These indicators help define the infrastructural baseline through a set of variables felt to best describe local quality of life (Table 1.1.8-1).

In addition to describing the availability of existing facilities, services and amenities in the study area region, it is also important to know how the residents perceive their situation. For example, do they think their level of police protection is excessive, just about right, or inadequate? An individual's feeling of safety is partially influenced by which perception is held, as is their satisfaction with their community, its government, and its quality of life.

A survey by the Governor's Commission on the Future of Nevada has recently been completed which provides information by counties on local values, desires, and the perceptual aspects of community facilities such as education, health, economic growth, public service variables, lifestyle factors and others. In order to further define the quality of life, including concerns over the future for residents of communities where operating bases are being considered, values from the Governor's Commission survey are presented by county to attempt a more thorough presentation of baseline quality of life.

A brief review of quality of life indicators for White Pine County shows it to be a fairly typical rural Nevada county with a few clear distinctions. While Nevada

as a whole has been growing rapidly for the last decade, White Pine County and Ely have not shared in this growth. Along with a decline in their labor force, they have experienced considerable out-migration in recent years because of mine closures. Housing values are well below the state average and tend to be somewhat more overcrowded and owner occupied. In the area of health, White Pine County is slightly below the state and national averages on most indicators while they are well below average in their number of physicians, having only .3/1000 population compared to the national average of 1.9/1000 population. Public safety factors show White Pine County to be very congruous with national averages for police officers/1000 population and crime rates, whereas the state statistics, which are dominated by the two urban areas, show very high crime rates. Social disorganization indicators reveal its divorce rate to be very high by national averages, and in comparison to other rural counties, but low in comparison to the state figure (11.2 compared to 17.9/1000 population, respectively). The alcoholism rate of rural Nevada counties, at 38.3/1000 population, is very near the national average of 42.0/1000, while it is well below the state average of 67.7/1000 population. Indicators for the education component show White Pine County to be very similar to rural Nevada counties. The pupil/teacher ratio is similar to the state average while the median school years completed of 12.2 is slightly below the state average of 12.6.

White Pine County has a strong dependence on the mining industry as its dominant employer. Thus its population and employment statistics show recurrent boom and bust cycles tied to fluctuating mineral prices. Currently, it is in a busy cycle with high unemployment and a recent loss of population and employment due to Kennecott Copper being shut down. These circumstances are strongly reflected in the attitudes held by local residents.

Open spaces, relaxed lifestyles, and clean air are the three values most cited by county residents as to what it is that they like about living in Nevada. Over 80 percent report a willingness to alter their life style by riding a bus to work and having an increased population. On the other hand, changes in life style which are least acceptable include reduced access to the out-of-doors, hunting, and fishing, and an increase in federal regulations. White Pine residents further cite unemployment/economic development, federal government regulation, and lack of industry/economic diversity as the most important problems facing their area. In addition, 86 percent felt that growth (more people) would be beneficial to their community, 73 percent were not pleased with their lack of growth over the last few years, and 86 percent felt that it was "of major importance" to develop sources of employment other than gaming. Their preferences for future growth include expansion in mining, power plants, and agriculture. Other types of economic activities are ranked much lower in preference by White Pine citizens.

Of the amenities available to the local community as public services a majority of the White Pine County residents who returned questionnaires preferred that spending over the next twenty years remain the same for arts and culture, fire protection, services to economically disadvantaged and handicapped. A majority preferred that spending support should be greater for streets and highways, transportation other than highways, primary and secondary education, services to senior citizens, and colleges and universities. Support for parks and recreation and land use planning was closely divided between those preferring to spend more and those satisfied with current levels of expenditures while low-cost housing had nearly

an even response suggesting that support be less, greater and the same. Further information relating to public services was sought in questions about the adequacy of selected services. In White Pine County public transit was clearly seen as inadequate whereas health services were perceived as adequate by a majority of the respondents. In the area of government and planning, community planning of land uses was agreeable to the majority.

School districts and educational institutions received mixed evaluations in terms of their adequacy at preparing students for the future. Nevada universities and community colleges were seen as more adequate than the local school district, where those who offered an opinion were sharply divided about its adequacy at preparing students for the future. In a related opinion, 88 percent of White Pine respondents thought that state supported higher education should provide more vocational training.

In summary, Ely and White Pine County are fairly typical rural Nevada areas which have suffered severe economic and population decline from closing copper mines. This experience has disposed them to look favorably at projects that could reverse the decline experienced during the 1970s. A clear majority of the residents favor further economic and industrial diversification and moderate population growth. This strong endorsement of growth is tempered by their strong opposition to increased federal regulations and an equally strong endorsement of rural values embracing moderate growth and a love for open space, clean air, and relaxed life styles. The assumption can be made that most of the residents remaining in the Ely area have a deep attachment to their lifestyle and community.

The Governor's Commission survey reveals that 60 percent of those returning the questionnaire had lived there over 26 years. A survey done for the White Pine Power Project corroborates this long and strong attachment to the area. The study reports that residents are quite satisfied indicating they live in the "best community they could live in". Over two-thirds of those surveyed had lived there over 20 years as well. The residents are interested in bringing in projects that generate economic development, but they want this growth to be carefully integrated into the old community and of a scale such that project-induced growth does not overwhelm the community (Bureau of Business and Economic Research, 1979). Quoting from their survey summary "...residents within the study area generally perceive their social well-being and quality of life to be positive. The major exception, of course, is directly related to the community's desperate need for commercial/industrial diversification."

ENERGY SUPPLY (1.1.9)

Electrical energy is supplied to the Ely area by Mt. Wheeler Power, Inc., (MWP), a rural electric cooperative, with a peak demand of 25 MW. Mt. Wheeler Power, Inc., has no generating facilities and relies on purchased power transmitted from other utilities via transmission lines.

Ely is located in an area without natural gas service. Service could be extended into the area by Southeast Gas Corporation (SGC) in Las Vegas, but there are presently no plans for such an extension. The closest point on the SGC distribution system is approximately 125 mi NNW of Ely in the ELKO area. Home energy requirements in the Ely area are supplied by bottled gas, fuel oil and

electricity. Bottled gas, fuel oil, gasoline and deisel fuel are trucked from bulk fuel handling terminals in Salt Lake City and Las Vegas to local distribution centers. The bottled gas (propane) is marketed locally between companies: H and R Propane, Cal-Gas, and Turner-Gas. Fuel oil, gasoline and deisel fuel are distributed by local representatives of four major oil companies, AMCO, Chevron USA, Phillips 66 and Texaco.

TRAFFIC AND TRANSPORTATION (1.1.10)

The proposed base site is located 10 miles south of the city of Ely on the Pioche Highway (U.S. Highways 50 and 93). Major access to the proposed site will be along this route. Both U.S. 50 northwest of Ely and U.S. 93 north of Ely will also be affected, since some of the off-base personnel are expected to reside in or near the communities of Ruth and McGill.

A schematic map of the existing road network is shown on Figure 1.1.10-1. Also shown are the 1979 traffic volumes. Traffic volumes may be expected to remain fairly constant, as without M-X and other major projects, no growth is expected. The Pioche Highway between the base and Ely has an ADT of only 820 vehicles and unless some major industry or M-X moves into the area it is not expected to increase appreciably.

For more information, refer to ETR 19.

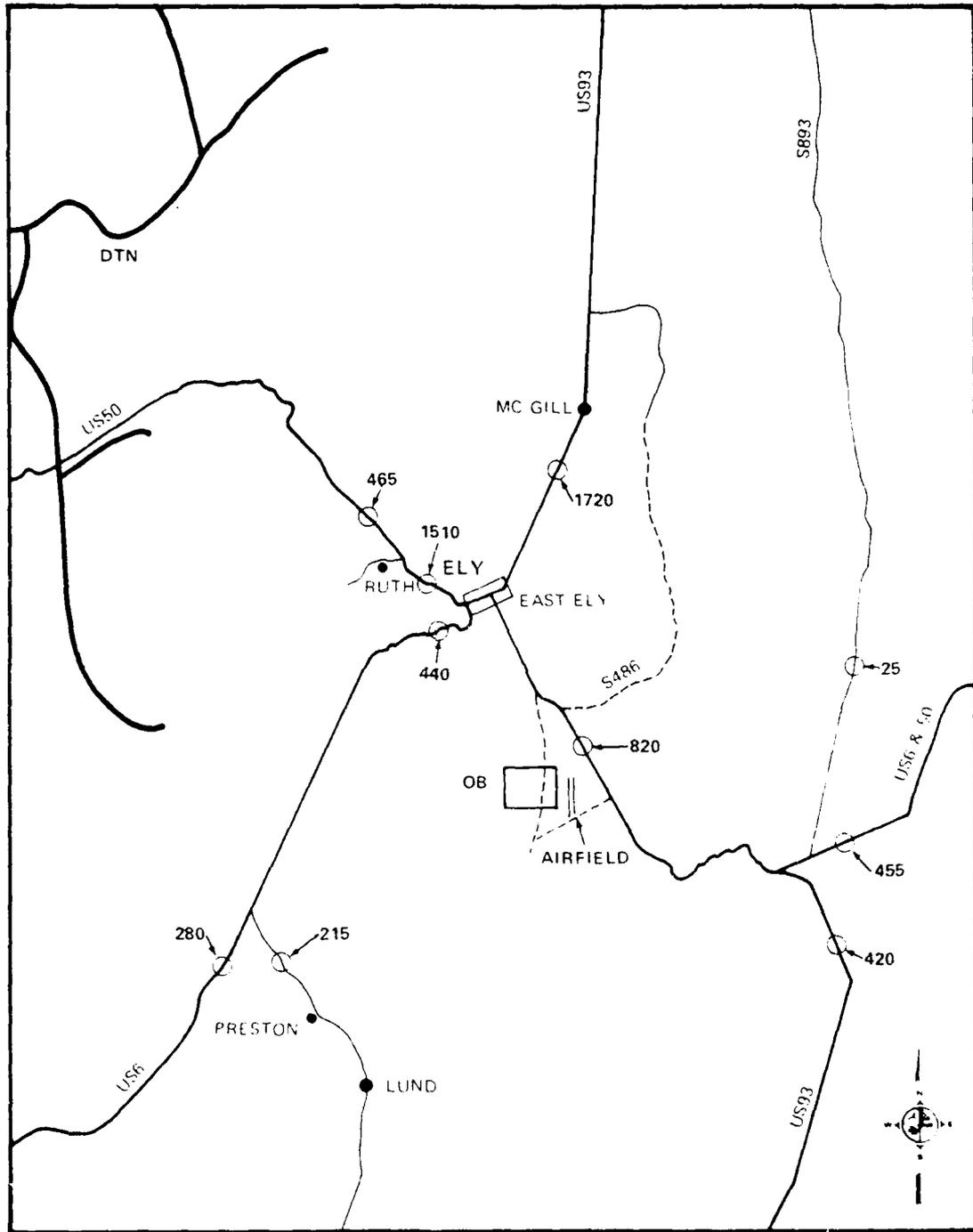
NATIVE AMERICANS (1.1.11)

Community Environment Native Americans

Ely and vicinity was a major Shoshone occupation area in late prehistoric and early historic times. Nineteenth century Indian villages are recorded for Ely, Duck Creek, Warm Springs, Schellbourne, Egan Canyon, and Cherry Creek. Additionally, the Ely, Duck Creek, and Cherry Creek villages served as festival centers in historic times. A total of 20 known aboriginal habitation sites occur in the Steptoe Valley unit. This undoubtedly represents only a small fraction of potential sites. The unit contains 225 springs, a large number of which are likely to be associated with sensitive cultural materials.

Due to the formerly dense Shoshone occupation of the Ely area, extensive burial grounds are expected in the foothill and mountain areas. Nine caves and natural rock shelters are recorded, one of which is associated with rock art. The Egan and Shell Creek Ranges which flank Steptoe Valley also contain extensive pinyon groves. Pine-nuts continue to be harvested annually by contemporary Native American Indians in the area, and constitute a valuable cultural resource.

There are two Shoshone Indian reserves in the general Ely vicinity, the Ely Colony and the Duckwater Reservation. The Ely Colony consists of 93 tribally-owned acres and ten acres leased from the county located in the town of Ely and has an enrolled population of 160, of whom 74 live in the colony. The Duckwater Reservation consists of 3,815 tribally-owned acres 70 miles southeast of Ely and has an enrolled population of 101. The Duckwater Reservation also holds 352,000 acres in BLM grazing permits and has applied for withdrawal of that acreage.



LEGEND 000 1979 TRAFFIC VOLUMES, ELY, NEVADA

SCHEMATIC NOT TO SCALE

2179-A

SOURCE NEVADA DEPARTMENT OF TRANSPORTATION

Figure 1.1.10-1. Existing traffic volumes in the vicinity of Ely.

Ely is in the Steptoe hydrological basin. Steptoe Creek is the most notable surface water in the area, but ephemeral streams emanating from the Duck Creek, Hell Creek, and Egan mountain ranges abound. The multiple streams and creeks are the sources of groundwater recharge for the area and the Indian and non-Indian communities depend on that groundwater for their domestic and commercial water needs.

The Duckwater Reservation is located in the Railroad-Northern hydrological unit. The principal sources of water for the Duckwater Indians are Bull Creek, Duck Creek, and Currant Creek. There are numerous ephemeral streams which flow intermittently from the surrounding mountains and which frequently flood the Duckwater area when the snow cap melts in the spring.

The general Ely area is economically depressed; there is little or no irrigated land in the vicinity and only a minimum amount of farming is practiced. There is no irrigated acreage on the Duckwater reservation although 930 acres are considered irrigable. The Duckwater reservation lands are used primarily for stock grazing and the Duckwater Indians have BLM grazing permits for 352,000 acres. The Duckwater reservation applied for withdrawal of those lands, to increase their economic base, in 1977. Action on their application is still pending. The limited acreage in the Ely Colony precludes stock raising and/or agricultural pursuits except for limited subsistence activities and the colony lands are primarily used for residential purposes although plans exist for the construction of a full service truck stop. Copper mining is the only industry in the area.

Employment and income statistics reflect the generally depressed economic situation. The combined Indian labor force for the DW reservation and Ely Colony is estimated to be 75 men and women but with high underemployment rates and 47 unemployed. The average per capita income for the Ely Colony is only \$700/year and the average family income ranges from \$3,200 - 3,500/yr income.

The poverty level for the Indian communities can be seen from the general community conditions. Housing conditions are poor and existing structures are overcrowded; public utilities and health services and facilities are minimal or absent and there is a similar paucity of private sector services on the reserves.

Detailed and reservation-specific data on land use, water resources and use, demographic characteristics, employment, income and tribal enterprises, community and social structure and other socioeconomic data collected by a field research team are currently being analyzed.

Operating Base and Vicinity Native Americans

Although Steptoe Valley is known to have been a Shoshone population center, little is known about later prehistoric and early historic settlements south of the Ely area. Archaeological sites of undetermined antiquity are found along the numerous springs which occur in the Egan and Shell Creek Ranges adjacent to the OB site. Historic Shoshone settlements are especially likely along Steptoe Creek, just west of the proposed base area. Culturally sensitive burial and spiritual sites are expected in foothill and mountain regions. More detailed cultural resource data are currently being gathered in field studies at the Ely Indian Colony.

The Ely Colony of Shoshone Indians consists of 93 acres of tribally-owned land and 10 acres leased from the county, located in the town of Ely. The Native American population is estimated to be 160, of whom 74 live in the Colony itself. However, none are known to live in the proposed OB site area and there are no known Native American uses of the land currently proposed for base withdrawal. Site-specific economic and demographic data collected by a research team in the field are currently being analyzed.

ARCHAEOLOGICAL AND HISTORICAL RESOURCES (1.1.12)

There are at least three known archaeological sites in the immediate vicinity of the Ely alternative, including the Ward Charcoal Ovens National Register Site. The archaeological sites represent limited activity sites, primarily lithic scatters whose precise functions are not yet determined. Ward Charcoal Ovens are comprised of six stone beehive ovens where timber was reduced for the smelters of Ward, a mining town dating to 1876.

Despite the fact that few intensive surveys have been conducted within Steptoe Valley, there are approximately 114 known sites in the valley (Table 1.1.12-1). The majority of these sites are aboriginal limited activity sites. Within a 20 mi radius of the Ely OB approximately 74 percent of the land area is of moderate or high sensitivity. While the first phase of a regional sample survey program was implemented in southern Steptoe Valley during the summer of 1980, the results of that survey will not be available until the Final EIS.

Paleontology

Along the edge of Steptoe Valley between Ely and the proposed operating base are outcrops of the Sheep Pass Formation. Some of these outcrops contain fossils and one vertebrate fossil has been found. Paleozoic rock outcroppings in the mountain ranges east and west of the valley contain an assortment of fossils.

OTHER PROJECTS (1.1.13)

Economic Activity

While economic growth has been relatively slow, expansion of mineral production and the development of energy resources are forecast for the county in the near future. The Kennecott Copper Company's mine near Ruth and metal processing in McGill are expected to slowly build employment levels in the county, beginning in 1980. The second major project forecast--the White Pine Power Project (WPPP)--includes the construction and operation of a 1,350 mw coal-fired power plant, scheduled to begin in 1984. If realized, cumulative effects of these two projects will peak in 1987, generating an expected 4,353 new jobs. This growth would be roughly 180 percent of total county employment of 3,952 jobs in 1977. In the long-run, well over 2,000 jobs would be created on an annual basis. In addition, although not included in baseline employment projections used in this study, a major new electronics manufacturing facility is under construction near Ely. The Lynch Communication Systems' operation is expected to employ 100 people by late 1981, and 500 by 1990 (Bourne, White Pine County, 1980).

Table 1.1.13-1 presents employment projections over the period 1980-1994 for White Pine County. These forecasts have been separated into Baseline 1 and

Table 1.1.12-1. The locations of known site types by topographic zone in Steptoe Valley (179).

SITE TYPE	TOPOGRAPHIC SETTING				
	INDETERMINATE	MOUNTAINS/ FOOTHILLS	UPPER BAJADA	LOWER BAJADA	VALLEY FLOOR
Indeterminate	1	9	2	0	0
Multiple Activity (e.g. habitation sites)	0	13	2	0	1
Special Purpose (e.g. rock art)	0	1	1	0	0
Limited Activity (e.g. campsites)	0	54	10	3	5
Isolated Finds	0	2	5	3	2
Total = 114	1	79	20	6	8
Percentage = 100	1	69	18	5	7

3482

Table 1.1.13-1. Projected employment by major industrial sector, White Pine County, 1994.

White Pine County	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Baseline 1															
Agriculture	187	187	187	188	188	188	188	189	189	190	190	190	190	190	191
Mining	156	155	158	161	165	171	174	178	182	191	195	200	206	206	211
Contract construction	67	63	71	71	75	78	80	82	84	88	90	92	95	95	97
Manufacturing	409	460	512	565	617	670	721	773	824	895	943	982	951	951	972
Transport, Commun., Utilities	141	146	149	154	160	165	168	172	176	180	184	188	192	192	200
Wholesale & Retail Trade	229	233	230	244	250	253	262	267	272	285	290	296	301	301	307
Finance, Ins., Real Estate	46	48	49	51	52	54	55	56	58	59	60	62	63	64	65
Services	420	433	448	465	481	500	513	526	538	552	566	581	594	609	623
Government	283	289	295	301	308	314	320	325	330	335	340	344	347	350	353
Non-Farm Proprietors	92	94	95	97	100	102	104	106	108	110	112	114	116	118	120
TOTAL	2,031	2,113	2,202	2,298	2,397	2,497	2,585	2,672	2,761	2,852	2,911	2,966	3,024	3,082	3,140
Baseline 2															
Agriculture	187	187	187	188	188	191	193	194	194	193	192	193	193	194	194
Mining	156	155	158	161	166	174	176	180	184	191	197	200	206	206	211
Contract construction	67	63	71	71	75	78	80	82	84	88	90	92	95	95	97
Manufacturing	409	460	512	565	617	677	731	785	835	884	907	921	940	959	980
Transport, Commun., Utilities	141	146	149	154	163	173	174	182	193	195	203	206	212	212	217
Wholesale & Retail Trade	229	233	239	244	257	267	274	282	291	300	308	314	320	327	333
Finance, Ins., Real Estate	46	48	49	51	54	56	57	58	60	61	62	63	64	65	66
Services	420	433	449	466	483	503	517	531	544	560	575	591	606	622	638
Government	283	289	295	301	314	314	320	326	331	337	343	349	354	360	366
Non-Farm Proprietors	92	94	95	97	103	104	105	107	108	110	112	114	116	118	120
TOTAL	2,031	2,114	2,203	2,301	2,419	2,565	2,701	2,825	2,946	3,061	3,177	3,293	3,410	3,525	3,646

Source: Bureau of Business and Economic Research, University of Utah, 1980.

Baseline 2. The first set of projections are essentially an extrapolation of 1967-1978 growth trends in White Pine County. Baseline 2 includes Baseline 1 growth plus WPPP and expansion of Kennecott Copper Company operations. These projections have been developed by the University of Utah's Bureau of Business and Economic Research. These forecasts project employment by place of residence and not place of work, as in Table 1.1.1-1 and 1.1.1-2. In the case of White Pine County, many persons working in the county live elsewhere, thereby reducing employment figures. In comparison to the 1977 employment figure of 3,952 presented in Tables 1.1.1-1 and 1.1.1-2, employment by place of residence for this same year equals 3,430 jobs (Nevada Employment Security Department, 1980). Employment by place of residence for 1978 equals 2,820, and for 1979 this figure declined to 2,780. Forecasts for both Baselines project a further decline in employment by place of residence to 2,031 jobs in 1980. Under Baseline 1 conditions, subsequent to 1980, employment is forecast to increase at an average annual rate of 4.9 percent over the 1980-1994 period, but the total number of jobs increase only by 1,109. Most growth is forecast to occur in the manufacturing sector, followed by service and trade industries. Baseline 2 diverges from Baseline 1 in 1984, when, due to the employment requirements of the two projects identified above, the rate of employment growth more than doubles, yielding an average annual growth rate of 7.1 percent over the 1980-1994 period. Under Baseline 2, growth is very heavily concentrated in mining and transportation and also in services and trade industries. All are principal contributors of direct and support employment for the Kennecott and WPPP projects. These projects would very likely induce significant stress on the county's economy as industries adjust; local labor shortages, wage inflation, and in-migration of new workers in key occupations would occur.

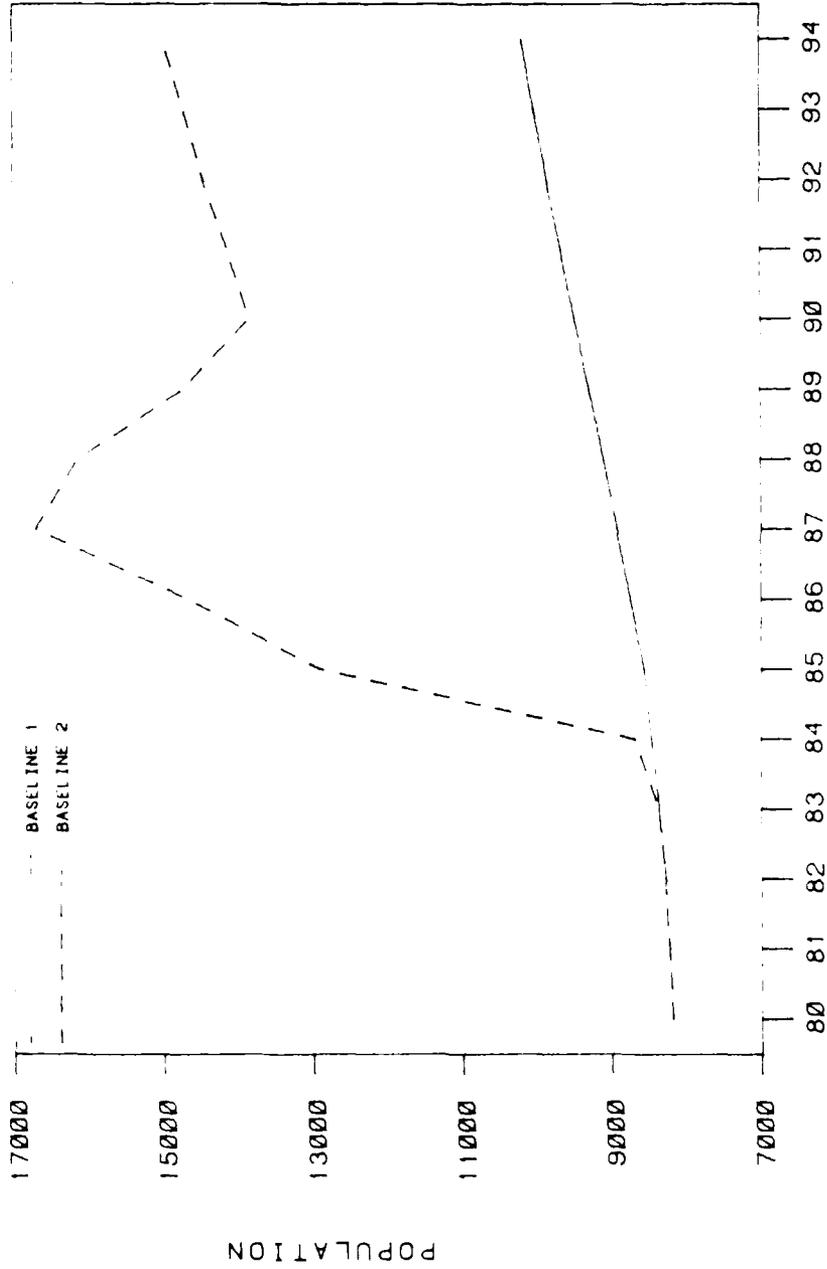
Population

Figure 1.1.13-1 shows two population projections for the 1980 to 1994 period for White Pine County that were developed by the University of Utah's Bureau of Business and Economic Research. The first projection, labeled Baseline 1, consists of an extrapolation of past growth trends in the county, and the second projection, Baseline 2, includes Baseline 1 growth plus the population growth attributable to the other projects that are anticipated in White Pine County.

Under Baseline 1 conditions population is projected to increase at a compound annual rate of 1.6 percent over the 1980 to 1994 period, increasing from 8,246 in 1980 to 10,238 in 1994. Baseline 2 diverges from the normal growth assumption, Baseline 1, in 1984, when due to the labor requirements of the White Pine Power Project and the Kennecott Copper Mine and Metal processing activities, population growth accelerates from a forecasted population of 8,746 in 1984. The population is expected to peak at some 16,768 three years later, representing a 24.2 percent annual compound rate of growth. After 1987 the population is projected to fall off to just under 4,000 people in 1990 as construction activities cease, and then resume a steady growth to 15,050 by 1994, representing a 47 percent increase over Baseline 1.

Such rapid peak construction period growth is likely to cause significant stress on housing conditions, community infrastructure and services and the quality of life in White Pine County.

POPULATION BASELINES 182, WHITE PINE COUNTY, 1980-1994



C3167A

Source: Bureau of Economic and Business Research, University of Utah, September, 1988

Figure 1.1.13-1. Population baselines 1 and 2, White Pine County, 1980-1994.

1.2 NATURAL ENVIRONMENT

BIOLOGICAL RESOURCES (1.2.1)

Vegetation

Information on vegetation types of the valley was obtained from the Bureau of Land Management (BLM). Vegetation data in the mountainous areas were obtained from the U. S. Forest Service (USFS). More generalized information was obtained from the Soil Conservation Service (SCS). Figure 1.2.1-1 shows the candidate OB location with respect to those major vegetation types in the surrounding region that occupy areas large enough to be mapped at the given scale. The main vegetation and land cover types on the valley bottom and low bajadas are agricultural (hay meadows primarily), desert marsh and spring vegetation, riparian woodland, and Great Basin sagebrush. Great Basin sagebrush, grassland, and pinyon-juniper woodland dominate the mid and high elevation bajadas.

Comins Lake and Steptoe Creek, indicated as permanent surface water features on the USGS 1:250,000 maps, are located in the portion of the valley proposed as an operating base location. Agricultural activity (hay meadows) occurs along Steptoe Creek from the town of Ely south towards Comins Lake. The valley bottom, south of Comins Lake, at approximately 6,400 ft, is also dominated by an agricultural type. Shallenberger Spring is located in an agricultural region north of Comins Lake. SCS data indicate that meadow and floodplain associations also occur in these wet, valley bottom areas.

In parts of the valley bottom, rubber rabbitbrush (Chrysothamnus nauseosus) predominates on the borders of agricultural areas, due to the capacity of this species to become quickly established in areas of soil disturbance.

The bajadas between 6,400 ft and 7,000 ft support Great Basin sagebrush, dominated by big sagebrush (Artemisia tridentata), and black sagebrush (Artemisia riva), silvery-gray shrubs 2 to 7 ft tall. There is also an area of bunchgrass of medium height. In some areas where grassland types occur, the grassland was artificially created or enhanced by removing the original native vegetation, usually a Great Basin sagebrush type, and planting grasses. The individual grass species that constitute this type are not specified in available data, but planted crested wheatgrass (Agropyron cristatum), an introduced forage species, is usually dominant.

Pinyon-juniper woodland, dominated by single-leaved pinyon (Pinus monophylla) and Utah juniper (Juniperus osteosperma), occurs on high bajadas and in montane areas above 6,700 ft. The community contains scattered small trees, 10 to 30 ft tall, with a shrub understory. On the high bajadas, the understory is generally Great Basin sagebrush; in the mountains, the understory is often dominated by mountain shrubs such as manzanita (Arctostaphylos sp.), which occurs in the Egan Range west of the potential operating base site. The dominant species along Steptoe Creek above 6,800 ft is black sagebrush.

In addition to vegetation types described for the potential OB site, the valley floor, between the towns of Ely and McGill, has areas dominated by species of the shadscale scrub vegetation type, including winterfat (Eurotia lanata) and shadscale (Atriplex confertifolia).

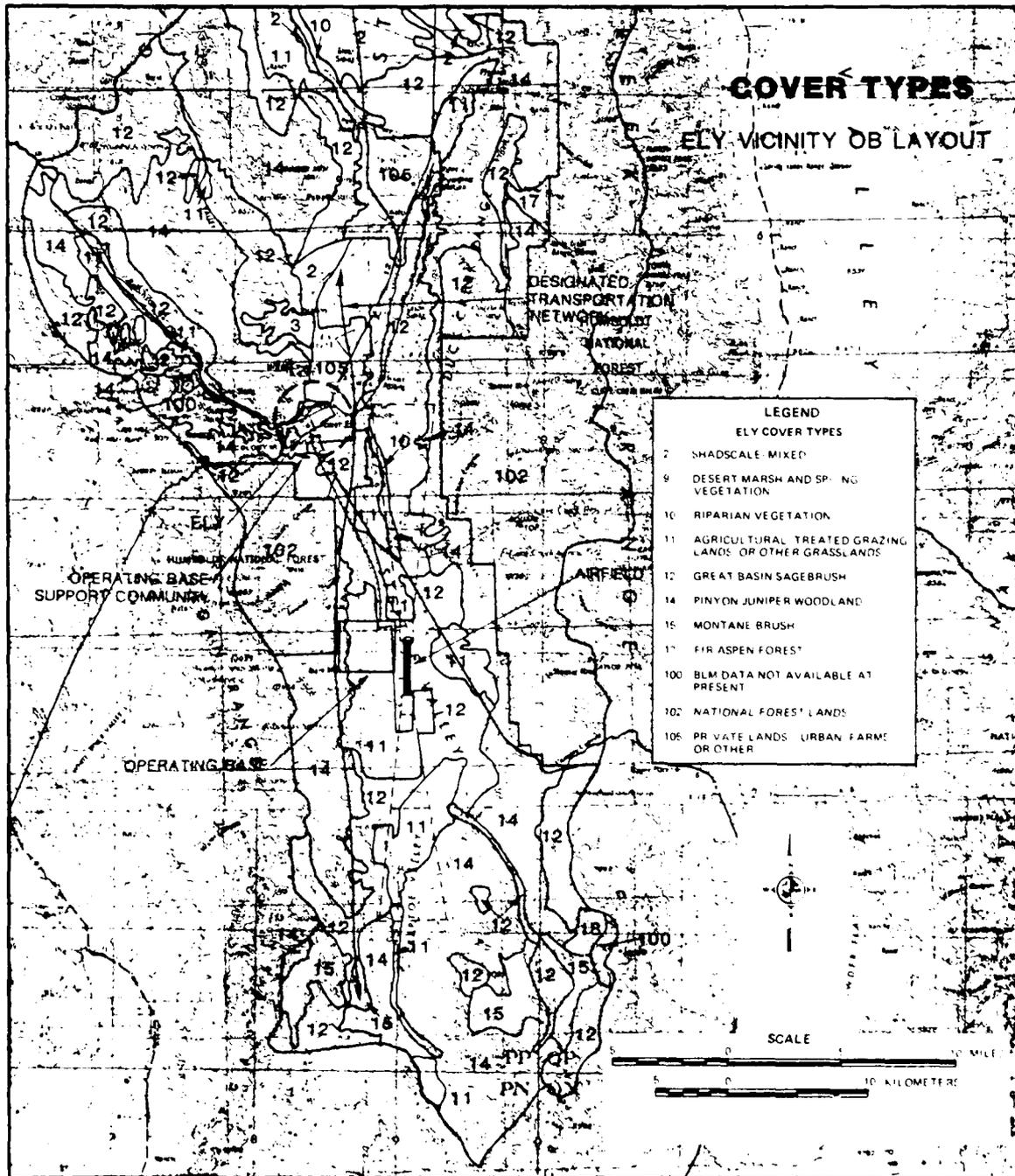


Figure 1.2.1-1. Vegetation cover types in the vicinity of Ely.

Wildlife

Mule deer occur throughout the area in the mountains with key summer range directly to the west in the Egan Range and key summer, winter, and year-long range directly to the east in the Duck Creek Range. A migration route crosses highway 93 to the east of the base site in the Duck Creek Range. Pronghorn antelope ranges with winter and year-long key habitat are located north of the Ely site. Elk range is present directly to the east in the Duck Creek Range. This range includes key summer and winter habitat. Sage grouse ranges with two known strutting grounds and one known brood use area are located directly in southern Steptoe Valley. Sage grouse ranges with brood use areas and strutting grounds are located throughout Steptoe valley from the valley floor up into the mountains. Waterfowl are found on Comins Lake which is in southern Steptoe Valley.

Aquatic Species

Within the watershed containing the proposed Ely OB, 17 streams contain trout population sufficiently large to support game fisheries. Principal game species found in these streams are rainbow, brook, and brown trout. Cutthroat trout are also present in two streams in the northern portion of Steptoe Valley. Warmer water game fish are present in Comins and Bassett Lakes and Ruth Pond. Principal species are northern pike, largemouth bass and catfish.

Protected Species

Approximately 10 mi from the Ely candidate OB site to the north in Steptoe Valley and approximately 12 mi to the east in Spring Valley, bald eagles (federally protected) have been observed foraging during the winter months. No traditional roost sites have been found in these valleys.

One state protected fish, the relict dace, occurs in aquatic habitats about 6 mi (10 km) or more from the Ely potential OB location. Although it is listed as threatened by Nevada Department of Wildlife, its status is in the process of being downgraded with the recent discovery of numerous new populations. A recommended protected snail, the Steptoe turban also occurs approximately 15 mi from this potential OB location.

The broad pod freckled milkvetch (Astragalus lentiginosus var. latus), listed by Northern Nevada Native Plant (NNNPS) Society as a species of special concern, is known from the Ward Mine area about 5 mi south of the proposed operating base. Another location is known about 10 mi north of this one. This species is usually found in colonies on limestone gravel slopes in the timber belt at about 7,500 feet elevation. Two other species occur within 25 mi. They are the Pennell penstemon (Penstemon francisci-pennelli) and the interrupted Cryptantha (Cryptantha interrupta).

Wilderness and Significant Natural Areas

Potential wilderness and significant natural areas located within a 50 mi radius of the potential Ely OB site are listed in Table 1.2.1-1.

Table 1. Potential wilderness and significant natural areas within a 50-mi radius of the Ely DB site.

SIGNIFICANT NATURAL AREAS	
	MI FROM DB SITE
1. MHP	42
2. ...	47
3. ...	47
4. ...	54
5. ...	0
6. ...	4
7. ...	4
8. ...	9
SUM	
Total miles within km from potential Ely DB site:	
DOMINANT NATURAL AREAS	
	MI FROM DB SITE
1. ...	48
2. ...	46
3. ...	44
4. ...	7
5. ...	17
6. ...	4
7. ...	24
8. ...	27
9. ...	7
10. ...	14
11. ...	10
12. ...	10
13. ...	7
14. ...	17
15. ...	12
16. Snake Basin Spring Valley Study Area	7
17. Spring Valley White Side Flat	7
18. Spring Valley Swamp Cedar	14
19. Swamp Cedar	14
20. Wayne Kirch	38
21. Wheeler Peak Scenic Area	13
22. Whipple Cave	10
SUM	
1. The Lakes of Gandy Mountains	42

1190-1

SURFACE WATER (1.2.2)

Source

For the most part, usable streamflow is derived from the mountains, supplied by snowmelt during the spring months of April through June. The estimated average annual runoff from the mountain areas above 5,900 ft is 33.9×10^8 ft³. Nearly half of the runoff comes from the drainage areas of Duck and Steptoe Creeks and about 20 percent is derived from the Cherry Creek Range, mostly in the areas drained by McDermitt and Goshute Creeks. Runoff also occurs from precipitation on the alluvial apron and valley lowland, although this runoff is generally erratic.

Average annual precipitation occurs during the December through May period. Much of the winter precipitation accumulates as snow which, when it melts, contributes significantly to the spring runoff. Average annual precipitation varies from as little as 6 in. in the lowlands to 20 in. in the mountains. At the project site, average annual precipitation is 8 in.

Mean annual evaporation is in the range of 46 in. to 48 in.

Streams

Duck and Steptoe creeks, whose sources are in the Schell Creek Range, are the main streams in Steptoe Valley. Only Steptoe Creek reaches the basin floor. Ely and East Ely are located several km from Steptoe Creek which flows northward along the central axis of Steptoe Valley. During periods of high flow Steptoe Creek is joined by Duck Creek west of McGill.

Several smaller creeks, such as Murry and Gleason creeks, drain the Egan Range in the vicinity of Ely. Other creeks drain from the Schell Creek Range north of Duck Creek and from the Cherry Creek Mountains in the northern part of the valley. Flow in most streams reaches the lowland only during periods of high runoff from snowmelt or high-intensity precipitation.

Lakes and Reservoirs

Bassett Lake, about 6 mi northeast of McGill (10 mi northeast of Ely and vicinity) is formed by a small dam across the valley lowland. The lake is supplied by water from Steptoe Creek, Duck Creek, outflow from the McGill plant, McGill Springs, and springs in the lowland west of McGill. Under favorable runoff conditions, outflow from Bassett Lake may flow northward to Goshute Lake. This flow may be augmented by tributary flow north of Bassett Lake.

Springs

Springs supply significant quantities of water in the Comins Lake area (6 mi southwest of Ely) and along the west side of the valley southward from Steptoe. Additional areas exist in the northern part of the valley. Ely and east Ely's principal sources of public supply are from Murry Springs, in Murry Canyon, just south of Ely. McGill uses part of McGill Warm Springs for its municipal pool and part for copper production.

Drainage

Precipitation which falls in the mountains drains to the valley floor, which slopes to the northeast along its central axis.

Valley Outflow

Steptoe Creek flows out the north end of the valley only during periods of large runoff.

Current Use

The principal source of public supply for Ely and east Ely is Murry Springs. The average spring discharge has been estimated at 6 to 8 cfs, but the flow appears to have been considerably less in recent years. Part of the unused supply or waste water from the public supply system is used for irrigation. Annual use for municipal supplies at Ely, east Ely, McGill and Ruth, obtained from both wells and springs, is on the order of 2.9×10^3 AFY.

Streams and springs are principal sources for supply of agricultural needs. Most of this water has been used to irrigate meadow hay and pasture. Principal source areas are along the west side of the valley and in the Comins Lake area.

Mining and processing copper ore is the principal industrial use of water in Steptoe Valley. The Silver King Mines, Inc., north of Ely, used (as of 1967) the Lackawanna Springs, discharge around $0.3 \text{ ft}^3/\text{s}$ per year, for milling operations. At McGill, water is supplied for plant operations from Duck Creek and McGill Springs, at an average value of 14.5×10^3 AFY per year. Other industrial use of water is small and depends largely upon the municipal supply of Ely for its requirements.

Additional details are presented in the water resources technical report

GROUNDWATER (1.2.3)

Location of Groundwater

A large quantity of groundwater is stored in the valleyfill. Beneath the area of groundwater evapotranspiration, and within the upper 100 ft of saturated deposits, lie an estimated 2.1 million acre-feet.

Source

Nearly half of the 78,000 acre-feet of runoff is generated in the drainage areas of Duck and Steptoe creeks in the Schell Creek Range. About one fifth is generated in the drainage areas of Goshute and McDermitt creeks in the Cherry Creek Range. Most of the runoff comes from spring snowmelt, from precipitation in the mountains above 7,000 feet. Additional runoff is generated below 7,000 feet (the general valley floor); however, this precipitation is erratic and not susceptible to management use.

Movement

It is inferred that most of the groundwater recharge moves into the valleyfill system through consolidated rocks below the land surface. General movement within the valley is northward. Underflow has not been accurately estimated.

Natural Drainage

Natural discharge from lowland springs is approximately 22,000 acre/ft per year.

Current Use

The largest current groundwater demand in Steptoe Valley is for copper production, about 14,500 acre/ft a year. Agriculture has used between 2,000 and 3,000 acre/ft a year. The current public demand is about 1,200 acre/ft per year. Ely and east Ely (as well as McGill and Ruth) use some groundwater from wells, but most of their current use has come from springs.

Trend

Currently, agriculture gets most of its water from streams and springs. However, acreage of cultivated crops and improved meadows is increasing, and further development of wells was in process in 1967.

Quality

Chemical quality of groundwater in the valley is good, but locally may not be suitable for all uses.

Additional detail is given in the water resources technical report.

SOILS/SLOPE (1.2.4)

The soils of the potential OB site south of Ely formed on gently sloping (generally 3 to 5 percent) alluvial fans. They are calcareous, have loamy skeletal textures and are gray to very pale brown in color. A layer of soil cemented by silica and calcium carbonate, known as a duripan, may be found at less than 29 in. below the surface. The soils are well drained to the duripan, have a moderately rapid permeability, low available water capacity, low quantities of organic matter and a low shrink-swell potential (U.S.D.A. Soil Conservation Service, January 1976). The erosion hazard on these soils is moderate. Severe limitations exist for these soils if used as septic tank absorption fields while moderate limitations exist if used for local roads and streets. The soils of this area belong primarily to the Durorthid great group of the USDA soil taxonomic system. Minor areas of soils belonging to the Torriorthent, Camborthid, and Haplargid great groups also exist.

Seismicity

The Ely basing area is located in southern Steptoe Valley in a currently quiescent seismic area, although relatively strong earthquakes are believed to have struck in the Lehman Caves National Monument area sometime during the Pleistocene. A mapped trace of a Quaternary fault on the westerly flanks of the Schell

Creek Range indicates possible activity before the time of man. Historic seismic activity, however, is of low order. The area is located over 100 mi from known severe tremors of modern times. A possibility exists of recurrence of episode re-adjustments in crustal tectonics in the area, but it is remote. For the sake of introducing a double factor of safety, nevertheless, it is recommended that structures be designed and built to resist a maximum ground motion equivalent to 0.3g. There is one fault located 7 mi to the southeast of the operating base. The mapped trend of the fault is only 2 mi long and seismic levels would be expected to be low. Movement on this fault has occurred during the quaternary. Other small lineaments identified from air photos that could be faults cross the area of the operating base test site. The age of past movement on any of these features is unknown.

AIR QUALITY (1.2.5)

Monitoring data are collected at the McGill mining facility near Ely. Sulfur dioxide levels recorded at the facility exceed the SO₂ NAAQS, causing the SO₂ nonattainment status of the Steptoe Valley. Annual TSP levels in 1977 equalled the primary NAAQS (60 ug/m³). More recent TSP data, reported by EPA, indicate TSP standard excesses have also occurred at the McGill smelter. There are no data on other gaseous criteria pollutant levels in the regional or community Ely areas. Emissions data are provided in Table 1.2.5-1.

No existing or recommended Class I areas are within 100 miles of the Ely area.

Ely, Nevada, is located in the eastern-central part of the state within hydrographic subbasin No. 179. Particulate emissions for the basin area have been measured at 28,908 tons per year (26,220 tonnes per year) from all sources except windblown fugitive dust. The windblown fugitive dust source contributes another 43,758 tons per year (39,689 tonnes per year) to make a total particulate emission of 72,666 tons per year (65,909 tonnes per year). The area of subbasin No. 179 is 1,942 mi² (5,028 km²) and the yearly particulate density is therefore 37.4 tons per year per mi² (13.1 tonnes per year per km²).

The gaseous pollutant baseline levels for Nevada are presently only available on an AQCR basis. Ely is located within AQCR No. 147. The baseline levels for CO, SO_x, NO_x, and hydrocarbons reported for AQCR No. 147 are listed in Table 1.2.5-1. An approximate density range for each pollutant is also reported in Table 1.2.5-1. Refinement of the values in this table will take place when gaseous emission data on a subbasin basis is received from the state of Nevada.

Climatology

All of the potential operating base (OB) locations are in areas with good dispersion potential. Sufficiently detailed climatological data does not exist to make any conclusion about climate differences between potential OB locations in each basing area. A summary of some important climatological parameters relevant to air quality appears in Table 1.2.5-2. With a higher average annual wind speed, the dispersion potential is somewhat higher in the Texas/New Mexico region than in the Nevada/Utah region although fugitive dust problems are also more frequent. Another significant factor in the frequency of occurrence of blowing dust in the Texas/Oklahoma area is the soil texture. At Ely on the other hand, the occurrence

Table 1.2.5-1. Total emissions and emission density levels of alternative potential OB locations.

EMITTER EMISSIONS (Tons/yr)	POTENTIAL OPERATING PACE LOCATION						
	UTAH MUNICIPALITY	COCONO, UTAH MUNICIPALITY	BEAUFORT, UTAH ^a	MILFORD, UTAH ^b	DELTA, UTAH ^c	PARIAHPT, TEXAS ^d	STAVIS NEW MEXICO ^e
Total Particulate Emissions Tons/yr	32,666	115,547	3,800	2,088	4,541	51,923	28,875
Particulate Density Tons/yr/mi ²	32.4	125.0	<1	<1	<1	0.1-10	1-10
Total SO _x Emissions Tons/yr	234,426	33,363,274,426	974	158	294	74,928	138,083
SO _x Density Tons/yr/mi ²	10-1000	0.1-10	<1	<1	<1	0.1-10	<1
Total NO _x Emissions Tons/yr	12,641	12,641,96,178	1,836	943	1,588	140,323	29,202
NO _x Density Tons/yr/mi ²	<1	0.1-10	<1	<1	<1	0.1-10	<1
Total Hydrocarbon Emissions Tons/yr	15,673	15,673,21,071	2,273	1,186	2,114	152,036	38,471
Hydrocarbon Density Tons/yr/mi ²	<1	0.1-10	<1	<1	<1	0.3-10	<1
Total CO Emissions Tons/yr	79,808	79,808,131,010	11,760	6,130	11,040	1,160,143	112,916
CO Density Tons/yr/mi ²	<10	0.1-10	<10	<10	<10	0.1-100	10-30

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^a Particulate data are latest data available from Utah Dept. of Health (pre-1970). Particulate data are reported on hydrographic sub-basin basis. Particulate data for Utah which have been further distributed to various systems emission data are from NEPC (1973) and EPA Emissions Trends Report (1977).
^b SO_x density and particulate density are based on 147,000 sq. miles. Emissions levels are given as range in this data from both NEPC (1973) and latest emission levels reported by county. CO density is based on 147,000 sq. miles. Particulate data do not include contribution from combustion engine data reported from EPA Emissions Trends Report (1977).
^c Particulate and hydrocarbon emissions are reported for EPA sub-basin 211 from NEPC (1973). Density values from EPA Emissions Trends Report (1977).
^d Particulate and hydrocarbon emissions are reported for EPA sub-basin 113 from NEPC (1973). Density values from EPA Emissions Trends Report (1977).
^e Particulate and hydrocarbon emissions are reported for EPA sub-basin 113 from NEPC (1973). Density values from EPA Emissions Trends Report (1977).

Table 1.2.5-2. Climatological data for the potential operating base site.

COMMUNITY IDENTICAL TO LOCATION	MEAN ANNUAL PRECIPITATION (in.)	MEAN ANNUAL VISIBILITY	VISIBLE DUST FRE- QUENCY ¹	AVERAGE ANNUAL MIXING HEIGHT (meters)		AVERAGE ANNUAL WIND SPEED (m/sec) ²	
				MORNING ³	AFTERNOON ³	MORNING ³	AFTERNOON ³
Ely, Nevada	6.33	70 mi	0.054%	300	2,400	4.0	6.0
Coyote Springs, Nevada	4.55	70 mi	0.200%	300	2,500	4.0	6.0
Beryl, Utah	11.03	70 mi	0.50%	300	2,600	4.0	6.0
Milford, Utah	8.00	70 mi	0.200%	300	2,600	4.0	6.0
Delta, Utah	7.16	70 mi	0.250%	300	2,500	4.0	6.0
Dalhart, Texas	16.33	45-70 mi	1.200%	350	2,100	6.5	9.0
Aloria, New Mexico	17.47	45-70 mi	2.100%	400	2,300	6.2	7.5

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¹Percent of hourly observations per year with visible dust; values at Coyote Springs, Beryl, Milford, and Dalhart have been estimated from nearby weather stations.

²Estimated from values at nearby weather stations.

³Wind speed is averaged through the mixing layer.

of visible dust is infrequent although the prevailing SSW wind will move any dust towards the NNE or from the site to the town of Ely. In the Nevada/Utah region mean annual precipitation is approximately the same at all locations with Ely's 8.33 in. being somewhat typical. Dispersion at the Nevada/Utah sites will be primarily a function of local winds and topography. There is no site-specific data to indicate that any location is preferable to another. In all locations, atmospheric dispersion is greater during the spring and summer seasons. This is because unstable conditions and large afternoon mixing heights are most common in the summer while the greatest wind speeds and relatively large mixing heights occur during the spring. Precipitation which would limit natural dust emissions does not have any pronounced seasonal maximum in the Nevada/Utah region.

2.0 ENVIRONMENTAL CONSEQUENCES FOR THE OPERATING BASE VICINITY

2.1 HUMAN ENVIRONMENT

EFFECTS ON EMPLOYMENT AND LABOR FORCE (2.1.1)

Ely would be the location of a second operating base under Alternatives 3 and 5, as seen in Table 2.1.1-1. The M-X system would create employment in White Pine County as the result of building and operating this base, as well as from construction and assembly and checkout of DDA facilities under all full deployment alternatives in Nevada/Utah. These employment effects would significantly alter the size and structure of the county's economy.

Direct, Indirect and Total M-X-Related Employment

Table 2.1.1-1 presents direct, indirect and total labor requirements for Alternative 3 and DDA construction labor projected for all full deployment options in Nevada/Utah. Since Alternative 5 labor requirements are identical, they will not be presented here. Construction of DDA facilities is projected to begin in 1984, run 4 years, and peak at 2,600 jobs in 1986. An additional 570 workers would be employed in assembly and checkout of county DDA facilities in the same year. Operating base construction under both alternatives is scheduled concurrently, with a peak in 1987, at 2,100 jobs.

Recent trend-growth employment projections of the Bureau of Economic and Business Research, University of Utah, indicate a total of 100 jobs in the contract construction industry in White Pine County in 1986, one-fortieth of the combined peak construction labor demand of 4,000 persons. Peak construction labor demand would be roughly 150 percent of total baseline employment of 2,600 jobs in that year (University of Utah, BEBR, October 1980). Employment demand of this scale would create significant short-run stress in the county's building trades industry, inducing skilled labor shortages, wage inflation, and large scale immigration of workers into White Pine County.

Cumulative employment impacts from other projects could exacerbate growth stress in this county. There is a significant probability that other projects - notably

Table 2.1.1-1.

M-X RELATED SYSTEM EMPLOYMENT BY PLACE OF EMPLOYMENT, IN WHITE PINE

ALTERNATIVE 3, FULL EMPLOYMENT - NEVADA/UTAH
 BASE I AT BERG, NV (CHROM CO.)
 BASE II AT ELY, NV (WHITE PINE CO.)

TYPE OF EMPLOYMENT	NUMBER OF JOBS													
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
TECHNICAL FACILITIES	0	0	50	850	2800	650	0	0	0	0	0	0	0	
CONSTRUCTION	0	0	10	180	570	160	0	0	0	0	0	0	0	
ASSEMBLY + CONSTRUCT	0	0	0	0	0	0	0	0	0	0	0	0	0	
BASE	0	0	0	200	1350	2050	1450	750	0	0	0	0	0	
CONSTRUCTION	0	0	0	0	0	0	0	0	0	0	0	0	0	
ASSEMBLY AND CHECKOUT	0	0	0	0	0	0	0	0	0	0	0	0	0	
OPERATIONS	0	0	0	0	100	200	300	450	450	450	450	450	450	
OFFICERS	0	0	0	0	1100	2200	2250	4400	4400	4400	4400	4400	4400	
ENLISTED PERSONNEL	0	0	0	0	200	400	650	850	850	850	850	850	850	
CIVILIANS	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL DIRECT	0	0	60	1230	5920	5660	5700	6450	5700	5700	5700	5700	5700	
INDIRECT	0	0	478	1725	4040	5269	5059	4276	2949	1720	1449	1437	1437	
TOTAL	0	0	538	2955	9960	10929	10759	10726	8649	7420	7149	7137	7137	

SOURCE: MDR SCIENCES, 31-OCT-80

M-X RELATED SYSTEM EMPLOYMENT BY PLACE OF EMPLOYMENT, IN WHITE PINE

ALTERNATIVE 3, FULL EMPLOYMENT - NEVADA/UTAH
 BASE I AT MILFORD, UT (BEAVER CO.)
 BASE II AT ELY, NV (WHITE PINE CO.)

TYPE OF EMPLOYMENT	NUMBER OF JOBS													
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	
TECHNICAL FACILITIES	0	0	50	850	2600	650	0	0	0	0	0	0	0	
CONSTRUCTION	0	0	10	180	570	160	0	0	0	0	0	0	0	
ASSEMBLY + CONSTRUCT	0	0	0	0	0	0	0	0	0	0	0	0	0	
BASE	0	0	0	200	1350	2050	1450	750	0	0	0	0	0	
CONSTRUCTION	0	0	0	0	0	0	0	0	0	0	0	0	0	
ASSEMBLY AND CHECKOUT	0	0	0	0	0	0	0	0	0	0	0	0	0	
OPERATIONS	0	0	0	0	100	200	300	450	450	450	450	450	450	
OFFICERS	0	0	0	0	1100	2200	2250	4400	4400	4400	4400	4400	4400	
ENLISTED PERSONNEL	0	0	0	0	200	400	650	850	850	850	850	850	850	
CIVILIANS	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL DIRECT	0	0	60	1230	5920	5660	5700	6450	5700	5700	5700	5700	5700	
INDIRECT	0	0	438	1725	4040	5269	5059	4276	2949	1720	1449	1437	1437	
TOTAL	0	0	538	2955	9960	10929	10759	10726	8649	7420	7149	7137	7137	

SOURCE: MDR SCIENCES, 31-OCT-80

the reopening of Kennecott Copper Company's mine near Ruth and the construction and operation of the White Pine Power Project - would begin in the county over the same time period as M-X. Including WPPP, the Kennecott expansion and other, smaller projects, Baseline 2 employment in 1986 would be 5,900 jobs. Peak construction demand represents about 70 percent of Baseline 2 employment in 1986.

Operation of the base would begin in 1986, with initial staffing of 1,400 persons, with the phasing-in of operations personnel completed by 1989. Table 2.1.1-1 indicates that long-run direct employment at the base in White Pine County would equal 5,700, of which 85 percent would be military personnel.

Indirect employment would be generated in the county as a result of the respending of project payrolls, as well as base procurement of goods and services. Particularly in Ely, project-related investments by local, state and federal governments and private businesses also would create additional short-run employment. Such employment would begin in 1984, peak at 5,300 jobs in 1988, and decline thereafter. The long-run level of indirect employment is projected at about 1,400 jobs in 1992.

Table 2.1.1-1 indicates that peak total employment by place of work could reach 10,900 jobs in 1987, about 350 percent of trend growth employment projections of 3,100 jobs, and almost 200 percent of 5,800 Baseline 2 jobs in that year. However, a more important measure of local effects would be employment change by place of residence, i.e. adjusting employment for cross-county commuting. In the case of White Pine County, the peak figure of 10,900 given above adjusts upward to 11,200, indicating about 300 workers employed on the project, notably on DDA construction in northeastern Nye County, northern Lincoln County and western Millard County, could live in White Pine County. This figure of 11,200 is more than 350 percent above the trend growth employment projection. Under either Alternative 3 or 4, over the long run, 7,100 jobs would be created for residents of White Pine County; this is 200 percent above long-term trend-growth projections. Under other full deployment alternatives, with only DDA facility construction in White Pine County, short run boom-type growth would result in the county. With Alternatives 3 and 4, employment growth is more rapid and much greater; but it is more stable over the long run.

Historically, the private economy of the county has been dominated by mining and smelting employment, and has exhibited a slow employment growth rate of 1.2 percent per year over the 1967-1977 period. Trend-growth projections presume a continuation of these historic trends, but including other projects in the county would alter this stagnant long-term picture. Employment forecasts including these projects in addition to M-X add about 2,000 more jobs in 1987, and about 1,600 additional jobs after 1990. These trends indicate that White Pine County would not easily assimilate growth of the magnitude projected under M-X Alternatives 3 and 4. This could be particularly serious in the early years, and is worsened by including the cumulative effects of other projects.

The employment impacts of Alternative 3 have been estimated using two different methodologies. The first of these applies the county-level interindustry models used to analyze all the deployment options considered in this report. The second approach utilizes a dynamic economic-base simulation model developed by the University of Utah, Bureau of Economic and Business Research.

The results of the simulation analysis provide a useful basis of comparison for the interindustry model results.

In White Pine County, the interindustry approach indicates a peak employment increase of 11,200 jobs in 1987 (as discussed above) under Alternative 3, while long-run employment is 7,100 higher than baseline projections. The simulation approach indicates a substantially lower peak impact of 8,300 jobs and a long-term change of 5,900 jobs. Relative to baseline employment projections, however, these differences are much less important, as suggested by Figure 2.1.1-1. Both analyses indicate total employment changes which are extremely large compared to no-project conditions.

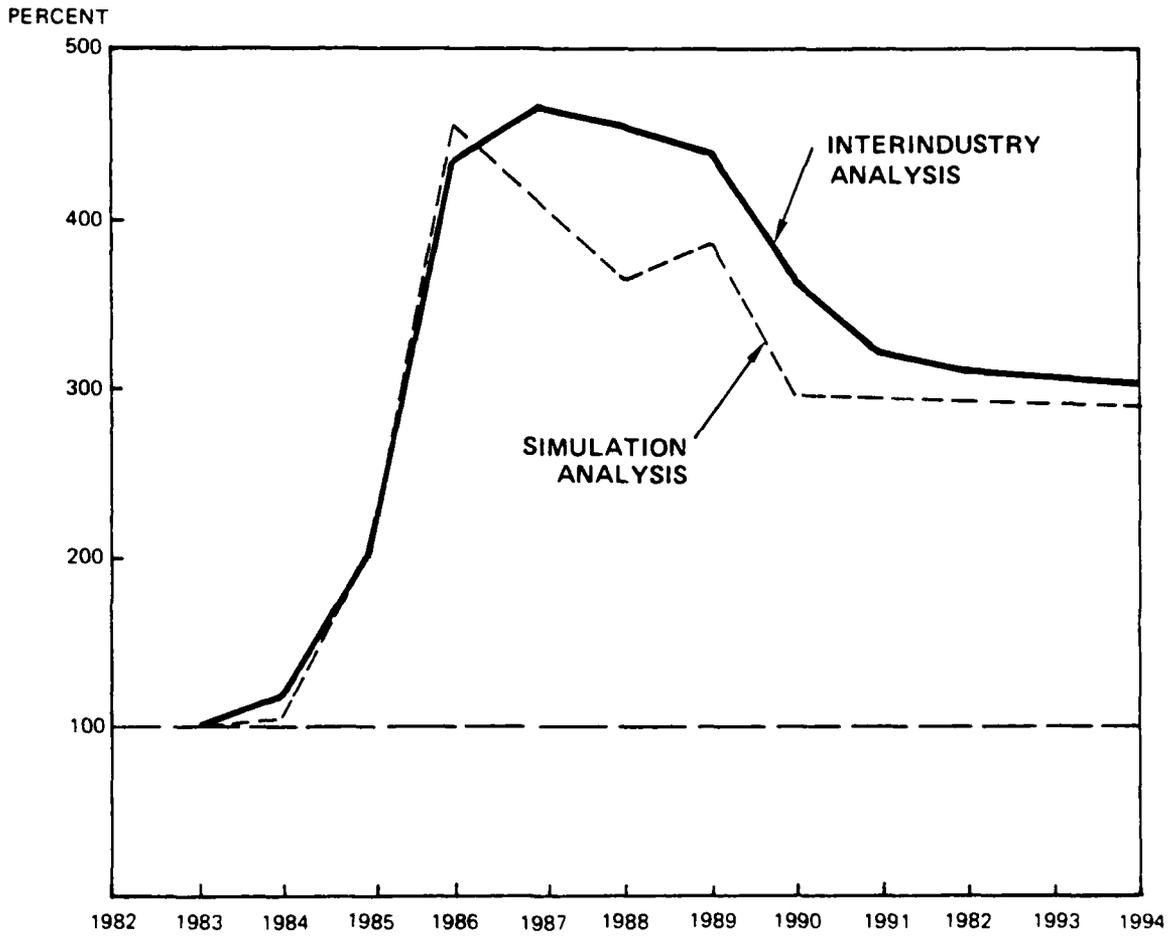
Labor Force Impacts

Labor markets would become very tight over the short run, particularly in the construction trades. In such a relatively small labor market, significant immigration of construction and operations personnel would be required. Some indirectly employed workers also would immigrate from outside the county. Tables 2.1.1-2 and 2.1.1-3 present labor immigration estimates for White Pine County under Alternative 3 for Baselines 1 and 2, respectively. These figures are very important since they form the basis for civilian project-related population growth, and determine the project's impacts on community services and infrastructure and the local public sector. Total civilian M-X-related employment is calculated from direct and indirect labor demand (presented in Table 2.1.1-1), adjusted to employment by place of residence. This figure peaks at 8,900 workers in 1986. In the same year, White Pine County's available labor force is projected at about 400 persons under Baseline 1 growth projections, and 600 under Baseline 2. These latter figures include an estimate of the projected unemployed labor force, less an estimate of those persons who would likely remain unemployed even in extremely tight labor markets.

The "net civilian labor force impact" compares the expected available labor pool in White Pine County with M-X demand for civilian labor. It represents cumulative civilian labor force in-migration into the county, which in 1986 would equal about 8,900 workers under Baseline 1, and 8,700 workers under Baseline 2. Thus, through 1986, a total of 8,700-8,900 civilian workers would become new residents in the county. These data also indicate rapid outmigration after 1986 as job opportunities in the county diminish; "net civilian labor force impacts" decline. This figure stabilizes at 2,300 persons by 1992 under both baseline growth scenarios, and this is the estimated long-run civilian worker immigration into White Pine County under Alternatives 3 and 4. Following peak immigration, labor market stress would decline somewhat, unemployment rates could increase, and the rapid induced growth in construction trades wage levels would begin to decline.

EFFECTS ON INCOME AND EARNINGS (2.1.2)

Earnings impacts in White Pine County are closely related to employment effects discussed in Section 2.1.1. Table 2.1.1-1 presents estimates of earnings by place of work for Alternative 3, where Ely would be the location of a second operating base and DDA facilities would be sited in the county. A second operating base would also be located near Ely under Alternative 5, but effects here are identical to those presented in Table 2.1.2-1. The table indicates that M-X related earnings would peak at about \$219 million in 1986. Growth of this magnitude would



SOURCES: INDUSTRY ANALYSIS-HDR SCIENCES.
 SIMULATION ANALYSIS- U.OF UTAH, BEBR.

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Figure 2.1.1-1. White Pine County employment with M-X as percent of employment without M-X, Alternative 3.

Table 2.1.1-2.

TOTAL CIVILIAN M-I RELATED EMPLOYMENT, AVAILABLE RESIDENT LABOR FORCE,
AND NET CIVILIAN LABOR FORCE IMPACT BY PLACE OF RESIDENCE
FOR WHITE PINE

ALTERNATIVE 3, FULL DEPLOYMENT - NEVADA/UTAH (1)
BASE I AT BERYL, UT (IRON CO.)
BASE II AT ELY, NV (WHITE PINE CO.)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TOTAL CIVILIAN M-I RELATED EMPLOYMENT	0	0	555	3043	8850	8816	7559	6026	3799	2570	2299	2287	2287
AVAILABLE RESIDENT LABOR FORCE	333	336	340	344	351	359	365	373	381	388	395	402	408
NET CIVILIAN LABOR FORCE IMPACT	0	0	318	2835	8896	8746	7410	5813	3626	2392	2335	2333	2331

SOURCE: HDR SCIENCES, 31-OCT-80

Table 2.1.1-3.

TOTAL CIVILIAN M-X RELATED EMPLOYMENT, AVAILABLE RESIDENT LABOR FORCE,
AND NET CIVILIAN LABOR FORCE IMPACT BY PLACE OF RESIDENCE
FOR WHITE PINE

ALTERNATIVE 3, FULL DEPLOYMENT - NEVADA/UTAH
BASE I AT BERYL, UT (IRON CO.)
BASE II AT ELY, NV (WHITE PINE CO.)

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
TOTAL CIVILIAN M-X RELATED EMPLOYMENT	0	0	555	3043	8850	8816	7559	6026	3799	2570	2299	2287	2287
AVAILABLE RESIDENT LABOR FORCE	333	336	347	349	358	369	376	384	392	400	408	417	426
NET CIVILIAN LABOR FORCE IMPACT	0	0	317	2712	8651	8425	7120	5590	3504	2200	2276	2273	2269

SOURCE: HDR SCIENCES, 31 OCT 80

represent a net increase of about 400 percent over the county's 1978 earnings of \$55 million (1980 dollars). Of this increase, about one half would be associated with DDA construction and hence would be felt in the county under all full deployment options in Nevada/Utah. Long run effects occur only when White Pine County is the location of an operating base. Table 2.1.2-1 indicates that with a second operating base located there, long run earnings would stabilize in White Pine County at about \$97 million by 1993. This figure is about 175 percent of 1978 total earnings. About 80 percent of the long run figure would be directly attributable to base payrolls.

White Pine County has recently exhibited little earnings growth; real total earnings grew by 1.9 percent per year over the 1967-1977 period, well below state and national averages. Furthering its likely adjustment problems, the county has been dominated by mining and government sectors, without the diverse commercial sector needed to readily supply consumption demands of project workers. Rapid upward adjustment of wages and prices would be probable from the rapid infusion of high paid workers into the county, with a more stable long-term price level reached after the boom of base construction has passed.

The required adjustments in the county's economy would be much larger and more permanent under those options where an operating base is located in the county.

EFFECTS ON PUBLIC FINANCE (2.1.3)

This section presents the aggregate expenditures, revenues and net impacts estimated for all local governments in White Pine County. Peak year and long-term capital expenditure requirements also are presented. The effects discussed reflect aggregate effects and can not be interpreted as estimates associated with a specific jurisdiction. Effects specific to the local school district constitute a major portion of the aggregate effects and are presented separately. Estimates are presented for both low and high baseline scenerios. However, only the anticipated deficits/surpluses are discussed for the low baseline scenerio as the net effects associated with other project-induced population in-migration is uncertain at this time.

The net fiscal impacts in the White Pine County area are greatest under Alternatives 3 and 5 where smaller second operating bases are proposed for the area. Peak year deficits (1986) amount to approximately \$3.8 million under both the alternatives (Table 2.1.3-1). This represents about 16 percent of the total operating expenditures estimated at this time. Under the proposed action and Alternatives 1, 2, 4, and 6 where DDA facilities are only proposed for the area, peak year (1986) deficits are slightly less (\$1.6 million), representing about 11.8 percent of the estimated expenditure level at this time. Under these alternatives, the early years of the project have the potential for inducing significant changes in service levels throughout the area unless timely outside aid and/or mitigative strategies are available. No significant long-term impacts are anticipated under any of the alternatives.

Effects on the education system in the county follow similar patterns. Largest effects are anticipated under Alternatives 3 and 5 where operating bases are proposed for the area. However, while the maximum impact occurs in the 1986 period where operating deficits of approximately \$1.5 million are anticipated under these alternatives (Table 2.1.3-2), maximum expenditure levels are not anticipated

Table 2.1.2-1.

H-1 RELATED EARNINGS, IN MILLIONS OF FY 1980 DOLLARS, IN WHITE PINE
 ALTERNATIVE 3 - FULL DEPLOYMENT - NEVADA/UTAH
 BASE I AT BERYL, UT (FIRM CO.)
 BASE II AT ELY, NV (WHITE PINE CO.)

SOURCE OF EARNINGS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
CLUSTER FACILITIES CONSTRUCTION, ASSEMBLY, AND CHECKOUT	0.0	0.0	1.9	33.1	101.6	25.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BASE CONSTRUCTION, ASSEMBLY, AND CHECKOUT	0.0	0.0	0.0	6.7	45.4	68.9	48.7	25.2	0.0	0.0	0.0	0.0	0.0
OPERATIONS	0.0	0.0	0.0	0.0	19.1	38.1	58.9	78.5	78.5	78.5	78.5	78.5	78.5
INDIRECT	0.0	0.0	6.2	22.4	32.5	68.5	65.8	55.6	38.3	22.4	18.8	18.7	18.7
TOTAL	0.0	0.0	8.1	62.2	218.5	201.3	173.4	159.3	116.9	100.9	97.3	97.2	97.2

SOURCE: HMR SCIENCES, 31-OCT-80

Table 2.1.1.3-2. (Page 2 of 2)

ALTERNATIVE 4												
RESOURCES												
W/THREAT	4725	4720	4803	4806	4907	5000	5101	5201	5404	5506	5700	5706
W/THREAT	4725	4720	4803	4806	4907	5000	5101	5201	5404	5506	5700	5706
DIFFERENCE	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES												
W/THREAT	4857	4803	4857	5126	5126	5230	5326	5439	5554	5627	5764	5768
W/THREAT	4857	4803	4857	5126	5126	5230	5326	5439	5554	5627	5764	5768
DIFFERENCE	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT	0	0	0	0	0	0	0	0	0	0	0	0
ALTERNATIVE 5												
RESOURCES												
W/THREAT	4725	4720	4803	4806	4907	5000	5101	5201	5404	5506	5600	5706
W/THREAT	4725	4720	4803	4806	4907	5000	5101	5201	5404	5506	5600	5706
DIFFERENCE	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES												
W/THREAT	4857	4803	4857	5126	5126	5230	5326	5439	5554	5627	5764	5768
W/THREAT	4857	4803	4857	5126	5126	5230	5326	5439	5554	5627	5764	5768
DIFFERENCE	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT	0	0	0	0	0	0	0	0	0	0	0	0
ALTERNATIVE A												
RESOURCES												
W/THREAT	4725	4720	4803	4806	4907	5000	5101	5201	5404	5506	5600	5706
W/THREAT	4725	4720	4803	4806	4907	5000	5101	5201	5404	5506	5600	5706
DIFFERENCE	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES												
W/THREAT	4857	4803	4857	5126	5126	5230	5326	5439	5554	5627	5764	5768
W/THREAT	4857	4803	4857	5126	5126	5230	5326	5439	5554	5627	5764	5768
DIFFERENCE	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT	0	0	0	0	0	0	0	0	0	0	0	0
ALTERNATIVE BA												
RESOURCES												
W/THREAT	4725	4720	4803	4806	4907	5000	5101	5201	5404	5506	5600	5706
W/THREAT	4725	4720	4803	4806	4907	5000	5101	5201	5404	5506	5600	5706
DIFFERENCE	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPENDITURES												
W/THREAT	4857	4803	4857	5126	5126	5230	5326	5439	5554	5627	5764	5768
W/THREAT	4857	4803	4857	5126	5126	5230	5326	5439	5554	5627	5764	5768
DIFFERENCE	0	0	0	0	0	0	0	0	0	0	0	0
PERCENT DIFF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET IMPACT	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 2.1.1.3-2. (Page 2 of 2)

until 1989. Under the remaining alternatives, deficits are also anticipated during the 1985-1986 period (also the years of maximum expenditure impact) and range from \$300,000 - \$600,000. In all cases the potential for adverse effects in the form of reduced service levels is quite high in the 1984-1986 period. Mitigative measures and/or substantial outside aid would be necessary to prevent service level degradation in the area.

Total long term capital expenditures under Alternatives 3 and 5 amount to \$27.2 million (Table 2.1.3-3). Under both alternatives school expenditures account for 67 percent of total capital outlays in the long term. Under the remaining alternatives, no long term capital expenditures are required. Peak year requirements, however, are present under all alternatives and range from about \$200,000 under Alternative 8a to \$51.1 million under Alternatives 3 and 5. The fiscal effects associated the high baseline scenerio under each type of analysis are shown in Tables 2.1.3-4 through 2.1.3-6.

The level of capital expenditure requirements estimated in the White Pine county area when compared to the reserved bonding capacities of the various jurisdictions indicates the inability of the area to finance the projects necessary to support these levels of infrastructure growth. However, the importance of having the infrastructure facilities operative before the population in-migration begins in the area cannot be over-emphasized.

Federal assistance will be necessary to maintain anticipated service level demands. While peak year costs under each alternative are substantially higher than the long-term costs, the use of temporary facilities and/or other mitigative strategies can reduced these costs substantially.

EFFECTS ON POPULATION AND COMMUNITIES (2.1.4)

The population effects of a second operating base near Ely, Nevada, which is proposed in Alternatives 3 and 5, are projected to occur exclusively within White Pine County. The M-X-related in-migrant population generated by the base is projected to reach a maximum during the construction "boom" of about 21,500 persons in 1988, an increase of 235 percent over the trend-growth baseline population projected that year, as shown in Table 2.1.4-1. If the effects of other concurrent projects such as the White Pine Power Project are added to those of M-X, a total of 28,000 in-migrants would be present in the county in 1988, an increase of more than 300 percent over the trend-growth projection. Over the five year construction boom from 1984 through 1988, White Pine County's growth rate would increase to 29 percent annually with M-X and to 35 percent with other concurrent projects, compared to a trend growth rate of 1.5 percent annually during the same period. In the long term out-migration of construction-related population would reduce the total M-X population change to about 14,300 by 1992, approximately 145 percent above the trend-growth baseline. With the effects of other projects added to M-X, the cumulative long term in-migration would be about 19,100 persons, 186 percent over the trend baseline.

The construction-related population projected to be present in White Pine County would total about 4,000 persons in 1988, the peak year, although as many as 10,100 would be in the county in 1986. The number present in the peak year represents about 19 percent of all project-related in-migrants, while the equivalent

Table 2.1.3-3.

AGE RELATED CAPITAL STRUCTURE REQUIREMENTS (THOUSANDS BY 1980 BY BASELINE) UJA
 CODES: WATS DIVE

SERVICE	1980: FROM (1980)		ANNUAL IMPROVEMENT REQUIRED (1)		1980 YEAR	
	GENERAL OBLIGATION BOND TERMS (2)	REVENUE BOND TERMS (3)	GENERAL OBLIGATION BOND TERMS (2)	REVENUE BOND TERMS (3)	GENERAL OBLIGATION BOND TERMS (2)	REVENUE BOND TERMS (3)
PROPOSED SYSTEM						
GENERAL OBLIGATION BOND TERMS (2)	0.0	0.0	0.0	0.0	4886.5	4886.5
REVENUE BOND TERMS (3)	0.0	0.0	0.0	0.0	2761.1	2761.1
TOTAL	0.0	0.0	0.0	0.0	7647.6	7647.6
ALTERNATIVE 1						
GENERAL OBLIGATION BOND TERMS (2)	0.0	0.0	0.0	0.0	4886.5	4886.5
REVENUE BOND TERMS (3)	0.0	0.0	0.0	0.0	2761.1	2761.1
TOTAL	0.0	0.0	0.0	0.0	7647.6	7647.6
ALTERNATIVE 2						
GENERAL OBLIGATION BOND TERMS (2)	0.0	0.0	0.0	0.0	4886.5	4886.5
REVENUE BOND TERMS (3)	0.0	0.0	0.0	0.0	2761.1	2761.1
TOTAL	0.0	0.0	0.0	0.0	7647.6	7647.6
ALTERNATIVE 3						
GENERAL OBLIGATION BOND TERMS (2)	5139.1	3139.1	5139.1	3139.1	10278.2	10278.2
REVENUE BOND TERMS (3)	3871.6	3871.6	3871.6	3871.6	7743.2	7743.2
TOTAL	9010.7	7010.7	9010.7	7010.7	18021.4	18021.4
ALTERNATIVE 4						
GENERAL OBLIGATION BOND TERMS (2)	0.0	0.0	0.0	0.0	4886.5	4886.5
REVENUE BOND TERMS (3)	0.0	0.0	0.0	0.0	2761.1	2761.1
TOTAL	0.0	0.0	0.0	0.0	7647.6	7647.6
ALTERNATIVE 5						
GENERAL OBLIGATION BOND TERMS (2)	5139.1	3139.1	5139.1	3139.1	10278.2	10278.2
REVENUE BOND TERMS (3)	3871.6	3871.6	3871.6	3871.6	7743.2	7743.2
TOTAL	9010.7	7010.7	9010.7	7010.7	18021.4	18021.4
ALTERNATIVE 6						
GENERAL OBLIGATION BOND TERMS (2)	0.0	0.0	0.0	0.0	4886.5	4886.5
REVENUE BOND TERMS (3)	0.0	0.0	0.0	0.0	2761.1	2761.1
TOTAL	0.0	0.0	0.0	0.0	7647.6	7647.6
ALTERNATIVE 7A						
GENERAL OBLIGATION BOND TERMS (2)	0.0	0.0	0.0	0.0	4886.5	4886.5
REVENUE BOND TERMS (3)	0.0	0.0	0.0	0.0	2761.1	2761.1
TOTAL	0.0	0.0	0.0	0.0	7647.6	7647.6

(1) WITHIN ANNUAL LOSSES OF REVENUES
 (2) GENERAL OBLIGATION BOND TERMS, FIVE, TWENTY, THIRTY, FORTY, FIFTY, SIXTY, SEVENTY, EIGHTY, NINETY, HUNDRED PERCENT, MARKET VALUE, CUMULATIVE
 (3) REVENUE BOND TERMS, FIVE, TWENTY, THIRTY, FORTY, FIFTY, SIXTY, SEVENTY, EIGHTY, NINETY, HUNDRED PERCENT, MARKET VALUE, CUMULATIVE

Table 2.1.4-1.

PROJECTED BASELINE POPULATION, M X RELATED POPULATION CHANGE, AND CUMULATIVE POPULATION CHANGE RELATED TO M X AND OTHER PROJECTS, BY ALTERNATIVE, IN WHITE PINE

ALTERNATIVE	1987	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
BASELINE POPULATION WITH TREND GROWTH (IG)	8346	8426	8522	8630	8702	8807	8937	9137	9346	9545	9725	9895	10077
	8348	8411	8466	8527	8570	8620	8670	8719	8777	8822	8872	8919	8971
	0.0	0.1	2.2	30.3	67.3	86.6	76.9	46.6	46.5	46.6	46.6	46.6	46.6
PROJECTED ACTION	0	0	10	2151	4843	2546	870	110	0	0	0	0	0
	0	0	0	24.9	77.7	20.7	9.5	1.2	0.0	0.0	0.0	0.0	0.0
	0	0	0	3035	4423	2005	460	0	0	0	0	0	0
M X IMPACT WITH IG	2	5	214	4370	13201	9816	2507	5431	4357	4471	4609	4694	4812
	0.0	0.1	2.7	71.8	141.0	102.4	82.0	58.1	45.6	46.0	46.5	46.6	47.0
	0	0	0	0	0	0	0	0	0	0	0	0	0
ALTERNATIVE 1	0	0	665	5074	18256	21278	21514	21217	21100	14476	14394	14350	14347
	0	0	0	60.5	207.2	236.8	235.1	227.0	179.2	140.7	142.58	142.51	142.39
	0	0	0	4950	17007	20608	20970	20803	16860	14258	14259	14260	14239
M X IMPACT WITH IG	2	5	879	9295	23716	28469	28019	26276	21217	18279	18060	18049	18051
	0.0	0.1	10.1	107.7	267.5	316.8	306.2	288.7	222.1	192.6	190.4	187.9	186.1
	0	0	0	0	0	0	0	0	0	0	0	0	0
ALTERNATIVE 5	0	0	605	5074	18256	21278	21514	21217	17100	14476	14358	14350	14347
	0	0	0	60.5	207.2	236.8	235.1	227.0	179.2	140.7	142.58	142.51	142.39
	0	0	0	4950	17007	20608	20970	20803	16860	14258	14259	14260	14239
M X IMPACT WITH IG	2	5	879	9295	23716	28469	28019	26276	21217	18279	18060	18049	18051
	0.0	0.1	10.1	107.7	267.5	316.8	306.2	288.7	222.1	192.6	190.4	187.9	186.1
	0	0	0	0	0	0	0	0	0	0	0	0	0

SOURCE: WILD SCIENCES, 1 NOV 00

proportions for military operations and civilian indirect and operations populations would be 42 percent and 39 percent, respectively (Table 2.1.4-2). The construction-related population, a large share of whom would be workers present without families, would likely have higher incomes, a slightly larger family household size, and younger age distribution than the general population (Mountain West Research, Inc., 1975), while the military-related population would contain a large share of single persons and have a younger age structure and lower average income (at least for enlisted personnel) than the general population. The civilian operations and indirect population generated by project-related expansion of local economic activity would likely approximate the characteristics of the population of the western United States. The construction-related and indirect populations are projected to be temporarily present in White Pine County, with the permanent in-migrants comprised entirely of military and civilian operations workers and their families. About 34 percent of the in-migrants present in the peak year (7,400 persons) are projected to be civilian labor force participants and another 26 percent (5,600) would be school age population. In the long-term, about 16 percent of the 14,350 permanent in-migrants would be civilian labor force participants and another 28 percent are projected to be school age population.

The projected M-X-related in-migrant population at the county level has been disaggregated to three spatial categories of residence: construction camps, the operating base, and local communities (Table 2.1.4-3). In 1988, the peak year, about 63 percent of the in-migrants present (13,600 persons) would require accommodations in local communities, while the remainder is projected to be housed on the base. Earlier, in 1986, as many as 1,800 transient construction workers present without families would be housed in temporary construction camps near DDA facilities. In the long-term, only about one-third of the permanent in-migrants would have to be absorbed in communities, with the remaining two-thirds housed onbase. The community population growth generated within White Pine County by the proposed base in Alternatives 3 and 5 is most likely to be absorbed in the vicinity of Ely, with smaller effects in the communities of McGill and Ruth.

EFFECTS ON LAND USE (2.1.5)

Community Land Use - Alternative 3 and 5

Changes in the community land use patterns in White Pine County are dependent upon which of the alternatives is selected for deployment. Under Alternatives 3 and 5, an OB II and construction camp would be located near Ely in central White Pine County. The remaining full deployment alternatives in Nevada/Utah only call for a construction camp in the area. Table 2.1.5-1 provides the land requirements for community land uses in White Pine County. From the table, it is evident that the largest land requirements occur in 1987 under Alternative 3 and 5. The growth in demand for these alternatives begins in 1984 with 98 acres. Three years later, the peak demand is reached with 2,151 acres. This demand is proportioned out among the following land use categories: residential, 1,593 acres; retail, commercial, and industrial, 89 acres; streets and highways, 716 acres; and public/institutional, 253 acres.

The peak construction period continues into 1988 with an 8 percent decrease in land requirements followed by sharper declines in 1989-90. Beginning in 1991, the long-term plateau is reached with approximately 760 acres required. Of this long-term acreage, 46 percent is utilized for permanent housing.

PROJECED CUMULATIVE POPULATION IN MIGRATION BY PLACE OF RESIDENCE, BY ALTERNATIVE, IN WHITE PINE
ASSOCIATE BOUND WASHLE

ALTERNATIVE / PLACE OF RESIDENCE	1987	1981	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
ALTERNATIVE 1													
PROPOSED ACTION													
CONSTRUCTION CAMPS	0	0	10	553	1017	411	0	0	0	0	0	0	0
OPERATIONS BASE	0	0	0	0	0	0	0	0	0	0	0	0	0
LOCAL COMMUNITIES	0	0	0	1597	5026	2113	870	110	0	0	0	0	0
TOTAL	0	0	10	2151	6043	2546	870	110	0	0	0	0	0
ALTERNATIVE 3													
CONSTRUCTION CAMPS	0	0	10	563	1035	472	0	0	0	0	0	0	0
OPERATIONS BASE	0	0	0	90	3071	5812	7912	10075	9756	9756	9756	9756	9756
LOCAL COMMUNITIES	0	0	625	4570	13750	14974	15602	11142	7344	4717	4570	4574	4570
TOTAL	0	0	635	5224	18256	21278	21514	21217	17100	14476	14354	14350	14347
ALTERNATIVE 5													
CONSTRUCTION CAMPS	0	0	10	563	1035	472	0	0	0	0	0	0	0
OPERATIONS BASE	0	0	0	90	3071	5812	7912	10075	9756	9756	9756	9756	9756
LOCAL COMMUNITIES	0	0	635	4370	13350	14974	13602	11142	7344	4717	4570	4574	4570
TOTAL	0	0	645	5024	18356	21278	21514	21217	17100	14476	14354	14350	14347

Table 2.1.5-1.

CUMULATIVE M-I RELATED LAND REQUIREMENTS (ACRES) BY USE CATEGORY, BY ALTERNATIVE IN WHITE PINE
 ASSUMING TREND BASELINE

ALTERNATIVE / LAND USE CATEGORY	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
PROPOSED ACTION	0	0	0	0	0	0	0	0	0	0	0	0	0
PERMANENT HOMES	0	0	0	96	302	135	57	7	0	0	0	0	0
MOBILE HOMES	0	0	0	96	302	135	57	7	0	0	0	0	0
SUBTOTAL	0	0	0	192	604	270	114	14	0	0	0	0	0
RETAIL/COMM /INNOV	0	0	1	14	208	118	39	4	0	0	0	0	0
STIS AND HWYS	0	0	0	66	201	86	39	1	0	0	0	0	0
PUBLIC/INSTITUTIONAL	0	0	0	32	63	39	15	1	0	0	0	0	0
TOTAL	0	0	1	208	632	296	120	17	0	0	0	0	0
ALTERNATIVE 3													
PERMANENT HOMES	0	0	10	32	177	345	567	432	427	331	349	349	349
MOBILE HOMES	0	0	39	266	729	740	672	445	103	82	63	63	63
SUBTOTAL	0	0	49	318	906	1093	1039	877	620	413	412	412	412
RETAIL/COMM /INNOV	0	0	5	27	86	89	80	48	46	37	36	36	36
STIS AND HWYS	0	0	33	216	607	716	661	353	376	240	238	237	237
PUBLIC/INSTITUTIONAL	0	0	10	77	239	233	234	179	116	78	76	76	76
TOTAL	0	0	98	636	1838	2151	1984	1677	1139	768	762	761	760
ALTERNATIVE 5													
PERMANENT HOMES	0	0	10	32	177	345	567	432	427	331	349	349	349
MOBILE HOMES	0	0	39	266	729	740	672	445	103	82	63	63	63
SUBTOTAL	0	0	49	318	906	1093	1039	877	620	413	412	412	412
RETAIL/COMM /INNOV	0	0	5	27	86	89	80	48	46	37	36	36	36
STIS AND HWYS	0	0	33	216	607	716	661	353	376	240	238	237	237
PUBLIC/INSTITUTIONAL	0	0	10	77	239	233	234	179	116	78	76	76	76
TOTAL	0	0	98	636	1838	2151	1984	1677	1139	768	762	761	760
ALTERNATIVE 6													
PERMANENT HOMES	0	0	0	0	0	12	7	1	0	0	0	0	0
MOBILE HOMES	0	0	0	96	302	125	51	6	0	0	0	0	0
SUBTOTAL	0	0	0	96	302	137	58	7	0	0	0	0	0
RETAIL/COMM /INNOV	0	0	1	14	41	18	9	4	0	0	0	0	0
STIS AND HWYS	0	0	0	66	208	93	39	3	0	0	0	0	0
PUBLIC/INSTITUTIONAL	0	0	0	32	101	39	15	1	0	0	0	0	0
TOTAL	0	0	1	208	632	287	111	17	0	0	0	0	0

SOURCE: HWY SCIENCES, I-198V-BU

Impact on Availability of Urban Land

The ability of the communities to meet the project requirements varies over time. Information concerning the availability of urban land and the impacts of the M-X requirements on vacant urban land and on the size of the communities is provided in Table 2.1.5-2. In the peak year of construction (1987), an additional 1,258 acres would have to be converted to urban development to supplement the current available vacant land (893 acres) in order to meet the requirement on a permanent basis. Such is the case since the peak requirements equal 240 percent of the current vacant land within the urban areas. In the White Pine County General plan, land suitable for meeting this shortfall is identified as "capable of supporting urban development." However, the lands are presently designated for agriculture, mining, and open space rather than urban development. The lands falling into this category within commuting distance from Ely are in three areas: north of Ely, north of McGill, and between Preston and Lund. In order for these lands to become available for urban development, an evaluation would have to be made by the county in order to ascertain the conformity of urban development in these areas with the goals and policies of the general plan. The following policies would be included in such an evaluation:

- o that existing agricultural lands in White Pine County shall be preserved whenever possible to protect the agricultural economic base of the county and to plan for the orderly expansion of certain designated urban areas;
- o that "leap-frog" development shall be discouraged;
- o that the county's growth shall be concentrated at the following locations only: Ely, Ruth, McGill, Preston-Lund, and Baker; however, other growth areas may be considered during the life of the General Plan (20 years), but any such areas must be shown conclusively to produce beneficial and not adverse impacts upon the County (White Pine County, 1976).

Expansion of the urban areas would have to be carefully guided in order to maintain consistency with the first two policies while the latter provides an opportunity for such expansion.

The opportunities for development in Ruth is limited because of mining activity in the area and the limited amount of private land available. While a greater amount of land is available for development in McGill, the county general plan recommends most of the private land for industrial development. In addition, there could be conflicts with a high-water table, mining, and other industrial developments if extensive residential expansion was undertaken.

The area having the most potential for expanded residential development in the Ely area lies south on the "bench land" above the city. Presently an annexation of 1,200 to 1,400 acres in this area is being considered. The development of this land, already contiguous to the city, would comply with the expansion policy of the general plan: growth around the city of Ely shall proceed outward from the present urban core (White Pine County, 1976). If the annexation of the "bench land" is completed, the need for an additional 2,150 acres during the peak year will be satisfied.

Table 2.1.5-2. M-X urban land requirements and impacts, White Pine County.

ALTERNATIVE* (TYPE OF FACILITY)	CURRENT URBAN LAND**			PEAK YEAR				LONG TERM			
	VACANT (ACRES)	DEVELOPED (ACRES)	TOTAL (ACRES)	LAND REQUIREMENT		PROJECTED VACANT LAND		LAND REQUIREMENT		PROJECTED VACANT LAND	
				ACRES	% OF DEVELOPED LAND	ACRES	% OF TOTAL URBAN LAND	ACRES	% OF DEVELOPED LAND	ACRES	% OF TOTAL URBAN LAND
3. 5 (OB II) Proposed Action, 1. 2, 4. 6, (Con- struction (amp)	893	1,872	2,765	2,151	114.9	-1,258	—	761	40.7	132	4.8
	893	1,872	2,765	652	34.8	241	8.7	0	0	893	32.3

*Only representative alternatives are listed.

**Includes land within existing incorporated and unincorporated communities.

Source: White Pine County, 1976.

In all likelihood, the development needed to serve the difference between the peak period demand and the long term demand will not utilize the full amount of land projected. Nevertheless, the demand will still be at levels greater than can be provided by the communities. As a result, the peak period urban land area requirements will have substantial adverse effects upon the supply of urban land. If additional lands are opened up for urban land development through either general plan amendments and/or annexation, the adverse effects on the availability of urban land can be mitigated.

Ely, Ruth, and McGill have the ability to meet the long term demand with the current supply of vacant land. However, this would leave only about 5 percent of the urban land as vacant. This amount of vacant urban land is insufficient to retain a healthy market for construction and growth in all land use sectors. As such, the impact of the long-term land requirements on White Pine County is adverse, in the absence of annexations or other increases in the availability of land for urban development.

Other Alternatives

The urban land requirements begin in 1985 for the proposed action and Alternatives 1, 2, 4, and 6. Peak demand (652 acres) occurs in the following year with requirements diminishing until 1989. The peak impact of the peak year requirements relative to the availability of land currently vacant should not be significant. It is recognized that the peak requirements will reduce the percentage of vacant urban land in the county to only 9 percent. However, the duration of the requirements at the peak level is only one year and it is likely that the requirements will be met in sizable proportion by overcrowding of some permanent facilities thus reducing the apex of the demand.

Other Impacts

The size of the existing communities will be rapidly increased during the construction period. The effect will amount to an increase of 115 percent, or more than a doubling of the current areal extent of the communities if all of the land is developed on a permanent basis. In the following three years, the communities on a countywide average will recede to their long term size. This permanent level is an increase of 40 percent over their present size. Since Ely is the major city of White Pine County, it is likely to receive the major proportion of the expansion and contraction impacts. The effect of this growth on Ely, Ruth, and McGill could result in leap-frog developments and a sharp escalation in property values followed by a decline at the end of the construction period, if proper planning measures are not taken in advance.

Due to the proportion and rapidity of growth to be experienced in Ely, Ruth, and McGill, it is anticipated that the character of the communities will change significantly. This change of character is likely to be in conflict with the goal of the general plan "to provide for controlled growth designed to enhance and preserve the smalltown rural way of life enjoyed by the local residents of White Pine County" (White Pine County, 1976).

The potential is very high for adverse effects on permanent land use patterns as a result of the quick growth during the construction period. The peak demands

are 1.8 times greater than the long term demands. Hence, a large proportion of growth in Ely taking place during the construction period is only temporary. Long-range planning and land use design will be severely constrained during the peak period without the additional consideration that many of the land uses will be removed in a few years.

Other Projects in Area

A coal-fired power plant is being proposed in White Pine County by a consortium of utility companies including the Los Angeles Department of Water and Power. At the present time, the site location and timing of the power plant has not been determined. The effect of the power plant on the land use patterns and land requirements in the Ely, Ruth, and McGill area would be in addition to the effects of the M-X-related offbase households. Until more specific construction and operation details of the power plant are available, cumulative impact analysis of the M-X and White Pine Power Project on urban land requirements cannot be provided.

Conclusions

The impacts of Alternative 3 and 5 on the amount of land currently available for urban development are adverse for both the peak and long term time periods. However, this situation can be rectified by amendments to the White Pine County General Plan and/or annexations by the city of Ely. The long term growth impacts and proportion of temporary land uses would result in adverse impacts upon the land use patterns, urban design, and stable land values in the absence of preplanning and other land use controls. Other alternatives would have significant impacts upon the availability of urban land or permanent land use patterns.

Rural Land Use

Agriculture

Figure 2.1.5-1 shows the potential operating base near Ely, Nevada and the croplands in the area. Table 2.1.5-3 shows the number of acres of each type of cropland that would be occupied by the potential base facilities, and the number of acres of each cropland type within the suitability zone around the potential base.

It can be seen that the base would occupy no existing cropland. However, 2,050 acres of the suitability zone is in existing irrigated agriculture. This is equal to 4.4 percent of the suitability zone. Further, 1,800 acres of the suitability zone are in dry cropland; this is 3.9 percent of the suitable zone. Ample area exists within the zone to relocate the base without having to use cropland. Because of its proximity to the potential operating base, the croplands within the suitability zone could be subject to pressure for private urban development unless laws protecting such farmland are adopted and enforced by the county.

Effects on Recreation

There are two recreation sites within the suitability envelopes of the proposed OB site, Comins and Bassett Lakes (See Fig. 2.1.5-2). It is doubtful that these lakes will be directly impacted by the construction of the OB site or that access to these sites will be limited. Their value as recreational resources (they represent two of

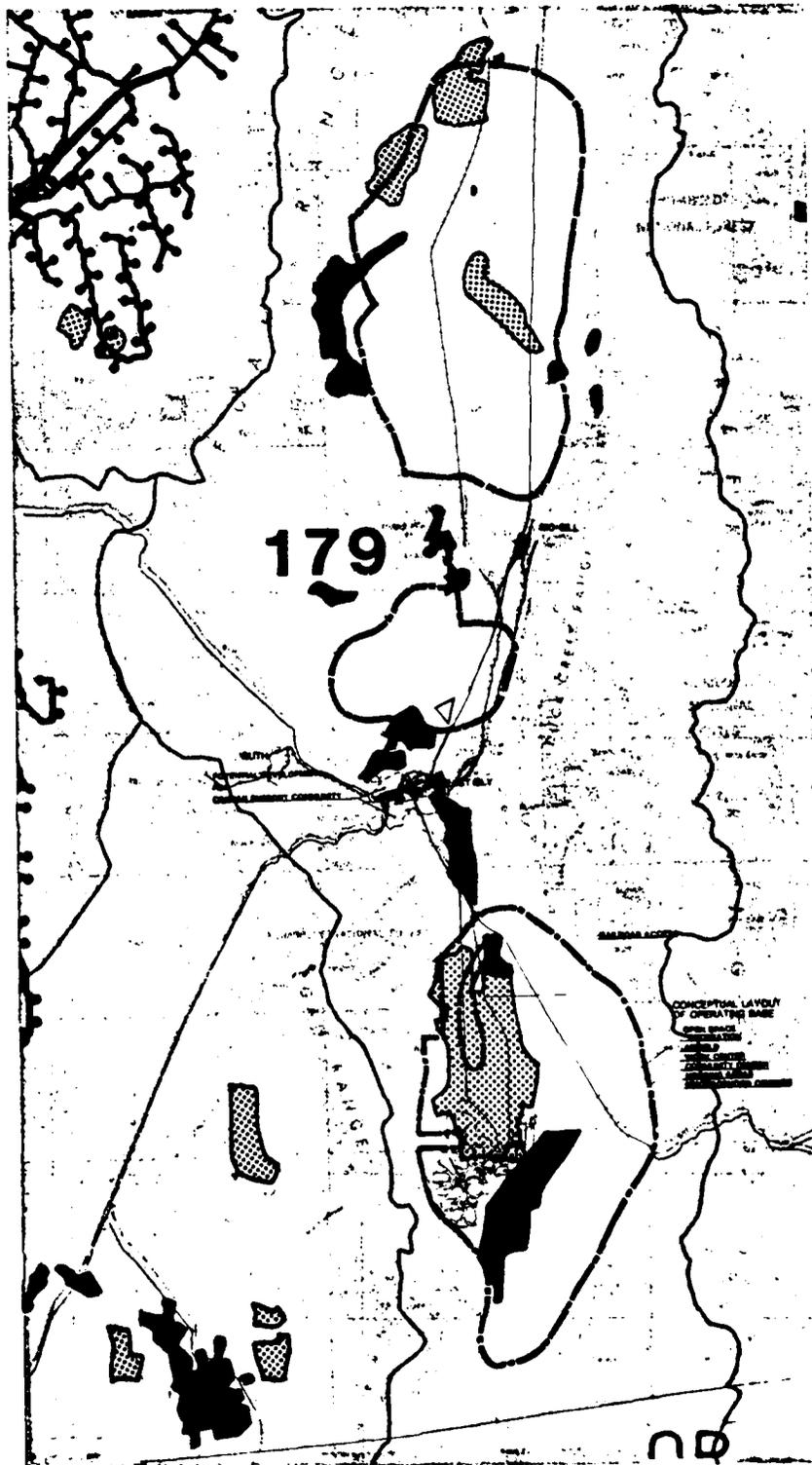


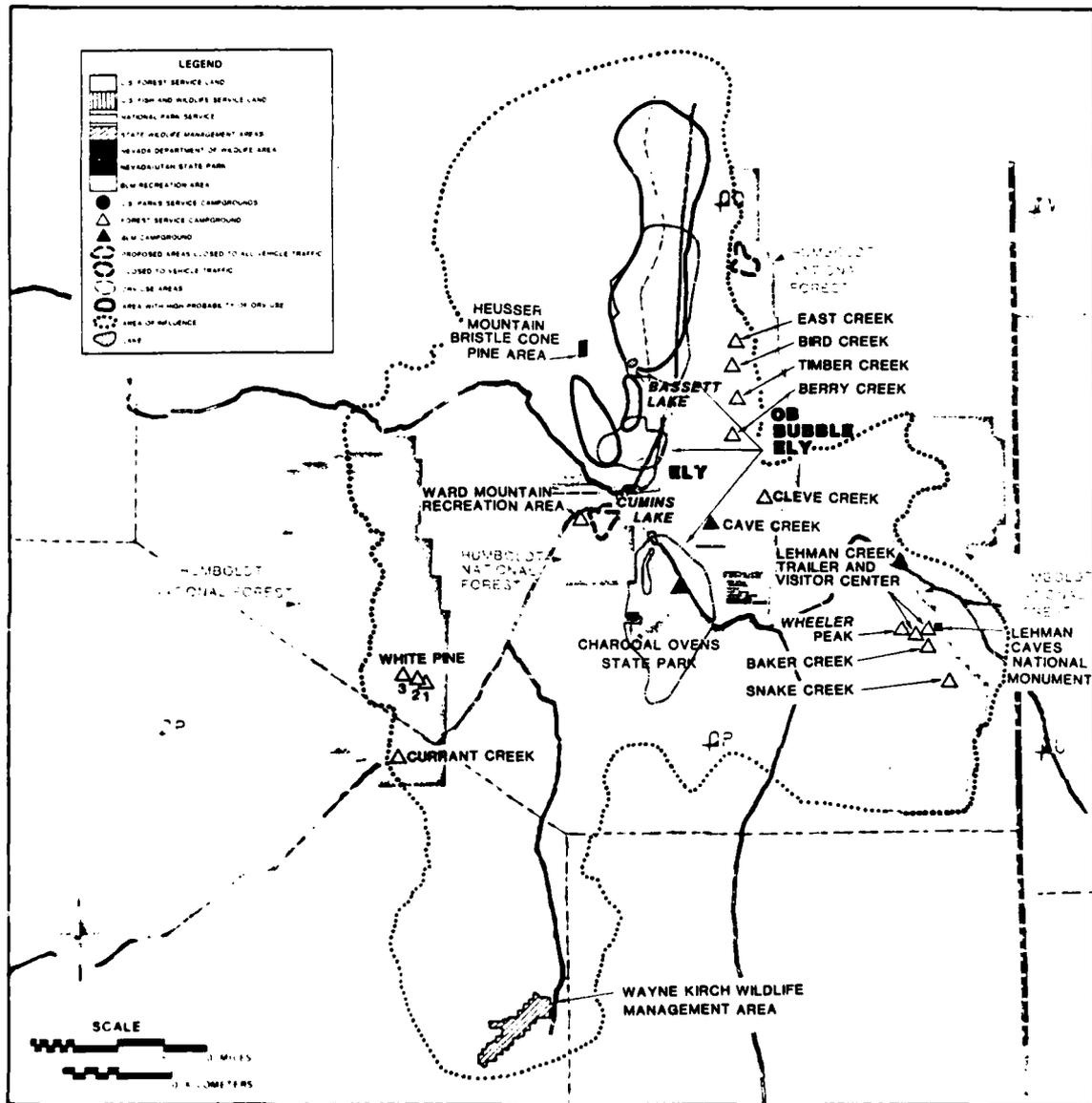
Figure 2.1.5-1. Irrigated cropland in the Ely OB vicinity.

Table 2.1.5-3. Cropland uses at potential operating base facilities at Ely, Nevada.

CROPLAND TYPE	OPERATING BASE FACILITIES		SUITABILITY ZONE	
	ACRES	PERCENT	ACRES	PERCENT OF ZONE
Irrigated	0	0	2,050	4.4
Dry	0	0	1,800	3.9
Total	0	0	3,850	8.3

3862

Source: University of Nevada, April 1966.



3191-C-1

Figure 2.1.5-2. Area of most intensive recreational influence around the proposed Ely OB site.

only three 3 lakes in the vicinity) and their limited areas (approximately 150 acres) would strongly suggest avoidance by the project. If they are preserved, recreational activity will persist.

The BLM (1978) has identified two areas north of Ely, Smith Valley and Duck Creek Basin, as areas of high potential ORV use. Portions of these areas occur within two of the suitability envelopes. Location of the OB within either envelope will result in restrictions in ORV activity within the area. In all likelihood, any ORV use that may have occurred in these areas will occur in more remote areas within these valleys and the Heusser Mountain area.

The expected M-X induced in-migration of 21,500 people into White Pine County during the peak year, 1988, would produce a 235 percent population increase over the baseline population projection of 9,152. Decreasing to a steady state by 1994, the M-X in-migration will be 140 percent over baseline. These increases will have the greatest impact potential on recreation sites in the vicinity. According to the indirect effect index analysis, the following sites are expected to receive the greatest demand: Comins and Bassett Lakes, Ward Mountain Recreation Area, U.S.F.S. campgrounds in the Schell Creek range, Lehman Caves National Monument, Wheeler Peak Scenic Area, and Charcoal Ovens State Park.

Fishing resource sites within approximately 50 miles of the proposed Ely OB would be expected to receive the largest amount of new fishing pressure. Resources within 50 miles are in Steptoe, Spring, Snake, White River, Jakes, Butte, Long, Newark, Railroad, Cave and Lake hydrologic subunits. For a list of the fishing resources within these subunits see the Aquatic Habitats and Biota Technical Report. Significant increases in demand are expected for all forms of recreation in the vicinity with significant impacts to water-based recreation and campground facilities.

There appears to be enough dispersed recreation opportunities in this region to support the added demand. Hiking, backpacking, ORV travel and motorcycle riding areas are in good supply. It is difficult to evaluate the adequacy of this supply with added demands; however, the large amount of public lands surrounding Ely would suggest a diversity of management alternatives should these present sites become overcrowded and more be needed.

EFFECTS ON LAND OWNERSHIP (2.1.6)

Ely, Nevada

Figure 1.1.5-1 shows the potential operating base at Ely, Nevada, and the land ownerships in the area. Table 2.1.6-1 shows the number of acres of land of each ownership type that would be occupied by the potential operating base and facilities, and the number of acres of each type within the suitability zone around the potential base.

It can be seen that 80 percent of the area of the operating base facilities would be located on BLM land and 20 percent on private land. The suitability zone is 83 percent BLM and 17 percent private land.

The 5,140 acres of BLM land is equal to 0.1 percent of the BLM land in White Pine County, and the 1,300 acres of private land for the operating base is equal to

Table 2.1.6-1. Land ownership at potential operating base facilities at Ely, Nevada.

OWNERSHIP TYPE	OPERATING BASE FACILITIES		SUITABILITY ZONE	
	ACRE	PERCENT OF OB	ACRE	PERCENT OF ZONE
Private	1,300	20	25,600	17
State	0	0	0	0
	5,140	80	123,300	83
Total	6,440	100	149,100	100

3857-1

Source: University of Nevada, 1972.

0.3 percent of the private land in that county. These are not considered to be significant impacts.

EFFECTS ON HOUSING (2.1.7)

White Pine County is most impacted under Alternatives 3 and 5, when Operating Base II will be located near Ely. Here the housing requirements are identical, with needs first expected to be felt in 1984, reaching a peak in 1987 when 5,141 housing units are projected to be necessary to house M-X-related workers and their families in local communities. These include 880 single-family units, 519 multi-family units, and 3,742 mobile homes. After construction is completed, the requirements fall, particularly between 1989 and 1991, to reach a long term need for 1,583 units in 1994, comprised of 950 single-family, 317 multi-family, and 317 mobile homes. Again such a drop will result in large surpluses, particularly of mobile homes--over 1,200 in 1990 alone, for example (Table 2.1.7-1). The anticipated presence of other projects, because of the higher population base involved, will reduce the number of in-migrants, and thus housing needs, a little, as shown in Table 2.1.7-2. They will similarly reduce the surpluses and call for removals of mobile homes. However, when added to the requirements of M-X, the combined housing unit needs are projected to reach 7,747 units by 1987, about 240 percent above the normal or trend growth baseline requirements, compared to only a 160 percent increase due to M-X alone (Table 2.1.7-3). Even in the long term, other projects double the M-X requirements to produce a combined need for 3,273 units in 1994, some 89 percent above baseline.

The other alternatives only affect White Pine County temporarily, with the Proposed Action and Alternatives 1, 2, 3 and 6 having identical requirements which start in 1985 and reach their peak in the following year when 1,508 units, all mobile homes, are needed. Within four years, however, the M-X related housing requirements fall to zero, necessitating the removal of all of the mobile homes, most of which will not be needed by 1987 (Table 2.1.7-1). The normal growth baseline's requirements will not be sufficiently large to absorb a significant portion of this surplus. The presence of other projects reduces the net M-X housing unit requirements in the peak-year and shortens, by one year, the duration of M-X impacts (Table 2.1.7-2). They also will, therefore, reduce the surpluses somewhat. This is because the presence of other anticipated projects will boost the population and labor force of White Pine County, reducing a little the number of in-migrants needed to fill M-X related jobs, and thereby reducing the associated housing needs. However, when the housing requirements of M-X and other projects are added together, the combined requirement reaches 3,599 housing units, some 114 percent above the trend growth baseline requirements, compared to only 48 percent above for M-X alone (Table 2.1.7-3).

The alternative expected to least affect White Pine County is the split-deployment one, Alternative 8A, where only 21 mobile homes are needed in the peak year, and which are scheduled to be removed within two years. No spillover effects from White Pine County are anticipated.

EFFECTS ON COMMUNITY INFRASTRUCTURE (2.1.8)

M-X deployment Alternatives 3 and 5 identify a potential second operating base location in the vicinity of Ely (White Pine County), Nevada. Construction of

Table 2.1.7-1.

CUMULATIVE M-X RELATED HOUSING UNIT REQUIREMENTS IN LOCAL COMMUNITIES BY HOUSING TYPE, BY ALTERNATIVE, IN WHITE PINE
ASSUMING TREND BASELINE

ALTERNATIVE / HOUSING TYPE	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	3001	3029	3064	3103	3167	3231	3290	3360	3432	3497	3561	3623	3681
IMPOSED ACTION													
SINGLE FAMILY UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0
MULTI-FAMILY UNITS	0	0	0	0	0	0	0	0	0	0	0	0	0
MOBILE HOMES	0	0	0	477	1508	674	284	36	0	0	0	0	0
TOTAL M-X RELATED	0	0	0	477	1508	674	284	36	0	0	0	0	0
M-X PLUS BASELINE	3001	3029	3064	3582	4675	3905	3574	3396	3432	3497	3561	3623	3681
ALTERNATIVE 3													
SINGLE FAMILY UNITS	0	0	29	123	433	880	935	1122	1126	895	951	951	950
MULTI-FAMILY UNITS	0	0	33	113	325	519	551	578	553	356	317	317	317
MOBILE HOMES	0	0	176	1329	3643	3742	3261	2227	967	410	317	317	317
TOTAL M-X RELATED	0	0	246	1565	4401	5141	4748	3926	2615	1631	1386	1584	1583
M-X PLUS BASELINE	3001	3029	3310	4668	7568	8372	8038	7284	6047	5128	5147	5207	5264
ALTERNATIVE 5													
SINGLE FAMILY UNITS	0	0	29	123	433	880	935	1122	1126	895	951	951	950
MULTI-FAMILY UNITS	0	0	29	113	325	519	551	578	523	356	317	317	317
MOBILE HOMES	0	0	196	1329	3643	3742	3261	2227	967	410	317	317	317
TOTAL M-X RELATED	0	0	246	1565	4401	5141	4748	3926	2615	1631	1386	1584	1583
M-X PLUS BASELINE	3001	3029	3310	4668	7568	8372	8038	7286	6047	5128	5147	5207	5264

Table 2.1.7-2.

CUMULATIVE M X RELATED HOUSING UNIT REQUIREMENTS IN LOCAL COMMUNITIES BY HOUSING TYPE, BY ALTERNATIVE, IN WHITE PINK

ALTERNATIVE / HOUSING TYPE	1980	1983	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
ALTERNATIVE 1												
ASSUMING HIGH BASELINE												
BASELINE REQUIREMENTS	3001	3031	3144	4665	5099	5829	5313	4999	5104	5219	5311	5411
PROPOSED ACTION												
SINGLE FAMILY UNITS	0	0	0	0	0	0	0	0	0	0	0	0
MULTI FAMILY UNITS	0	0	0	0	0	0	0	0	0	0	0	0
MOBILE HOMES	0	0	0	1467	321	146	0	0	0	0	0	0
TOTAL M X RELATED	0	0	0	1467	321	146	0	0	0	0	0	0
M X PLUS BASELINE	3001	3031	3144	6132	5420	5975	5313	4999	5104	5219	5311	5411
ALTERNATIVE 2												
ASSUMING HIGH BASELINE												
BASELINE REQUIREMENTS	3001	3031	3366	6145	9555	10398	9107	7524	6834	6766	6056	6734
PROPOSED ACTION												
SINGLE FAMILY UNITS	0	0	24	116	843	898	1086	1088	852	928	927	926
MULTI FAMILY UNITS	0	0	24	106	500	530	459	505	310	309	309	309
MOBILE HOMES	0	0	174	1257	3607	3147	2149	932	307	309	309	309
TOTAL M X RELATED	0	0	242	1480	4256	4576	3794	2525	1590	1547	1545	1543
M X PLUS BASELINE	3001	3031	3366	6145	9555	10398	9107	7524	6834	6766	6056	6734
ALTERNATIVE 3												
ASSUMING HIGH BASELINE												
BASELINE REQUIREMENTS	3001	3031	3806	6145	7553	10329	9167	7534	6654	6766	6856	6734
PROPOSED ACTION												
SINGLE FAMILY UNITS	0	0	24	116	413	891	1086	1088	852	928	927	926
MULTI FAMILY UNITS	0	0	24	106	313	500	459	505	310	309	309	309
MOBILE HOMES	0	0	174	1257	3229	3607	2149	932	307	309	309	309
TOTAL M X RELATED	0	0	242	1480	4256	4576	3794	2525	1590	1547	1545	1543
M X PLUS BASELINE	3001	3031	3806	6145	7553	10329	9167	7534	6654	6766	6856	6734

Table 2.1.7-3.

CUMULATIVE BASELINE HOUSING UNIT REQUIREMENTS IN LOCAL COMMUNITIES, AND CUMULATIVE TOTAL HOUSING UNIT REQUIREMENTS RELATED TO M X AND OTHER PROJECTS, BY ALTERNATIVE, IN WHITE PINE

ALTERNATIVE	1982	1987	1988	1989	1990	1991	1992	1993	1994	
BASELINE REQUIREMENTS										
WITH TRENCH (TIC)	3001	3029	3064	3103	3167	3271	3290	3360	3432	3481
WITH OTHER PROJECTS (HO)	3001	3071	3144	4665	5299	6029	5822	5313	4999	5104
% ABOVE TO	0.0	0.1	2.6	50.3	67.3	86.6	76.9	58.1	43.6	46.5
PROPOSED ACTION										
M X HOUSING WITH TO	0	0	0	472	1508	674	284	36	0	0
% ABOVE TO BASELINE	0.0	0.0	0.0	15.4	47.6	20.9	8.6	1.1	0.0	0.0
M X HOUSING WITH HO	0	0	0	449	1467	521	146	0	0	0
% ABOVE TO BASELINE	0.0	0.1	2.6	64.8	113.6	102.7	81.3	58.1	43.6	46.6
ALTERNATIVE 3										
M X HOUSING WITH TO	0	0	246	1565	4401	5141	4740	3926	2615	1583
% ABOVE TO BASELINE	0.0	0.0	8.0	50.4	138.9	159.1	144.3	116.8	76.2	43.0
M X HOUSING WITH HO	0	0	242	1480	4236	4950	4376	3794	2525	1543
% ABOVE TO BASELINE	0.0	0.1	32.2	30.42	63.88	77.47	71.07	57.46	40.91	32.73
ALTERNATIVE 5										
M X HOUSING WITH TO	0	0	246	1565	4401	5141	4740	3926	2615	1583
% ABOVE TO BASELINE	0.0	0.0	8.0	50.4	138.9	159.1	144.3	116.8	76.2	43.0
M X HOUSING WITH HO	0	0	242	1480	4236	4950	4376	3794	2525	1543
% ABOVE TO BASELINE	0.0	0.1	32.2	30.42	63.88	77.47	71.07	57.46	40.91	32.73

such a facility would result in the in-migration of construction workers and their families in the short term, as well as long term base personnel. This population in-migration will place additional demands on community infrastructure necessitating the recruitment of more teachers, health care personnel, law enforcement and fire personnel. There will also be impacts on parks and recreation and on basic utilities such as water and solid waste disposal, creating the need for expanded or new facilities. The accommodation of M-X related needs for community services will be fulfilled primarily by White Pine County. For that reason the following discussion will concentrate upon the effects likely to be experienced in White Pine County under Alternatives 3 and 5.

Education

White Pine County School District, which currently maintains an enrollment capacity of approximately 2,700 is not expected to experience enrollment demands in excess of capacity under projected normal growth conditions through 1994. Table 2.1.8-1 presents the number of school-aged children expected by grade group for each M-X alternative between the years 1982 and 1984 on an annual basis. As indicated, in 1985 Alternatives 3 and 5 may each add up to approximately 550 additional pupils to the school district, an increase of approximately 25.0 percent over the 2,250 pupils anticipated given normal baseline growth. When combining M-X-related enrollment demands with those required under normal growth conditions, it is evident that the school district will realize a need for additional facilities and staffing during this year. By 1988, the year of peak enrollment growth attributable to M-X, the percentage increase for Alternatives 3 and 5 may range between approximately 230.0 and 240.0 percent over the nearly 2,400 resident school-aged children forecast for the time period.

Subsequent to peak year enrollment demands resulting from M-X, enrollment levels can be expected to stabilize. Table 2.1.8-1 indicates that the White Pine County School District may have to provide long-term educational services for approximately 6,800 pupils should an M-X operating base be located near Ely. Of this total, nearly 61.0 percent would be attributable to M-X. Should no operating base be located in White Pine County, the school district would still receive additional demands for educational services as a result of spillover effects of technical facility construction nearby and in adjacent counties. These effects, however, are anticipated to be of short duration (a four year period between 1985 and 1989) and result in an increase in enrollments over baseline of no larger than 76.0 percent during the peak year 1986 for Alternatives 1, 2, 4, 6, 8A and the Proposed Action at which time 2,290 pupils will already require educational services under normal growth conditions.

Table 2.1.8-2 indicates the number of teachers which may be required to accommodate baseline and M-X-related enrollment demands on a grade group basis for all years between 1982 and 1994. As was the case with enrollments, Alternatives 3 and 5 will require the largest number of teachers. These alternatives may initially require six additional teachers to accommodate M-X-related enrollment increases in 1984 and necessitate nearly 240 by 1989. Approximately 175 teachers would be needed to accommodate long-term demands. This brings the total long-term teacher requirements to approximately 29.5 when combining M-X-related teachers required with those which would be required to accommodate baseline enrollment levels. It is likely that the school district may experience difficulty in

Table 2.1.8-1.

PROJECTED BASELINE AND M-1 INDUCED SCHOOL ENROLLMENTS BY GRADE LEVEL, BY ALTERNATIVE, IN WHITE PINE
 ASSUMING TREND BASELINE

ALTERNATIVE / NUMBER MULTIPLY BY GRADE LEVEL	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE ENROLLMENTS	2167	2190	2213	2243	2270	2306	2379	2429	2481	2520	2575	2630	2681
PROPOSED ACTION													
N-4	0	0	0	0	0	0	0	0	0	0	0	0	0
7-9	0	0	0	0	0	0	0	0	0	0	0	0	0
10-12	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL M-1 RELATED	0	0	0	0	0	0	0	0	0	0	0	0	0
M-1 PLUS BASELINE	2167	2190	2213	2243	2270	2306	2379	2429	2481	2520	2575	2630	2681
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 3													
N-4	0	0	44	602	2281	2494	2792	2824	2324	2072	2060	2060	2059
7-9	0	0	25	130	142	134	1396	1412	1168	1026	1030	1030	1030
10-12	0	0	33	201	1162	1217	1376	1413	1168	1026	1030	1030	1030
TOTAL M-1 RELATED	0	0	100	433	163	44	8	8	0	0	0	0	0
M-1 PLUS BASELINE	2167	2190	2213	2243	2270	2306	2379	2429	2481	2520	2575	2630	2681
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	4.6	19.4	93.6	107.4	100.0	98.8	95.9	80.5	79.6	79.1	78.7
ALTERNATIVE 5													
N-4	0	0	16	607	2703	2644	2773	2824	2324	2072	2060	2060	2059
7-9	0	0	23	130	142	134	1396	1412	1168	1026	1030	1030	1030
10-12	0	0	33	201	1162	1217	1376	1413	1168	1026	1030	1030	1030
TOTAL M-1 RELATED	0	0	72	438	163	44	8	8	0	0	0	0	0
M-1 PLUS BASELINE	2167	2190	2213	2243	2270	2306	2379	2429	2481	2520	2575	2630	2681
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	3.3	19.5	93.6	107.4	100.0	98.8	95.9	80.5	79.6	79.1	78.7

SOURCE: IBM SCIENCE, 1-NOV-80

Table 2.1.1.8-2.

PROJECTED BASELINE AND M-F INDUCED TEACHER REQUIREMENTS BY GRADE LEVEL, BY ALTERNATIVE, IN WHITE PINE
ADAPTING TREND BASELINE

ALTERNATIVE / NUMBER TEACHERS BY GRADE LEVEL	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	98	99	100	101	104	106	108	110	112	114	117	119	120
PROPOSED ACTION													
8-9	0	0	0	11	33	13	3	1	0	0	0	0	0
7-9	0	0	0	4	19	7	3	0	0	0	0	0	0
10-12	0	0	0	4	20	7	3	0	0	0	0	0	0
TOTAL M-F RELATED	0	0	0	19	72	27	13	1	0	0	0	0	0
M-F PLUS BASELINE	98	99	100	124	177	134	119	111	112	114	117	119	120
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	0.0	22.6	70.1	26.4	10.2	0.9	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 2													
8-9	0	0	0	24	91	108	112	113	93	93	92	92	92
7-9	0	0	1	13	30	27	21	21	31	43	45	45	45
10-12	0	0	1	14	32	31	23	24	32	47	47	47	47
TOTAL M-F RELATED	0	0	2	51	153	166	155	158	156	183	189	189	189
M-F PLUS BASELINE	98	99	104	182	247	234	218	229	209	207	206	208	208
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	6.0	80.0	189.4	214.7	218.2	216.4	174.4	182.3	148.4	146.1	143.8
ALTERNATIVE 3													
8-9	0	0	0	24	91	100	113	113	92	93	92	92	92
7-9	0	0	1	13	30	27	21	21	31	43	45	45	45
10-12	0	0	1	14	32	31	23	24	32	47	47	47	47
TOTAL M-F RELATED	0	0	2	51	153	158	157	158	155	183	189	189	189
M-F PLUS BASELINE	98	99	106	182	247	234	218	229	209	207	206	208	208
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	6.0	80.0	189.4	214.7	218.2	216.4	174.4	182.3	148.4	146.1	143.8

SOURCE: FOR SCIENCES, 1-MON-80

...ing and retaining an adequate staffing level. All other alternatives are not expected to require additional teachers in the long term.

The proportion of total enrollments and teachers required attributable to other projects in the area when compared to those attributable to M-X plus baseline-growth is substantial. For example, under Alternatives 3 and 5, in which a small operating base may be located near Ely, of the nearly 9,700 total enrollments which the school district might expect during peak year 1988 under a cumulative growth scenario, approximately 19.0 percent are other project related. This may further accentuate the realization by local school officials that the capacity problems which they are likely to encounter solely from M-X-related enrollment demands in 1985, will be greatly compounded in the long-term when also considering additional enrollment increments associated with other area projects.

Health Care Services

M-X project related requirements for health care personnel and facilities are shown in Table 2.1.8-3 for White Pine County. Under Alternative 3 with the second base located near Ely, the need for health care personnel peaks in 1987, when 17 physicians, 53 nurses, 5 dentists, 3 mental health personnel and 44 additional hospital beds would be required. M-X related peak demand increases the normal baseline growth requirements by more than 130 percent and would severely strain the local health care facilities at least temporarily.

This situation would be further exacerbated with the demand generated by other projects such as the White Pine Power Project and the reopening of the Kennecott mines. The cumulative demand during the peak year could be more than double the normal growth requirements of about 60 health care personnel and 35 hospital beds. Even during the steady state, the cumulative requirements would be more than 65 percent over the normal growth requirements, necessitating long-term mitigating measures to ensure adequate health care facilities in the county. The need is all the greater due to White Pine County's remote location from large metropolitan areas of the Nevada/Utah region.

Public Safety Service

Tables 2.1.8-4 and 2.1.8-5 present the requirements for law enforcement and fire personnel in White Pine County resulting from the M-X project. White Pine County police and fire personnel requirements peak in 1988 and 1987, respectively, under both Alternatives 3 and 5. Under the other alternatives the peak occurs in 1986 for both police and fire personnel. The number of additional law enforcement personnel is expected in the peak year of Alternatives 3 and 5 to be 238.9 percent above the number projected to be needed under normal growth conditions. This significant increase will likely place heavy burdens on the existing law enforcement system. Problems of crowded facilities, particularly jails, and of attracting and keeping enough qualified people to serve as deputies and police officers will be critical ones.

M-X related fire personnel requirements reach a level 171.4 percent over baseline in the peak year of Alternatives 3 and 5. This sizable increase will put strain on the existing fire protection services. The community fire protection forces in White Pine County are composed primarily of volunteers. With the influx

Table 2.1.8-3.

PROJECTED BASELINE AND M.I. RELATED MENTAL HEALTH SERVICES AND HOSPITAL BED REQUIREMENTS, IN WHITE PINE
ASSURING TRENDS DOWNTIME

ALTERNATIVE / REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE													
PHYSICIANS	17	17	17	12	13	13	13	14	14	14	14	15	15
REGISTERED NURSES	37	37	38	38	37	40	41	42	42	43	44	45	46
DENTISTS	4	4	4	4	4	4	4	4	5	5	5	5	5
MENTAL HEALTH PERSON	2	2	2	2	2	2	2	2	2	2	2	2	2
HOSPITAL BEDS	31	33	34	34	35	35	36	37	38	38	39	40	40
PROPOSED ACTION													
PHYSICIANS	0	0	0	1	2	2	2	0	0	0	0	0	0
REGISTERED NURSES	0	0	0	2	2	2	2	0	0	0	0	0	0
DENTISTS	0	0	0	0	0	0	0	0	0	0	0	0	0
MENTAL HEALTH PERSON	0	0	0	0	0	0	0	0	0	0	0	0	0
HOSPITAL BEDS	0	0	0	3	10	5	2	0	0	0	0	0	0
ALTERNATIVE 3													
PHYSICIANS	0	0	1	5	15	17	16	12	7	3	3	3	3
REGISTERED NURSES	0	0	2	15	41	53	48	37	22	10	7	7	9
DENTISTS	0	0	0	1	4	5	5	4	2	1	1	1	1
MENTAL HEALTH PERSON	0	0	0	1	2	3	2	2	1	0	0	0	0
HOSPITAL BEDS	0	0	2	14	35	44	40	31	19	9	8	8	8
ALTERNATIVE 5													
PHYSICIANS	0	0	1	5	10	17	16	12	7	3	3	3	3
REGISTERED NURSES	0	0	2	15	41	53	48	37	22	10	7	7	9
DENTISTS	0	0	0	1	4	5	5	4	2	1	1	1	1
MENTAL HEALTH PERSON	0	0	0	1	2	3	2	2	1	0	0	0	0
HOSPITAL BEDS	0	0	2	14	35	44	40	31	19	9	8	8	8

SOURCE: MDR SCIENCES, 1 NOV 80

Table 2.1.8-4.

PROJECTED BASELINE AMT. M-X RELATED REQUIREMENTS FOR LAW ENFORCEMENT PERSONNEL BY ALTERNATIVE, IN WHITE PINE
 ASSUMING TREND BASELINE

ALTERNATIVE / PERSONNEL REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	16	16	17	17	17	17	18	18	19	19	19	20	20
PROPOSED ACTION													
M-X REQUIREMENTS	0	0	0	4	13	5	1	0	0	0	0	0	0
M-X PLUS BASELINE	16	16	17	21	30	22	19	18	19	19	19	20	20
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	0.0	23.2	73.8	27.8	5.5	0.0	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 2													
M-X REQUIREMENTS	0	0	1	10	36	42	43	42	34	29	20	20	28
M-X PLUS BASELINE	16	16	18	27	53	59	61	60	53	48	47	48	48
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	5.9	57.9	204.3	233.7	234.9	224.7	178.1	149.1	141.3	138.9	136.7
ALTERNATIVE 3													
M-X REQUIREMENTS	0	0	1	10	36	42	43	42	34	29	20	20	28
M-X PLUS BASELINE	16	16	18	27	53	59	61	60	53	48	47	48	48
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	5.9	57.9	204.3	233.7	234.9	224.7	178.1	149.1	141.3	138.9	136.7

SOURCE: URBAN SCIENTIFIC, 1-1989, 8/89

Table 2.1.8-5.

PROJECTED BASELINE AND M X RELATED REQUIREMENTS FOR FIRE PROTECTION PERSONNEL BY ALTERNATIVE, IN THOUSANDS, ASSUMING TREND BASELINE

ALTERNATIVE / PERSONNEL REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
BASELINE REQUIREMENTS	17	13	14	14	14	14	15	15	15	16	16	16	16
PROPOSED ACTION													
M X REQUIREMENTS	0	0	0	2	0	3	1	0	0	0	0	0	0
M X PLUS BASELINE	17	13	14	16	14	17	16	15	15	16	16	16	16
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	0.0	14.0	0.0	20.2	6.6	0.0	0.0	0.0	0.0	0.0	0.0
ALTERNATIVE 1													
M X REQUIREMENTS	0	0	1	7	20	24	22	18	12	7	7	7	7
M X PLUS BASELINE	17	13	15	21	34	38	37	33	27	23	23	23	23
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	7.1	49.2	131.4	161.8	145.7	116.7	76.2	43.6	42.8	42.1	41.4
ALTERNATIVE 2													
M X REQUIREMENTS	0	0	1	7	20	24	22	18	12	7	7	7	7
M X PLUS BASELINE	17	13	15	21	34	38	37	33	27	23	23	23	23
PERCENT DIFFERENCE FROM BASELINE	0.0	0.0	7.1	49.2	131.4	161.8	145.7	116.7	76.2	43.6	42.8	42.1	41.4

UNIT: THOUSANDS PERSONNEL

of a large population the volunteer force may find it difficult to continue to provide adequate fire protection, particularly for scattered mobile homes and large commercial buildings. Under the other alternatives police requirements are 76.5 percent and fire 57.1 percent over baseline in the peak year. These figures still represent substantial increases in the need for services which may be difficult to meet in the peak year.

Subsequent to peak year demands on public safety services the out-migration of construction workers will occur resulting in a continuing decrease at the county level in total personnel requirements attributable to M-X deployment. Personnel requirements in White Pine County stabilize and reach a steady state around 1991/1992 for Alternatives 3 and 5 and in 1989 for the other alternatives. This is the level of impact which can be most usefully mitigated through long range planning. The aforementioned tables indicate the number of police and fire personnel that will be required in the long term and the percent over baseline requirements that they represent. No long term effects are expected under any of the alternatives but Alternatives 3 and 5 under which M-X induced public safety personnel requirements represent a significant difference from the projected baseline requirements for the period 1991 to 1993. In White Pine County long term needs can possibly be accommodated with sufficient advance planning and funding, however, the level of need will require substantial and permanent expansion of police and fire facilities and personnel.

Parks and Recreation

M-X-induced population in-migration into White Pine County will create an increased demand for both urban and regional parks and recreational facilities if the Ely area is selected as a base location. Although Ely has a variety of facilities and parks within its boundaries, this increase in demand could stress existing urban facilities. Also, surrounding this city are several large recreational areas, particularly in Humboldt National Forest. However, to meet the increased needs, recreation planning, funds and land will be required. The land requirements for expansion of local recreational facilities are presented in Table 2.1.8-6.

The projected population growth due to M-X would increase the peak year land requirements for recreation and parks by 94 acres and long-term requirements by 29 acres in White Pine County if Ely is chosen as the site for the second base. The other major projects in the area are not expected to add significantly to this requirement. Additional rural acreage may be required for such recreational pursuits as off-road vehicular activity in order to spare habitats of rare and endangered species of plants and wildlife.

The U.S. Forest Service could open more lands for informal outdoor activities such as hunting, fishing and camping. Also, through Subdivision and Planned Unit Development ordinances, a community can require certain amounts of recreation or open space in housing and mobile home developments.

Solid Waste Disposal

M-X-induced in-migration to the Ely area will create additional quantities of solid wastes not only in residences but also in the additional business and governmental activities required to support this population increment in White Pine County.

Table 2.1.8-6.

PROJECTED H-1 RELATED LAND REQUIREMENTS FOR PARKS AND PLAYGROUNDS, BY ALTERNATIVE, IN WHITE PINE
 ASSUMING TREND BASELINE

ALTERNATIVE / LAND REQUIREMENTS	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
ALTERNATIVE 1													
PROPOSED ACTION													
PLAYGROUNDS	0	0	0	2	5	2	1	0	0	0	0	0	0
NEIGHBORHOOD PARKS	0	0	0	2	7	3	1	0	0	0	0	0	0
COMMUNITY PARKS	0	0	0	6	20	8	3	0	0	0	0	0	0
TOTAL	0	0	0	10	32	13	5	0	0	0	0	0	0
ALTERNATIVE 2													
PLAYGROUNDS	0	0	1	5	13	15	14	11	7	5	5	5	5
NEIGHBORHOOD PARKS	0	0	1	6	17	19	18	14	10	6	6	6	6
COMMUNITY PARKS	0	0	3	18	53	60	54	45	29	19	18	18	18
TOTAL	0	0	5	29	83	94	86	70	46	30	29	29	29
ALTERNATIVE 5													
PLAYGROUNDS	0	0	1	5	13	15	14	11	7	5	5	5	5
NEIGHBORHOOD PARKS	0	0	1	6	17	19	18	14	10	6	6	6	6
COMMUNITY PARKS	0	0	3	18	53	60	54	45	29	19	18	18	18
TOTAL	0	0	5	29	83	94	86	70	46	30	29	29	29

SOURCE: HMR SCIENCE, 1-NOV 80

The population corresponding to the trend baseline growth will, by 1994, exhaust the 35 acres currently available near Ely for solid waste disposal. If Ely is chosen as the site for the second base, the M-X-induced population demands for solid-waste disposal land area will begin in 1984. About 11 acres of landfill areas will provide for the M-X-induced solid waste stream for White Pine County and, in fact, provide for all major-project induced solid wastes through 2009, that is, over the 20-year operational life of the M-X system.

The effect of M-X OB sites on White Pine County land requirements for solid waste disposal are illustrated in Table 2.1.8-7.

EFFECTS ON QUALITY OF LIFE (2.1.9)

The impact projections are conditional in that they are contingent on the actions taken by policy makers and also on the basic assumptions concerning factors such as the levels and pace of development which will occur. Moreover, the components of quality of life are numerous and complex and there is a great deal of uncertainty as to the probable outcomes since the basic models are lacking. Individual preference functions are unknown and community preference functions are hard to ascertain. Nevertheless, an attempt has been made to provide comparisons, within the framework of certain assumptions, suggestive of the trend of growth impacts on the communities in question.

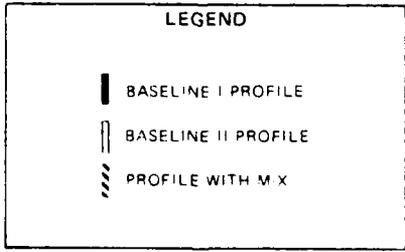
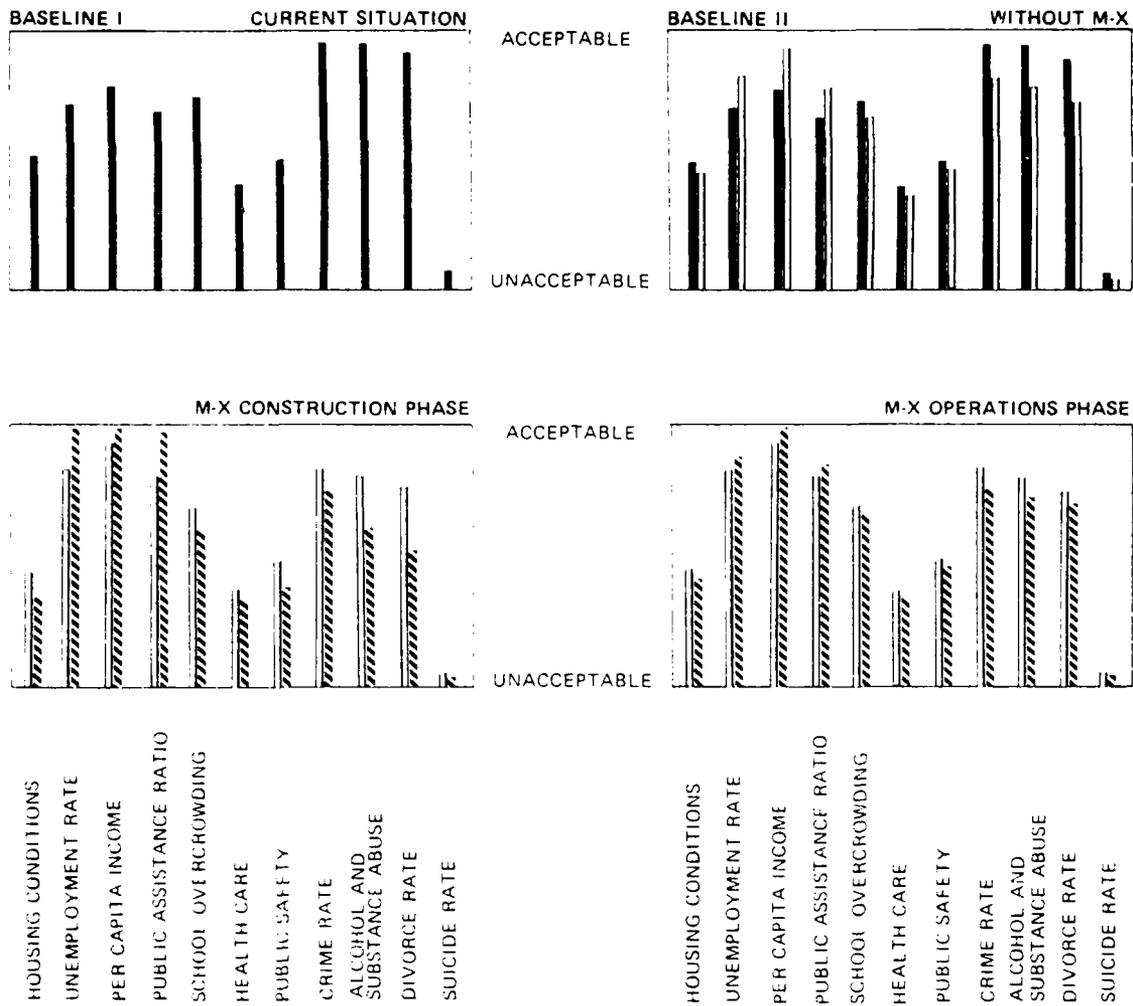
The rapid population growth that can be anticipated if an operating base is located in the vicinity of Ely will result in many objective and subjective changes in the quality of life in the surrounding communities. Figure 2.1.9-1 attempts to show potential changes in the quality of life that might reasonably be expected. The histograms portray an assessment of the impact on the quality of life, as measured by a particular index, in a range from acceptable to unacceptable. The four segments of the figure depict: (a) Baseline I, which simply portrays the county's particular index value as a proportion of the corresponding state index value (where acceptable denotes a value that is 50 percent better than the state figure, and unacceptable represents a value that is 100 percent worse than the state figure), for eleven quality of life indices; (b) Baseline II, the anticipated changes in these indices without M-X deployment in the county, but with the presence of other known projects; (c) anticipated changes during the M-X construction phase compared to Baseline II; and (d) anticipated changes during the M-X operations phase compared to Baseline II. Changes in the indices are assumed to be related to the rapidity of population growth. Since the quality of life literature points to a rapid deterioration of social organization with boomtown growth, it is assumed that such indices as crime, alcohol and substance abuse, divorce and suicide rates, may increase as much as four times the compound annual population growth rate. The economic well-being indices, e.g., per capita income, the unemployment rate, and the public assistance ratio (the proportion of the population on public assistance of some kind), on the other hand, are assumed to change at only double the annual compound population change rate. The remaining indices, housing conditions (a measure of overcrowding), school overcrowding (the ratio of pupils to teachers), health care (doctors, dentists and registered nurses per 1,000 population, the number of hospital beds per 1,000 population), and public safety (ratio of police officers to population), collectively referred to as the community service indices, are all assumed to change inversely and linearly with the compound annual rate of population change.

Table 2.1.8-7.

PROPOSED BASELINE AND M X RELATED LAND REQUIREMENTS (AERIALS FINE SOLID WASTE DISPOSAL) BY ALTERNATIVE - IN WHITE FINE
 ASSUMING TREND BASELINE

ALTERNATIVE	1981	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
LAND REQUIREMENTS	1.1	1.1	1.1	1.1	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5
BASELINE REQUIREMENTS	1.1	1.1	1.1	1.1	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5
PROPOSED ACTION	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
M X REQUIREMENTS	1.1	1.1	1.1	1.1	1.6	1.5	1.4	1.4	1.4	1.5	1.5	1.5
M X PLUS BASELINE	2.2	2.2	2.2	2.2	3.3	3.4	3.1	3.1	3.1	3.2	3.2	3.2
PERCENT DIFFERENCE	0.0	0.0	0.0	0.0	20.3	7.3	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL BASELINE	1.1	1.1	1.1	1.1	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5
ALTERNATIVE 1	0.0	0.0	0.1	0.2	0.0	2.2	2.0	1.7	1.1	0.7	0.7	0.7
M X REQUIREMENTS	1.1	1.1	1.4	2.0	3.3	3.5	3.4	3.1	2.5	2.2	2.2	2.2
M X PLUS BASELINE	2.2	2.2	2.5	4.0	6.6	6.9	6.5	4.8	3.6	2.9	2.9	2.9
PERCENT DIFFERENCE	0.0	0.0	7.8	26.1	151.4	163.2	145.7	123.3	76.8	40.0	47.1	46.3
TOTAL BASELINE	1.1	1.1	1.1	1.1	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5
ALTERNATIVE 3	0.0	0.0	0.1	0.2	0.0	2.2	2.0	1.7	1.1	0.7	0.7	0.7
M X REQUIREMENTS	1.1	1.1	1.4	2.0	3.3	3.5	3.4	3.1	2.5	2.2	2.2	2.2
M X PLUS BASELINE	2.2	2.2	2.5	4.0	6.6	6.9	6.5	4.8	3.6	2.9	2.9	2.9
PERCENT DIFFERENCE	0.0	0.0	7.8	26.1	151.4	163.2	145.7	123.3	76.8	40.0	47.1	46.3
TOTAL BASELINE	1.1	1.1	1.1	1.1	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5

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Figure 2.1.9-1. Potential changes in the Quality of Life Profiles of White Pine County, Nevada.

Quality of Life Changes without M-X

Although White Pine County has undergone a decline in employment and subsequent net out-migration in recent years it is estimated that other projects, particularly the White Pine Power Project, Kennecott Ruth Mine reopening, and metal processing, will result in a compound annual rate of growth of 15 percent between 1982 and 1987. This rate of growth is likely to make housing conditions, health care services and public safety, already below state average standards, worse (Figure 2.1.9-1, upper right quadrant, which shows the Baseline II profile over Baseline I). The baseline suicide rate, at 60 per 100,000 population, is already abnormally high (nearly five times the national rate) and is either an anomaly or due to the relatively small population base. In any event, fairly rapid growth is likely to exacerbate the suicide rate. Similarly, the other social disorganization indices are likely to get worse, but since White Pine County's baseline conditions are considerably better than the state average, the net result will be a diminished quality of life but one that is still better than the state average, as measured by these particular indices. Fairly rapid growth is also likely to positively affect the economic well-being indices, already better than the state average (Figure 2.1.9-1, I, upper right quadrant).

Quality of Life During the M-X Construction Phase

During the construction phase, assuming an operating base is located near Ely, a peak cumulative influx of some 21,000 additional people is expected, resulting in a peak cumulative population change of 130 percent over Baseline II. Up to the peak M-X construction period, population will be growing at a compound annual rate of 35 percent. This very rapid pace is likely to significantly exacerbate housing conditions, health care services, public safety and the suicide rate, all of which were worse than average for Nevada to begin with. School overcrowding, alcohol and substance abuse and the divorce rate indices, all previously better than the state average, are now likely to increase substantially and fall below the state averages. The crime rate can also be expected to increase, but because of White Pine County's low baseline rate, even a doubling of crime will still leave the county better off than the state average for this quality of life index (Figure 2.1.9-1, lower left quadrant).

A compound annual growth rate of 35 percent, on the other hand, can be expected to markedly reduce unemployment rates, already below the Nevada average. Similarly the proportions of the population on public assistance, which was previously slightly higher than the state average, might be expected to be substantially lower during construction, thus scoring better than the state average. Per capita incomes can also be expected to increase substantially (Figure 2.1.9-1, lower left quadrant), partly because of the generally high wages paid to construction crews, and to the reduction of unemployment.

Quality of Life During the M-X Operations Phase

By 1992, the steady-state M-X-related population influx will have leveled off at some 14,000 additional people, representing a 145 percent increase over the Baseline II population. It will have taken 10 years to attain this level representing a compound annual growth rate of 13.2 percent. This overall rate of growth, while substantial, is significantly less than during the construction phase and so the effects on the quality of life can be expected to be less marked. The housing

condition, health care facilities, public safety and the suicide rate indices, below state average to begin with, remain so. The school overcrowding index, initially above the state average, can still be expected to be somewhat below the state average unless proper mitigation measures are taken to ameliorate such conditions. Unlike the construction phase, when the divorce, alcohol and substance abuse rates fell below the state averages, these indices now rank White Pine above the state average, although still worse than the initial baseline condition. Reductions in the unemployment rate and the public assistance ratio will most likely not be as pronounced as during the construction phase, but nevertheless still make White Pine County better off than the state baseline average. Similarly, per capita incomes will still be much better than the Nevada average (Figure 2.1.9-1).

EFFECTS ON ENERGY (2.1.10)

Construction and operation of the M-X defense system operating base near Ely will require substantial improvements in energy transportation capabilities. In addition, development of the required energy handling facilities must precede M-X system construction.

To meet the demand for fossil fuels due to M-X deployment, natural gas lines could be extended into the area by Southwest Gas Corporation. However, there are presently no plans for extension into the area.

Diesel and gasoline may need reallocation to meet induced consumption requirements of M-X construction.

The electrical load increase in the Ely area due to an M-X operating base and the associated population increase would be about 36 MW (see ETR-24 para 3.4). Since the present Mt. Wheeler Power (MWP) system peak is approximately 25 MW, this increase in electrical load would have a substantial impact.

The largest impacts on power supplies would occur prior to 1986. The IPP and Moon Lake generating plants are scheduled to be on-line in 1986 and the White Pine plant is scheduled to be on-line in 1989. Plans indicate that a 230 KV line from IPP would pass through the area and be located in MWP service area, but could not provide power before 1986.

As a rural cooperative, MWP could get a loan from a rural electrification administration, but the rate payers in the MWP service area would have to repay construction loans. The federal government or the Air Force could provide financial assistance for the construction of new 230-KV lines to minimize impacts on MWP users and to accelerate construction of new transmission lines. See the Power and Energy Technical Report (ETA-24) for detailed information.

Mitigations

Careful siting, taking into account the environmental restrictions and concerns, can mitigate the potential impacts of both fuel and power facilities. Coordination with the utility companies can assure minimum impact on current electrical power and fuel users and assure that the M-X system becomes operational as planned. Similarly, impacts on fuel availability can be mitigated by timely adjustment of allocations. Alternate energy system development and energy conserving construction will reduce external energy demands.

EFFECTS ON TRANSPORTATION (2.1.11)

The population in-migration associated with construction and operation of an operating base near Ely would have a corresponding impact on traffic in the surrounding area. In general, the impacts would be similar to those discussed for the Beryl site. The existing highway between the proposed operating base site and Ely would have the greatest increase in traffic as a result of the project. The combination of baseline traffic, assuming the high baseline case, and M-X-induced traffic would exceed the capacity of the existing road. If the operating base is constructed at this location, the road would have to be widened to four lanes. Figure 2.1.11-1 presents the anticipated 1992 traffic. Implementation of mitigation measures such as staggered work shifts and/or substantial use of buses and carpools could eliminate the need to widen the road for the entire distance but capacity improvements would still be needed near the base and on the approach to Ely.

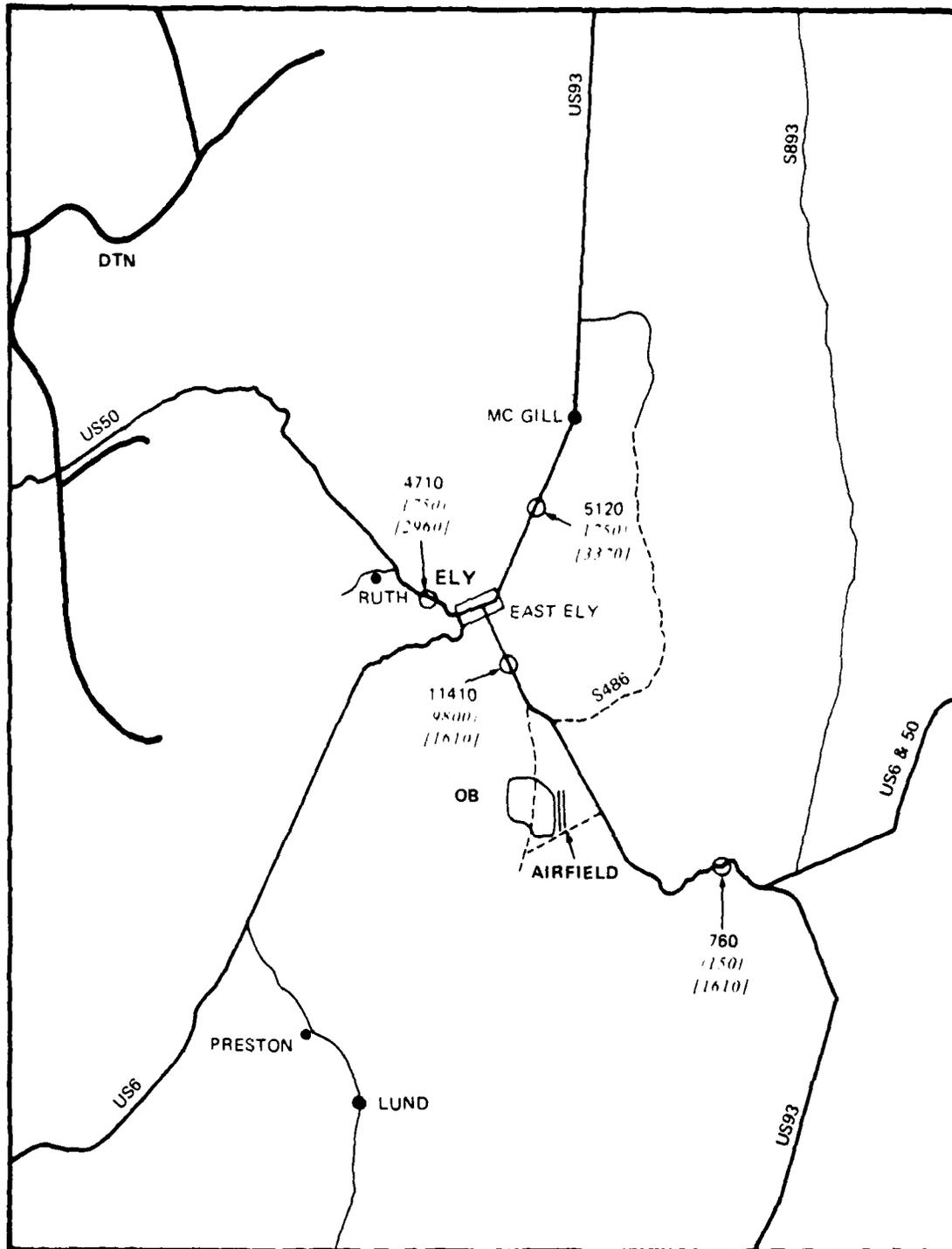
The community of Ely and its immediate vicinity is expected to absorb most of the project induced growth (as much as 80 percent which was assumed for traffic estimating purposes). The community would about double in population with a corresponding increase in traffic. Provisions, including new streets as well as new housing, would have to be made to accommodate the anticipated in-migration. The addition of around 1,500 new households would generate approximately 15,000 trips, or traffic movements, on an average day. Good planning and orderly development can prevent many traffic problems from occurring, but improvements would undoubtedly have to be made at numerous locations on existing streets to properly accommodate the additional traffic. Where these improvements would be needed would depend upon the specific growth patterns that develop.

The communities of Ruth and McGill are also expected to experience some growth as a result of the project but much less than Ely. While some localized traffic problems may occur at a few locations, substantial traffic problems are not anticipated.

EFFECTS ON NATIVE AMERICANS (2.1.12)

Pine-nut gathering areas and hunting areas in the Schell Creek, Egan, and Cherry Creek mountain ranges may be subject to indirect impacts as a result of rapid population growth in the Ely area. The projected 237 percent increase in the White Pine County population as a result of OB siting will create new recreational demands and encourage the development of new facilities, such as mountain campgrounds and ski resorts. Similarly, demand for seasonal hunting permits may be expected to increase, thereby placing Native Americans in competition with newcomers for legal rights to exploit deer and other game necessary for subsistence. Little is currently known about the gathering of native food, craft, or medicinal plants by members of the Ely Colony. Further study is required to assess potential impacts on these resources.

M-X OB construction in the vicinity of Ely is expected to directly impact the Ely Colony and have indirect impacts on other Indian reserves in the area, including the Duckwater Reservation 70 mi southwest of Ely. Ely is expected to attract Native Americans and others in search of work as a large number of jobs will become available in the area. The Native American population in the community is expected to at least double or triple, and could make severe problems in the colony.



LEGEND
 000 TOTAL 1992 TRAFFIC
 (---) MX TRAFFIC
 (---) 1992 TRAFFIC WITHOUT MX

SCHMATIC: NOT TO SCALE

2186-A-1

Figure 2.1.11-1. Projected traffic volumes in the vicinity of Ely, assuming second operating base.

In-migration and rapid growth will limit traditional Native American activities, diminish traditional values, and decrease their importance in the area. The rapid in-migration of Native Americans and other groups into the Ely/Ely Colony area will have other socioeconomic effects as well. The housing situation at the Colony is poor; there are only 17 housing units in standard condition and at least 22 new units are needed to replace substandard units and to meet demand (Facilitors, Inc., 1980). Population in-migration will likely further stress housing markets.

Detailed cultural resource and socioeconomic data collected at Ely Colony are being analyzed to refine the analysis of the impacts of a potential base site on Native Americans.

EFFECTS ON ARCHAEOLOGICAL AND HISTORICAL RESOURCES (2.1.13)

Direct impacts to cultural resources cannot be fully assessed at this time due to the lack of intensive survey at the proposed OB site and in the three OB suitability zones. However, numerous sites have been recorded in Steptoe Valley, and highly sensitive areas in the vicinity of the Ely alternative have been defined as the mountain foothills, the upper bajada zone, and all water sources regardless of topographic setting. Of the 105 sites recorded in the Ely vicinity, nearly 85 percent occur in the mountains and upper bajada/foothill zone. In the region within a 20 mile radius of the Ely OB, nearly 1,000 square miles representing about 80 percent of the area is considered to be of potential high to moderate sensitivity. There are at least three known limited activity sites in the immediate vicinity of the proposed OB in addition to the Ward mining district and the Ward Charcoal Ovens National Register site.

As depicted, the Ely OB does not directly impact any known sites; however, the Ward Ovens are located immediately to the north of the residential and recreational areas. While not directly impacted, the criteria of adverse effect (36 CFR 800) include "isolation from or alteration of the surrounding environment" and "introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting". Furthermore, placement of the residential area on the upper bajada of the Egan Range in the vicinity of numerous springs has the potential to have a significant impact on cultural resources. Any movement of facilities should consider placement on unwatered mid to lower bajada areas. The three suitable zones under consideration are considered highly sensitive to impacts to cultural resources.

Indirect impacts to cultural resources are also estimated to be substantial from an induced M-X population growth of 21,000 in White Pine County representing a 237 percent increase in 1987 and from an operating base population of about 10,000 by 1989. This sharp growth in population and increased accessibility to once-remote areas provided by the M-X road network will cause a proportional increase in indirect impacts. Impacts from increased population, accessibility, and site sensitivity due to development of the Ely OB are summarized in Chapter 4 of the EIS.

Growth-related impacts to historical and architectural properties in nearby communities are likely to be greatest in Ely, McGill, and Ruth.

Reduced population incursion, restricted access to sensitive areas, protective measures, community planning, and increased public education are measures which can serve to reduce these effects.

Because direct and indirect impacts to National Register and eligible properties are anticipated, a Programmatic Memorandum of Agreement has been developed between the Advisory Council on Historic Preservation, the Air Force, and other concerned agencies. This PMOA outlines a program which, if implemented, will avoid or satisfactorily mitigate adverse effects on historic and cultural properties.

Paleontological Resources

No direct impact is expected.

2.2 NATURAL ENVIRONMENT

EFFECTS ON VEGETATION (2.2.1)

The Ely site would be used for the second operating base for Alternative 3 and 5. A general discussion of impacts to native vegetation that would result from use of the Ely site is given in Chapter 4 of the EIS, in the section on native vegetation.

A potentially serious impact not discussed in detail in Chapter 4 is the invasion of disturbed rangeland by the toxic weed halogeton (Halogeton glomeratus) (Young et al., 1975). The effects of halogeton invasion are discussed in ETR-14.

Another significant potential impact is the loss of riparian woodland trees from along the banks of creeks in Steptoe Valley. Cottonwoods and other moisture-dependent species that provide valuable forage and wildlife habitat would be lost if groundwater overdrafting results in lowered and more intermittent stream flow.

EFFECTS ON WILDLIFE (2.2.2)

Elk and mule deer in the surrounding mountains may move from their preferred range as a result of increased recreation by backpackers, hikers and campers. Construction of roads will dissect the mule deer range but is not expected to significantly effect mule deer movements. Poaching may increase.

Habitat supporting high densities of pronghorn, such as in upper Steptoe and Spring valleys, is characterized by the availability of water at intervals of 1-5 mi. Movement and recreation activities of an estimated 14,500, additional permanent residents in the Ely region would affect these pronghorn populations to some extent. Pronghorn range could be reduced due to pronghorn abandonment of waterholes frequented by humans. Increased illegal harvest and harassment by ORV enthusiasts could also affect pronghorn.

Sage grouse occur in most of southern Steptoe Valley. The most important parts of their range are the strutting grounds, brood use areas, and wintering grounds. Presently no wintering grounds are known in the area but one brood use area has been located. Upland meadows are heavily used by sage grouse in Nevada in July and August to raise broods. Disturbance of these areas in summer may also negatively affect sage grouse.

Both pronghorn and sage grouse are regionally significant wildlife species likely to be significantly impacted. The OB site at Ely would not have a significant impact upon sage grouse. However, when indirect effects are combined with those

from Beryl, under Alternative 3, and Milford, under Alternative 5, significant indirect effects are anticipated.

Waterfowl at Cumins Lake could be adversely affected by increased recreational use or by actions affecting water level. Waterfowl areas in Steptoe, Spring, and White River valleys, including Kirch Wildlife Management Area, could receive much higher hunting pressure. Significant impacts, however, are not expected.

The expansion of Ely will not significantly impact any of the wildlife species identified as of special concern. Common native species of animals, especially smaller, less mobile species such as reptiles and rodents, will be reduced in number as habitat is lost.

EFFECTS ON AQUATIC SPECIES (2.2.3)

Development within the suitability areas designated for the Ely OB could result in indirect impacts to Duck Creek, Steptoe Creek, Willow Creek, Bassett Lake, Comins Lake, and several small creeks east of Highway 93 north of McGill. Exact placement of OB facilities would determine those that would have the potential to receive direct disturbance and would be the receiving waters for increased sedimentation loads and non-point source pollutants.

Aquatic habitats containing gamefish within 50 mi of Ely would be expected to receive the bulk of increased fishing pressure as a result of increased population attracted to the new OB. Since residents of the Ely area currently constitute a substantial portion of fisherman using highly attractive resources (e.g., Comins Lake) in high numbers, use of gamefisheries resources in Jakes, White River, Spring, Snake and Steptoe valleys is expected to increase in proportion to the increase in local population. It is estimated that 15 more law enforcement officers would be required for the White Pine County area for adequate control if an OB was sited near Ely (L. Mc Lelland, 1980). Without the OB, two to three officers would be necessary within three years. A modification of management practices, including habitat restoration, bag size and gear restrictions and stocking rates, would be expected to maintain acceptable fishing success.

Game Fish

Game fisheries habitats which could be adversely impacted by expansion of Ely outside its present borders include Steptoe Creek and Comins Lake. Principal game fish in these habitats are rainbow trout, brown trout, brook trout, northern pike and largemouth bass. Current angler use of these habitats is high, and is expected to increase.

Indirect adverse impacts to game fish and their habitats would result from increased game fishing.

EFFECTS ON PROTECTED SPECIES (2.2.4)

Protected Terrestrial Species

The bald eagles that use Steptoe and Spring valleys during the winter would not be directly impacted. The closest bald eagle foraging area is approximately 6-7

mi from this proposed OB site. Although these areas are considered traditional use areas by the Nevada Department of Wildlife, no roost sites have yet been located.

Protected and Recommended Protected Aquatic Species

In Steptoe Valley, two state protected fish and one recommended protected invertebrate occur. The relict dace (state protected as threatened) and the Steptoe turban (a snail recommended for protection as threatened or endangered) are located within 15 mi of the OB site. The state protected (endangered) Utah cutthroat trout is located in Goshute Creek, about 60 mi north of the OB. The protected trout would be subject to increased fishing pressure. The nearby lowland habitats of the relict dace and the Steptoe turban would be subject to water quality and quantity reductions from OB and support community groundwater use and wastewater discharge.

In adjacent Spring Valley, a transplanted population of the federally protected Pahrump killifish resides in the Shoshone Ponds refugium, and relict dace and Utah cutthroat trout are found in certain lowland and montane habitats. White River Valley contains three state protected fish and five recommended-protected invertebrates. These include the White River springfish (two subspecies), the White River spinedace, and the White River desert sucker, which occupy various valley bottom spring habitats along with the recommended-protected invertebrates. Potential habitat degradation as a result of increased recreation may impact both lowland and montane sensitive aquatic habitats in these valleys. A detailed impact discussion of alternatives involving this OB and potential mitigations are presented in Chapter 4 of the EIS and the technical report on Protected Species, ETR 17.

Protected Rare Plants

Three rare plant species occur at Monte Neva Hot Springs, within the boundaries of the suitability zone. They are the Monte Neva Indian paintbrush (Castilleja salsuginosa), the spring-loving centaury (Centarium namophilum) and the sheathed deathcamus (Zigadenus vaginatus) (Nevada State Museum, 1980). The Indian paintbrush occurs on private property, but is likely to be susceptible to any substantial change in groundwater or surface water flow levels (Heckard, 1980). This species is included in a rulemaking package being put together by the USFWS.

High elevation rare species which occur in the mountain ranges to the east and west of the operating base may feel effects due to increased recreational use. This increased use would result from a net population increase which is projected for White Pine County due to M-X.

EFFECTS ON WILDERNESS AND SIGNIFICANT NATURAL AREAS (2.2.5)

Detailed analysis of OB impacts to wilderness are treated in Chapter 4 of the EIS. Discussion here is limited to significant natural areas. Figure 2.2.5-1 shows the OB location for Ely. No key natural areas will be directly affected by the base suitability envelope.

Impacts to key natural areas would be primarily due to the recreational activities of base personnel and associated in-migrants. Using the indirect effects analysis, areas likely to receive increased visitation as a result of siting a base at

Ely would include Wheeler Peak, Lehman Caves, Lexington Arch, Ruby Lake, Heusser Mountain, Hercules Gap, Mt. Grafton, Mt. Moriah, Spring Valley White Sage Flat, Shoshone Pygmy Sage Area, and Preston Big Springs.

EFFECTS ON SURFACE WATERS (2.2.6)

The construction of an operating base near Ely would use an estimated 1,800 to 3,400 acre-ft of water. Permanent operational water requirements are estimated to range from 2,600 to 3,500 acre-ft per year.

Construction and maintenance of the operating base could have an impact on surface water due to increases in flooding and erosion. Storm runoff will be increased by the introduction of impermeable surfaces and channelization. Surface water is already appropriated for other uses. If surface water rights are purchased, stream volumes may be locally reduced, but reduction of total surface water volume will be partially offset by return flow after treatment, especially during the operations phase.

Construction of an operating base near Ely is estimated to result in moderate short-term erosion impacts due to the present moderate erosion rating of the predominating soils of the area. Erosion impacts can be mitigated through revegetation of the disturbed soils and proper engineering design. Long-term impacts are expected to be low if the mitigating measures are properly employed.

Water Availability

Expansion in supply, storage and distribution of water will be necessary to meet the increase in demand created by the proposed M-X project. Additional problems are likely, due to competition for water by the White Pine Power Project. Project water requirements for Ely could be about 2.3 MGD, while those for the OB could equal from 2.3 to 3.1 MGD.

EFFECTS ON GROUNDWATER RESOURCES (2.2.7)

Under a full deployment basing mode, a second operating base (OB II) is proposed near Ely, Nevada. The OB II would include an airfield, support facilities, clear zones, and a railroad spur. The base would occupy approximately 4,000 acres.

This site lies within an area which is designated a critical groundwater basin by the Nevada State Engineer. This designation is mainly due to an application for appropriation by the White Pine Power Project which if used in total could put usage over the estimated perennial yield. Current use in Steptoe Valley is estimated to be 53,000 acre/ft per year (Cardinalli, 1979) and 32,000 acre/ft per year (DRI, Cochran et. al., 1980) while perennial yield is estimated to be 70,000 acre/ft per year (Eakin Hughes and More, 1967). The difference in current use estimates could well be the difference between withdrawal and consumption. It is evident, however, that the groundwater system is under considerable use.

Potential Impacts

Ely's groundwater supply could be impacted. Impacts would increase pumping costs due to lowered water table and possibly reduced well yields due to compaction.

Several springs and Comins Lake are among the possible areas of impacts to current appropriators and wildlife habitats.

When compared with the other alternative sites in Nevada/Utah the relative potential for impact at Ely would be low. This is mostly because Ely's groundwater resource is currently under less stress than that of any of the other OB site areas. Although Steptoe Valley is a designated critical groundwater basin, current groundwater usage is less than the perennial yield and sufficient quantities may exist for M-X operating base purposes. M-X withdrawals would be temporary and limited to the southern part of the valley. In these areas, widely separated stock wells provide water for the other uses and no significant impact on water levels and groundwater storage from M-X withdrawals would be anticipated. Extractions may reduce underflow to the south through the deep carbonate rocks aquifer. The springs do not appear to be part of the valley-fill aquifer system, so the project should have no effect on their discharge rates. Increased surface runoff during major storms would be minimal; local increases in sheet and stream-channel erosion may occur. Construction activities could degrade surface-water quality during thunderstorms, but no significant impact on groundwater quality would be expected.

Mitigation Measures

The M-X well field would be designed to avoid pumpage centers, springs, and local users. A numerical simulation model would be developed to evaluate the impact on the carbonate aquifer, and a monitoring network could be developed. The extraction program would be altered according to the information these provide. A local surface drainage system would be constructed to safely convey runoff from the M-X operating base site to natural drainage, with erosion control structures to stabilize channels and prevent streambed erosion. Temporary ponds would be constructed to reduce peak flows and to desilt the runoff and avoid downstream deposition. After completion of the M-X project, the water system may be available for local use. It may be possible to purchase existing water rights or to pipe water from nearby Spring Valley.

Loss of agricultural land could occur if additional water is obtained by the purchasing of water now being used for irrigation.

EFFECTS ON AIR QUALITY (2.2.8)

The air quality impact on the area around Ely was evaluated using three air quality models: IMPACT, PAL, and HIWAY.

Construction

Particulate emissions during construction of the OB were modeled with PAL*. Due to a lack of data, other construction related pollutants could not be modeled. The PAL results for two representative operating base construction area source sizes and two emission levels, mitigated and unmitigated, are presented in Figure 2.2.8-1. The mitigated case assumes enough dust control to reduce fugitive dust by 50 percent. The effective distance to the potentially affected population is 9 mi. The results indicate that a dust problem would exist at Ely. However, due to the

*IMPACT could not be used because the detailed emissions data required for this model were not available.

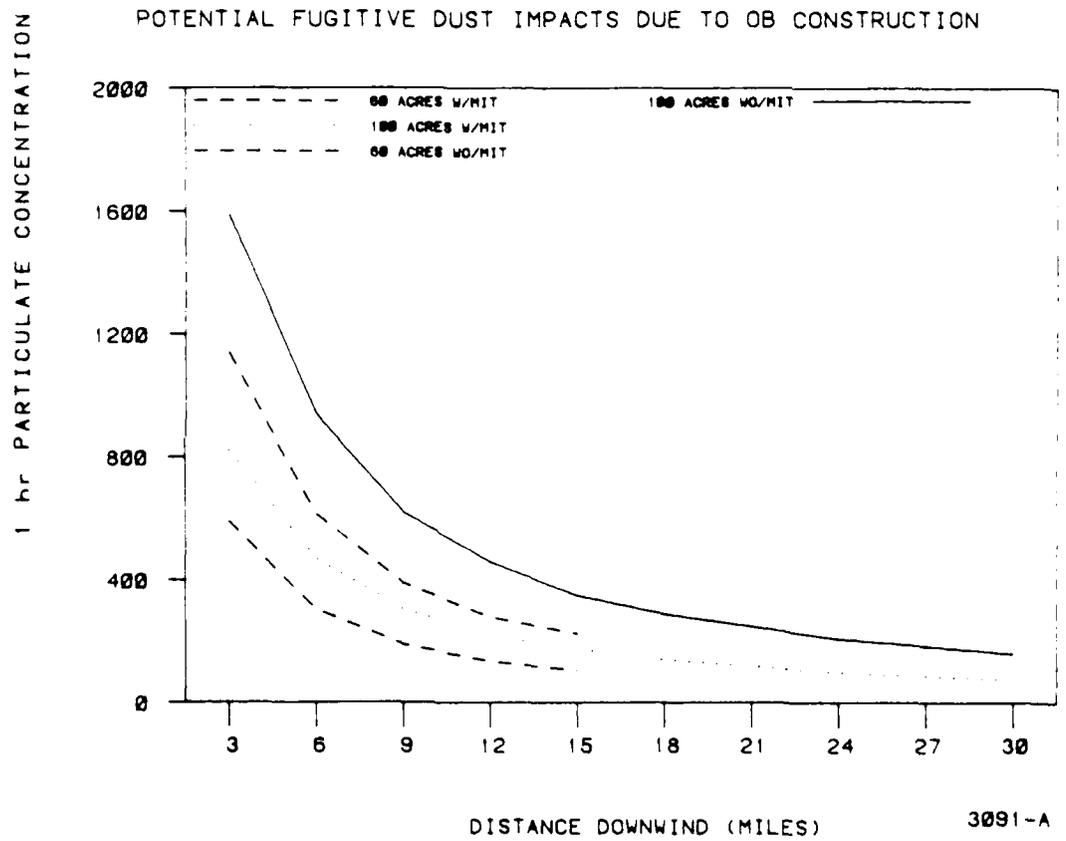


Figure 2.2.8-1. Potential fugitive dust impacts due to OB construction.

limitations of the PAL models and the conservative assumptions (i.e., that even large particles of dust remain in the air and do not settle to the ground), it is not anticipated that the levels of dust predicted by the model would actually exist.

To put the model results in perspective, fugitive dust from M-X construction activities generated by earthmoving equipment is similar to that used in any major construction program. Thus, the quantities of dust raised are essentially equivalent to those characteristic of other large construction efforts. At distances close to the construction activities, a dust problem would be expected and this is confirmed by initial modeling. Exact quantification is not possible, but results of the PAL model indicate that quantities will be large but localized (i.e., near the construction activity).

Operations

For general operational emissions, the IMPACT model was run for two gaseous pollutants, CO and NO_x. The emission levels were scaled from data for Vandenberg AFB, California, and redistributed to represent the expected operating base configuration. The results show that CO could reach a one-hour average concentration of 2.5 ppm (see Figures 2.2.8-2 and 2.2.8-3). The predicted CO values are well below both the federal and Nevada standards and no significant adverse impacts would be anticipated. The maximum one-hour average NO_x concentration of 0.13 ppm, while greater than the federal and Nevada annual standard, is anticipated to be of extremely short duration and should not lead to any significant long-term impacts. The emissions of SO_x and HC are less than those of NO_x or CO, so the predicted concentrations would also be smaller. Thus, no violations of the standards would be expected for NO_x and CO, and the same conclusion is expected for SO_x and HC.

The HIWAY model was used to examine the potential for local maxima one-hour average concentrations of hydrocarbons, CO and NO_x associated with peak-hour traffic. The results are shown in Table 2.2.8-1. The maximum predicted 1-hour average CO concentration of 7.7 ppm is well below the federal or Nevada standard of 35 ppm. As there are no federal or Nevada 1-hour HC and NO_x concentration standards, a direct comparison of the model results with standards is not possible. However, the concentrations corresponding to the estimated values are not anticipated to be of long duration. Predicted HC levels for the peak hour exceed the 3-hour average HC concentrations standard. It is possible that the peak 3-hour level will also exceed this standard. Hydrocarbon concentration is of concern because of its role as a precursor of photochemical oxidant formation.

Potential for oxidant formation due to HC and NO_x emissions would require sophisticated numerical modeling techniques.

Since Ely lies in a nonattainment area for sulfur dioxide (SO₂), any project which would require the combustion of fossil fuels could generate SO₂ emissions, and would require mitigation.

EFFECTS ON MINING AND GEOLOGY (2.2.9)

The Ely OB site is located south of the Ward mining district in southern Steptoe Valley. Some of the peripheral functions of the OB may conflict slightly

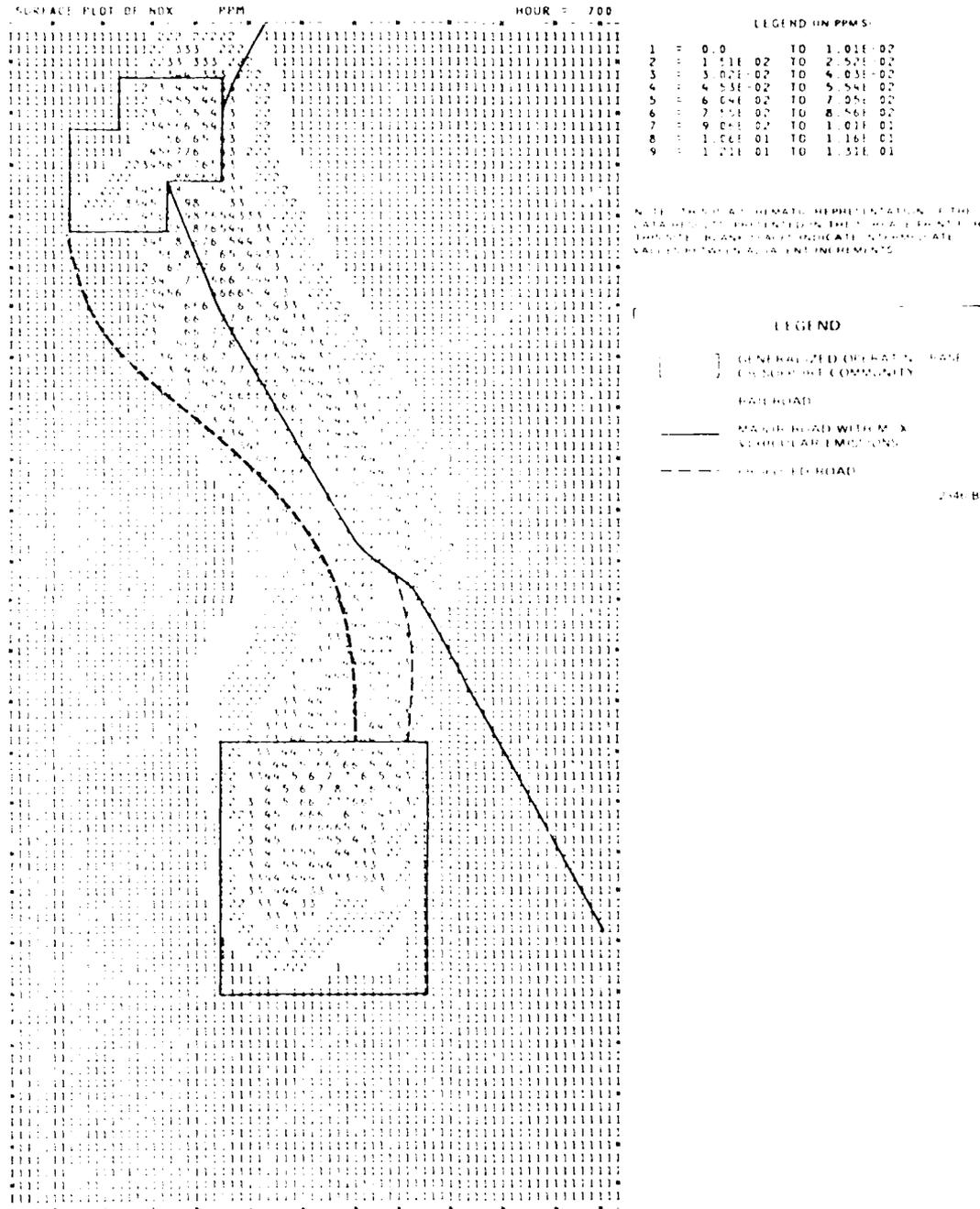


Figure 2.2.8-3. Predicted hourly NO_x concentrations in the vicinity of Ely, Nevada.

Table 2.2.8-1. Ely, Nevada traffic-related concentrations: 1-hour averages in $\mu\text{g}/\text{m}^3$ (ppm) 50 m from edge of roadway.

	PEAK HOUR* TRAFFIC VEHICLES/HOUR	CO	HC	NO _x
Baseline	273	1.3 (1,469)	0.18 (186)	1.14 (254)
Baseline Plus M-X Induced Traffic	1,643	7.7 (8,870)	2.02 (1,951)	1.78 (1,467)

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*Peak hour traffic is assumed to be 15 percent of the Average Daily Traffic (ADT).

*Hypothetical worst case meteorological conditions: 1 meter per second wind 15 meter mixing height, wind parallel to roadway, very stable atmosphere.

with future expansion of the Ward District if mineral values are found beneath the valley alluvium. There exists some potential for additional discoveries in the mountains of the Egan Range and in the valley fill along the front of the range.

*U.S. GOVERNMENT PRINTING OFFICE : 1961 O-723/284

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