Soil Resource Inventory

Umatilla National Forest
Pacific Northwest Region

Dale District
Heppner District
Pendleton District
Pomeroy District
Ukiah District
Walla Walla District

Inventory and Report by
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Preface

This Soil Resource Inventory for the Umatilla National Forest has been prepared to provide basic, fundamental facts about the soil and related resources. This general information will provide the land manager the necessary soil interpretations for extensive land management planning and resource planning. Information has been provided about soils, parent rock and plant community types. This report will serve as a permanent basic reference for many purposes. From this basic framework, future surveys and investigations can be conducted more efficiently to add detail and refinement needed for more intensive management.

Soil is a basic non-renewable forest resource. Future management options will be dictated by the way we manage it. Thus, maintenance or improvement of the soil resource is a primary goal of forest and related rangeland management. Meeting this goal allows the forest manager an opportunity to obtain optimum production of goods and services in a cost effective manner while incurring minimal physical and social environmental impacts.

The authority, objective and policy of soil survey, interpretations and management as stated in FSM 2550 is as follows:

Authority (FSM 2550.1)
"In discharging the responsibilities defined in the Organic Act of June 4, 1897, the Multiple Use—Sustained Yield Act of June 12, 1960, the Forest Service has a need for information on the nature and distribution of soils on National Forest System lands and a knowledge of their suitabilities for different uses and activities. The Multiple Use—Sustained Yield Act, in defining multiple use and sustained yield, specifically says '...without impairment of the productivity of the land'. Basic soil information is necessary to determine how best to meet this requirement."

Objective (FSM 2550.2)
"The broad objective is to secure correlated basic soil data applicable to intensive management of forest and rangelands. The soil program is designed to provide technical knowledge about soils in the form most usable for National Forest multiple use and resource planning, management and coordination."*

Policy (FSM 2550.3)
"Forest Service policy is to conduct soil resource inventories of National Forest lands as needed for proper development and management of all resources and activities. Soil resource inventories are made at varying orders of intensity tailored to specific National Forest management needs. These inventories will form the basis for interpretations about the soils to assist in the planning and management of forests and rangelands."

*Region 6, Soil Resource Inventory Handbook of Policy and Procedures, June 1972, by Loren Herman, Soil Scientist.

Use

The primary intended use of the Soil Resource Inventory is for the broad planning level. Major emphasis of this inventory is on interpretations and behavior of the soil resource in response to land management activities. This interpretation is based on the interrelated factors of soil and its relative position, geology (parent rock and geomorphology) and plant community types. Interpretations are based on field observations and anticipated relations to management activities.

The reconnaissance nature of this soil inventory lacks scale and detail needed for intensive, small area projects. Such projects require additional on-site investigations to insure reliability of interpretations for various uses.

*"The user's responsibility is to recognize the limitation of scale and information accuracy. Often the user will over extend the SRI information by thinking it will answer all his short term planning problems, that it is the ultimate and no more soil data or assistance is needed. The scope of the inventory is for broad planning purposes. Additional intensive inventories and interpretations will be needed for detail planning and project investigation."**

To aid the resource planner, this report was prepared in one book. Reproduction of the photos are used to give visual detail of the complex soil-plant community relationships. If needed, this book could be separated into two small booklets of photos and interpretations.

Soil Scientist, Lee Ehmer, conducted the field mapping from 1971 to 1975. Participation and valuable assistance was received in preparation of this report; I would like to thank the following units for their participation and valuable assistance in preparation of this inventory report.

—Umatilla National Forest
Photos and Maps—Regional Office Cartographics
Layout and Design—R-6 Media Design
Review—Regional Office, Soils and Geology

Special thanks are given to Mike Geist, Research Soil Scientist, PNW Range and Wildlife Habitat Laboratory, LaGrande, for soil analysis and preparation of the soil chemical and physical text.

Soil Chemical Properties and Management Implications for Selected SRI Sampling Sites on the Umatilla National Forest

*by J. Michael Geist and Lee Ehmer**

The ability to recognize soil-vegetation relationships helps resource managers in mapping efforts, extrapolation of experimental results, predicting ecological events on vegetatively denuded or degraded sites, locating potential spring developments, writing EAR's, etc. Time is saved which improves our ability to provide better resource care. It is to this end that we have directed this effort.

Quantified data related to physical and chemical properties of soils in eastern Oregon and Washington forested zones is relatively sparse. Further, abilities to interpret management implications and relationships between soil properties and vegetation, existing or potential, have been limited. Limitations arise partially from the shortage of data, which precludes our comparative ability, and from confounding factors which cloud cause-effect relationships. But, with more data, the chances improve for finding patterns in soil properties associated with vegetative patterns.

Data is presented below for 20 SRI soil units which were sampled and analyzed for chemical properties in an initial effort to improve the existing quantitative data base for the Umatilla National Forest. Some of the locations sampled are scheduled for timber harvest during the ensuing five years. Thus, current collections offer a reference base for followup comparisons of management influences on these areas.

We have listed some published materials which will serve to broaden the reader's own interpretive ability. The data listed therein, unpublished research data**, and our experience have been used in making comparisons or management interpretations here and in other text portions. Use of these interpretations will hopefully lead to refinement. User feedback to the authors will accelerate this process.

Methods

Soil samples were obtained from selected SRI reference locations which were visibly undisturbed and analyzed by field and laboratory procedures as described by Geist et al, (1975). Ehmer assigned plant communities using Hall's (1973) guide for the Blue Mountains. Surface litter was removed, thus, these data apply only to the mineral soil portions of the profile.

It is critical that these analytical data be compared with only those obtained by the same analytical methods. For example, pH was measured to 0.01 M $CaC1_2$ and are not directly comparable to pH measured in water. Soil reaction (pH) may be as much as 1 unit lower when measured in $CaC1_2$. Soil sampling depth allowances must be made also.

*Research Soil Scientist, USDA - Forest Service, Pacific Northwest Forest and Range Experiment Station, Range and Wildlife Habitat Laboratory, La Grande, Oregon; Soil Management Specialist, Wallowa-Whitman National Forest, Baker, Oregon.

**Geist, J. Michael, and Gerald S. Strickler. Unpublished manuscript. Physical and chemical properties of some soils in the Blue Mountains of Northeast Oregon.

Results

The analytical results have been grouped by Hall's (1973) plant community types and reported in Tables 1-7. Additional information pertaining to the soils and sites is presented in Table 8. Where more than one soil occurred in a community type, means and ranges of data are given; where 5 or more data values were involved, a coefficient of variation (standard deviation as a percentage of the mean) was calculated to further indicate variation in the data.

The groups formed were:

Group 1: Dominantly residual soils from basalt or andesite supporting dominantly ponderosa pine and included: Mixed conifer - pinegrass, CW-G1-11, and ponderosa pine-Douglas fir - elk sedge, CD-G1-11, plant community types (Table 1).

Group 2: Soils derived from volcanic ash over basalt or andesite residuum supporting mixed conifer stands and were of the mixed conifer-pinegrass, CW-G1-12, plant community (Table 2).

Group 3: Soils of volcanic ash origin over bedrock or buried residuum from basalt, andesite, or tuffaceous material which supported trees dominated by lodgepole pine, classified in the lodgepole-pinegrass-grouse huckleberry, C1-G2-11, plant community (Table 3).

Group 4: Soils developed from volcanic ash, over tuffaceous, basaltic and sedimentary materials; all supported stands dominated by white fir and were of the white fir-twin flower-forb, CW-F3-11, plant community (Table 4).

Group 5: Soils developed from volcanic ash over basalt or andesite residuum supporting tree stands dominated by white fir of the white fir-big huckleberry, CW-S2-11, plant community (Table 5).

Group 6: Soils like Group 5 supporting similar stands of the white fir-grouse huckleberry, CW-S8-11, plant community (Table 6).

Group 7: Soils like Groups 6 and 5 except colder, supporting tree stands dominated by subalpine fir and lodgepole pine of the subalpine fir-big huckleberry, CE-S3-11, plant community (Table 7).

General Trends

Soil reaction ranged from 4.8-6.0 and was the least variable chemical property. A weak relationship was noted between soil pH and total cations (bases). No abnormalties were indicated by these values.

Organic matter values ranged from 3 to 23% among surface (0-15 cm) layers. There was considerable overlapping in the ranges of organic matter among groups, which is expected, but values were generally higher in the following groups: ponderosa pine-residual soils, mixed conifer-ash soils, subalpine fir-big huckleberry-ash soils. One exception to this was in the group of white fir-twinflower-forb, ash soils which was highest of all soils analyzed. In all groups, values generally declined an average of about 50% with each deeper sampling increment of the profiles. Similar trends and exceptions were noted for total nitrogen values.

Total extractable cations declined from the surface downward, to depths where buried soil layers occurred, and then increased sharply. These discontinuities are frequently also associated with higher clay content in the buried layers. Trends in these data are dominantly controlled by the sum of calcium and magnesium values whose individual trends were also very similar.

Calcium to magnesium ratios ranged from 2 to 15 in surface soils but were mostly in the 3-8 range. Values between 5 and 1 are considered most desirable, but there appears to be no growth limiting imbalances.

Discussion and Management Implications

Those properties which appeared to be normal, adequate, etc., will not be addressed further, however, we will discuss unusual features or properties of management significance. Organic matter status is reported as an aid to interpreting disturbance influences in subsequent years and for a general basis of comparison.

Total nitrogen is reported here for use only as a general guide to nitrogen status. A small and often variable percentage of the total nitrogen content of soils becomes available annually for biological consumption. Thus, total nitrogen values can be misleading indicators of available nitrogen supply. Unpublished data for a separate set of test soils showed that total N was significantly correlated ($r=0.79$) with an experimental evaluation of nitrogen availability. The latter evaluation has shown promise recently as a means of assessing available soil N but has not been adequately tested. Thus, we have used total nitrogen as a general interpretive guide.

Research and experience in fertilizer use have shown Blue Mountain soils commonly respond to nitrogen and sulfur and occasionally phosphorus applications where introduced grasses commonly used in erosion seedings were the measured crop (Geist, 1971, 1976). This does not imply that fertilizers are commonly necessary for growth of erosion seedings, rather, that they stimulate growth and speed stabilization of disturbed soil surfaces.

Expected nutrient deficiencies for introduced herbaceous species used in erosion seedings are indicated below. These commonly do not apply to native herbaceous plants or trees as nutrient requirements usually differ. Deficiency

or "critical" levels in analytical results are presently unrefined and also vary in relation to the specific plant. Thus, we use the term expected in describing deficiencies. Future experience and research will aid in establishing more definitive critical levels. Subsoil nutrient status is discussed because topsoil is often displaced in mechanical operations and leaves subsoil exposed.

We encourage the practice of topsoil conservation to foster maintenance of nutrients, water holding capacity, water infiltration rates, etc. Where severe disturbance is expected, stockpiling of topsoil and later replacement is one conservation approach. Discing or ripping of subsoil should be performed to reduce compaction prior to topsoil replacement. We noted previously in the SRI for the Wallowa-Whitman National Forest that subsoils containing granitic materials may have lower nutrient status than those derived from other materials. In such instances, topsoil conservation is more critical.

Specific Properties by Soil Group

Group 1 Soils—

These soils are comparatively shallow, high in organic matter, have moderate but adequate phosphorus levels and are high in potassium. Fertilization should not be necessary on these and comparable soils. Shallower members will become marginal tree sites if significant profile truncation occurs.

Group 2 Soils—

Similar in properties to Group 1, but higher in water holding capacity due to higher volcanic ash influence. Phosphorus may be slightly deficient in some soils below 60-90 cm depth.

Group 3 Soils—

Two members have moderately low organic matter and total N and were also notably lower (10 ppm) in phosphorus below 15 cm. Expect phosphorus deficiencies with exposure of these lower materials in such soils. Total cations are comparatively low in all soils at all depths. This may have a relationship to overall nutrient status but evidence of this is lacking. Include nitrogen and sulfur if a fertilizer application of phosphorus is made. Add potassium also when subsoils below 90 cm are exposed and readings are less than 0.2 meq/100g. Water holding capacities are moderate, similar to Group 2.

Group 4 Soils—

One of the five soils in this group is markedly higher in organic matter and total N than other members to the 90 cm depth. This is partially related to its unique site conditions, which include location in a wet slump basin which provides subirrigation to plants and apparently results in a highly productive site and substantially greater nutrient turnover. The other members have moderate to moderately low organic matter and total N levels. Phosphorus is marginal in two cases below 60-90 cm, but this property ranges to high levels in subsoils of other members. Fertilize with nitrogen and sulfur only where rapid establishment is critical. Total cations were generally in the moderate to high range with one soil in the lower level (less than 5). Potassium levels appear adequate. Water holding capacities are relatively high.

Group 5 Soils—

Only one profile was investigated here and nutrient status appears moderate to high. Water holding capacity is fair, similar to Group 1.

Group 6 Soils—

Water holding capacities of these two soils are moderate. Organic matter, total N and potassium levels appear adequate. Phosphorus levels in one member were moderately low but likely adequate unless N and S are applied to speed erosion seeding establishment wherein additional P should be included. Total cations were relatively low, similar to Group 3.

Group 7 Soils—

Nutrient status of the soil sampled here appears adequate in all respects. However, if accelerated establishment of erosion seedings is required, fertilization with N, S, and P would aid this effort, primarily because of the shorter, cooler growing conditions associated with these plant community-soil associations.

When applying these and other pertinent results to mapping units, the manager must be sure he is dealing with comparable soils. Thus, the descriptive legend for the appropriate mapping unit(s) should be carefully scrutinized for agreement with observed characteristics in the field. Mapping units are rarely single homogenous soils and inclusions may have very different chemical as well as physical properties. Experience through consultations with the appropriate soil scientist will help improve independent judgments of this kind.

Obviously, the results of these samplings fall short of characterizing the variability which potentially exists among the whole array of areas encountered in this report. Future results can be shared among Ranger Districts, and even Forests, to build an increasingly useful reference to help predict the outcome of ensuing management efforts.

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Table 1. Chemical Properties of Group 1 Soils

Soil Depth	No. of observations	pH	Organic matter	Total nitrogen	C:N	Available P	Extractable cations					Ca:Mg
							Ca	Mg	Na	K	Total	
cm			--------Percent--------			ppm	----------meq/100 g----------					
						Means						
0- 15	5	5.3	9.28	0.23	24	33	18.4	6.3	0.1	1.6	26.1	3
15- 30	5	5.4	5.65	.15	22	29	18.4	6.6	.1	1.2	26.3	3
30- 60	4	5.5	3.68	.10	22	24	18.2	7.3	.1	1.1	26.7	3
60- 90	1	6.2	1.48	.07	13	17	20.8	10.7	.1	.4	32.0	2
90-120	1	6.3	.90	.06	9	10	20.5	11.3	.1	.2	32.1	2
						Ranges						
0-15	5	4.8-5.7	6.81-10.54	0.16-0.28	20-35	27-37	12.1-26.6	3.0-12.2	0.0-0.1	1.0-2.2	17.0-39.8	2-4
15-30	5	4.9-5.8	4.21- 7.24	.11- .19	17-31	21-37	11.2-29.2	3.1-13.2	.0- .1	.6-1.5	15.8-43.2	2-4
30-60	4	4.9-6.0	3.16- 4.49	.07- .13	15-29	19-29	10.3-25.3	3.1-13.5	.0- .1	.5-1.7	15.4-39.2	2-5
						Coefficients of variation (percent)						
0-15	5	6	15	22	25	15	33	59	26	28	36	26
15-30	5	7	24	21	27	22	39	63	56	31	42	26

Table 2. Chemical Properties of Group 2 Soils

Soil Depth	No. of observations	pH	Organic matter	Total nitrogen	C:N	Available P	Extractable cations					Ca:Mg
							Ca	Mg	Na	K	Total	
cm			--------Percent--------			ppm	----------meq/100 g----------					
						Means						
0- 15	2	5.2	7.81	0.19	24	33	11.4	2.3	0.1	2.0	15.5	5
15- 30	2	5.4	3.27	.10	19	23	7.8	1.8	.1	1.4	11.1	5
30- 60	2	5.3	1.73	.06	16	14	7.1	1.9	.1	.7	9.8	4
60- 90	1	5.2	.81	.04	12	10	6.2	1.9	.0	.5	8.7	3
90-120	1	4.9	.35	.02	11	9	7.3	2.8	.1	.3	10.6	3
120-150	1	5.1	.25	.01	11	8	8.4	3.2	.1	.2	11.9	3
						Ranges						
0-15	2	5.0-5.4	7.27-8.35	0.18-0.21	23-24	29-36	11.1-11.7	2.2-2.4	0.1-0.1	1.4-2.5	15.1-15.9	5-5
15-30	2	5.4-5.4	2.94-3.60	.12- .09	18-20	23-24	7.5- 8.2	1.7-1.9	.0- .1	1.3-1.6	10.9-11.3	4-5
30-60	2	5.2-5.4	1.01-2.45	.04- .08	12-19	13-16	5.8- 8.5	1.5-2.3	.0- .1	.7- .8	8.0-11.6	4-4

Table 3. Chemical Properties of Group 3 Soils

Soil Depth	No. of observations	pH	Organic matter	Total nitrogen	C:N	Available P	Extractable cations					Ca:Mg
							Ca	Mg	Na	K	Total	
cm			--------Percent--------			ppm	----------meq/100 g----------					
						Means						
0- 15	4	5.2	5.53	0.08	43	14	2.4	0.4	0.0	0.5	3.2	8
15- 30	4	5.5	2.51	.05	29	12	2.8	.4	.1	.4	3.7	6
30- 60	4	5.5	1.17	.03	26	11	3.7	.7	.1	.5	4.9	5
60- 90	2	5.6	.49	.01	18	6	3.2	.8	.1	.6	4.6	4
90-120	1	5.3	.12	.01	11	2	1.5	.7	.0	.1	2.4	2
120-150	1	5.0	.09	.01	7	2	1.1	.7	.0	.1	2.0	2
						Ranges						
0-15	4	4.9-5.4	3.22-7.46	0.05-0.11	27-54	12-15	1.3-2.9	0.1-0.5	0.0-0.0	0.3-0.6	1.8-3.8	7-11
15-30	4	5.3-5.8	1.59-3.41	.04- .07	21-37	9-16	.8-4.9	.1- .6	.0- .1	.3- .5	1.2-6.1	5- 8
30-60	4	5.3-5.7	.85-1.44	.02- .03	19-41	8-16	1.9-6.7	.5- .8	.0- .1	.4- .8	2.9-7.9	4- 9
60-90	2	5.6-5.6	.21- .76	.01- .02	11-25	2- 9	1.8-4.6	.7-1.0	.1- .1	.3- .9	2.8-6.5	3- 5

Table 4. Chemical Properties of Group 4 Soils

Soil Depth	No. of observations	pH	Organic matter	Total nitrogen	C:N	Available P	Extractable cations					Ca:Mg
							Ca	Mg	Na	K	Total	
cm			--------Percent--------			ppm	----------meq/100 g----------					
						Means						
0- 15	5	5.6	8.30	0.18	24	52	12.3	1.6	0.1	1.2	15.2	8
15- 30	5	5.7	3.57	.10	22	49	7.3	1.0	.0	1.1	9.4	8
30- 60	5	5.6	1.74	.05	21	36	5.1	.9	.1	.9	7.0	6
60- 90	5	5.3	.67	.03	13	20	5.0	1.5	.1	.6	7.3	3
90-120	4	5.1	.49	.03	11	22	13.1	5.3	.2	.6	19.2	3
120-150	3	4.9	.42	.02	11	24	14.8	5.6	.2	.4	21.1	3
						Ranges						
0- 15	5	5.1-5.9	3.90-23.82	0.09-0.44	19-31	19-93	4.4-26.6	0.5-3.3	0.0-0.1	0.7-1.9	5.7-31.7	6-10
15- 30	5	5.5-5.9	2.16- 8.51	.05- .24	19-27	16-95	2.9-15.8	.4-2.0	.0- .1	.6-1.5	4.0-18.7	4-10
30- 60	5	5.5-5.8	1.24- 3.23	.03- .12	16-25	12-69	1.6- 8.3	.3-1.9	.0- .1	.3-1.5	2.2-10.9	4- 8
60- 90	5	4.7-5.7	.34- 1.29	.02- .06	7-19	9-27	2.5- 7.0	1.1-2.3	.1- .2	.4- .8	4.1- 9.1	2- 5
90-120	4	4.6-5.5	.25- .68	.02- .03	9-12	10-41	5.0-19.9	1.9-9.0	.1- .3	.3-1.1	7.4-29.9	2- 3
120-150	3	4.7-5.2	.30- .80	.01- .03	8-14	6-45	9.4-24.4	4.0-8.6	.1- .3	.2- .7	13.7-33.9	2- 3
						Coefficients of variation (percent)						
0-15	5	6	105	80	19	63	73	74	43	44	70	20
15-30	5	2	78	85	13	72	72	71	47	40	65	33
30-60	5	2	48	74	19	67	61	73	59	61	60	24
60-90	5	7	56	51	36	43	32	32	42	28	27	39

Table 5. Chemical Properties of Group 5 Soils

Soil Depth	No. of observations	pH	Organic matter	Total nitrogen	C:N	Available P	Extractable cations					Ca:Mg
							Ca	Mg	Na	K	Total	
cm			--------Percent--------			ppm	----------meq/100 g----------					
						Means						
0-15	1	5.8	4.94	0.13	23	44	11.0	1.1	0.0	1.3	13.5	10
15-30	1	5.8	2.07	.06	21	25	5.9	.8	.0	1.0	7.7	7
30-60	1	5.4	1.21	.03	21	16	8.4	2.1	.0	1.3	11.3	4

Table 6. Chemical Properties of Group 6 Soils

Soil Depth	No. of observations	pH	Organic matter	Total nitrogen	C:N	Available P	Extractable cations					Ca:Mg
							Ca	Mg	Na	K	Total	
cm			--------Percent--------			ppm	----------meq/100 g----------					
						Means						
0-15	2	5.6	4.96	0.11	26	44	5.5	0.5	0.0	0.6	6.4	12
15-30	2	5.7	2.44	.07	22	30	3.4	.4	.0	.4	4.2	8
30-60	2	5.5	1.82	.05	27	26	3.5	.5	.1	.4	4.5	8
60-90	1	5.8	1.43	.06	14	64	3.6	.5	.0	.7	4.9	7
						Ranges						
0-15	2	5.5-5.6	4.90-5.02	0.09-0.13	22-30	13-75	5.4-5.6	0.4-0.7	0.0-0.0	0.5-0.6	5.9-6.9	9-15
15-30	2	5.5-6.0	2.40-2.49	.05- .08	17-27	11-49	2.6-4.2	.2- .5	.0- .0	.3- .5	3.1-5.3	2-13
30-60	2	5.3-5.7	1.61-2.03	.03- .06	16-37	15-37	3.3-3.7	.4- .5	.0- .1	.3- .6	4.1-4.8	8- 8

Table 7. Chemical Properties of Group 7 Soils

Soil Depth	No. of observations	pH	Organic matter	Total nitrogen	C:N	Available P	Extractable cations					Ca:Mg
							Ca	Mg	Na	K	Total	
cm			--------Percent--------			ppm	----------meq/100 g----------					
						Means						
0- 15	1	4.9	8.85	0.19	27	26	5.8	1.0	0.0	0.9	7.7	6
15- 30	1	5.2	3.84	.10	22	20	3.0	.8	.0	.7	4.6	4
30- 60	1	5.3	1.52	.05	20	16	6.2	2.1	.0	.7	9.0	3
60- 90	1	5.0	.77	.06	8	21	15.7	4.0	.1	1.1	20.8	4
90-120	1	4.8	.83	.02	19	19	22.8	6.7	.2	.8	30.4	3

Table 8. Site Information

SRI Number	Analysis Group	Elevation	Parent Material	Ash Thickness	Depth to Restriction	Bedrock Bedrock	Location Sec	Township	Range	District District
6	1	4560	Ash/Residium	25 cm	51 cm	Basalt	4,	6S,	28E	Heppner
12		3280	Ash/Residium	5	51	Basalt	25,	9N,	40E	Pomeroy
23		4160	Residium (Pyro)*	--	125	Basalt	5,	7S,	31E	Dale
23		4320	Residium (Pyro)	--	51	Basalt	15,	7S,	25E	Heppner
6		4720	Ash/Residium	15	31	Basalt	3,	5S,	30E	Ukiah
7	2	4840	Volcanic Ash	51	66	Basalt	8,	4S,	33E	Ukiah
15		3600	Volcanic Ash	86	94	Lacustrine	13,	5N,	41E	Walla Walla
69	3	5120	Volcanic Ash	31	36	Basalt (Tuff)	21,	7S,	33E	Dale
69		4860	Volcanic Ash	51	91	Tuff	29,	6S,	34E	Ukiah
85		5200	Volcanic Ash	58	183	Tuffaceous Sandstone	35,	4S,	29E	Heppner
74		5640	Volcanic Ash	46	56	Andesite	2,	7S,	35E	Dale
10	4	4660	Volcanic Ash	64	140	Sedimentary	20,	4N,	39E	Walla Walla
15		4280	Volcanic Ash	66	244	Basalt (Pyro)	24,	1S,	37E	Pendleton
22		4640	Volcanic Ash	61	112	Basalt (Pyro)	9,	8S,	26E	Heppner
66		4960	Volcanic Ash	91	127	Tuff	4,	5S,	28E	Heppner
89		5080	Volcanic Ash	76	91	Basalt (Pyro)	24,	5S,	28E	Heppner
14	5	5240	Volcanic Ash	51	66	Basalt	35,	9N,	42E	Pomeroy
13	6	4560	Volcanic Ash	66	76	Breccia	1,	1S,	36E	Pendleton
21		5400	Volcanic Ash	51	76	Basalt	21,	6S,	38E	Ukiah
18	7	6000	Volcanic Ash	66	114	Basalt	29,	8N,	43E	Pomeroy

*Pyroclastics

Geology

The purpose of this section is to discuss the geology and the sequence of geologic events which have resulted in the present day land surface features. Emphasis is given to processes and interrelationships of the various geologic units rather than dwelling on the age of the units.

Geologic History

During the Paleozoic era the regional land masses were completely under the sea. This allowed great quantities of material to be deposited, building up layers of sediment. Changes within the universe and earth brought about volcanic activity and related uplifting of the mountainous areas. As the land mass began to rise, the sea water drained off. The Coast range, Cascade and Blue Mountain ranges were gradually and differentially elevated. These mountains formed dams, holding back waters in extensive lake depressions with interconnecting rivers. Volcanism continued with extensive lava flows and sediment buildup in the inland lakes. Within the eastern region, the uplifting drained the area except for the high inland lakes. Gradually the sea water was replaced with fresh water. Drainage continued with the lake outlets wearing down exposing the bedded materials to erosion.

Following the lake drainage, pre-tertiary sediments were dominant. Two named formations of sediment were reorganized. They are the Hudspeth and Cable Creek. The Hudspeth consists of marine mudstone, siltstone and thin sandstones. It is overlain by the Cable Creek which consists of fluvial-deltaic sandstones and conglomerates.

The earliest of the Tertiary rocks is the Clarno Formation. The widely known Formation had lower members of thick andesite flows with intercolated, varicolored tuffaceous sediments, and volcanic breccias. Upper members were andesite flows, mudflows, lacustrine and fluvial tuffaceous sediments. This period of volcanism spilled lava flows across the old land surface. Lava dammed the drainage systems, created lakes and ponds which caught—entrapped—lacustrine silts and clays, which are now members of the John Day Formation.

The John Day Formation consists of varicolored fluvial and lacustrine tuffs, sands and gravels. The Cascade volcanoes are the sources of much of this material with beds closest to the Cascades being deposited last. A typical description of the John Day Formation is "volcanism of volcanic ashes, tuffs and lava flows—aeolian deposition in or near lakes". During the same period, the Blue Mountains were uplifting with local drainage dammed with silt and clays deposited.

During the Miocene and Pliocene Epochs, the region was dominated by volcanism with extensive eruptions of lava. The Miocene Epoch can be characterized by being lava and more lava, i.e., the Columbia River Group of lava and tuffs. One exposure at Gibbon shows 2,500 feet of basalt.

The next Epoch, Pliocene, is a transition between volcanism of the Miocene and glaciation of Pleistocene. The Rattlesnake Formation contains erupted material and gravels from the Columbia River lava flows.

During the late Pliocene Epoch, weather patterns began to change with the North American Continent becoming much colder. There was continental glaciation from Canada pushing into northern Washington as well as local glaciers. Most notably, in the Greenhorn area and adjacent Elkhorn Mountains. Glacial deposits are common in this high country, with outwash deposits along Spring, Salmon and Lightning Creeks, the North Fork of the John Day River and Trail Creek.

During the Pleistocene Epoch, climate was warming and the northern continental ice flows were receding. There were many lava flows and plugs. The Blue Mountains were uplifting with many local cones and vents like Spring, Sugarloaf, Thimbleberry, and Green Mountains. Mt. Hood, Mt. Jefferson and the Three Sisters poured out ejecta and lava, which were entrapped in the lakes of the high plains.

There were ice dams along the Columbia River, in particular at The Dalles and Wallula. A slide at Bonneville that blocked the Columbia River was the result of a thick clay lens between the lava. Deposits of silt and clay have been found at about 1,200 feet above The Dalles. Glacial Lake Missoula, collapsed during this period also making temporary dams at The Dalles and Wallula. At Wallula, sediments were deposited in the Columbia Basin as hydraulic pressures dug a six-mile channel through the basalt. As the ice melted and landscape eroded, the Umatilla drained stripping off the gravels and lacustrine silts leaving the channeled scablands along the Umatilla in the Stanfield area.

Recently, there were aeolian and alluvial sediments which covered the basalts. Winds, dominant out of the southwest, eroded the lacustrine silts deposited in the Umatilla basin. Some of these silts may be found in the Northern Blue Mountains of Walla Walla and Pomeroy districts.

The most recent, major event and one that gave the Blue Mountains a blanket of volcanic ash, was the eruption and ultimate collapse of Mt. Mazama. This one event gave the region nearly two feet of volcanic ash. Ash from this event carried as far as eastern Montana.

Physiography

The Blue Mountains separate the Columbia Plateau Province on the north from the Basin and Range Province to the south. Overall, the Blue Mountains are an asymmetrical anticline with a steep north flank and a gentle south flank which merges with the high plateau country. Major rivers which bound the area are the Columbia, Lewis and Snake. The John Day River drains the central region. The parallel mountain systems have forced the rivers to flow north and south with many turns. The Blue Mountains formed the eastern and southern shores of the fresh water inland lakes. Sedimentary rock was covered with successive outflows of volcanic rock with subsequent erosion exposing the lacustrine deposits. This is most prevalent around the toe slopes of the Blue Mountains, with only minor exposures.

There are two structural features of the Blue Mountains, the east-west arch of the uplift and the north to northwest orientation of folds and faults which bisect the axis of the uplift. Regional deformation formed the Rieth Ridge and Blue Mountain anticlines with the Agency Syncline between the two. (Refer to the generalized Tectonic map in the Appendix.)

Pre-Tertiary intrusions of quartz diorite are overlain unconformably by thick lava deposits and continental sediments. This pre-Tertiary rock and Clarno Formation crop out only in the higher Blue Mountains. Metamorphism has been fairly intense and occurred primarily adjacent to the granitic batholiths. There are outcroppings of these diorites along the ridge crest of Heppner and Ukiah Districts. Associated with this, on both flanks, is the metavolcanic and metasedimentary rock. There are some diorites along the crest from Madison Butte to Arbuckle Mountain with very old associated metasediments. The area around Penland Lake and north to the crest contains deposits of a tuffaceous sandstone. A large batholith occurs in the central portion of the Ukiah-Dale area, similarly there are many metamorphic rocks surrounding this area. Vinegar Hill and Indian Rock is another intrusion. This area has another unique feature, that being the past presence of local glaciers and present glacial valleys. Salmon Creek is an excellent example. Most of the outwash material flowed north and east, masking the underlaying sedimentary rock.

Along the southern Blue Mountains, there is a considerable cap of Columbia River lava. However, the John Day Formation is exposed along the John Day River flank and northern slope. West end of Heppner district is mostly all pyroclastic rocks with exception of the plateau-like basalt cap. Tuffaceous deposits exist from the Notch to Tamarack Mountain and throughout Bologna Basin. These areas are not all inclusive because recent erosion has exposed inclusions of the soft rock.

The southwest portion of the Dale District contains many pyroclastic deposits which exist unconformably across the eroded landscape.

Desolation Creek, Turner Basin and Oriental Basin are old landslide deposits. There is a considerable mass of pyroclastic and metasediment in this complex land flow.

If more detailed information about the geology of the area is desired, the reader should consult the references.

Rock Type or Soil Parent Material	Internal and External Characteristics of Rock Types and Parent Material	Dominant Soil Characteristics
Surface Flow Volcanics Basalt Andesite Rhyolite	—Hard, dense, fine grained material. —Water bearing in the permeable zones at the top or bottom of scoriaceous and fractured basalt flows.	—Frost heave potential —Weathers predominantly clay —High base status and pH
Tuffaceous Sediments Pyroclastics	—Silt or sandy material as matrix —Some tuffs are highly permeable —Unstable —Weathers readily —Dark reddish brown to light buff colors	—Fine textures —Homogeneous weathered residues —Montmorillonite clays —Generally deep
Granites Grano-diorites	—Generally hard, light colored rock with generally convex slopes —Weather to rounded, hummocky land forms —Weathered material tends to be unstable	—Generally thin soils except for the more sheltered areas. —Weathers to predominantly to sandy material —Quartz dominates which is chemically inert —Kaolinite clays may be found on northern, humid aspects. —Generally high in potassium —Low pH, base saturation and nutrients
Tuffaceous Sandstones	—Break down rapidly with fluctuating temperature and water content —Silt and sand matrix —Bedded materials may include clay lenses	—Homogenous weathered residues —Montmorillonite clays in subsoils —Medium to coarse textured surface soils —Low pH, base saturation and nutrients
Glacial Outwash	—Heterogeneous and erratic in nature —Low compactability with boulders included —A mixture of varying amounts of boulders, cobbles, gravel and sand in a generally impervious matrix of fines. —Unstable when saturated —Reflects the composition of the material over which the glaciers passed.	—Coarse textured surface over stratified materials —High in potassium —Low pH and base saturation
Meta Morphic Serpentine Gneiss	—Flat, plate-like appearance —Moderate strengths except serpentine which is hard and fractured	—Frost heave potential —Weathers to coarse and medium textures except humid areas which may be fine texture. —High base status and pH —Generally thin soil mantle
Lacustrine	—Stratified sand, silt and clays —Low structural strength when saturated —Slumpy and unstable land forms	—High in organic matter —Lateral subsoil moisture —Generally deep —Plastic silts and clays
Volcanic Ash	—Usually medium textured —Light grey to very light yellow brown —20-30" over all parent rock types, deeper on northern aspects. —Young deposit (geologically) —Found on all positions	—Dark brown to brown surface soils —High water holding capacities —Low bulk density —High porosity —Frequently silt sized —High available plant moisture —High infiltration dates —Moderately fertile —Mod-low cation exchange capacity —Low in clay —High in siliceous materials

Glossary

Aeolian (eolian) - applied to the erosive action of the wind, and to deposits which are due to transporting action of the wind.

A-horizon - zone of eluviation. The uppermost zone in the soil profile, from which soluble salts and colloids have been leached, and in which organic matter has accumulated.

Alluvium - All detrital deposits resulting from the operations of modern rivers, thus including the sediments laid down in river beds, flood plains, lakes, fans at the foot of mountain slopes and estuaries.

Andesite - a volcanic rock composed essentially of andesine and one or more mafic constituents.

Anticlinal - inclined toward each other, as, the ridge tiles of the roof of a house.

Anticline - a fold that is convex upward or had such an attitude at some stage of development.

Arkosic sandstone - a sandstone dominated by feldspar.

Ash flow - an avalanche of volcanic ash, generally a highly heated mixture of volcanic gases and ash, traveling down the flanks of a volcano or along the surface of the ground and produced by the explosive disintegration of viscous lava in a volcanic crater or by the explosive emission of gas changed ash from a fissure or group of fissures.

Basalt - an extrusive rock composed primarily of calcic plagioclase and pyroxene, with or without olivine.

Basement - complex generally of igneous and metamorphic rocks, overlain unconformably by sedimentary strata.

Batholith - a body of intrusive rock, with the general characteristics of stocks, but of larger size than is generally attributed to stocks or bosses.

B-horizon - illuvial horizon. The lower soil zone which is enriched by the deposition or precipitation of material from the overlying zone or A-horizon.

Breccia - fragmental rock whose components are angular and therefore, as distinguished from conglomerates, are not waterworn.

Buried Soil - soil covered by an alluvial, loessial or other deposit, usually at a depth greater than the thickness of the solum.

C-horizon - a layer of unconsolidated material, relatively little affected by the influence of organisms and presumed to be similar in chemical, physical, and mineralogical composition to the material from which at least a portion of the overlying solum has developed.

Coarse Fragments - rock or mineral particles greater than 2.0mm in diameter.
Gravel - Up to 3 inches in diameter
Cobble - From 3 to 10 inch diameter
Stone - Greater than 10 inch diameter
Boulder - Greater than 24 inch diameter

Colluvium - a general term applied to loose and incoherent deposits, usually at the foot of a slope or cliff and brought there chiefly by gravity. Talus and cliff debris are included in such deposits.

Conglomerate - puddingstone.
1) rounded waterworn fragments of rocks or pebbles, cemented together by another mineral substance; 2) a cemented clastic rock containing rounded fragments.

Desertification - the creation of desert-like conditions where none had existed before. Is the result of either the vagaries of weather and climate or the mismanagement of the land or, as in most cases, some combination of both. This is the case in fragile ecosystems like those in arid and semi-arid regions.

Ejecta - material thrown out by a volcano, such as ash, lapilli, bombs.

Epoch - geologic time unit corresponding to a series, subdivision of a period.

Eustatic - pertaining to simultaneous, world-wide changes in sea level.

Extrusive rocks - applied to those igneous rocks derived from magmas or magmatic materials poured out or ejected at the earth's surface, as distinct from the intrusive or plutonic igneous rocks which have been injected into older rocks at depth without reaching the surface.

Fault - a fracture or fracture zone along which there has been displacement of the sides relative to one another parallel to the fracture.

Fissure - an extensive crack, break, or fracture in the rocks.

Fold - a bend in strata or any planar structure.

Geomorphology - that branch of both physiography and geology which deals with the form of the earth, the general configuration of its surface, and the changes that take place in the evolution of land forms.

Glacierization - the inundation of the land by ice.

Granite - a plutonic rock consisting essentially of alkalic feldspar and quartz.

Granodiorite - a plutonic rock consisting of quartz, calcic pligoclase or andesine, and orthoclase, with biotite, hornblende or pyroxene as mafic constituents.

Igneous - formed by solidification from a molten or partially molten state, one of the two great classes into which all rocks are divided, and contrasted with sedimentary.

Intercolate - to insert among others, as, a bed or stratum of lava between layers of other material; to interstratify.

Intrusive - having, while fluid, penetrated into or between other rock indicating that the igneous rock is younger.

Intrusive rock - a rock that consolidated from magma beneath the surface of the earth.

Lava - fluid rock such as that which issues from a volvano or a fissure in the earth's surface; also the same material solidified by cooling.

Loess - a sediment, commonly nonstratified and commonly unconsolidated, composed dominantly of silt size particles, ordinarily with accessory clay and sand, deposited primarily by the wind.

Metamorphism - process by which consolidated rocks are altered in composition, texture, or internal structure by conditions and forces not resulting simply from burial and the weight of subsequently accumulated overburden. Pressure, heat and the introduction of new chemical substances are the principal causes.

Metasediments - partly metamorphosed sedimentary rock.

Metavolcanic - partly metamorphosed volcanic rock.

Mudstone - a sedimentary rock, an indurated clay which includes clay, silt, siltstone, shale and argillite.

Plutonic series - series of different rocks that evolved from the same original material through various metamorphic stages until final crystallization closed.

Province - a large area or region unified in some way and considered as a whole.

Pumice - an excessively cellular, glassy lava, generally of the composition of rhyolite.

Pyroclastic - a general term applied to detrital volcanic materials that have been explosively or aerially ejected from a volcanic vent. (detrital - minererals occurring in sedimentary rock, which were derived from pre-existing igneous, sedimentary or metamorphic rocks.)

Residual material - unconsolidated and partly weathered mineral material accumulated by disintegration of consolidated rock in place.

Residual Soil - a soil formed from, or resting on, consolidated rock of the same kind as that from which it was formed, and in the same location.

Sandstone - a cemented or otherwise compacted detrital sediment composed predominantly of quartz grains, the grades of the latter being those of sand.

Sedimentary - rocks formed by sediment especially clastic rocks, as conglomerate, sandstone, and shales, formed of fragments of other rock transported from their sources and deposited in water.

Serpentine - $Mg_3 Si_2 O_5 (OH)_4$ includes two distinct minerals, antigorite and chrysotile.

Siltstone - a very fine-grained consolidated clastic rock composed predominantly of particles of silt grade.

Soil creep - slow movement of rock fragments down even, gentle slopes.

Soil Depths -
0-10 inches - Very shallow
10-20 inches - Shallow
20-40 inches - Moderately deep
40-60 inches - Deep
60+ inches - Very deep

Solum - the upper part of the soil profile above the parent material, in which the processes of soil formation are taking place; the A and B horizons.

Streams -
youthful stream - is vigorous, rushing wildly down the mountain, cutting narrow steep sided canyons
middle aged - side erosion has widened the canyon and the meandering river has flattened the canyon floor
old age - meandered back and forth, widening the canyon into a valley, valley floor is flat with oxbows

Subsoil - the lower most part of the soil. Frequently designated as the B and C horizons.

Surface soil - the uppermost part of the soil, ordinarily moved in tillage, or its equivalent in uncultivated soils. Frequently, designated as the A-horizon.

Syncline - a fold in rocks in which the strata dip inward from both sides toward the axis.
ANT: Anticline

Texture - Relative proportions of sand, silt and clay.

Modifiers - Non-gravelly to slightly gravelly—0-15%

Modifiers - Non-gravelly to slightly gravelly—0.15% gravel by volume
- Gravelly—15-33% gravel by volume
- Very gravelly — greater than 35% gravel by volume

Tuff - a rock formed of compacted volcanic fragments, generally smaller than 4mm in diameter.

Unconformable - having the relation of unconformity to the underlying rocks; not succeeding the underlying strata in immediate order of age and in parallel position.

Uplift - elevation of any extensive part of the earth's surface relative to some other parts.

Volcanic ash - uncemented pyroclastic material consisting of fragments mostly under 4mm in diameter. Coarse ash is from ¼ to 4mm in grain size; fine ash is less than ¼ mm.

Volcanism; vulcanism - volcanic power or activity; volcanicity. All natural processes resulting in the formations of volcanoes, volcanic rocks, lava flows, etc.

Welded tuff - a tuff which has been indurated by the combined action of the heat retained by the particles and the enveloping hot gases.

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Climate

The climate of the survey area is temperate and semi-arid, although wide variations in temperature and precipitation occur between the lower and higher parts. Climate is of the continental type, with considerable daily and yearly temperature ranges. Relative humidity for the year is low. The summers are warm and a few days have temperatures above 100°F., but these hotter periods are not oppressive because of the low humidity. At the lower elevations, winters are comparatively mild, although freezing temperatures are common throughout December, January and February. Temperatures of 20° below zero or lower have been recorded at Pendleton. At higher elevations, winter weather is more severe and much lower temperatures for longer periods of time are encountered. At Meacham, a temperature of 51° F. below zero was recorded in 1933. Precipitation averages 20 inches in the lower elevations and about 55 inches at higher elevations. Precipitation occurs mostly in fall, winter and spring. Summers are dry.

Precipitation

Approximately 55 to 65 percent of the annual total precipitation occurs in the five month period between November and March and only about 8 to 12 percent falls during the June through August period. Yearly totals rise sharply with increase in elevation, but totals for the upper slopes of the Blue Mountains are less than the total precipitation for the Cascade's upper slopes. Annual totals for the Cascades range from 60-80 inches, while totals for the Blue Mountains range between 40-55 inches. The upper Blue Mountains' snowfall averages about 100 inches annually. In contrast, in the lowest elevation areas, the totals average between 12 and 20 inches annually.

Temperature

During the winter months, frigid Arctic air masses form over northern and central Canada. Most of the time, the masses are blocked out of the Columbia Basin by the Rocky Mountains. Occasionally, however, an Arctic air mass breaks over the mountains and spills into the Columbia Basin causing extreme winter conditions. During these periods, temperatures as low as -25° F. may occur. A minimum of -54°F. has occurred at Ukiah, Oregon. Average winter temperature (December, January and February) at Weston, Oregon (1,800 feet) is 33.4° F. At Meacham (5,400 feet) average winter temperature is 28.3° F.

In summer, as the ground heats more rapidly, the temperature of the eastward moving air increases. Occasionally, high pressure cells pass over the area, causing very hot and dry conditions. At these times, temperatures may go well over 100° F. throughout the Columbia Basin. A record high of 119° F. has been recorded at Pendleton, Oregon. Temperatures cool rapidly with increasing elevation. At 4,000 feet, daily mid-summer high temperatures rarely reach 90° F. Average summer temperature (June, July and August) at Weston, is 67.1° F. At Meacham, average summer temperature is 59.6° F.

Precipitation Summary of Storage Precipitation Gauges Umatilla Barometer Watershed

Station	Elevation	Period of Record *	Number of Years	Average Precipitation	Low Year	High Year
Andies Prairie	5,080	68-75	6	53.91	40.11	62.01
English Spring	5,050	68-75	7	49.93	38.42	60.55
Goodman	5,040	72-75	3	46.50	32.20	56.95
High Ridge #2	4,840	67-69	3	50.07	46.54	56.11
Buck Mountain	4,650	72-75	4	50.11	29.31	64.42
Bobsled	4,630	69-75	4	52.46	47.20	61.82
Round Mountain	4,600	68-70	3	32.42	27.80	36.00
Shimmiehorn	4,540	68-75	8	42.44	25.42	54.88
Ruckel	4,480	72-75	3	45.70	34.85	56.31
Ninemile	4,280	69-70	2	53.68	52.00	55.35
Stumbaugh	4,060	68-70	3	26.00	22.65	28.95
Powder Creek	2,600	67-75	8	35.48	27.51	51.15

*Yearly records published in "Surface Water Records and Precipitation Records of Oregon", by the State Engineer.

Umatilla National Forest Precipitation Stations

Station	Elevation	Average Annual Precipitation Inches
Greenhorn	6,300	43.4
Arbuckle Lookout	5,970	40.7
Olive Lake	5,937	32.8
Spruce Springs	5,720	43.8
Spout Springs	5,600	65.8
Arbuckle (N. Jones)	5,400	29.0
Jenifer #1	5,400	38.2
Camp	5,300	28.8
Snowboard	5,110	20.5
Tipton	5,100	26.2+
Andies Prairie	5,080	53.9
English Spring	5,050	49.9
Lucky Strike	5,050	28.9
Goodman	5,040	46.5
Goodman	5,000	45.6
Park	5,000	27.1
Granite	4,939	27.1
Rocky Ridge	4,900	49.2
High Ridge	4,900	56.6
Tollgate	4,890	52.2
High Ridge #2	4,840	50.1
County Line	4,800	22.2
Buck Mountain	4,650	50.1
Bobsled	4,630	52.5
Round Mountain	4,600	32.4
Shimmiehorn	4,540	42.4
Ruckel	4,480	45.7
Zig Zag	4,400	51.8
Tupper	4,300	23.0
Ninemile	4,280	53.7
Blue Mountain Sawmill	4,240	43.7
Cress	4,200	23.4
Stumbaugh	4,060	26.0
Meacham	4,050	33.9
Troy	4,000	34.4
Touchet Ridge	3,600	36.6
Anatone	3,570	22.8
Starkey	3,400	18.0
Ukiah	3,300	18.2
Weston 5	3,230	27.2
Elgin	2,670	23.4
Powder Creek	2,600	35.5
Corporation	2,400	42.0
Walla Walla 13	2,400	42.9
Dixie	2,350	26.9
Duncan	2,310	36.6
Gibbon	2,000	29.1
Mill Creek	2,000	39.2
Monument	1,990	11.1
Heppner	1,950	13.3
Pomeroy	1,900	17.1
Milton 6 SE	1,800	23.6
Spray	1,700	14.2
Pilot Rock	1,697	14.0
Pendleton	1,492	12.4

Summary of Recording Climatic Stations for the Umatilla Barometer Watershed

Station	Elevation Feet	Period of Record	Years of Record	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Water Year Total	Total 10-1 to 5-31	Total 6-1 to 9-30	Record Low Year	Record High Year
				AVERAGE PRECIPITATION IN INCHES																
Spout Springs	5,600	68-72	5	5.6	6.0	11.2	12.6	7.0	5.7	5.9	2.9	3.0	1.0	1.3	3.6	65.8	56.9	8.9	61.0	71.6
Goodman	5,000	67-71	5	4.3	4.4	6.9	8.1	3.7	2.9	3.1	2.5	3.5	.4	.9	2.2	42.9	35.9	7.0	37.7	45.6
High Ridge	4,900	68-75	8	4.1	7.0	10.6	9.5	5.4	5.3	5.1	2.5	2.4	.9	1.0	2.8	56.6	49.5	7.1	28.8	74.9
Rucky Ridge	4,900	72-75	4	2.3	7.4	10.5	8.2	6.0	4.8	3.1	2.0	1.6	1.1	.8	1.4	49.2	44.3	4.9	33.2	71.2
Zig Zag	4,400	73-75	3	2.2	7.0	9.4	6.7	3.7	3.3	4.6	2.2	2.4	5.0	1.5	1.8	51.8	41.1	10.7	43.5	62.0
Corporation	2,400	66-75	10	2.9	4.8	7.8	6.9	4.0	3.8	4.0	2.0	2.4	.5	.9	2.0	42.0	36.2	5.8	34.8	52.6

Mean Temperature

	Elev.	J	F	M	A	M	J	J	A	S	O	N	D	Ann.
Elgin	2670	29.7	33.3	37.7	46.6	53.3	59.5	67.2	64.2	58.4	48.7	36.9	32.5	47.3
Granite	4939	21.4	24.6	28.2	37.4	45.0	51.3	59.1	56.7	51.7	42.6	30.4	24.0	39.4
Heppner	1950	33.3	37.7	41.3	48.3	54.8	61.0	68.2	66.2	61.1	51.5	40.5	35.9	50.0
Meacham	4050	27.0	29.9	32.4	40.6	47.8	54.1	64.4	61.6	56.5	46.5	34.6	30.1	43.8
Ukiah	3300	25.6	30.2	34.6	42.8	49.1	54.6	61.8	59.0	54.3	45.5	34.5	29.2	43.4
Walla Walla	2400	29.2	33.6	38.0	46.4	53.2	58.2	65.4	62.8	57.3	47.6	35.3	31.6	46.6
Weston	1800	31.6	34.7	42.5	49.7	56.1	62.1	70.0	69.3	60.6	51.2	40.6	34.0	50.2
Corporation C.G.	2400	31.0	35.0	40.0	44.0	54.0	61.0	65.0	66.0	60.0	49.0	38.0	33.0	48.0

Total Precipitation

	Elev.	J	F	M	A	M	J	J	A	S	O	N	D	Ann.
Elgin	2670	3.07	2.37	2.40	1.72	2.08	1.42	.52	.69	1.06	2.23	2.87	3.06	23.49
Granite	4939	3.81	3.05	2.85	1.96	2.73	1.82	.72	.65	.94	1.85	2.67	3.84	26.89
Heppner	1950	1.47	1.19	1.49	1.06	1.80	1.24	.26	.54	.61	1.21	1.28	1.44	13.59
Meacham	4050	4.22	3.22	3.02	2.55	2.72	1.99	.40	.81	1.41	2.70	3.58	4.48	31.10
Ukiah	3300	1.91	1.76	1.72	1.52	1.89	1.99	.44	.52	.93	1.50	1.79	2.20	18.17
Walla Walla	2400	5.26	4.63	4.28	3.44	2.94	2.93	.66	.76	2.03	4.28	5.34	6.36	42.91
Weston	1800	2.35	2.26	2.46	1.90	1.99	1.33	.42	.65	1.30	1.76	2.75	2.34	21.51

Mapping Unit Legend

Surface Flow Volcanics—Basalts, Andesites, Rhyolite

Unit	Complex	Slope	Components			Aspect	Depth	Profile	Plant Community
1		2-20%				All	10-20"	Residual	Bluegrass, scabland, Bunchgrass, shallow soil Low sagebrush, bunchgrass
	012		50% - 1	50% - 2					
	013		40% - 1	40% - 3	20% - 4				
	014		60% - 1	30% - 4	10% - 3, 6				
2		2-10%				All	14-24"	Ash Residual	Bunchgrass, deep soil
	024		50% - 2	50% - 4					
	029		50% - 2	50% - 9					
3		2-35%				Southern	10-20"	Residual	Juniper, sage Bluegrass, scabland Bitterbrush, bunchgrass Curlleaf mountain mahogany
	034		60% - 3	40% - 4					
4		2-30%				Southern	10-20"	Residual	Ponderosa pine, wheat grass Ponderosa pine, fescue
	041		50% - 4	40% - 1, 3					
	043		50% - 4	40% - 3	10% - 6				
	046		60% - 4	40% - 6, 3					
	413		50% - 4	50% - 13, 9, 17					
5		25-55%				Southern	10-30"	Residual	Bunchgrass, shallow soil Bunchgrass, deep soil Curlleaf mountain mahogany Juniper, bunchgrass, sage
	512		50% - 5	30% - 12	20% - 91				
	524		50% - 5	40% - 24	10% - 91				
	547		50% - 5	30% - 47	20% - 91, 94				
	567		40% - 5	30% - 68	30% - 77, 91				
6		1-35%				Southern	14-30"	Residual	Ponderosa pine - Douglas fir, elk sedge Mixed conifer, pinegrass
	064		50% - 6	30% - 4	20% - 3, 7				
7		5-35%				Northern	20-40"	Ash Residual	Mixed conifer, pinegrass, ash soil Pine, Douglas fir, elk sedge Lodgepole, pinegrass, grouse huckleberry
	076		50% - 7	40% - 6	10% - 4				
	376		40% - 7	40% - 6	20% - 31, 39				
8		25-55%				Southern	10-20"	Residual Colluvial	Ponderosa pine, fescue Pine, Douglas fir, elk sedge Mixed conifer, pine grass, residual soil
	085		50% - 8	30% - 5	20% - 91				
	812		50% - 8	40% - 12	10% - 5, 91				
9		2-15%				All	10-20"	Residual	Bluegrass, scabland Moist meadow Dry meadow Bunchgrass on shallow soil
10		1-30%				Northern	40-120"+	Ash Residual	White fir, twin flower, forb White fir, huckleberry Lodgepole, huckleberry
	310		40% - 10	30% - 15	30% - 315, 30				
11		25-60%				Northern	40-120"+	Ash Colluvial	White fir, twin flower, forb White fir, huckleberry
	114		50% - 11	40% - 14	10% - 91, 92				
	311		40% - 11	40% - 14	20% - 19, 30, 39				
12		25-65%				Eastern Western	18-50"	Ash Colluvial	Mixed conifer, pinegrass, ash soil Mixed conifer, pinegrass, residual
	124		50% - 12	45% - 14	5% - 91				
	128		40% - 12	40% - 8	20% - 5, 91				
	129		40% - 12	40% - 91, 5	20% - 8				
	312		40% - 12	40% - 8	20% - 30, 39, 315				
13		1-35%				All	30-50"	Ash Residual	White fir, twinflower, forb White fir, huckleberry
	130		50% - 13	40% - 10	10% - 31, 16				
	133		50% - 13	40% - 3	10% - 17				
	135		50% - 13	50% - 15					
	138		50% - 13	50% - 18					
	139		50% - 13	40% - 9	10% - 17				
	313		40% - 13	30% - 17	30% - 31. 39				

Surface Flow Volcanics—Basalts, Andesites, Rhyolite

Unit	Complex	Slope	Components			Aspect	Depth	Profile	Plant Community
14		25-60%				Northern	40-60″	Ash Colluvial	White fir, twinflower, forb White fir, huckleberry White fir, grouse huckleberry
	141		50% - 14	40% - 19	10% - 91				
	149		50% - 14	30% - 91	20% - 12, 19				
	314		40% - 14	40% - 19, 12	20% - 31, 39				
15		2-25%				Northern	40-50″	Ash Residual	White fir, grouse huckleberry Lodgepole, grouse huckleberry Sub-alpine fir, huckleberry
	158		50% - 15	40% - 18	10% - 10				
	159		50% - 15	30% - 9	20% - 16, 17, 18				
	315		40% - 15	40% - 16, 18	20% - 31, 39				
	351		40% - 15	30% - 10	30% - 315				
16		1-35%				All	22-40″	Ash Residual	Lodgepole, pinegrass, grouse huckleberry Lodgepole, grouse huckleberry
	163		50% - 16	50% - 13					
	165		50% - 16	50% - 15					
	166		50% - 16	40% - 6	10% - 4				
17		5-30%				Southern	20-30″	Residual	Ponderosa pine, fescue Ponderosa pine, Douglas fir, elk sedge Lodgepole, pinegrass, grouse huckleberry Mixed conifer, pinegrass
	173		50% - 17	40% - 13	10% - 9, 4				
	174		50% - 17	30% - 4	20% - 3				
18		2-25%				All	20-40″	Ash Residual	Sub-alpine fir, big huckleberry White fir, grouse huckleberry Sub-alpine fir, grouse huckleberry Lodgepole, grouse huckleberry
	180		50% - 18	50% - 10					
	189		40% - 18	40% - 9	20% - 17				
19		25-65%				East West	20-60″	Ash colluvium	Sub-alpine fir, huckleberry White fir, grouse huckleberry Sub-alpine fir, grouse huckleberry
	191		50% - 19	40% - 11	10% - 91				
	194		50% - 19	40% - 14	10% - 91				
	199		50% - 19	40% - 91	10% - 20,14				
20		30-60%				Southern	15-40″	Residual colluvial	Ponderosa pine, Douglas fir, sedge Lodgepole, pinegrass, grouse huckleberry Sub-alpine fir, white bark pine, sedge Sub-alpine fir, grouse huckleberry
	201		50% - 20	35% - 12	15% - 91				
	209		40% - 20	40% - 19	20% - 91				
	211		50% - 20	40% - 11	10% - 12				
	291		50% - 20	40% - 91	10% - 19, 12				

Pyroclastics and Breccias With Surface Flow Volcanics

Unit	Complex	Slope	Components			Aspect	Depth	Profile	Plant Community
21		2-30%				Northern	40-80″+	Ash Residual	Mixed conifer, pine grass, ash soil White fir, twinflower, forb White fir, huckleberry Lodgepole, pinegrass, grouse huckleberry
	212		50% - 21	40% - 23	10% - 3, 4				
	213		40% - 21	40% - 3, 4	20% - 23				
	321		40% - 21	40% - 23	20% - 30, 31, 39				
22		25-60%				Northern	30-60″+	Ash colluvial	White fir, twinflower, forb White fir, huckleberry Mixed, conifer, pinegrass, ash soil
	224		50% - 22	40% - 24	10% - 91				
	229		50% - 22	40% - 91, 5	10% - 24				
	322		50% - 22	30% - 24	20% - 321				
23		2-30%				Southern	20-40″	Residual	Ponderosa pine, Douglas fir, elk sedge Ponderosa pine, fescue Mixed conifer, pinegrass, residual soil
	231		50% - 23	40% - 21	10% - 3, 4				
	233		40% - 23	30% - 31	30% - 3, 4				
	234		50% - 23	30% - 4	20% - 3				
	323		50% - 23	20% - 39	20% - 4 10%-321				

Unit	Complex	Slope	Components				Aspect	Depth	Profile	Plant Community
24		30-65%					Southern	20-40"	Colluvial	Mixed conifer, pinegrass, residual soil Ponderosa pine, Douglas fir, elk sedge Ponderosa pine, fescue Ponderosa pine, wheat grass
	242		50% - 24	30% - 22	10% - 91	10% - 5, 77				
	245		50% - 24	40% - 5	10% - 91					
	249		50% - 24	30% - 91	20% - 5					
	324		40% - 24	30% - 22	20% - 323	10% - 91				
26		5-30%					Southern	20-30"	Residual	Mixed conifer, pinegrass, residual soil Ponderosa pine, Douglas fir, elk sedge Mixed conifer, pinegrass, ash soil

Alluvials

Unit	Complex	Slope	Components	Aspect	Depth	Profile	Plant Community
30		1-6%		All	30-60" +	Alluvial	Dry meadow, moist meadow, wet meadow Quaking aspen meadow
31		1-6%		All	20-30"	Alluvial	Dry meadow, moist meadow, wet meadow Quaking aspen meadow
34		0-5%		All	20-40"	Residual Alluvial	Moist meadow, wet meadow Quaking aspen meadow
39		1-5%		All	20-120"	Alluvial	Moist meadow, quaking aspen meadow

Glacial Drift — Granite, Granodiorite

Unit	Complex	Slope	Components			Aspect	Depth	Profile	Plant Community
40		2-20%				All	20-30"	Residual	Alpine sage brush Sub-alpine fir, white bark pine, sedge Alpine fleece flower Alpine sedge
	441		40% - 40	40% - 41	20% - 93, 94				
41		5-30%				Northern	30-140"+	Ash Residual	Sub-alpine fir, grouse huckleberry Sub-alpine fir, white bark pine, sedge White fir, grouse huckleberry Lodgepole, grouse huckleberry
	419		40% - 41	40% - 66	20% - 69, 49				
	449		50% - 41	50% - 49					
	472		50% - 41	30% - 72	20% - 66				
42		30-70%				Northern	30-120" +	Ash Residual	Sub-alpine fir, grouse huckleberry White fir, grouse huckleberry Sub-alpine fir, white bark pine, sedge
	427		50% - 42	40% - 67	10% - 94				
	451		50% - 42	40% - 51	10% - 93, 94				
43		30-70%				Southern	30-60"	Residual Colluvial	Mixed conifer, pinegrass, residual soil Lodgepole, pinegrass, grouse huckleberry Ponderosa pine, Douglas fir, elk sedge
	437		50% - 43	40% - 47	10% - 93				

Meta Volcanics and Meta Sediments

Unit	Complex	Slope	Components				Aspect	Depth	Profile	Plant Community
46		2-35%					Southern	20-30"	Residual	Mixed conifer, pinegrass, residual soil Ponderosa pine, Douglas fir, elk sedge Lodgepole, pinegrass, grouse huckleberry
	346		40% - 46	30% - 47	20% - 321	10%-3				
	463		50% - 46	40% - 3	10% - 91					
	466		50% - 46	25% - 66	25% - 69					
	469		40% - 46	40% - 49	20% - 3					
47		25-60%					Southern	20-30"	Residual Colluvial	Mixed conifer, pinegrass, residual soil Ponderosa pine, Douglas fir, elk sedge Ponderosa pine, fescue Lodgepole, pinegrass, grouse huckleberry
	473		60% - 47	30% - 3, 5	10% - 94					
	475		50% - 47	30% - 57	10%-5	10% - 93, 94				
	476		50% - 47	40% - 68	10% - 77, 92, 94					
	479		50% - 47	30% - 94	20% - 77					
48		20-60%					Northern	30-44"	Ash residual	White fir, grouse huckleberry Lodgepole, huckleberry
	348		40% - 48	40% - 47	20% - 30, 31, 322					
	442		50% - 48	50% - 42						
	486		40% - 48	40% - 67	20% - 92, 94					
	487		40% - 48	40% - 47	20% - 94					
	489		40% - 48	40% - 94	20% - 47, 5					
49		2-35%					Northern	20-40"	Ash Residual	White fir, grouse huckleberry Lodgepole, huckleberry Lodgepole, grouse huckleberry
	496		50% - 49	40% - 66	10% - 30					

Meta Volcanics and Meta Sediments—High Elevation

Unit	Complex	Slope	Components			Aspect	Depth	Profile	Plant Community
50		30-65%				Southern	10-20''	Colluvial	Sub-alpine fir, white bark pine, sedge Alpine fescue, sage Ponderosa pine, Douglas fir, elk sedge
51		25-60%				Northern	20-50''	Ash Colluvial	Sub-alpine fir, whitebark pine, sedge Sub-alpine fir, grouse huckleberry White fir, grouse huckleberry Lodgepole, grouse huckleberry
	519		50% - 51	40% - 94	10% - 42				
52		2-15%				All	10-20''	Residual	Alpine, fleece flower Alpine, sagebrush Alpine, fescue
53		5-30%				Eastern Western	20-30''	Ash Residual	Sub-alpine fir, whitebark pine, sedge Sub-alpine fir, grouse huckleberry Alpine sagebrush

Granite — Granodiorites

Unit	Complex	Slope	Components			Aspect	Depth	Profile	Plant Community
56		2-35%				Southern	30-60''	Residual	Ponderosa pine, Douglas fir, elk sedge Ponderosa pine, fescue Mixed conifer, pinegrass, residual soil
	568		50% - 56	50% - 88					
57		25-60%				Eastern Western	30-60''	Ash Residual	Mixed conifer, pinegrass, ash soil Ponderosa pine, Douglas fir, nine bark Ponderosa pine, Douglas fir, elk sedge
	576		50% - 57	40% - 60	10% - 93				
58		25-70%				Northern	50-80''	Ash Residual	White fir, huckleberry White fir, twin flower, forb Mixed conifer, pinegrass, ash soil
	584		50% - 58	50% - 84					
59		40-70%				Southern	4-12''	Residual	Juniper, stiff sage, scabland Ponderosa pine, wheatgrass Ponderosa pine, fescue
	593		50% - 59	50% - 93					
	596		50% - 59	30% - 60	20% - 93				
60		30-70%				Southern	30-40''	Residual	Ponderosa pine, Douglas fir, elk sedge Mixed conifer, pinegrass, residual Ponderosa pine, fescue
	657		50% - 60	30% - 57	20% - 93				
	659		50% - 60	30% - 59	20% - 93				

Tuffaceous Sediments—Pyroclastics

Unit	Complex	Slope	Components			Aspect	Depth	Profile	Plant Community
66		5-35%				Northern	30-60"	Ash Residual	Mixed conifer, pinegrass, ash soil White fir, huckleberry White fir, twinflower, forb
	366		40% - 66	30% - 69	30% - 30, 39				
	662		50% - 66	50% - 72					
	669		50% - 66	50% - 69					
	674		50% - 66	30% - 74	20% - 73				
	675		50% - 66	50% - 75					
	697		40% - 66	30% - 69	30% - 70				
67		25-65%				Northern	40-100"	Ash Colluvial	White fir, twin flower, forb White fir, huckleberry Mixed conifer, pinegrass, ash soil White fir, grouse huckleberry
	367		40% - 67	30% - 68	20% - 30, 39, 366	10% - 91, 92			
	672		45% - 67	45% - 22	10% - 91, 92				
	678		40% - 67	40% - 68	20% - 91, 92				
	748		45% - 67	45% - 48	10% - 92, 94				
68		25-65%				Southern	40-100"	Residual Colluvial	Mixed conifer pinegrass, residual soil Ponderosa pine, Douglas fir, elk sedge Ponderosa pine, fescue Lodgepole pinegrass, grouse huckleberry
	677		50% - 68	30% - 77	20% - 92				
	684		40% - 68	30% - 24	20% - 5	10% - 91, 92			
	689		50% - 68	40% - 92, 91, 94	10% - 77, 24				
69		5-35%				Southern	30-60"+	Residual	Mixed conifer, pinegrass, residual Ponderosa pine, Douglas fir, elk sedge Ponderosa pine, fescue Ponderosa pine, wheatgrass
	693		50% - 69	40% - 73	10% - 4				
70		2-20%				All	30-60"+	Residual	Bunchgrass on deep soil Ponderosa pine, fescue Ponderosa pine, blue wildrye
71		2-30%				Southern	40-120"	Residual	Lodgepole, pinegrass, grouse huckleberry Ponderosa pine, Douglas fir, elk sedge Mixed conifer, pinegrass, residual soil
72		2-30%				Northern	40-120"	Ash Residual	Lodgepole, pinegrass, grouse huckleberry Lodgepole, grouse huckleberry Lodgepole, big huckleberry White fir, grouse huckleberry
73		2-35%				All	10-20"	Residual	Bunchgrass, shallow soil Curlleaf, mountain mahogany Juniper, bunchgrass, scabland Ponderosa pine, wheatgrass
	373		40% - 73	30% - 30	30% - 70				Lodgepole, grouse huckleberry
	730		50% - 73	50% - 70					
	738		50% - 73	50% - 88					
74		2-35%				Northern	30-70"	Ash Residual	White fir, twinflower, forb White fir, huckleberry Mixed conifer, pinegrass, ash soil Lodgepole, pinegrass, grouse huckleberry
	743		50% - 74	40% - 73	10% - 91, 92				
	746		50% - 74	40% - 46	10% - 73, 81				
75		2-30%				All	40-100"+	Ash Residual	Mixed conifer, pinegrass, ash soil Ponderosa pine, Douglas fir, elk sedge
76		25-60%				Northern	40-120"+	Ash Colluvial	White fir, huckleberry White fir, grouse huckleberry Lodgepole, Huckleberry
	767		40% - 76	40% - 67	20% - 91, 92				
77		25-60%				Southern	10-20"	Residual	Juniper, bunchgrass Curl leaf, mountain mahogany Ponderosa pine, fescue Ponderosa pine, Douglas fir, fescue

Tuffaceous Sandstones

Unit	Complex	Slope	Components			Aspect	Depth	Profile	Plant Community
80		25-60%				Southern	10-20"	Colluvial	Ponderosa pine, Douglas fir, elk sedge Mixed conifer, pinegrass, residual soil Ponderosa pine, wheatgrass Ponderosa pine, fescue
	877		40% - 80	30% - 77	30% - 91, 92				
	895		40% - 80	30% - 95	30% - 77				
81		2-20%				All	30-50"	Ash Residual	White fir, grouse huckleberry Lodgepole, big huckleberry Lodgepole, pinegrass, grouse huckleberry
	818		50% - 81	50% - 88					
82		2-10%				All	30-60"+	Ash Residual	Lodgepole, grouse huckleberry White fir, grouse huckleberry
	382		40% - 82	30% - 30	30% - 87				Sub-alpine fir, grouse huckleberry
83		2-35%				All	30-50"	Ash Residual	Lodgepole, pinegrass, grouse huckleberry Mixed conifer, pinegrass, ash soil
84		25-60%				Northern	14-40"	Ash Colluvial	White fir, huckleberry White fir, grouse huckleberry Lodgepole, huckleberry
	848		40% - 84	40% - 80	20% - 95				
	891		60% - 84	40% - 91, 95					
85		5-35%				Northern	40-60"+	Ash Residual	White fir, grouse huckleberry White fir, huckleberry Lodgepole, huckleberry
	869		40% - 85	40% - 69	20% - 89				
86		2-30%				All	30-60"+	Ash Residual	Lodgepole, pinegrass, grouse huckleberry Lodgepole, big huckleberry
87		2-30%				East West	40-60"+	Ash Residual	White fir, grouse huckleberry Lodgepole, big huckleberry White fir, huckleberry Lodgepole, grouse huckleberry
	872		50% - 87	50% - 82					
88		2-35%				Southern	20-30"+	Ash Residual	Lodgepole, pinegrass, grouse huckleberry Lodgepole, big huckleberry Lodgepole, grouse huckleberry
	853		40% - 88	30% - 83	20% - 85 10% - 95				
	867		40% - 88	30% - 86	30% - 87				
	894		40% - 88	40% - 89	20% - 4				
89		5-40%				All	30-50"+	Ash Residual	White fir, grouse huckleberry Mixed conifer, pinegrass, ash soil White fir, huckleberry

Miscellaneous Land Types

Unit	Complex	Components		
90		Alluvial Bottom Lands — Dredged		
91		Volcanics — Basalts, Andesites		
	900	60% - 91, 92	30% - 12	10% - 5, 11, 14, 312
	911	50% - 91	40% - 11	10% - 12, 14, 19
	912	50% - 91	40% - 12	10% - 14, 19, 20
	914	50% - 91	30% - 14	20% - 12
	915	40% - 91	40% - 5	20% - 8, 12, 19, 20, 24
	918	50% - 91	30% - 8	20% - 12
	919	60% - 91	30% - 19	10% - 20
	920	50% - 91	30% - 20	20% - 5
	922	60% - 91	30% - 22	10% - 24
	924	50% - 91	30% - 24	20% - 5
	991	50% - 91	50% - 9	
92		Tuffaceous Sediments, Pyroclastics		
	925	40% - 92	40% - 5	20% - 77
	927	50% - 92	40% - 67	10% - 68
	928	50% - 92	40% - 68	10% - 77
	997	50% - 92, 91	50% - 77, 5	
93		Granite, Granodiorites		
	935	50% - 93	50% - 50	
	958	50% - 93	50% - 58	
	960	40% - 93	30% - 60	30% - 59
94		Metamorphic Rock — Sedimentary, Volcanic		
	947	40% - 94	40% - 47	20% - 5
	948	50% - 94	30% - 48	20% - 47, 5
	951	50% - 94	50% - 51	
95		Tuffaceous Sandstone		

Users Note

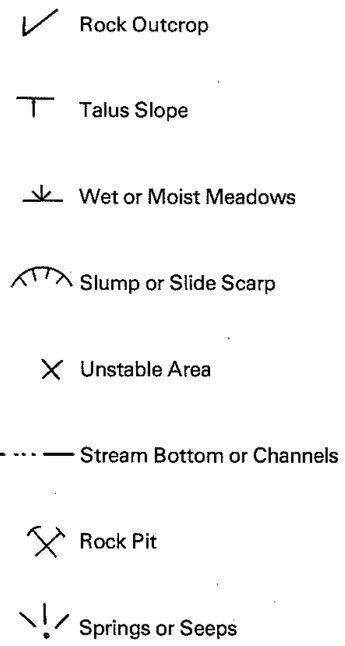
This soil inventory has been prepared on high elevation photos of scale approximately one inch per mile. Photography is nonrectified, thus, there is image distortion along the edges. Therefore, in some instances, the mapping units may not match because this distortion has left gaps or overlap with the adjacent photo. In some instances, reproduction is limited to the low quality of the original negative.

Mapping Unit Complexes

These are mapping units, designated by three digits, made up of two or more defined landtypes which exist in a relationship too complex to be delineated at this scale of photography.

Complex units may be generally managed as a whole, therefore, interpretations have been made on the most limiting factors of the complex.

Spot Symbol Legend



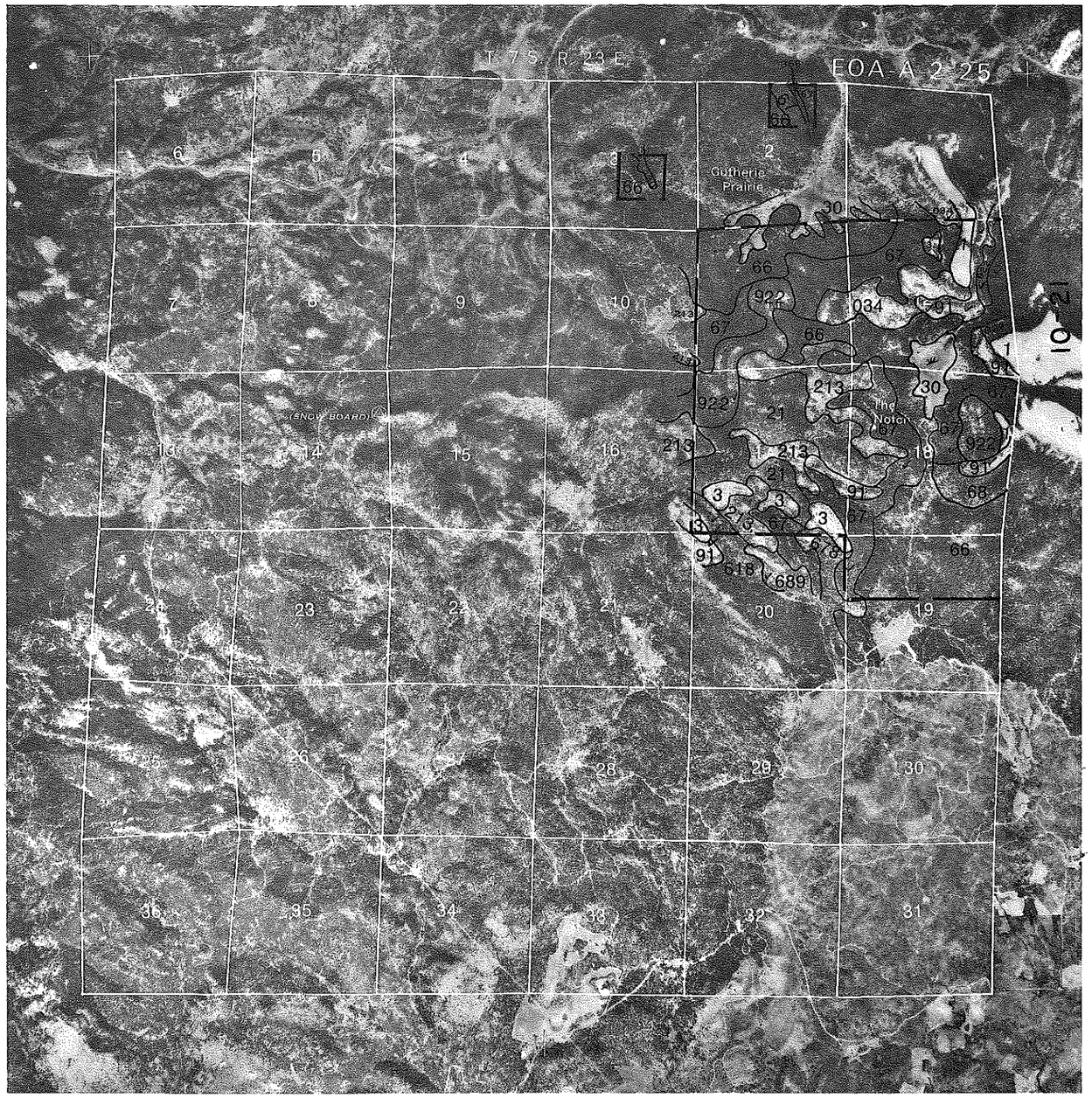
Aerial Photos with Mapping Units

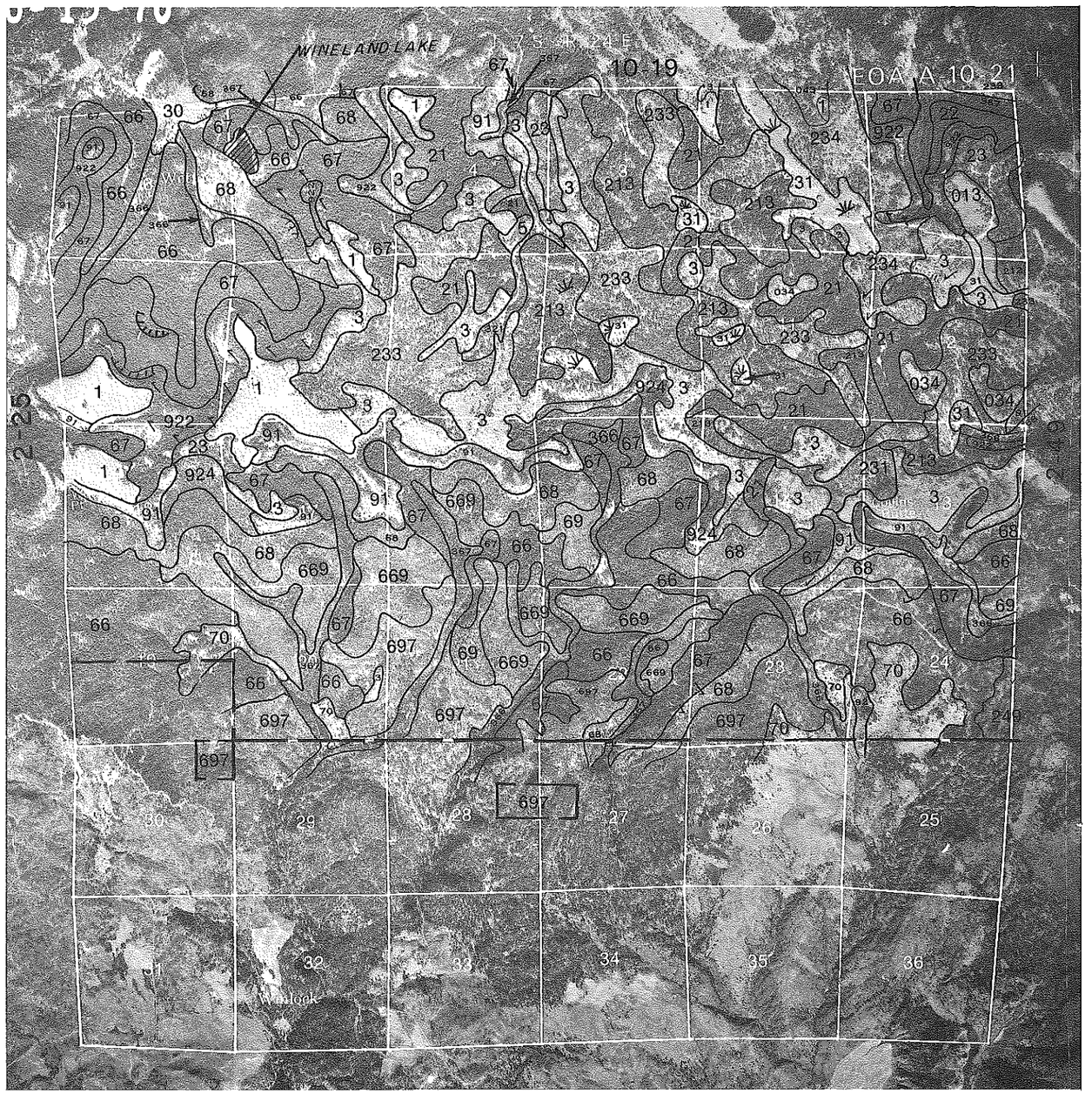
Southern Half First

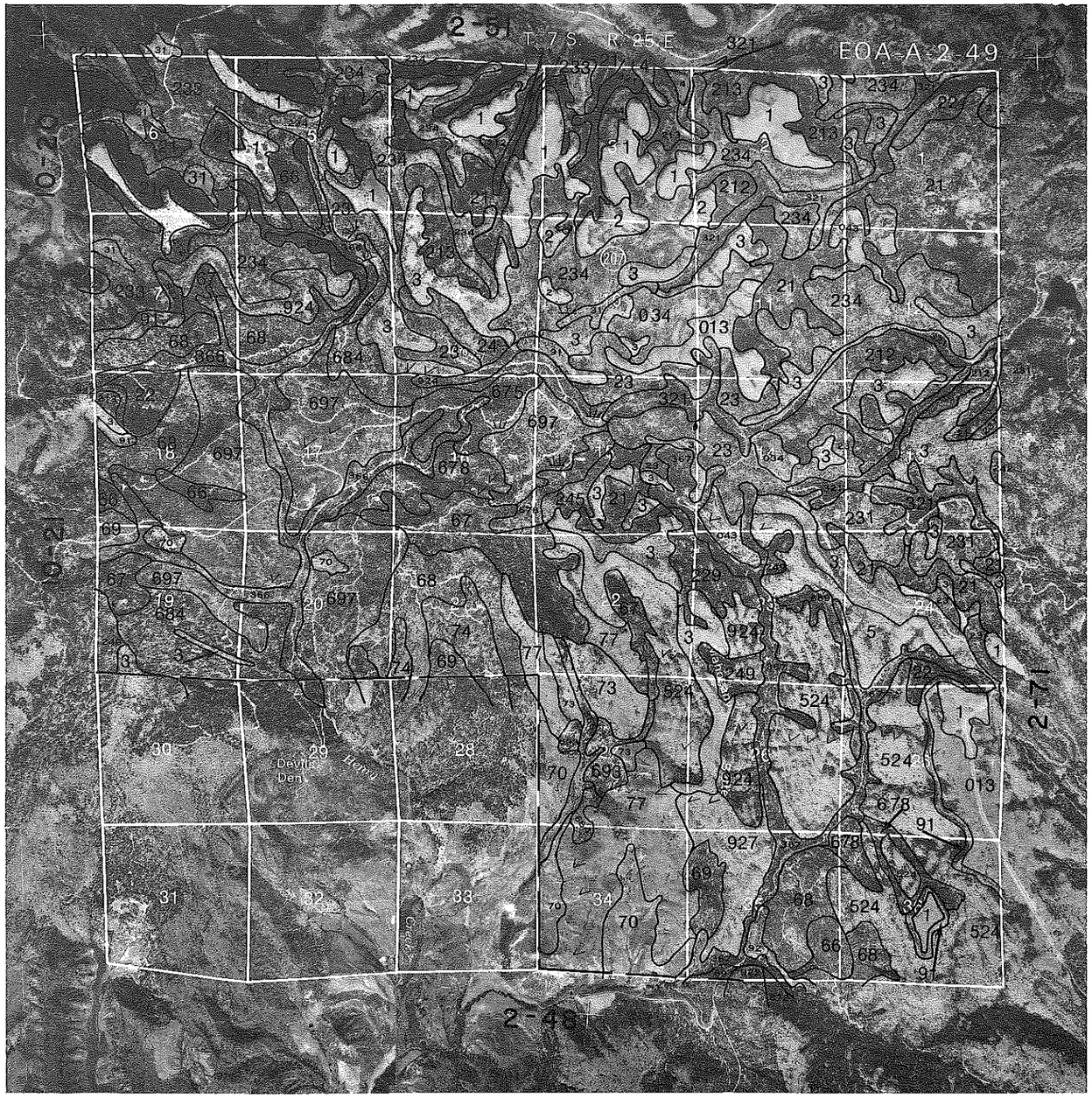

EOA A 2 48
997
997
997
730
524

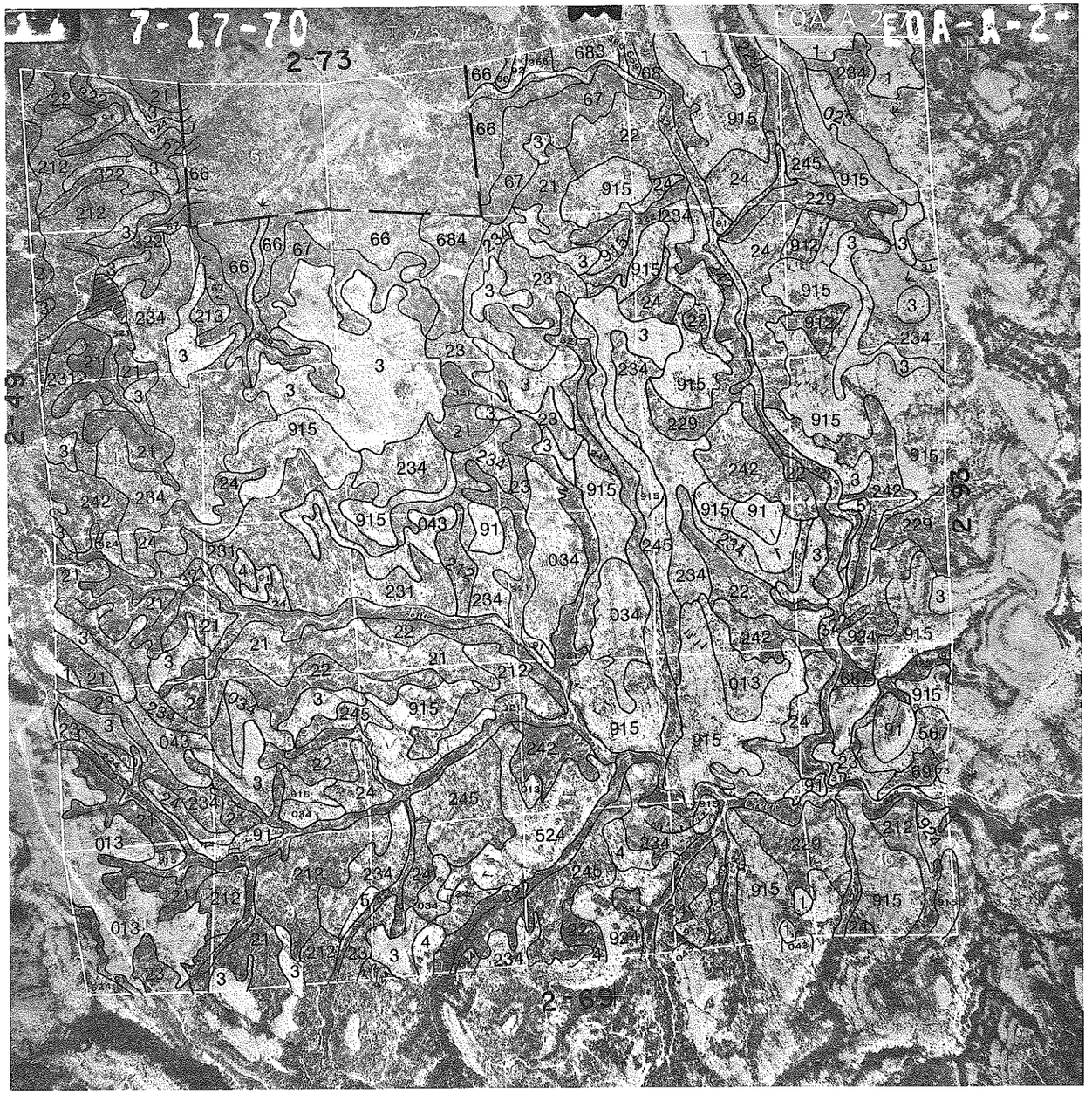

EOA A 2 69
915
915
915
915
977
977
524
524
567
567
567
567
567
73
73
73
73
73
73
73
77
77
77
77
77
234
234
234
234
234
212
212
212
212
212
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013
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012
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012
012
Tramarack

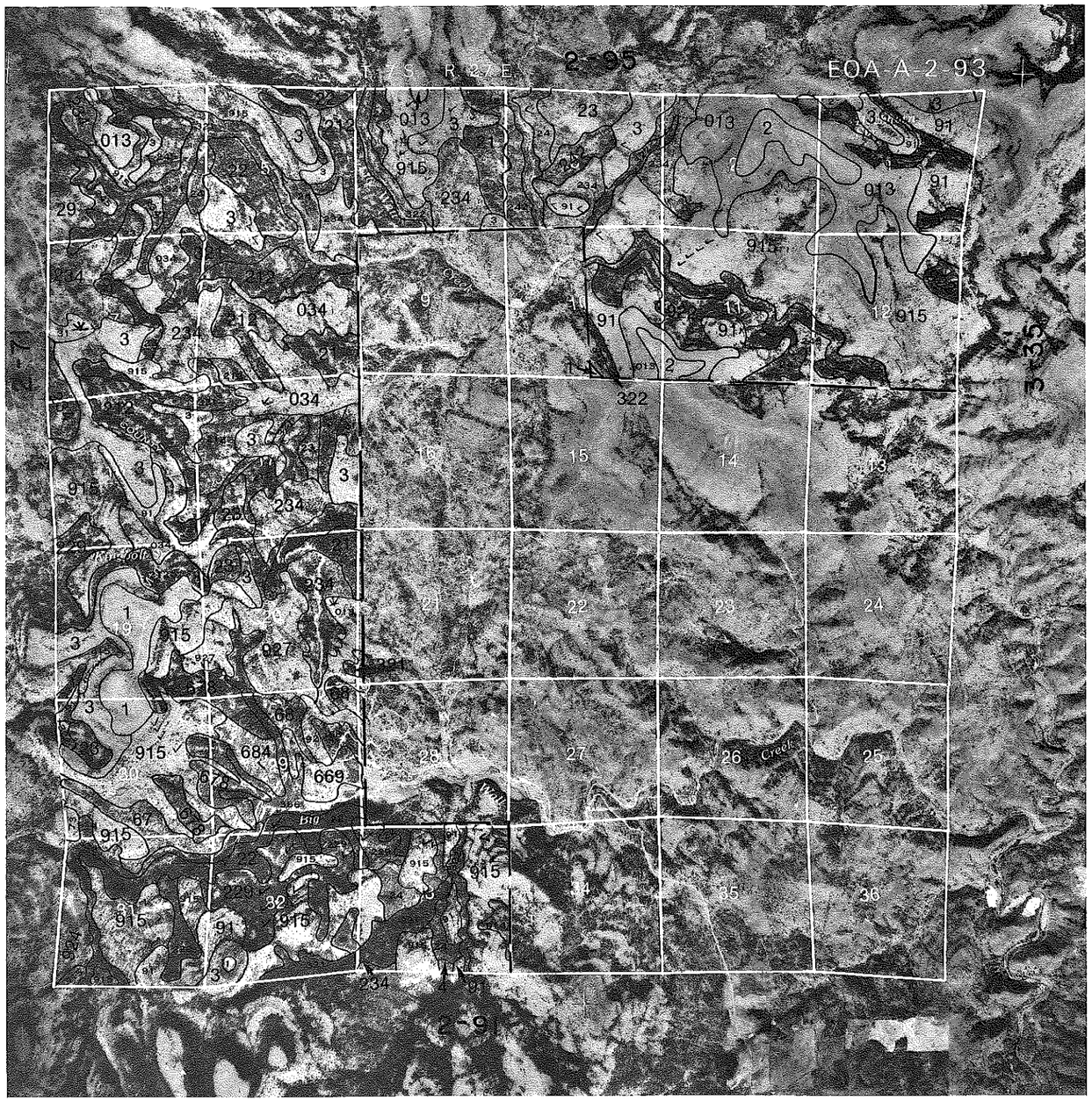

EOA-A-2-191
2-93
T. 8 N.
R. 7 E.

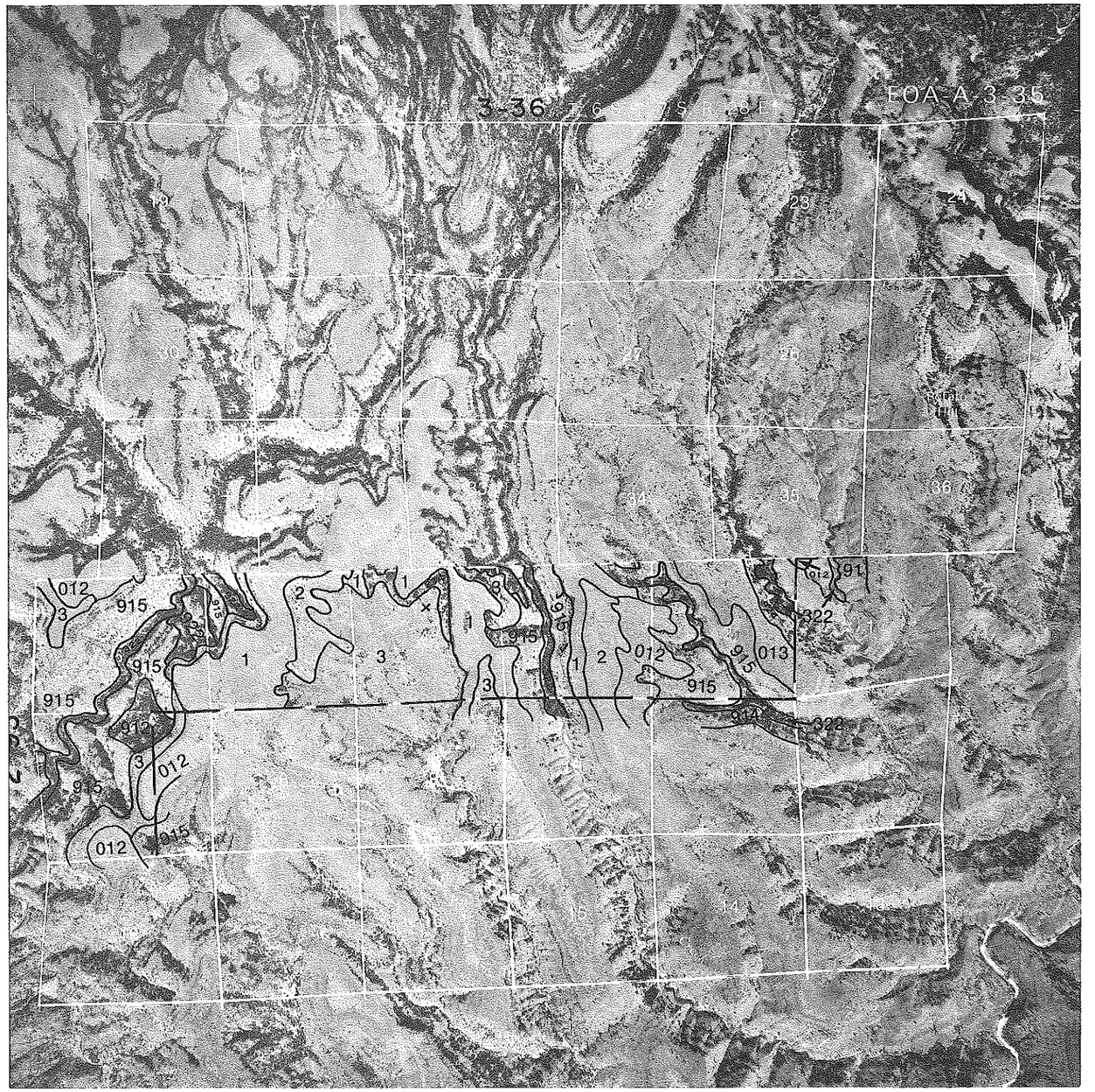

T 7 S R 23 E
EOA A 2 25
Guthrie Prairie
(SNOW BOARD)
Tire Notch
N


T 7 S R 24 E
EOA A 10 21
WINELAND LAKE
Windlook


2-51
T 7 S R 25 E
EOA-A-2-49
2-48

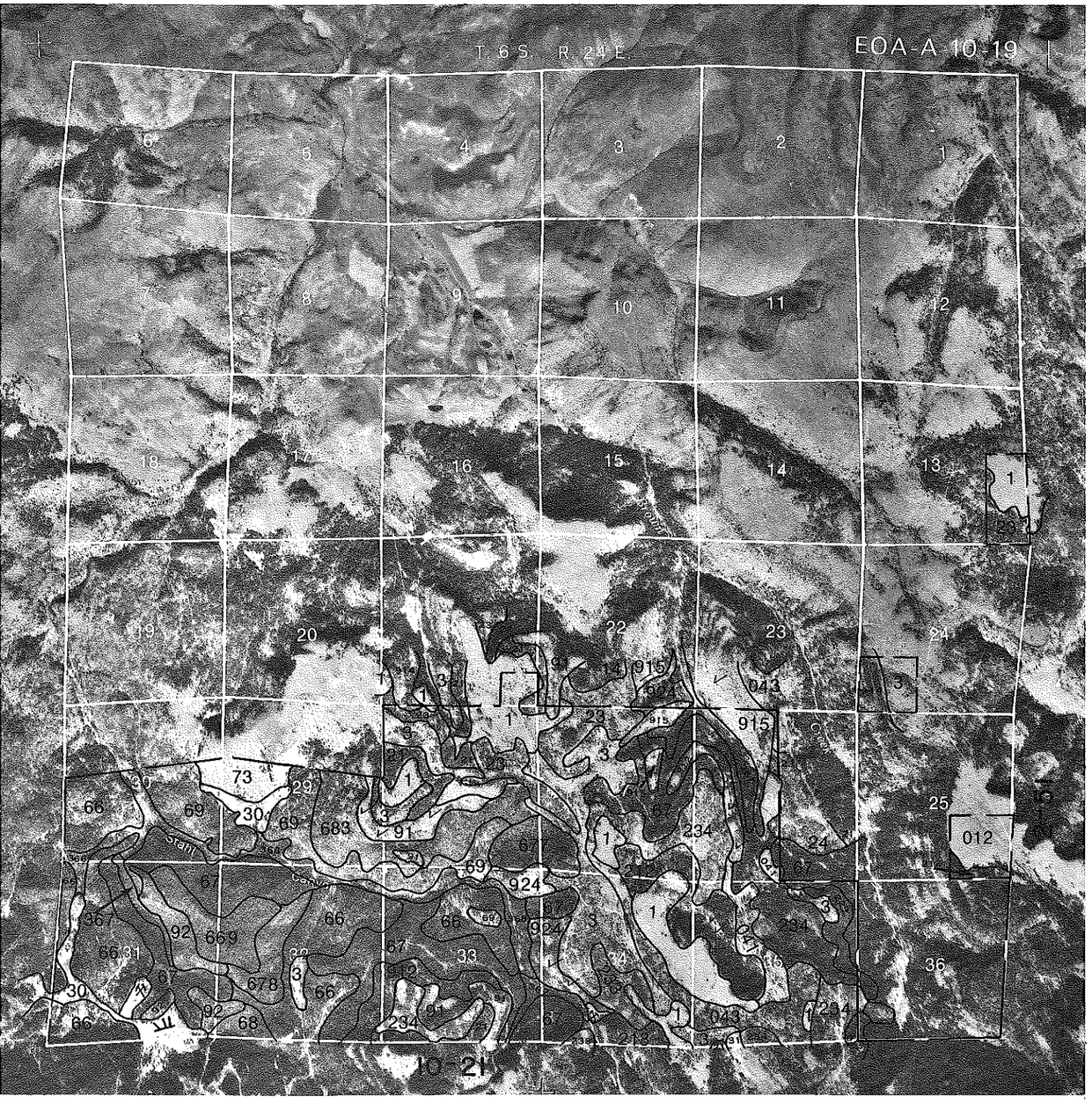

7-17-70
2-73
T 7 S R 26 E
EOA-A-2-
2-65


T 7 S R 27 E
2-95
EOA A-2-93
Big Dolly Creek
Creek


3-36
T 6 S R 20 E
EOA A-3-35

T 6 S R 24 E

EOA-A 10 19



10-21

T 6 S R 25 E

EOA-A 2 51



2 49

T 6 S R 26 E

EOA A 2 73

2-71

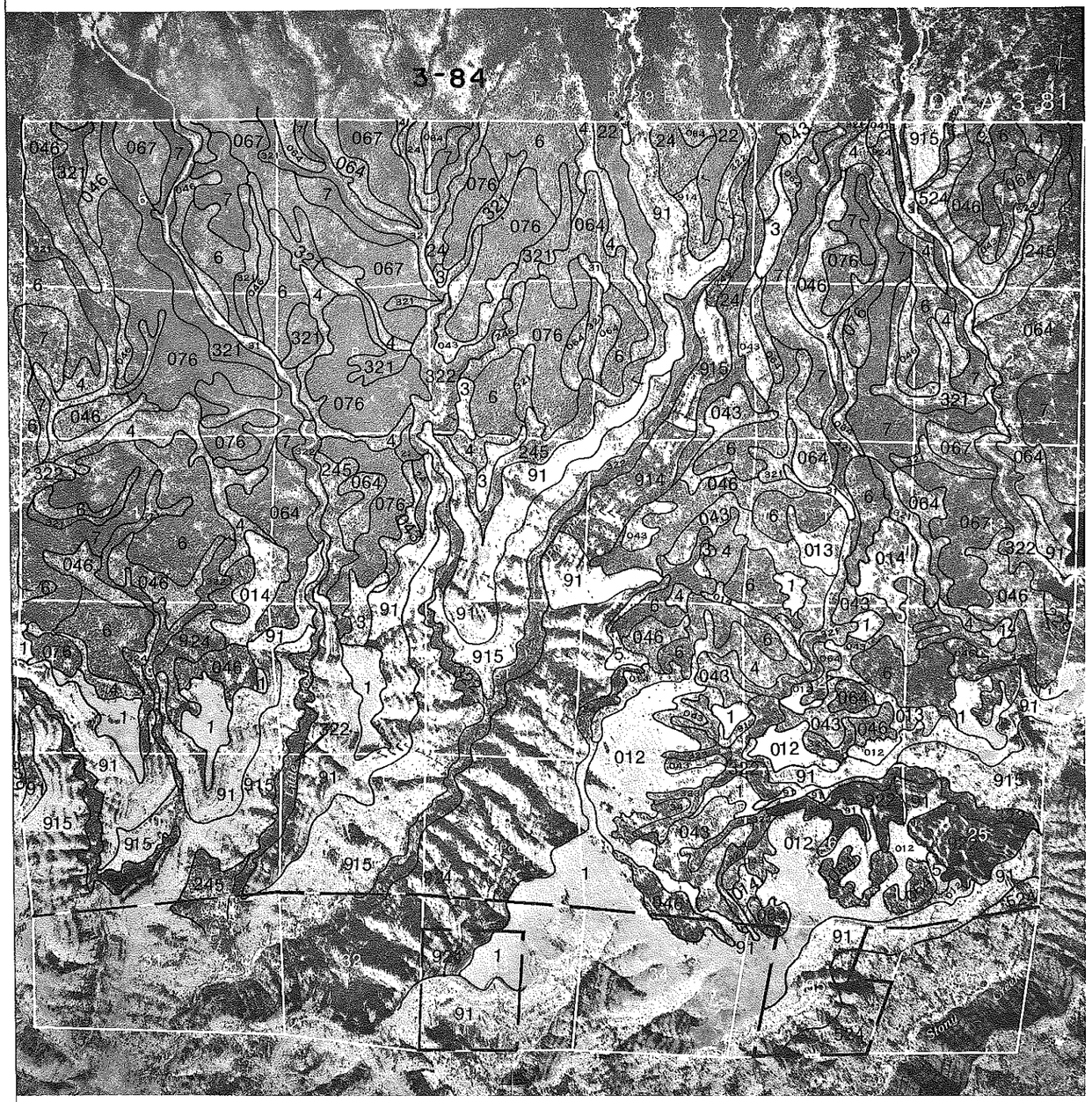
2-98

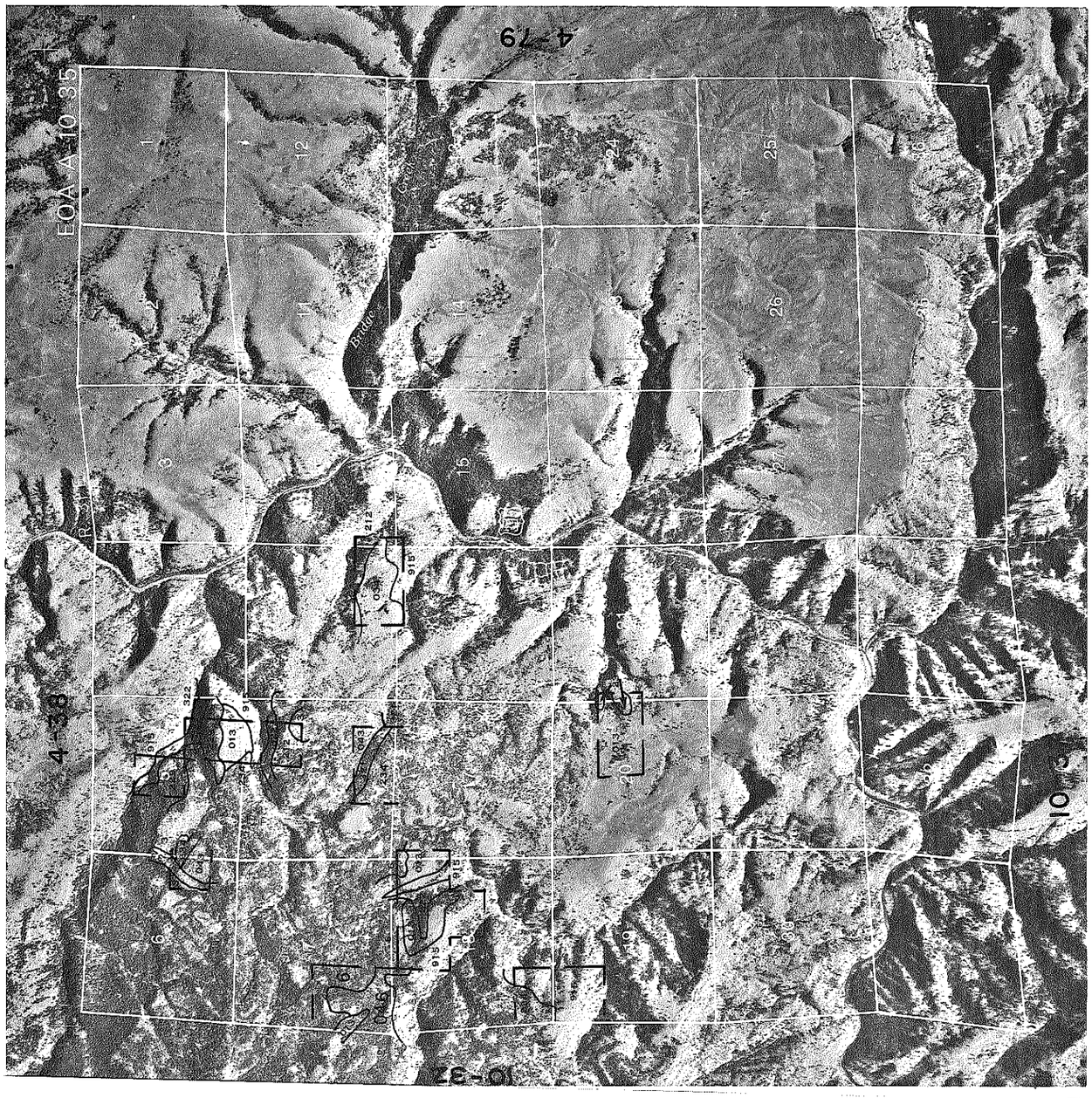
T 6 S R 27 E

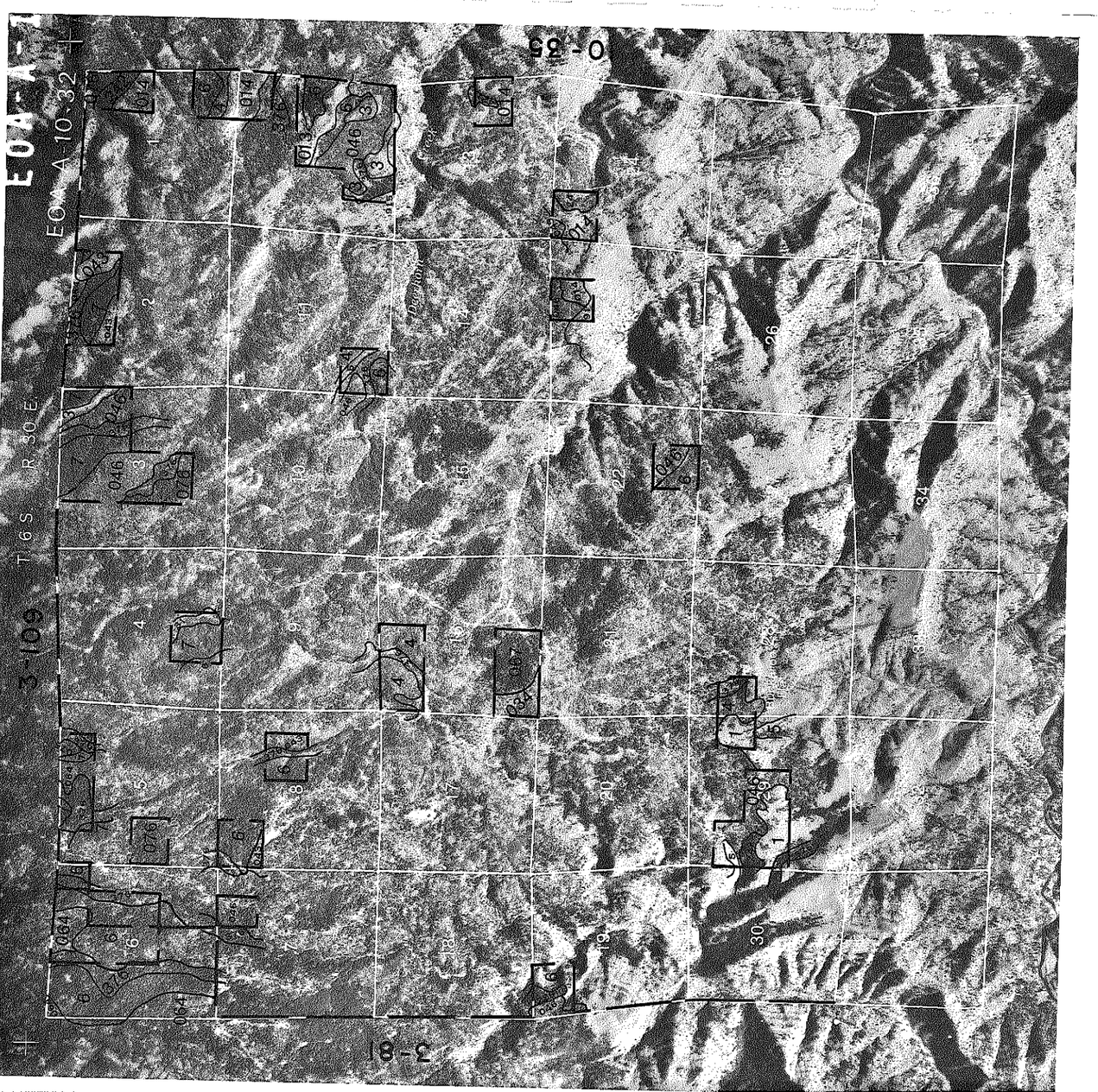
EOA A 2 95

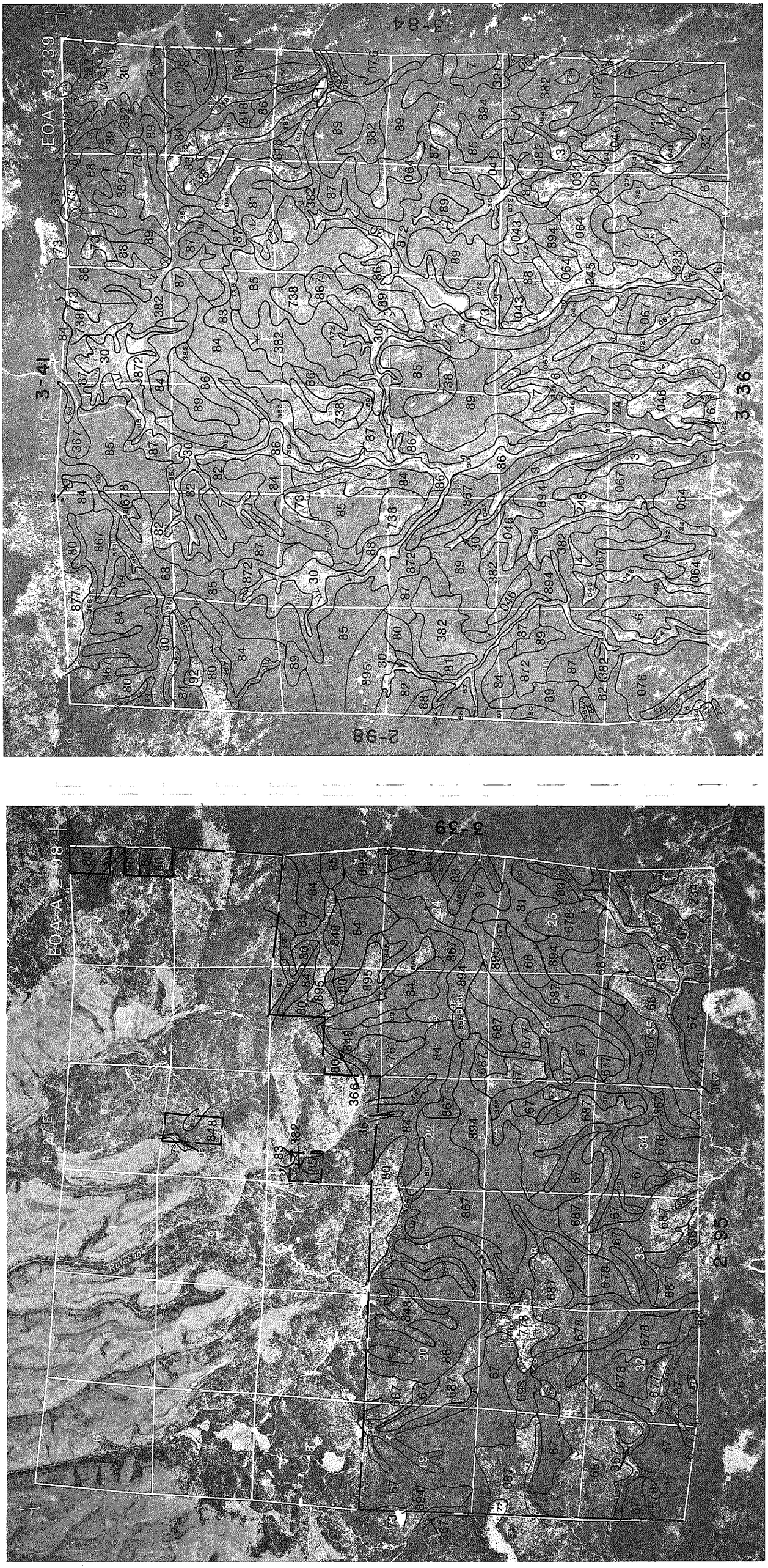
2-93


3-39
EOA A-3-36
3-35
3-38

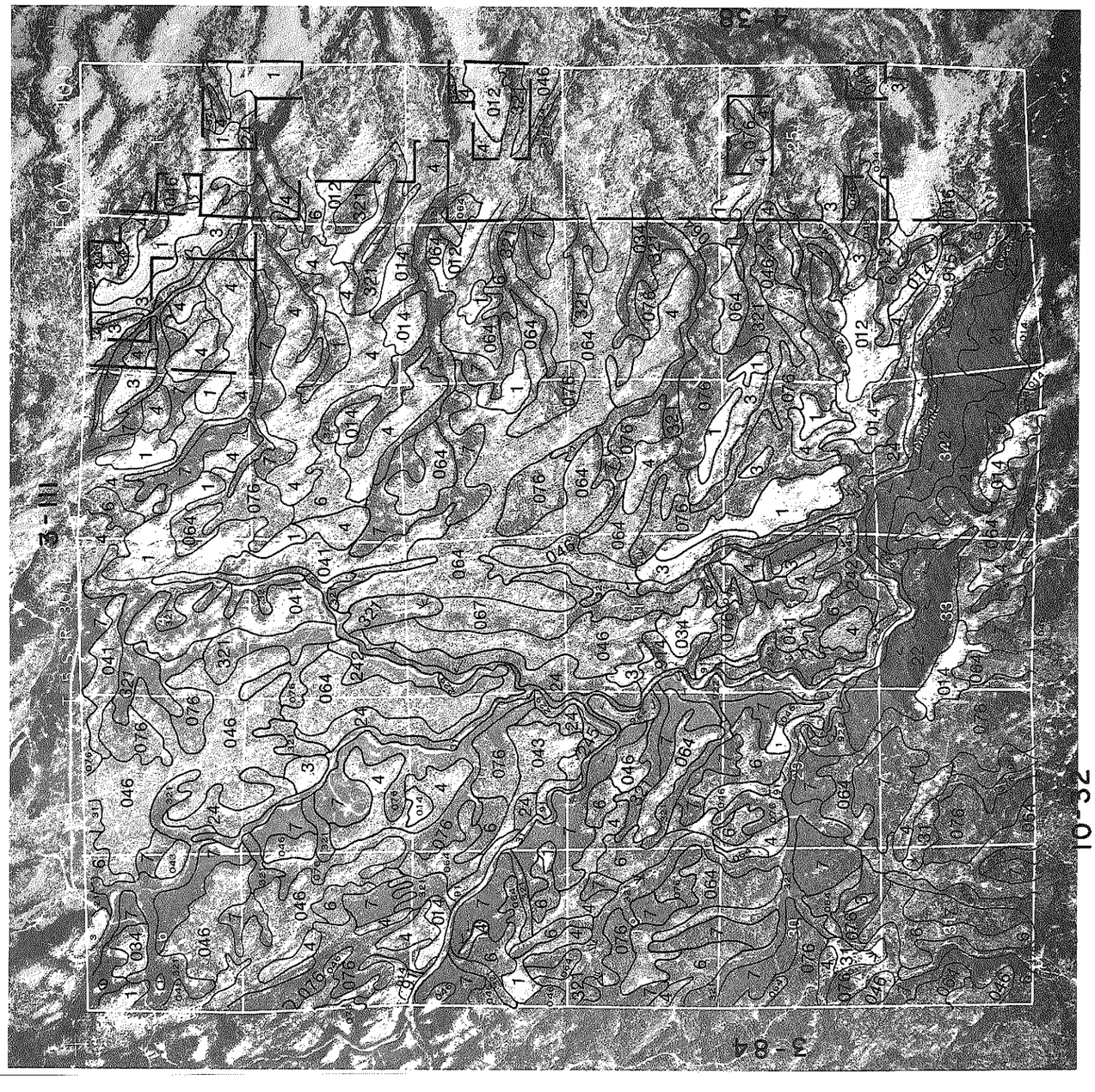

3-84
EOA 3-81

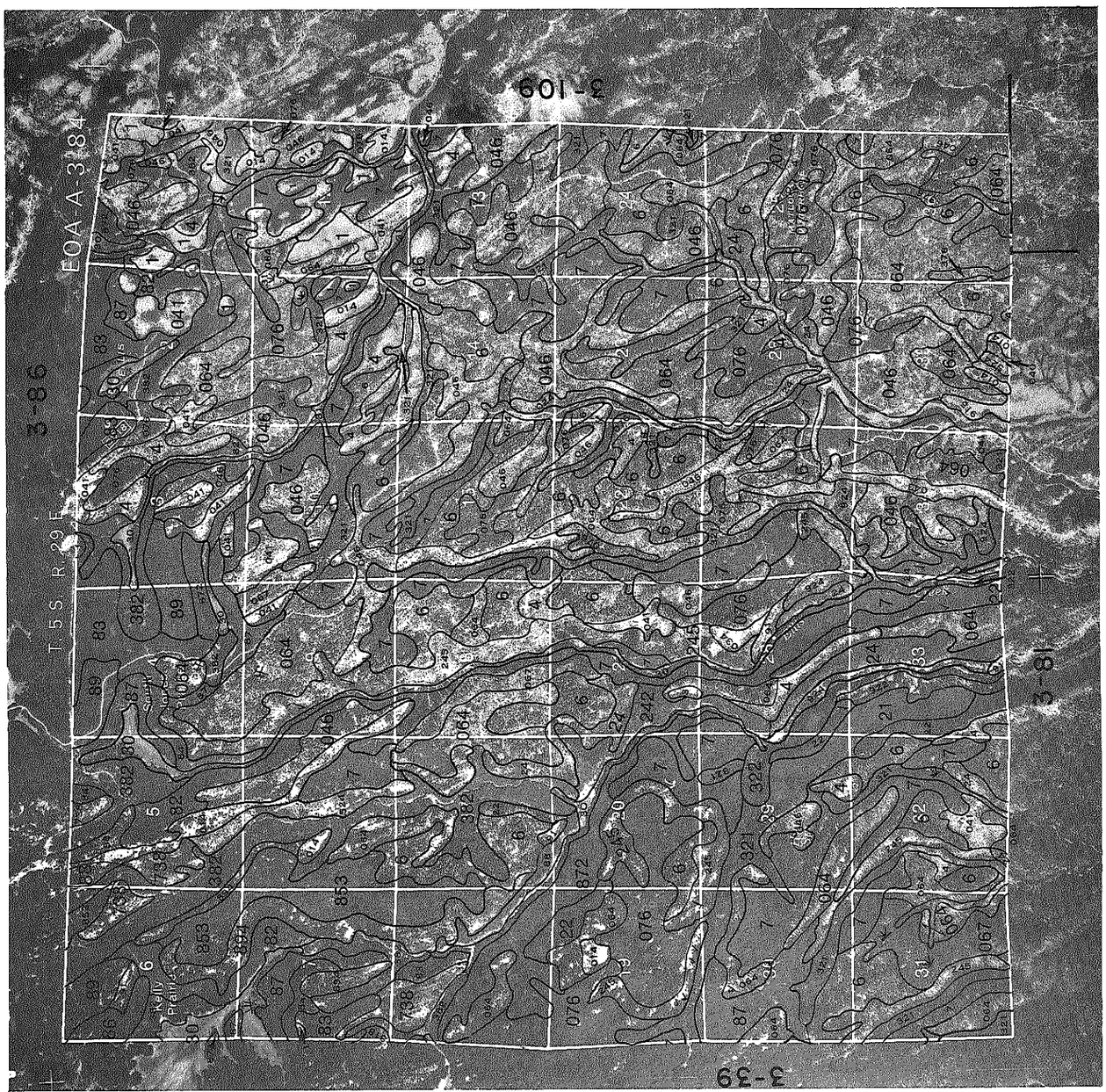

EOA A-10-35
4-138
4-79
10-32
10-C

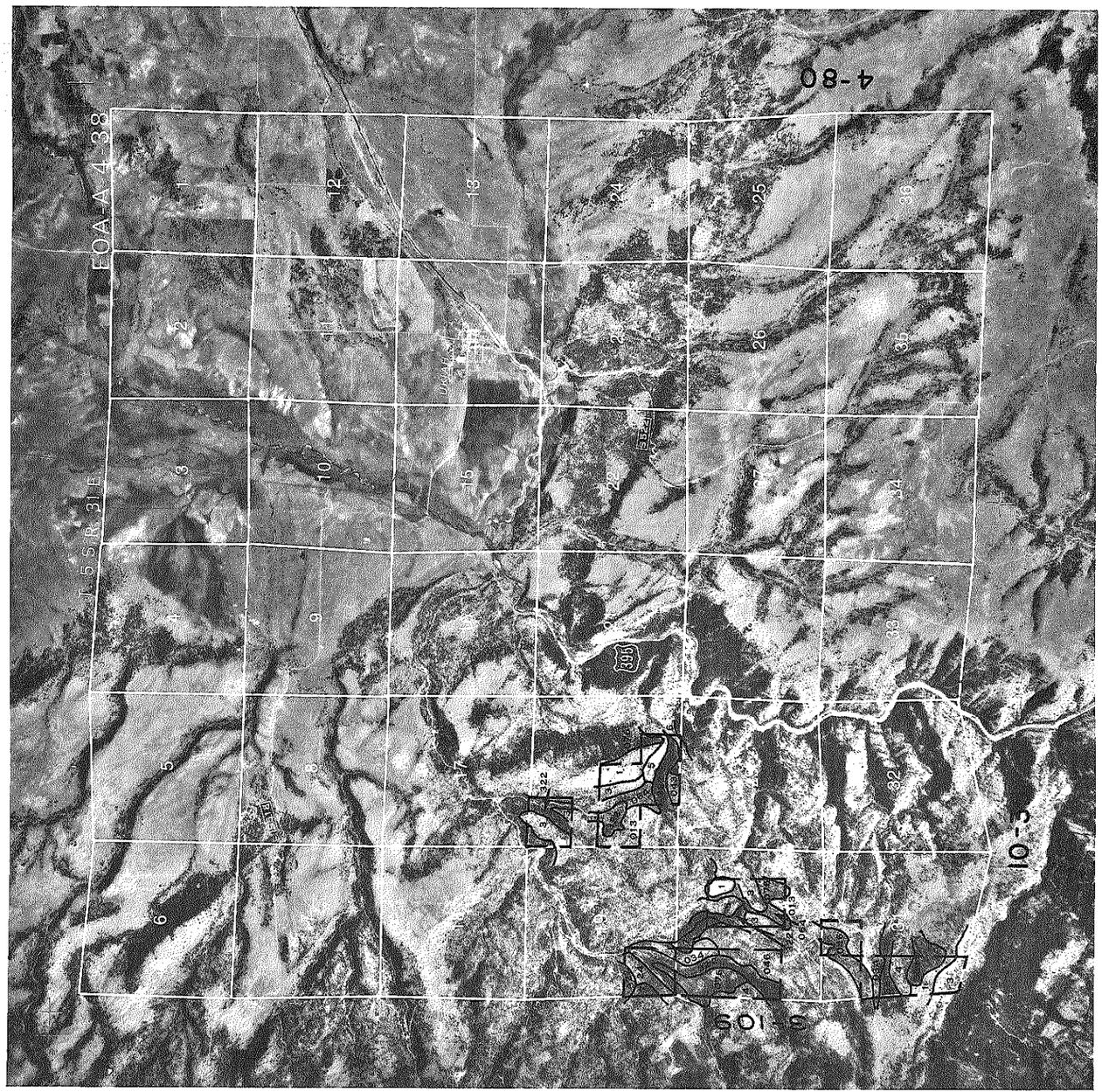

EOA A-10-32
3-109
T. 6 S.
R. 30 E.
3-81
0-33

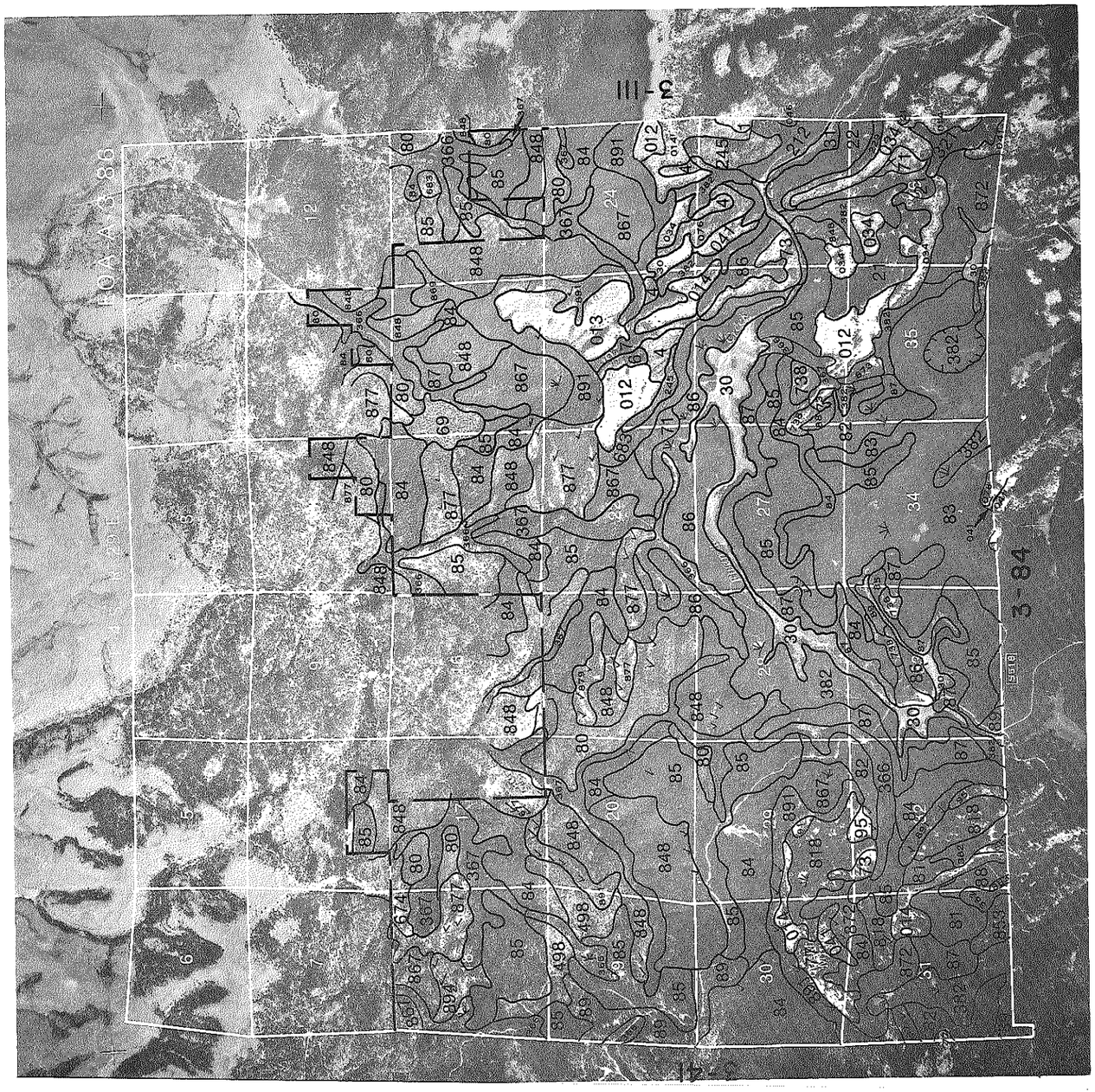

EOA-A-3-39
T 5 S R 28 E
3-41
3-84
3-36
2-98

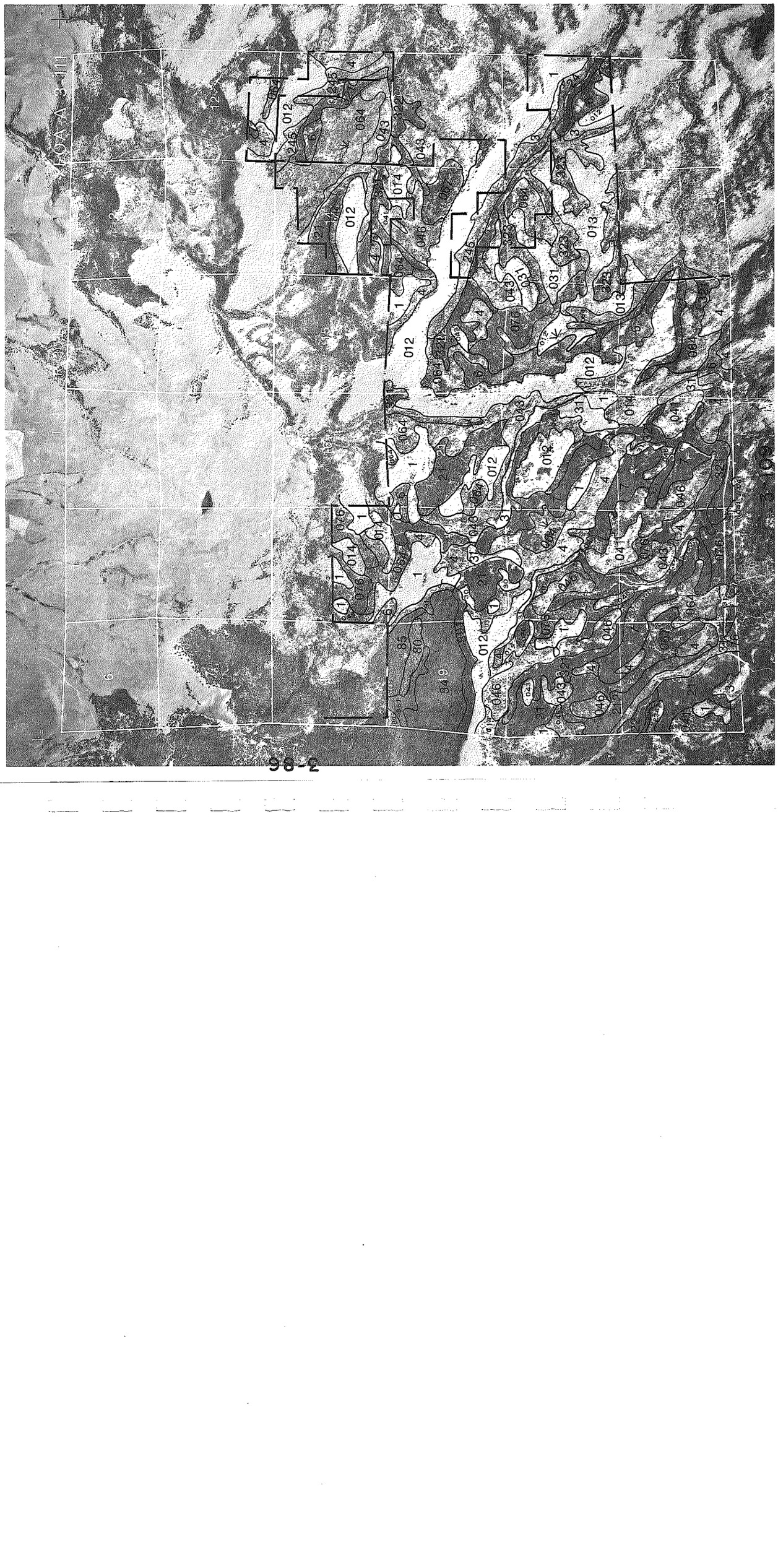
EOA-A-3-38
T 3 S R 47 E
3-39
2-95

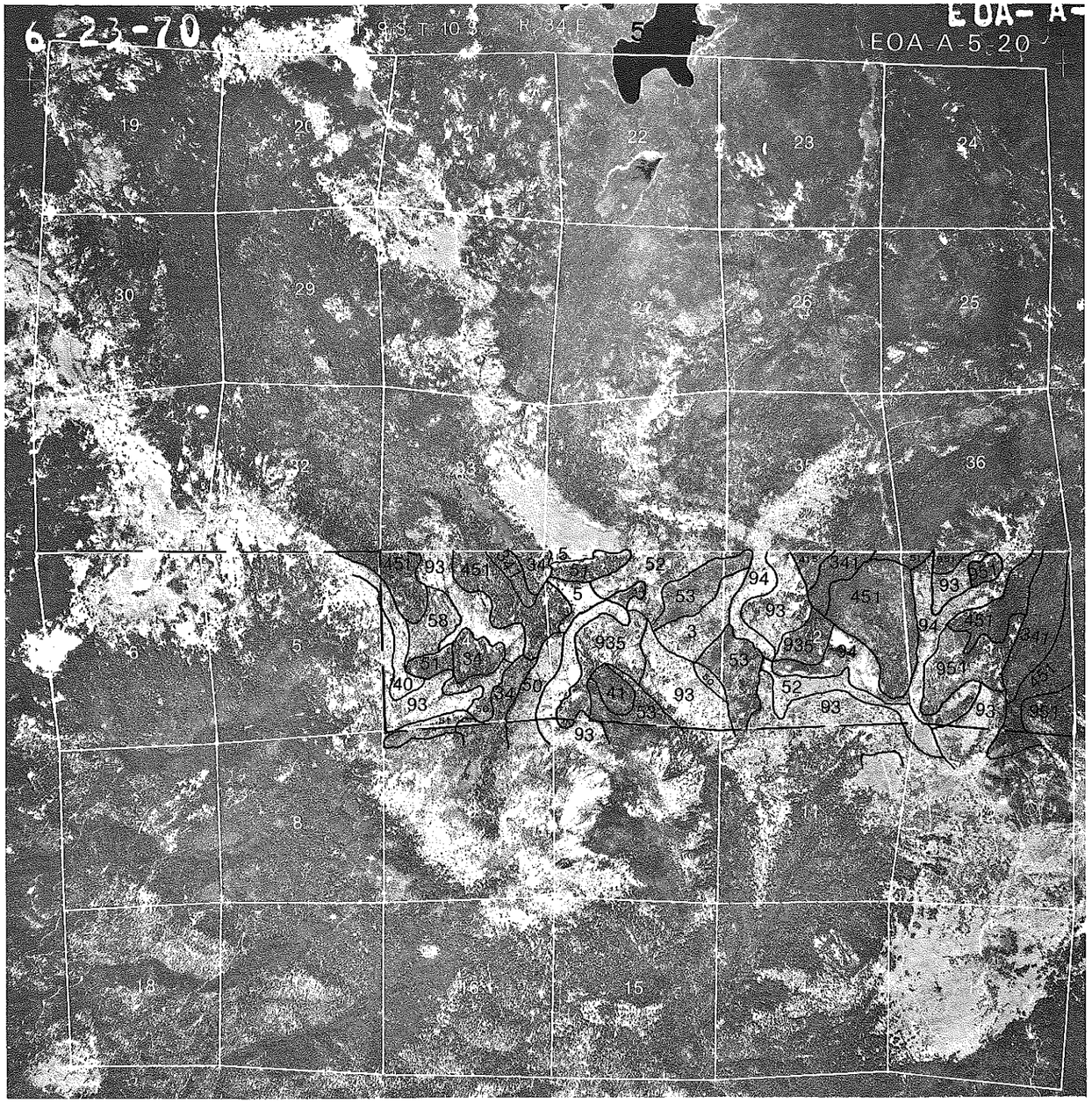

EOA-A 384
T 5 S R 30 E
3-111
3-84
3-32
3-38


EOA-A 384
T 5 S R 29 E
3-86
3-109
3-81
3-39

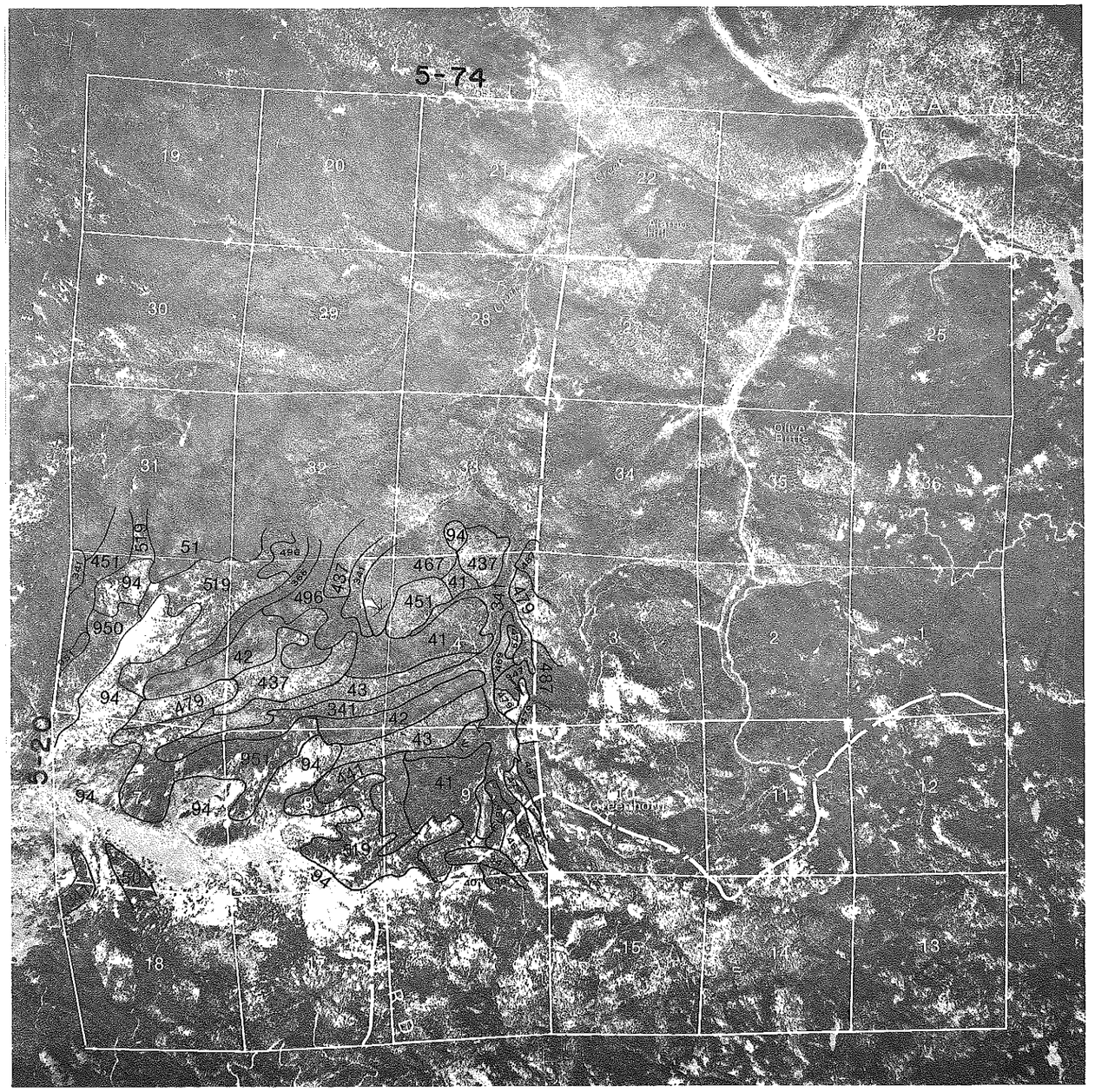

EOA-A-4-38
T. 55 R. 31 E.
4-80
3-109
3-10

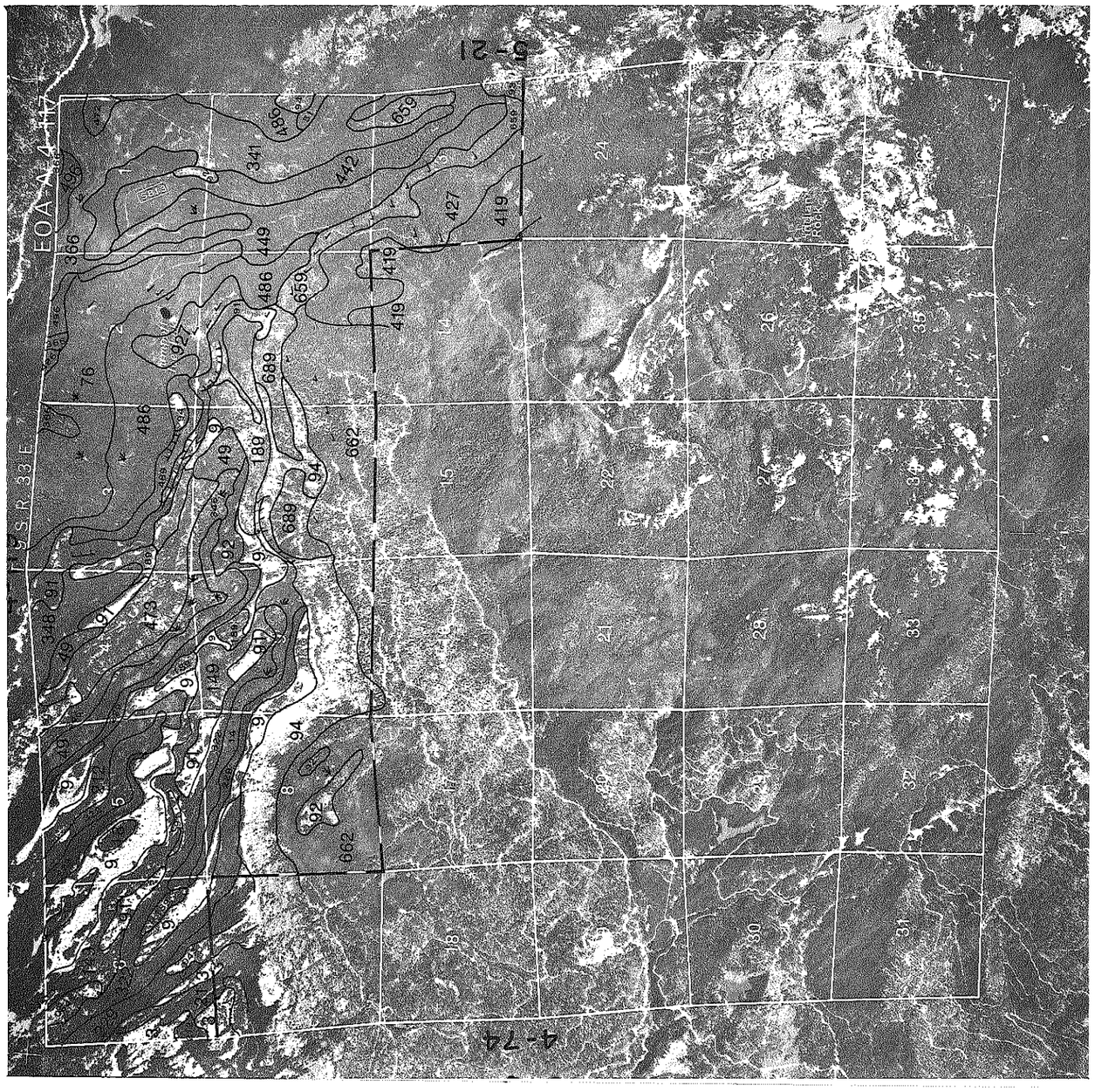

3-111
3-84
3-41
3-86

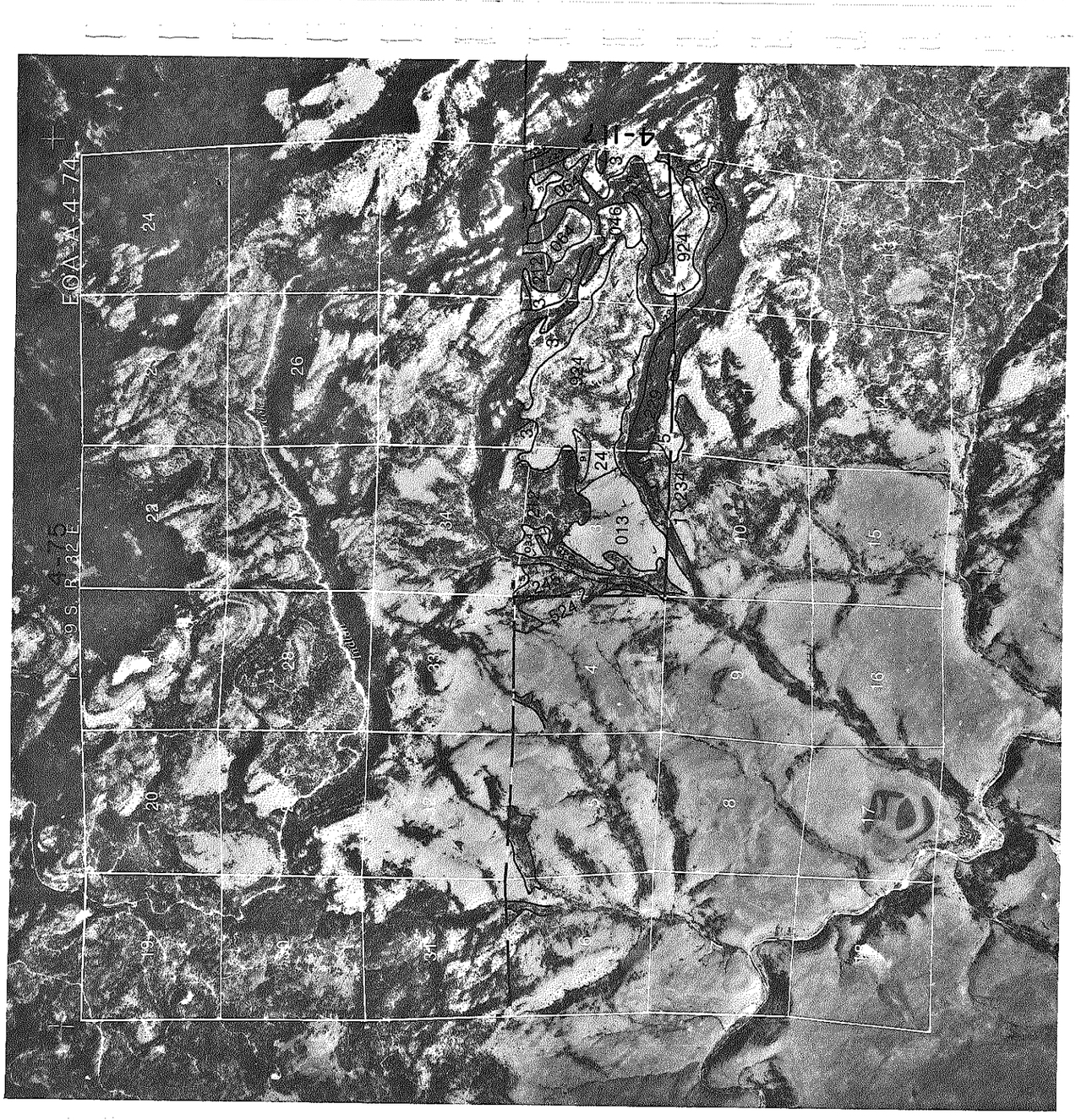

FOA-A-3-III
3-86

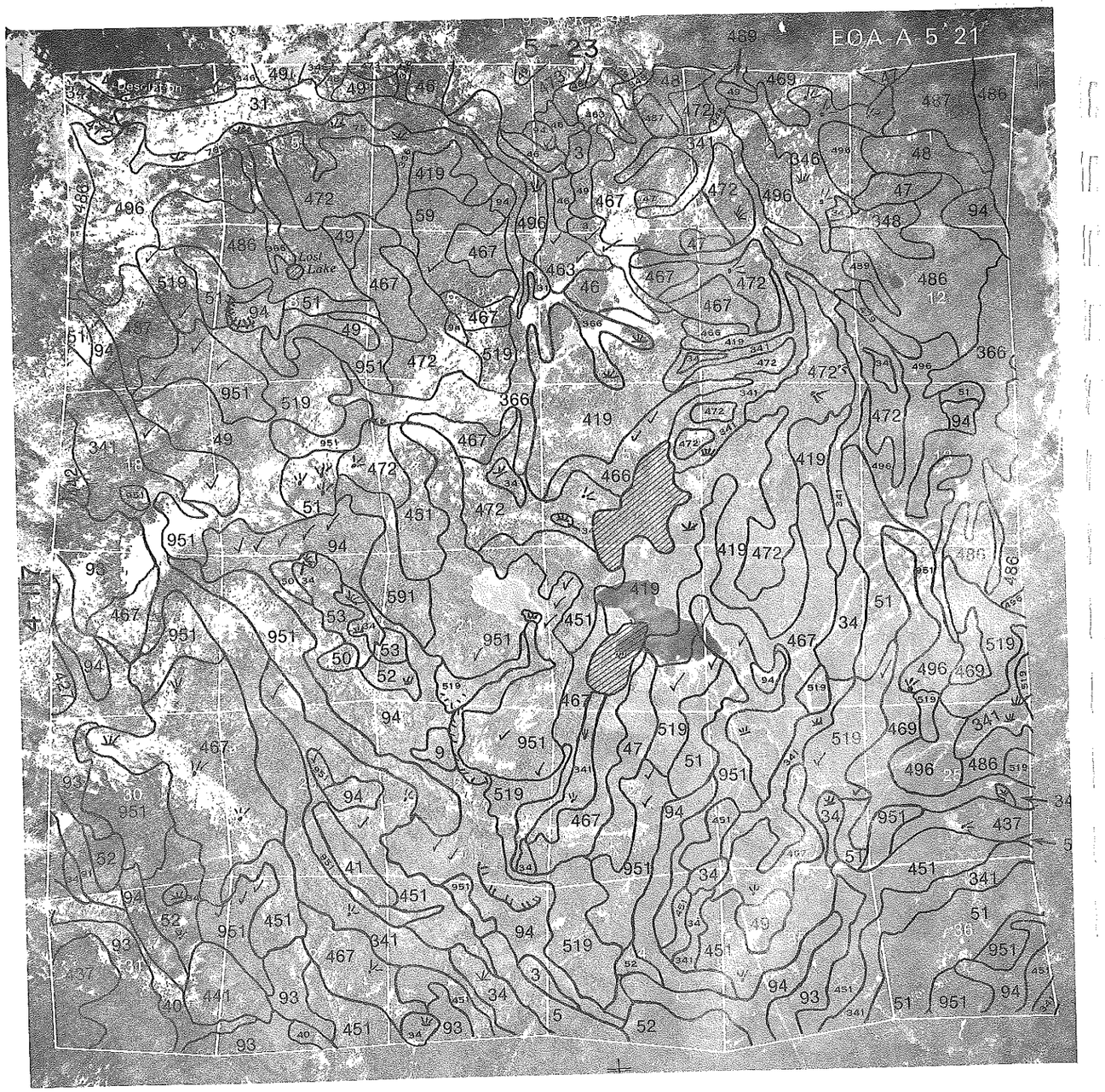

6-23-70
T. 9 S. T. 10 S. R. 34 E.
EOA-A-5-20
5
19
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14
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451
93
94
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467
950

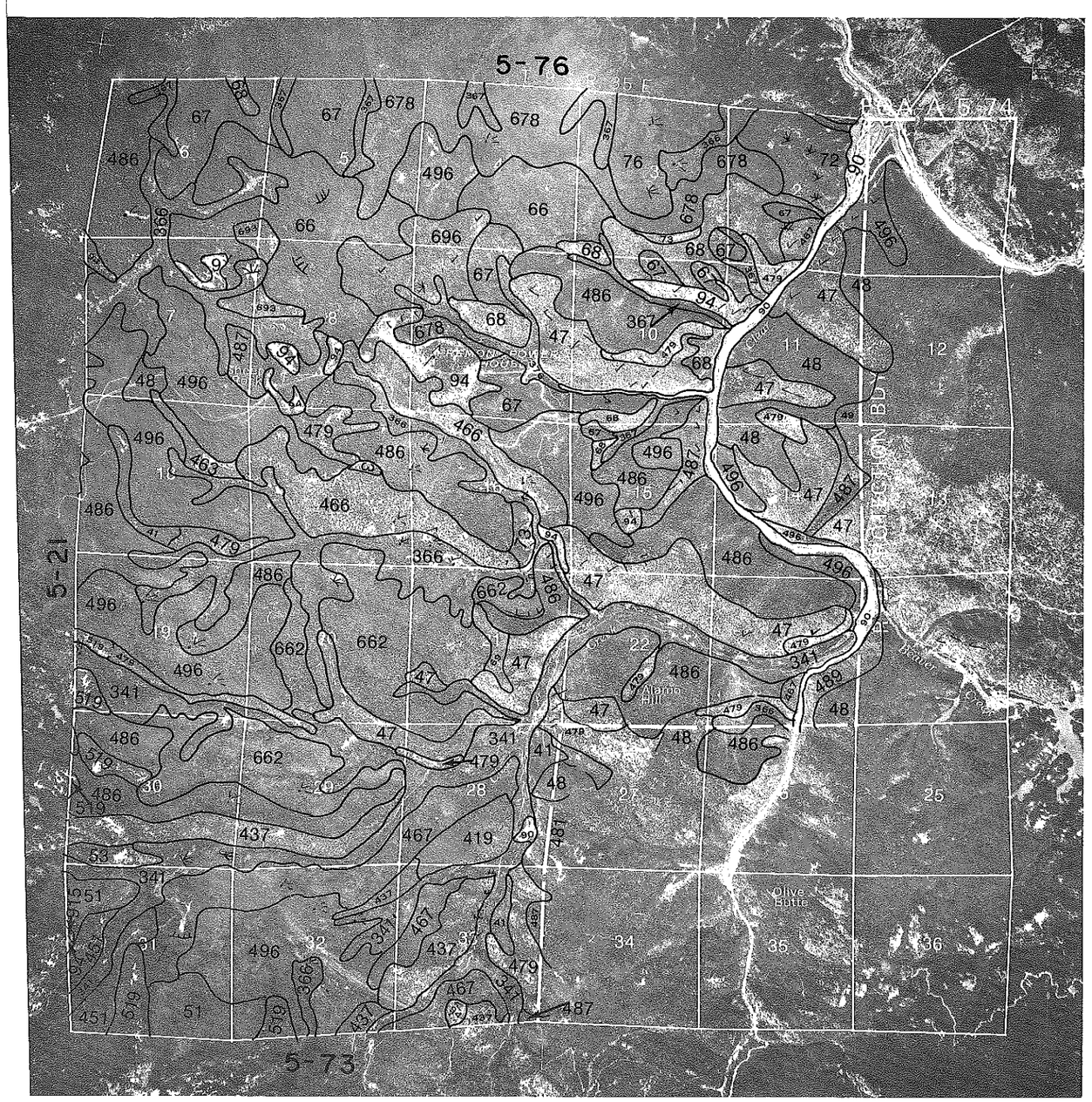
5-77

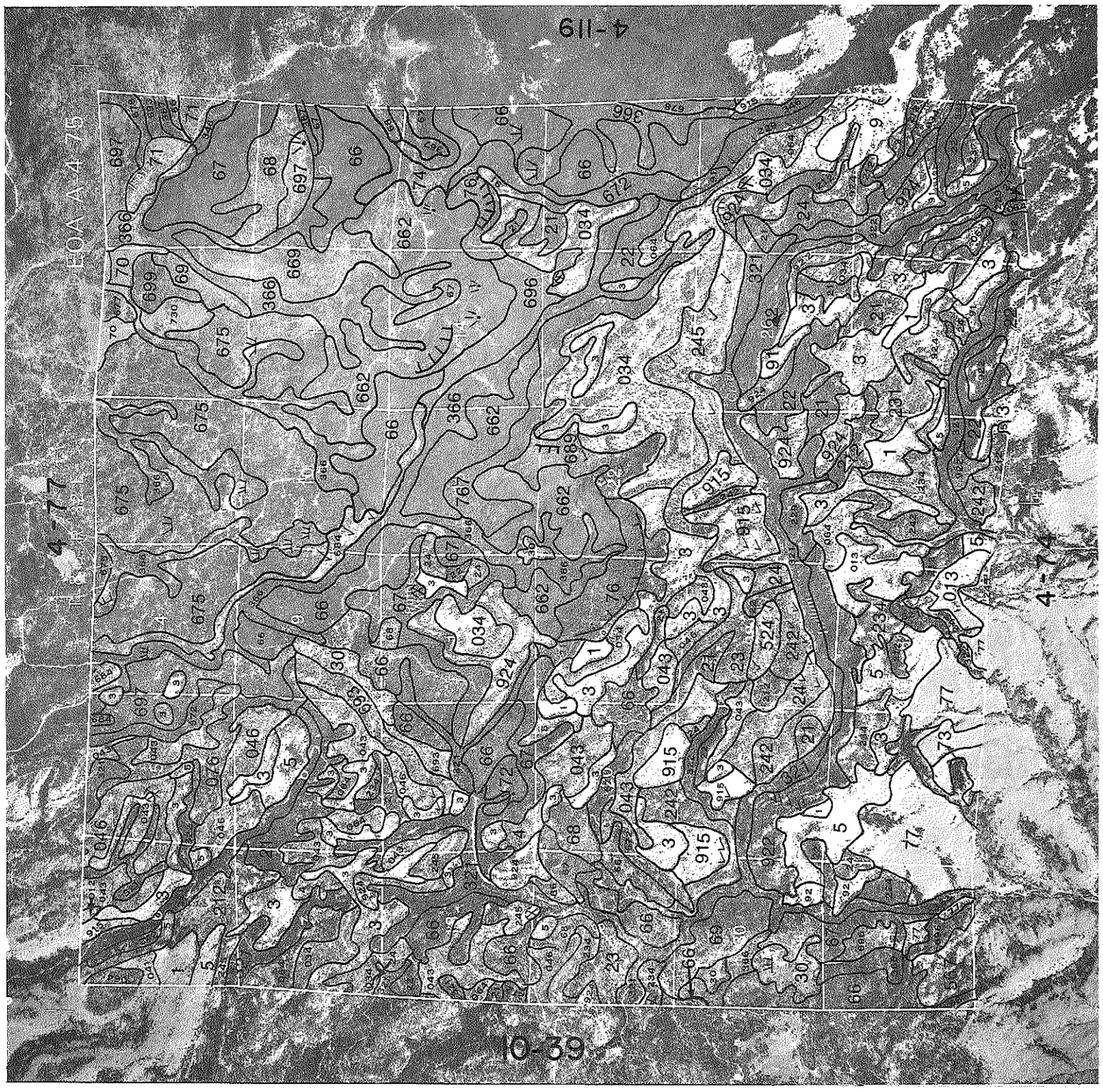

5-74
EOA-A-5-20
Olive Ridge
Deadhorse
19
20
21
22
30
29
28
27
25
31
32
33
34
35
36
6
5
4
3
2
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97

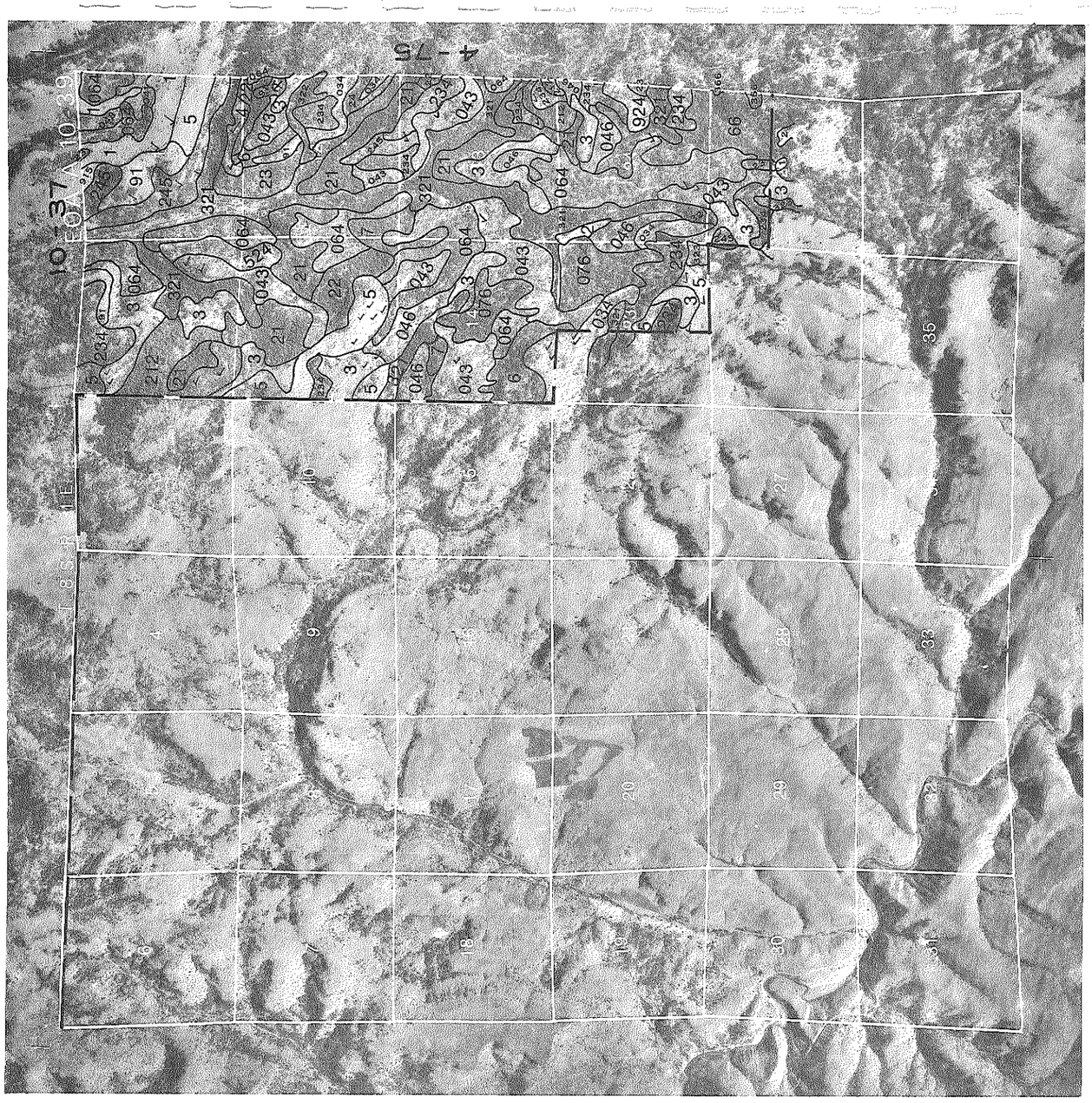

EOA-A-4-74
T 5 S., R. 33 E.
5-21
4-74

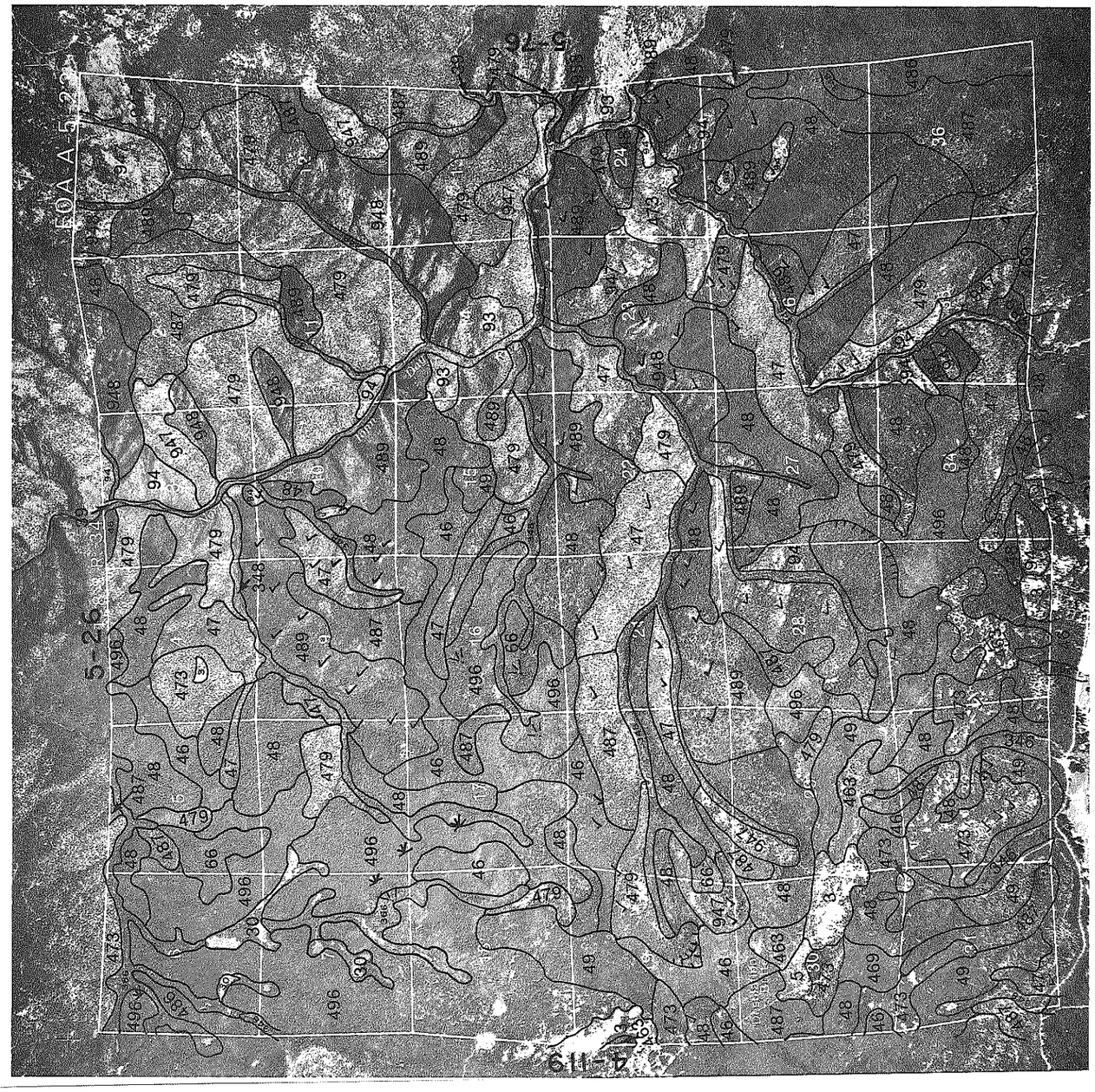

EOA-A-4-74
T. 9 S., R. 32 E.
4-75
4-117


5-23
EOA-A 5'21
4-12
Lost Lake


5-76
EOA-A 5'74
5-21
5-73
Olive Butte

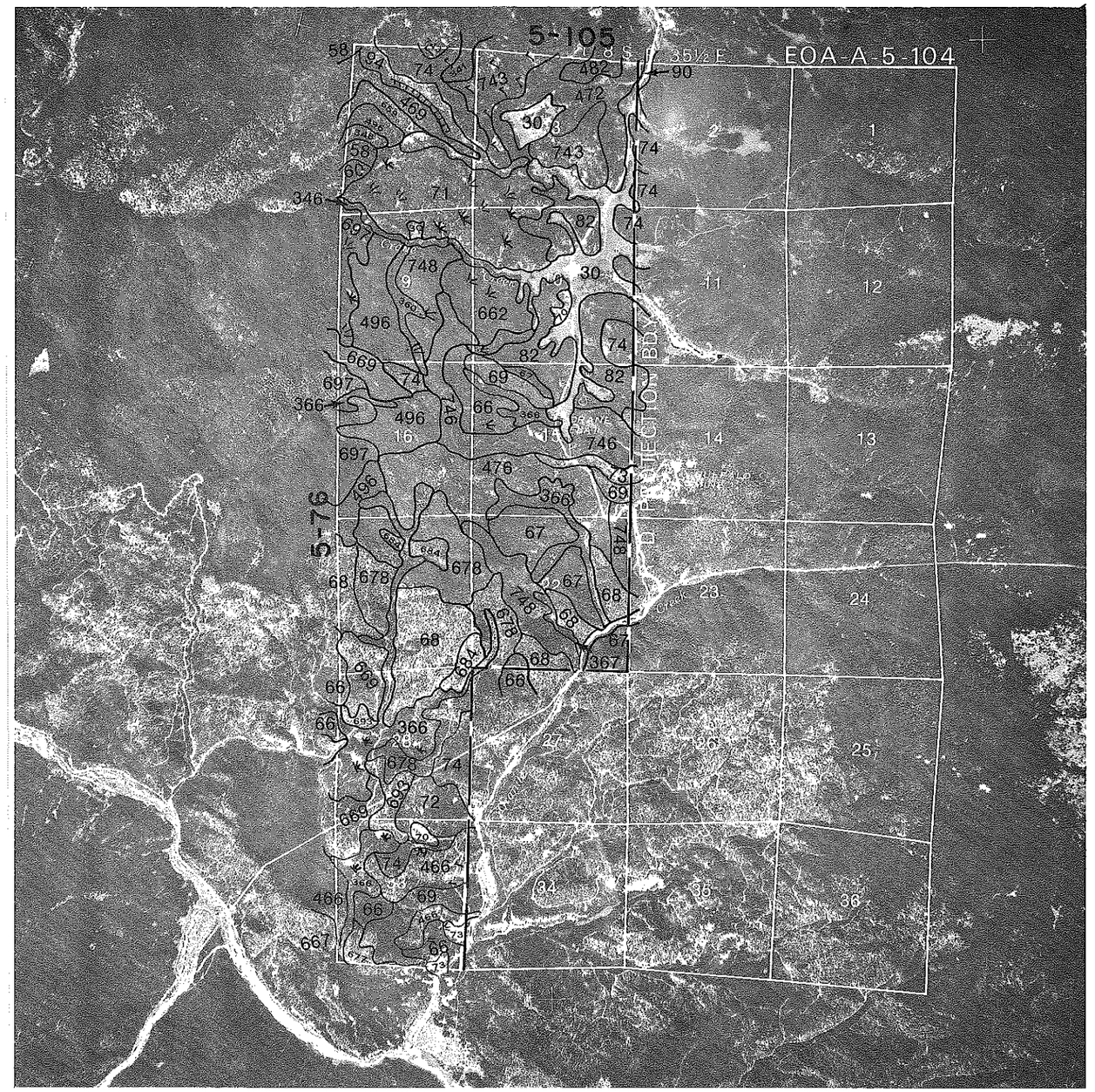

4-119
EOA A-4-75
4-77
4-74
10-39

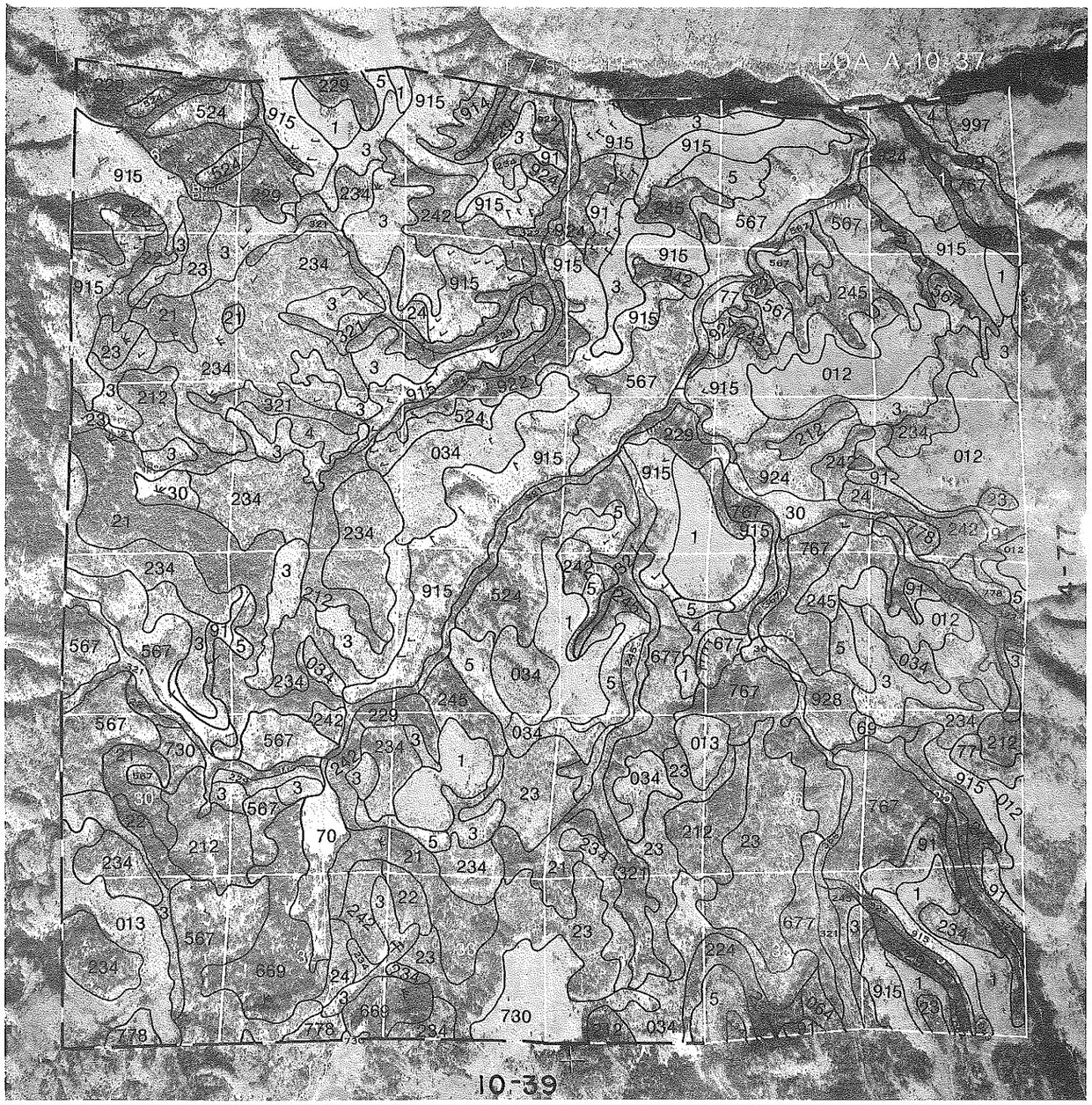

4-75
10-37
EOA A-10-39
18S R 11E

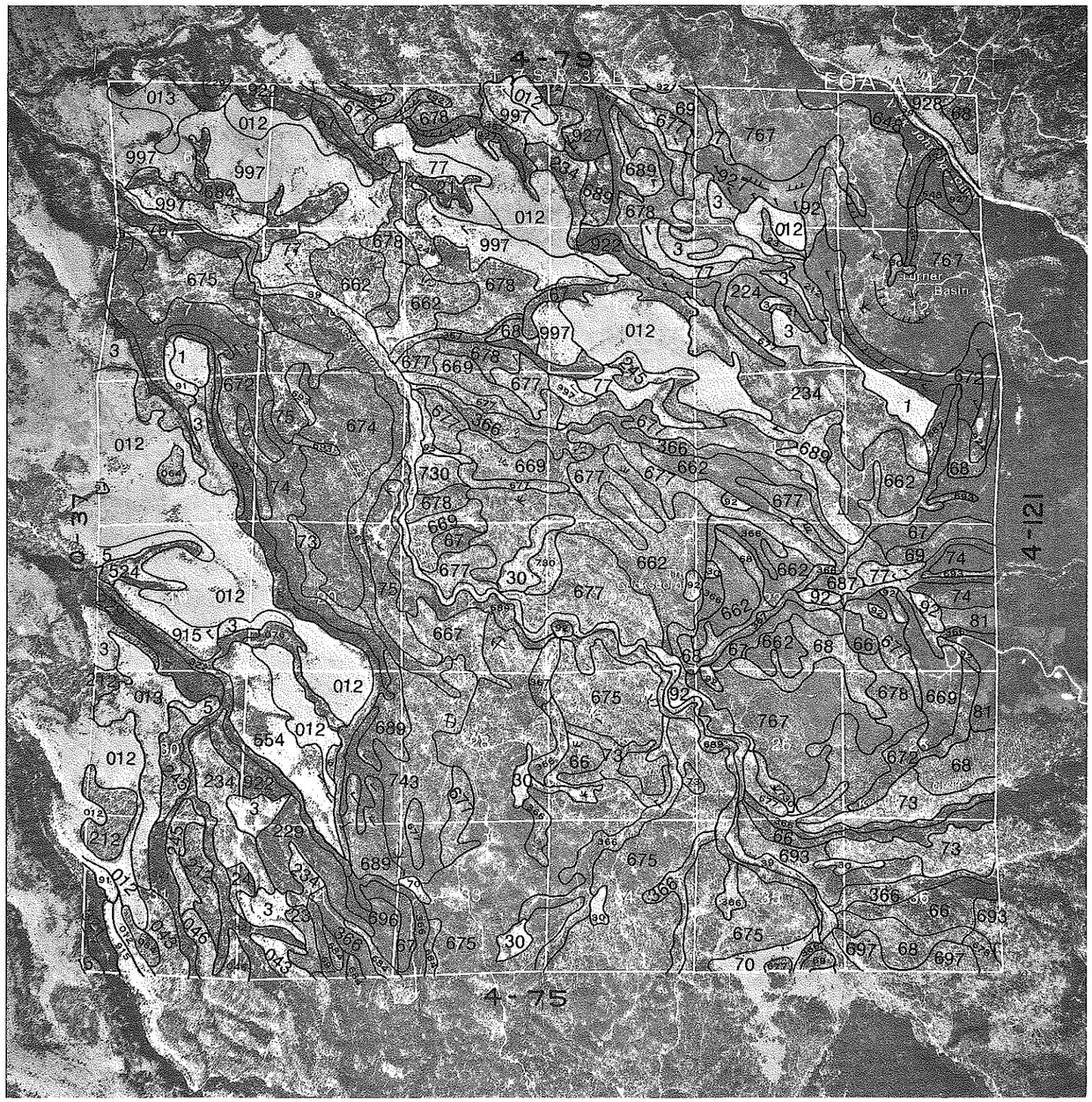

EOA A-5-26
5-26
5-76
4-119


EOA A-4-119
4-121
5-23
4-75
4-117

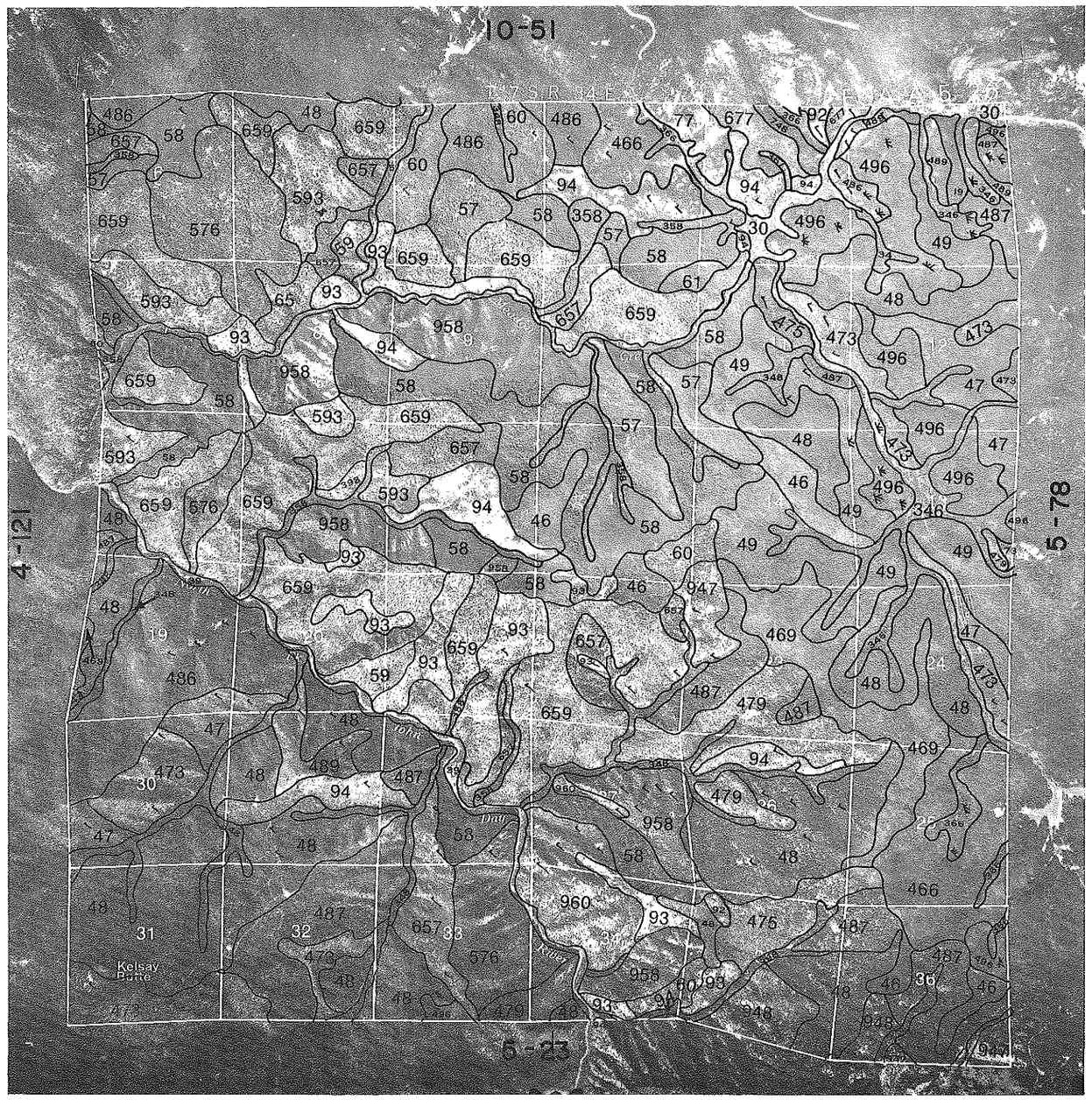

5-78
EOA-A-5-76
5-23
5-104
5-74

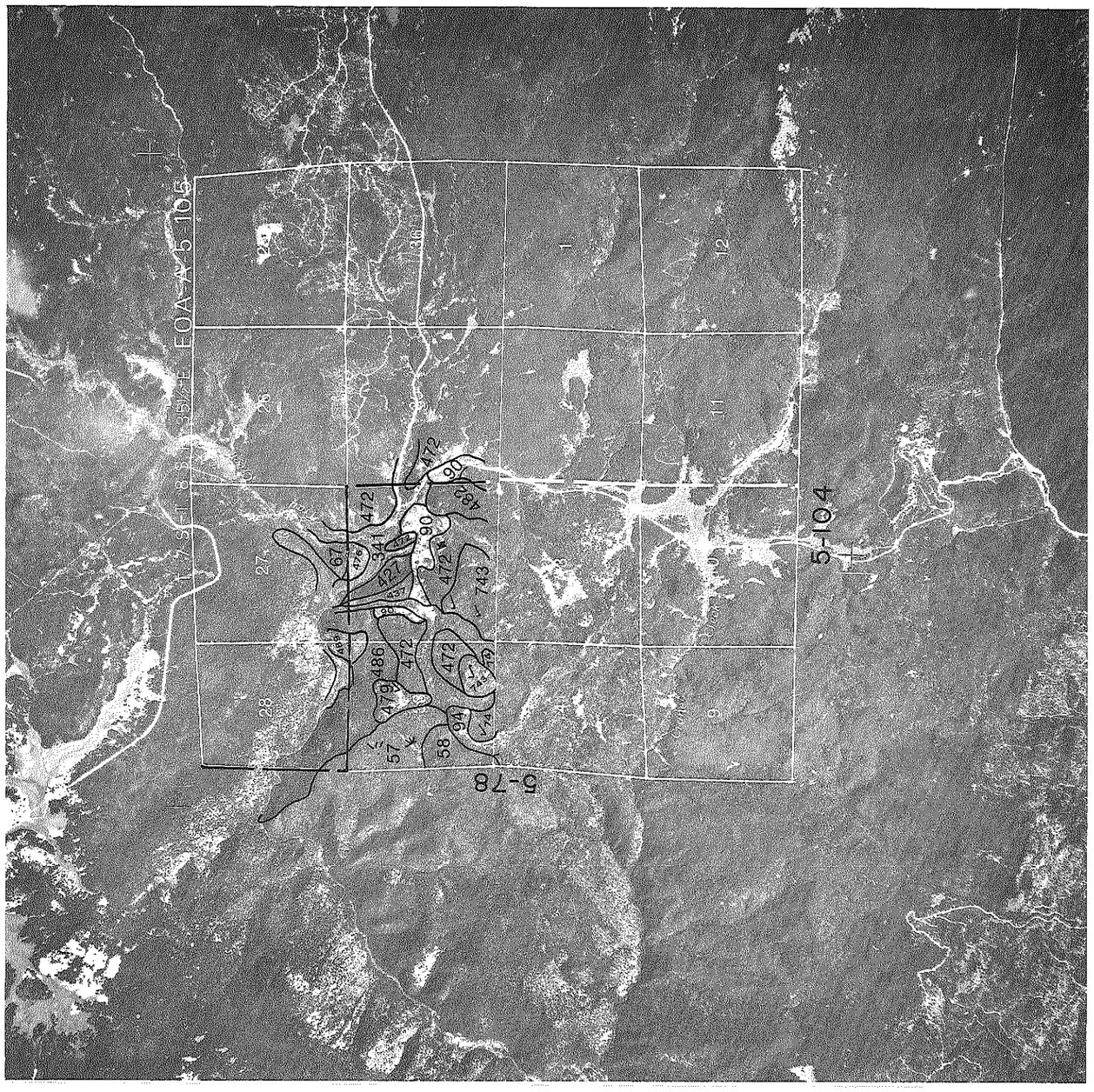

5-105
EOA-A-5-104
5-76
PUEBLO BDY

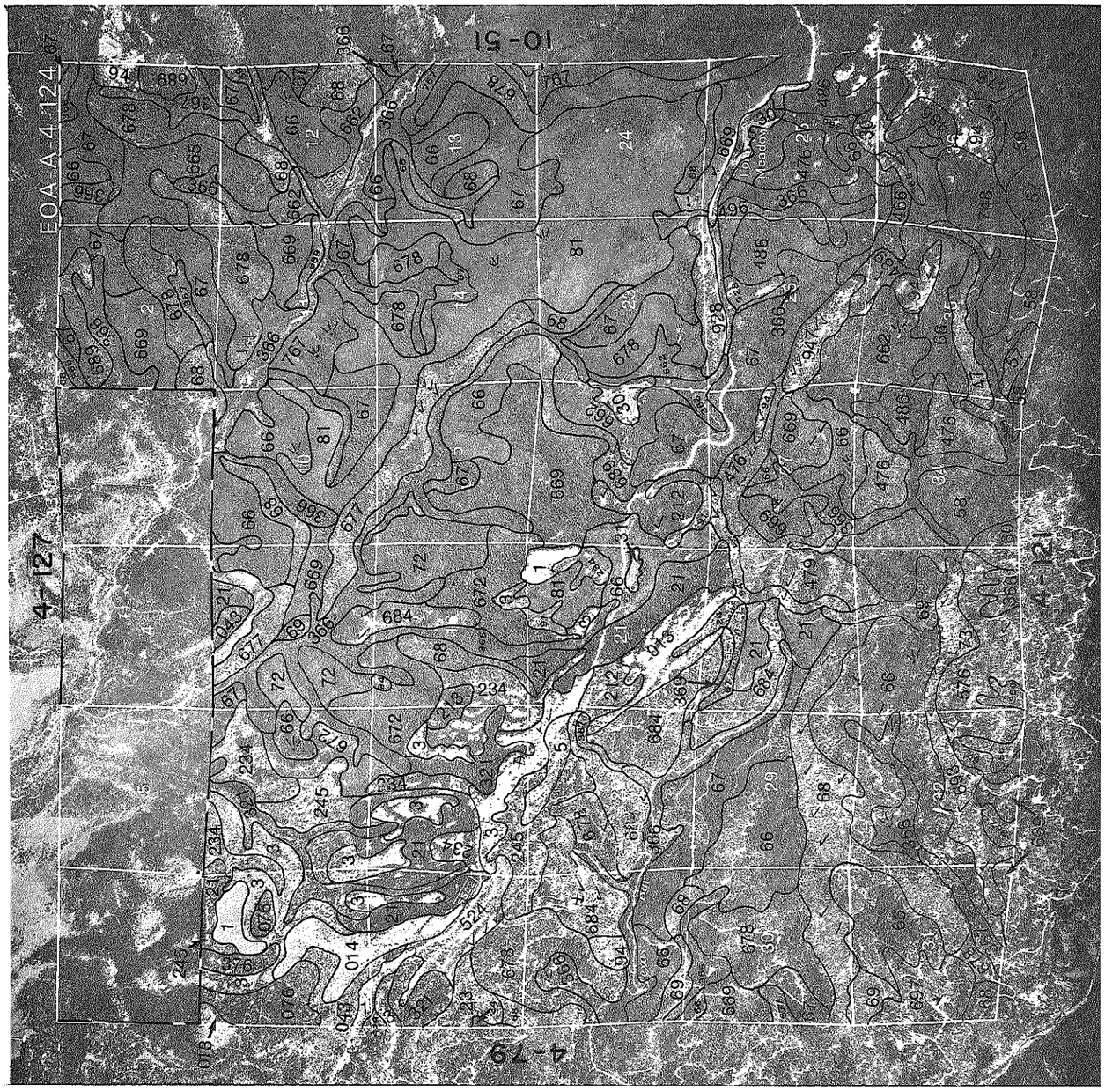

EOA A 10 37
10-39

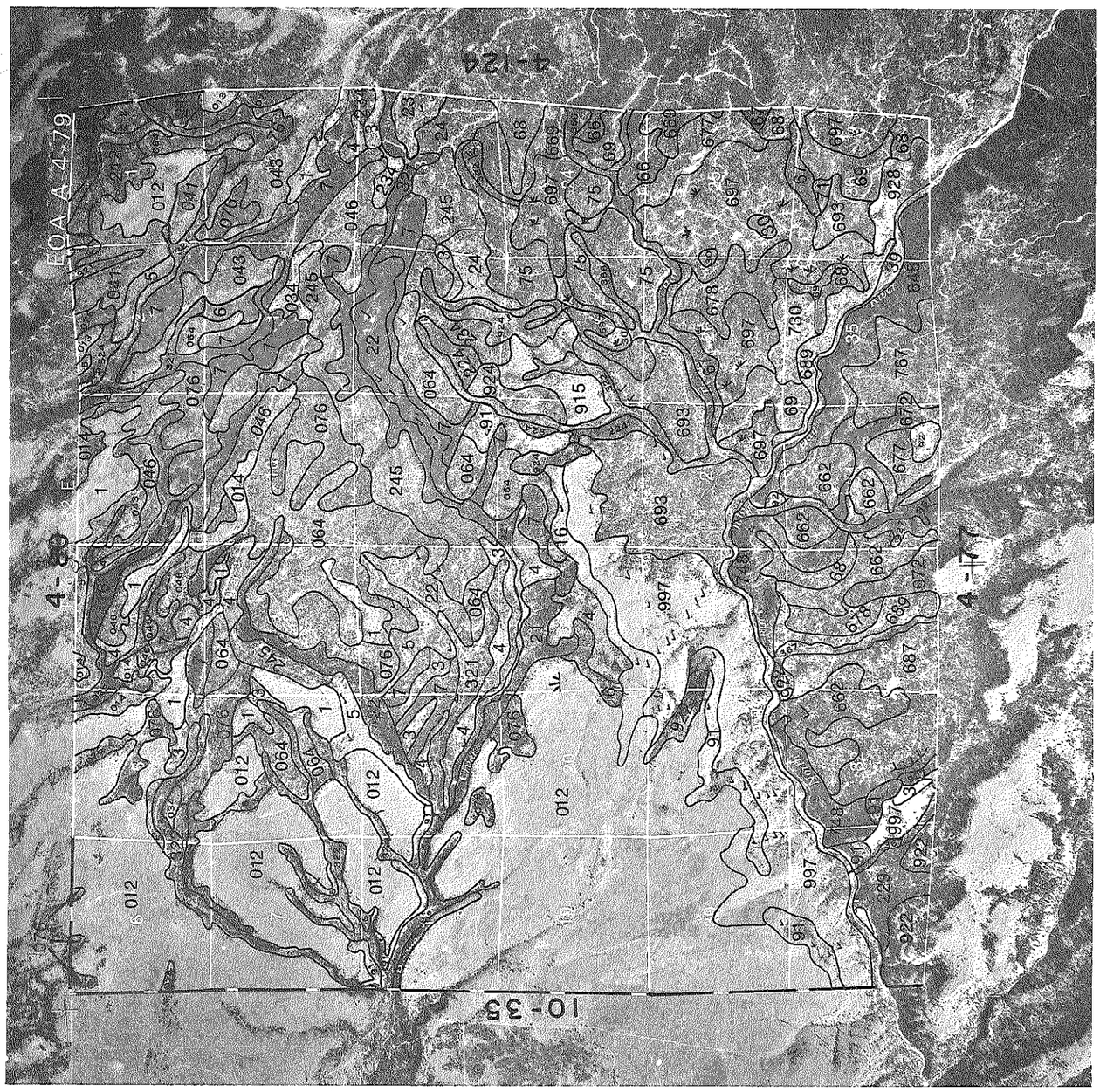

4-79
EOA A 4 77
4-121
4-75


EOA-A 4-121
4-124
5-26
4-119


10-51
4-121
87-5
5-23

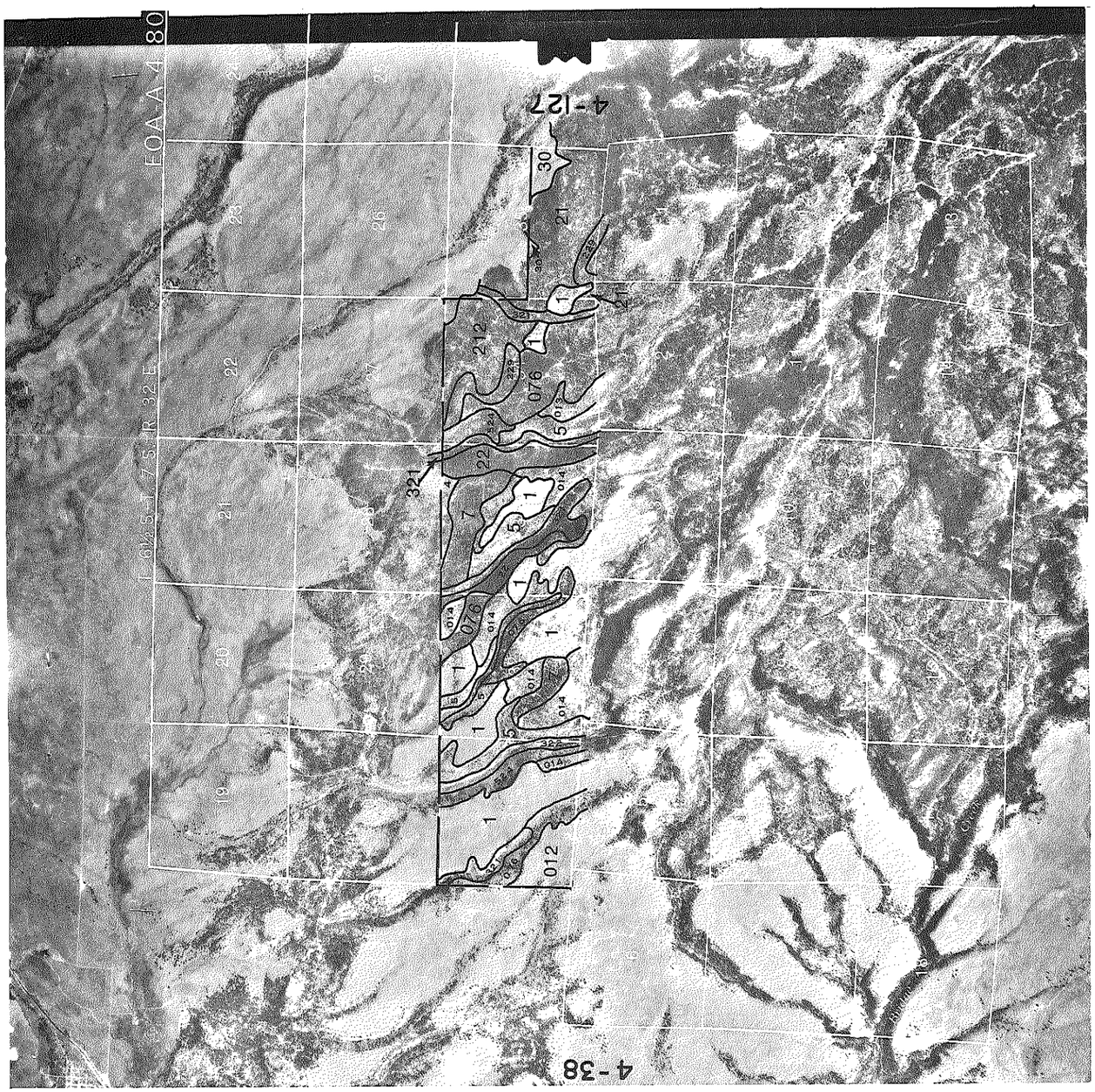

EOA-A-15-105
5-104
5-78
5-105
5-76
5-26

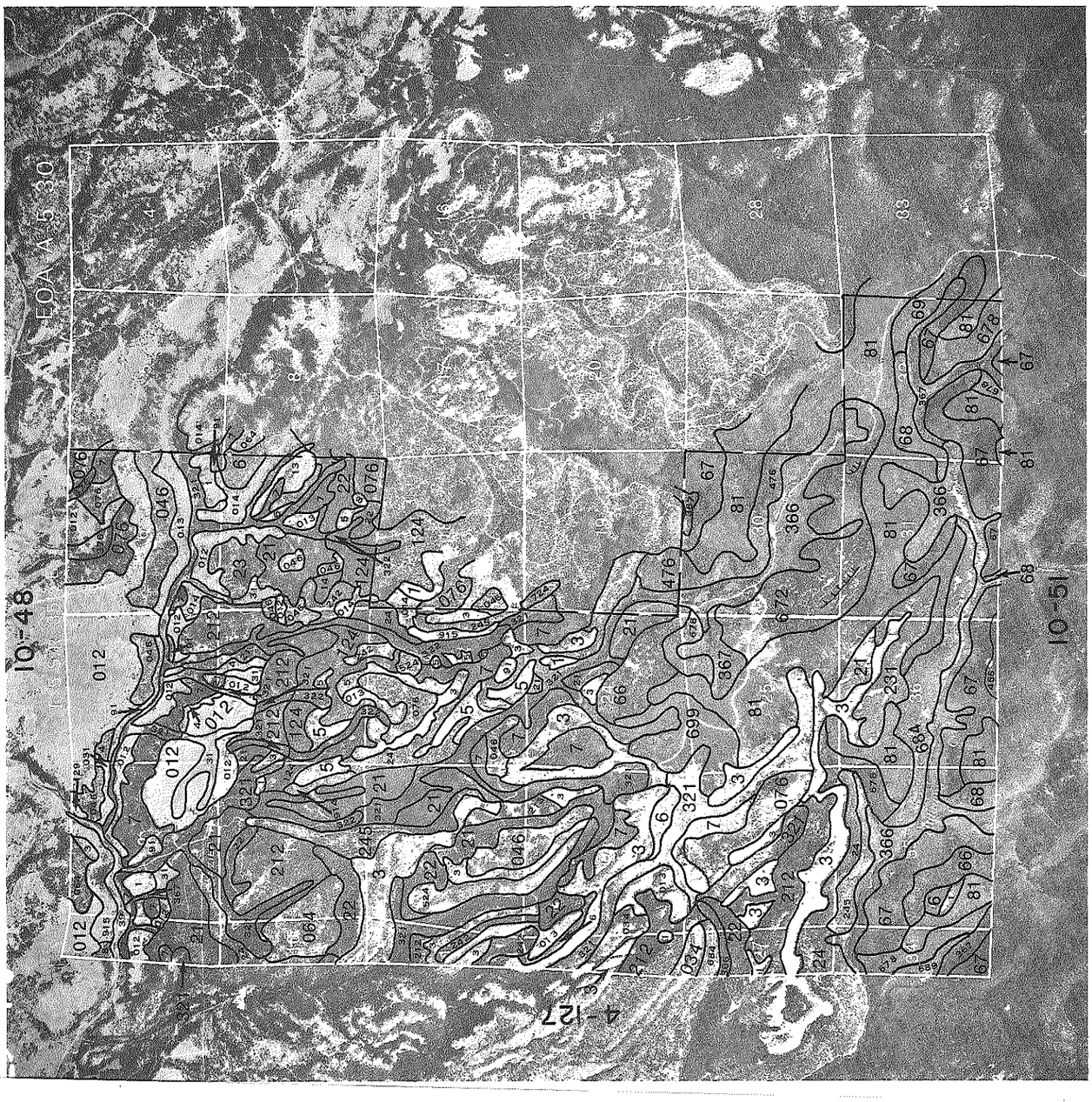

EOA A-4-124
4-127
4-121
4-79
10-51

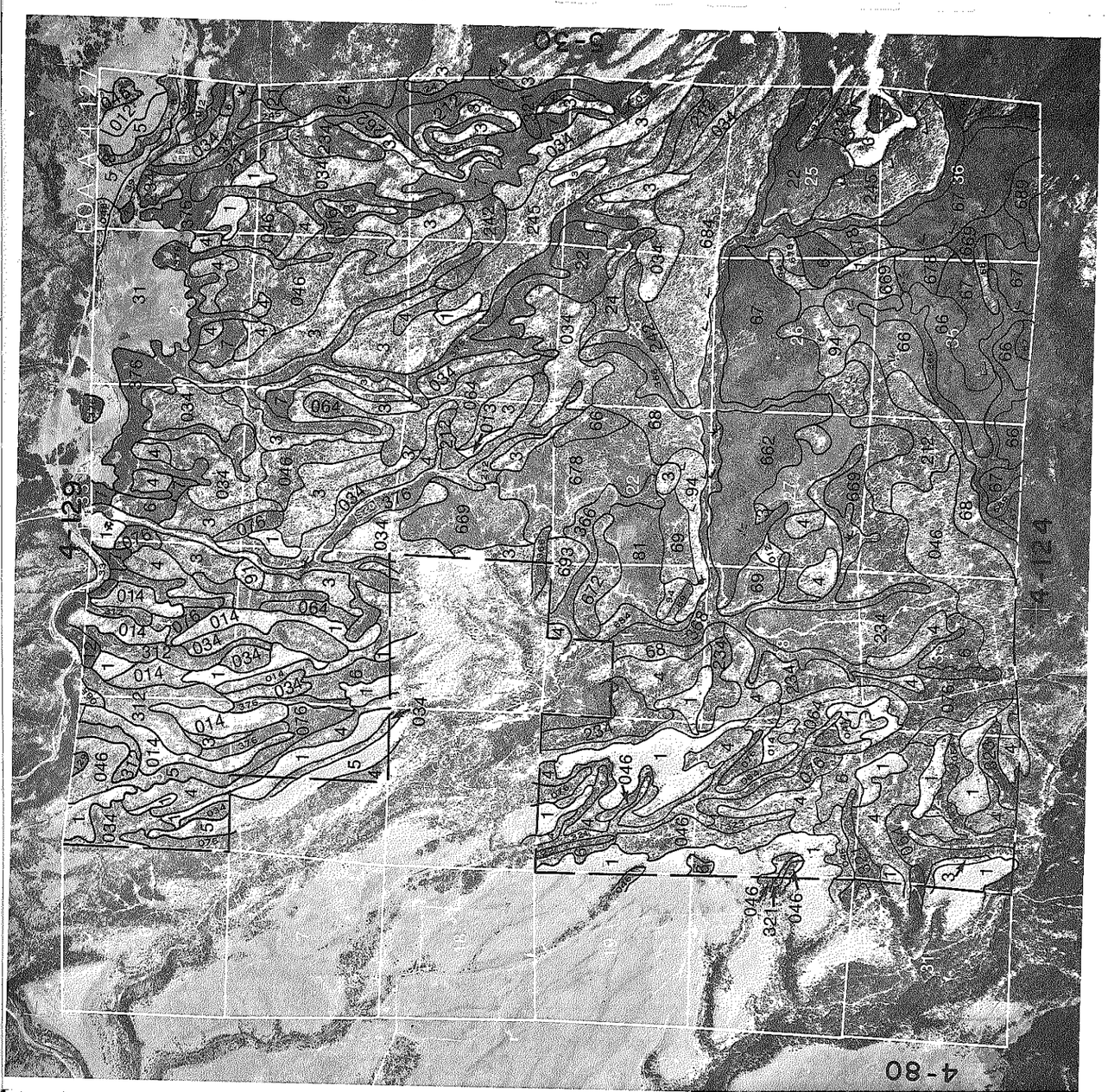

EOA A-4-79
4-124
4-89
4-77
10-33

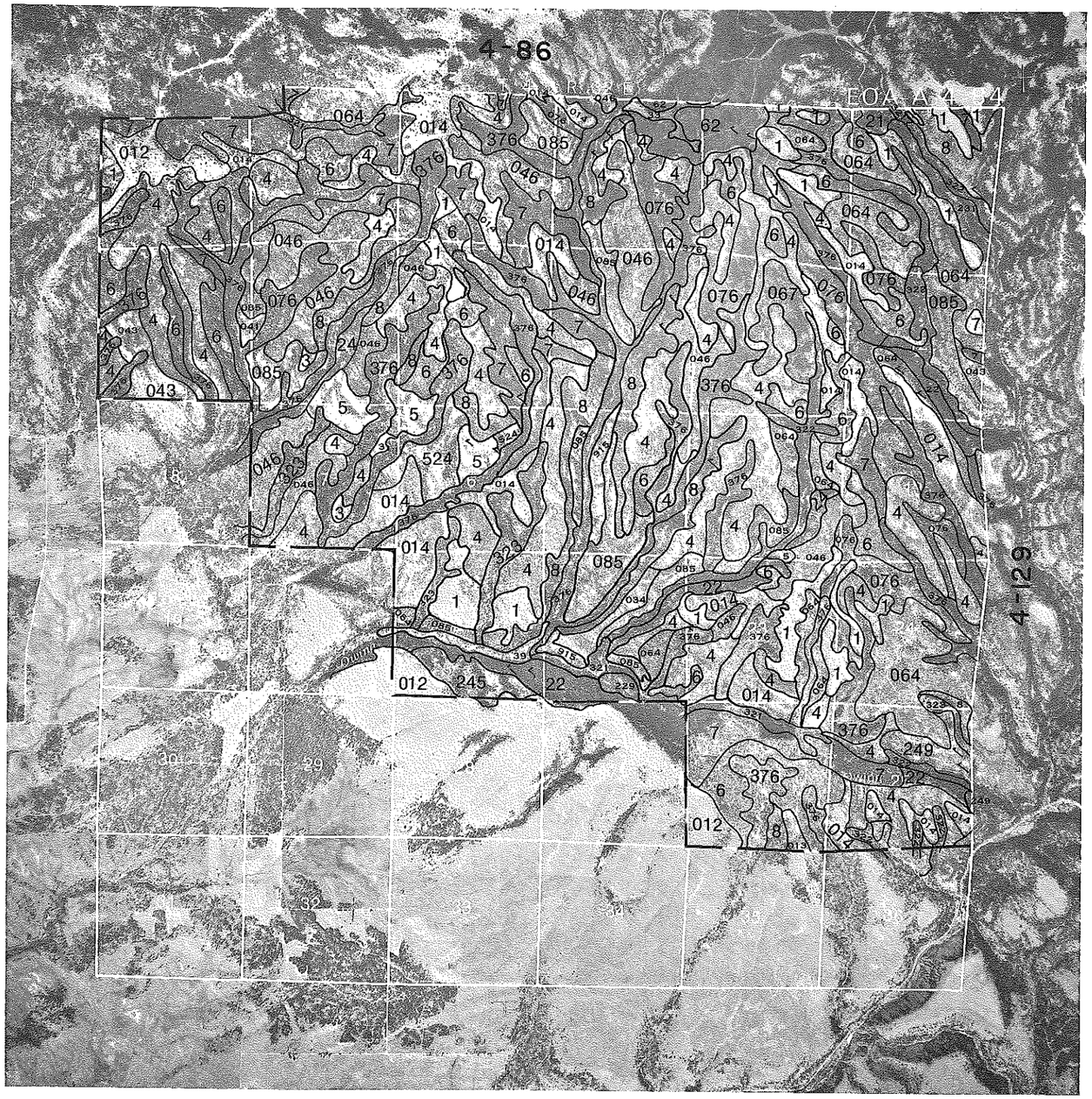

EOA-A-10-54
T. 6 S., R. 35 E.
PROTECTION
BDY
10-51

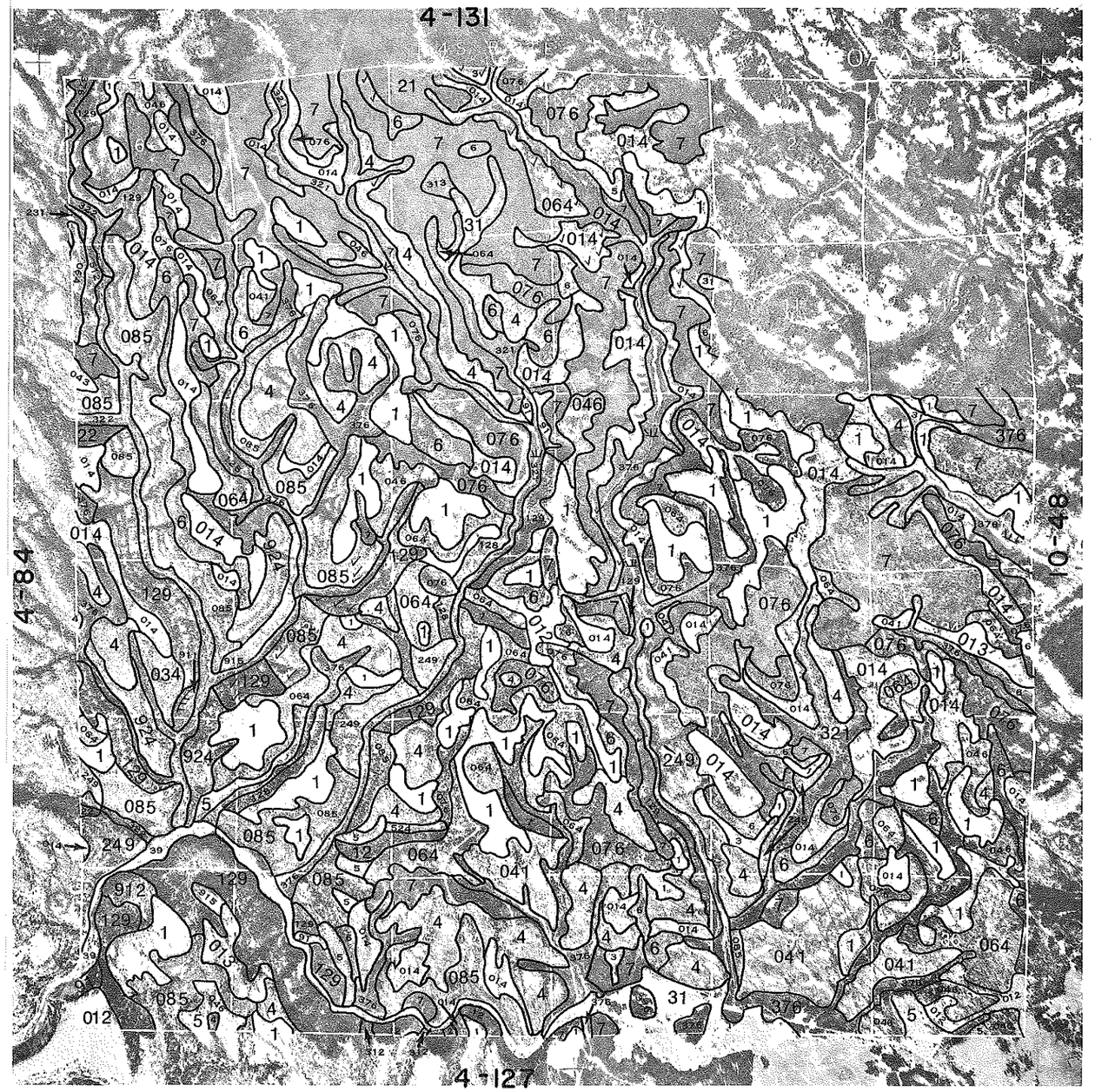

EOA-A-10-51
T. 6 S., R. 34 E.
10-54
4-124
5-26

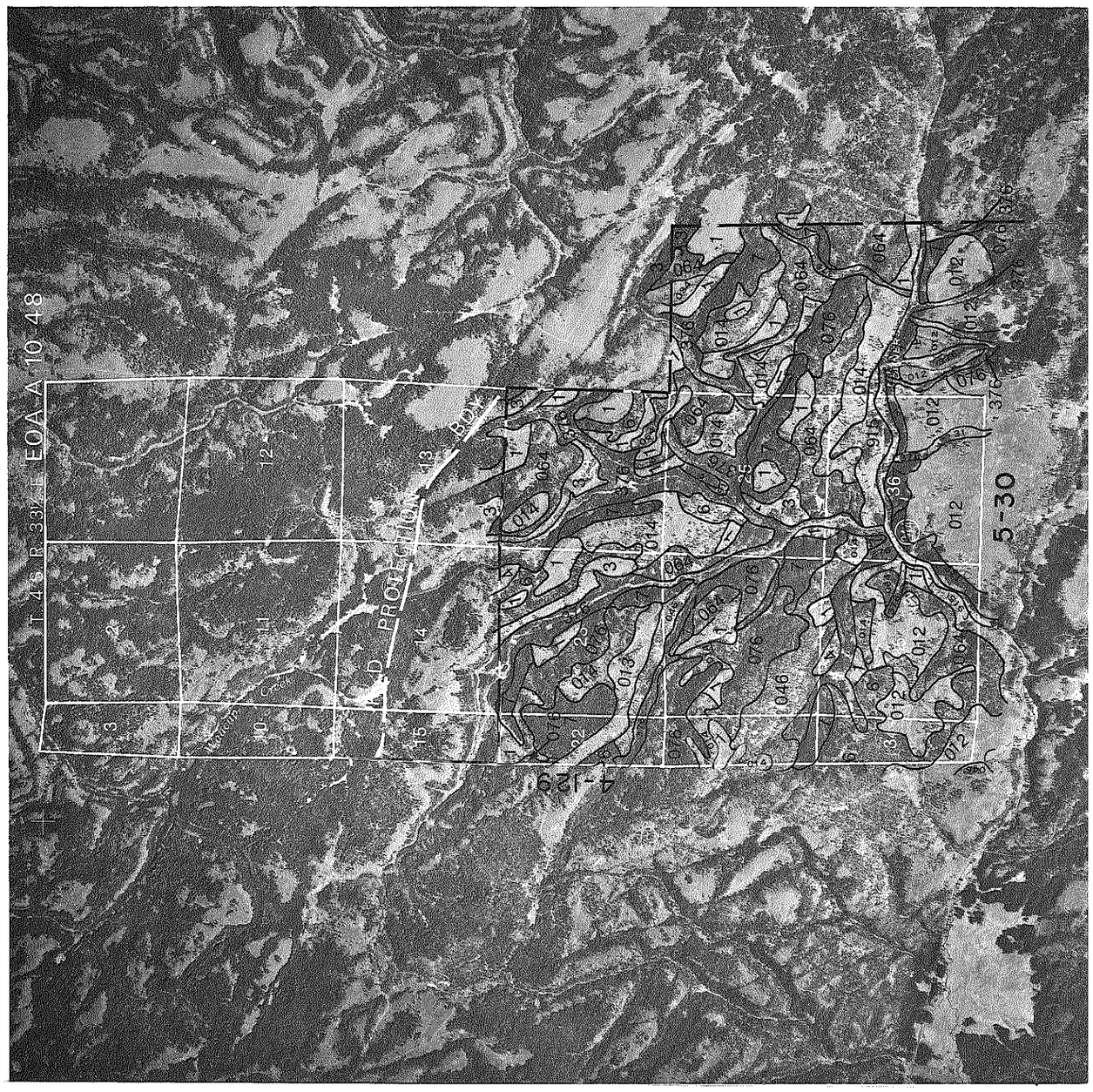

FOA-A-80
T. 6½ S., R. 32 E.
T. 7 S., R. 32 E.
4-127
4-38


EOA A-5 30
10-48
10-51
4-127

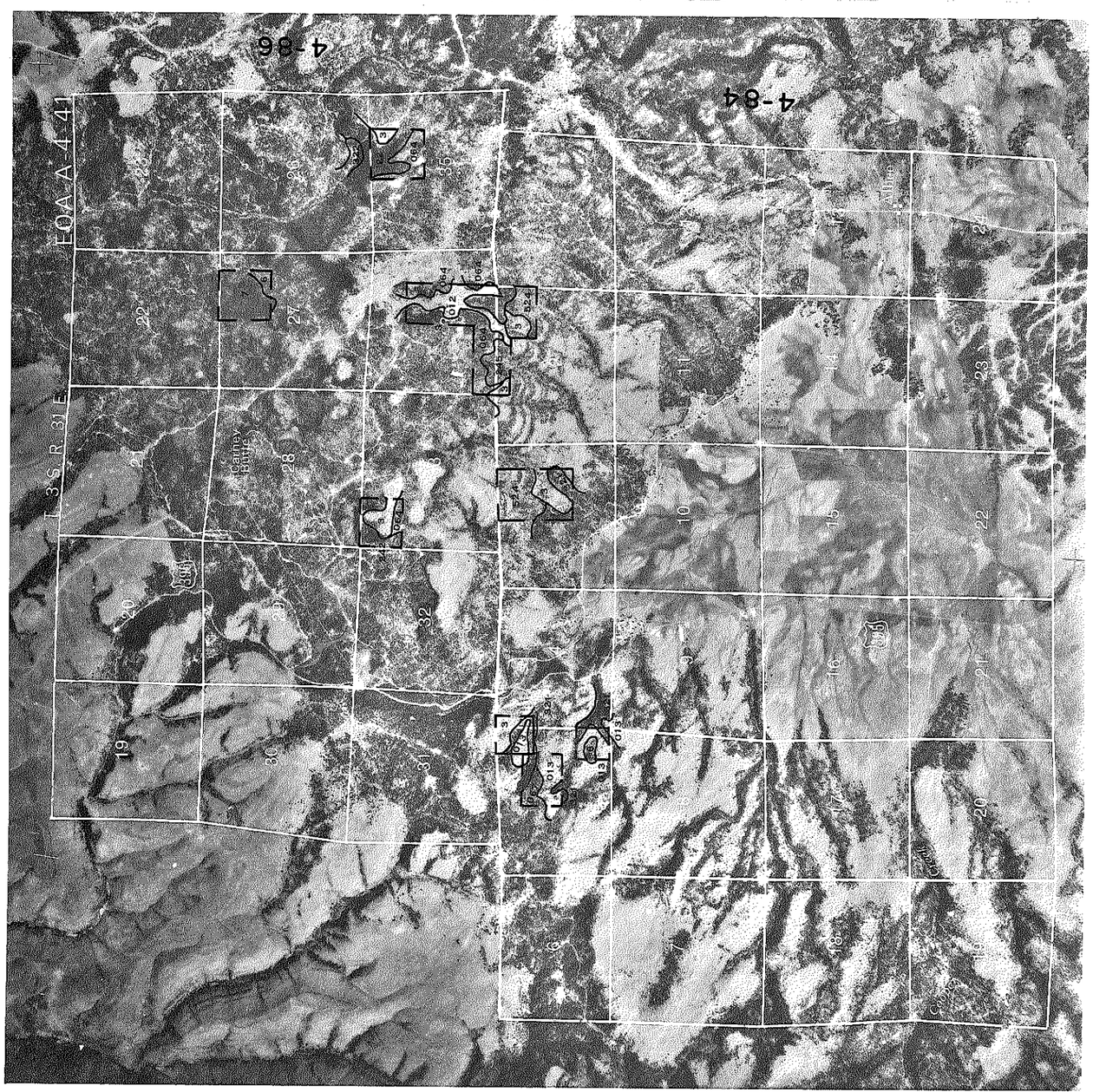

EOA A-5 12
4-129
4-124
4-80

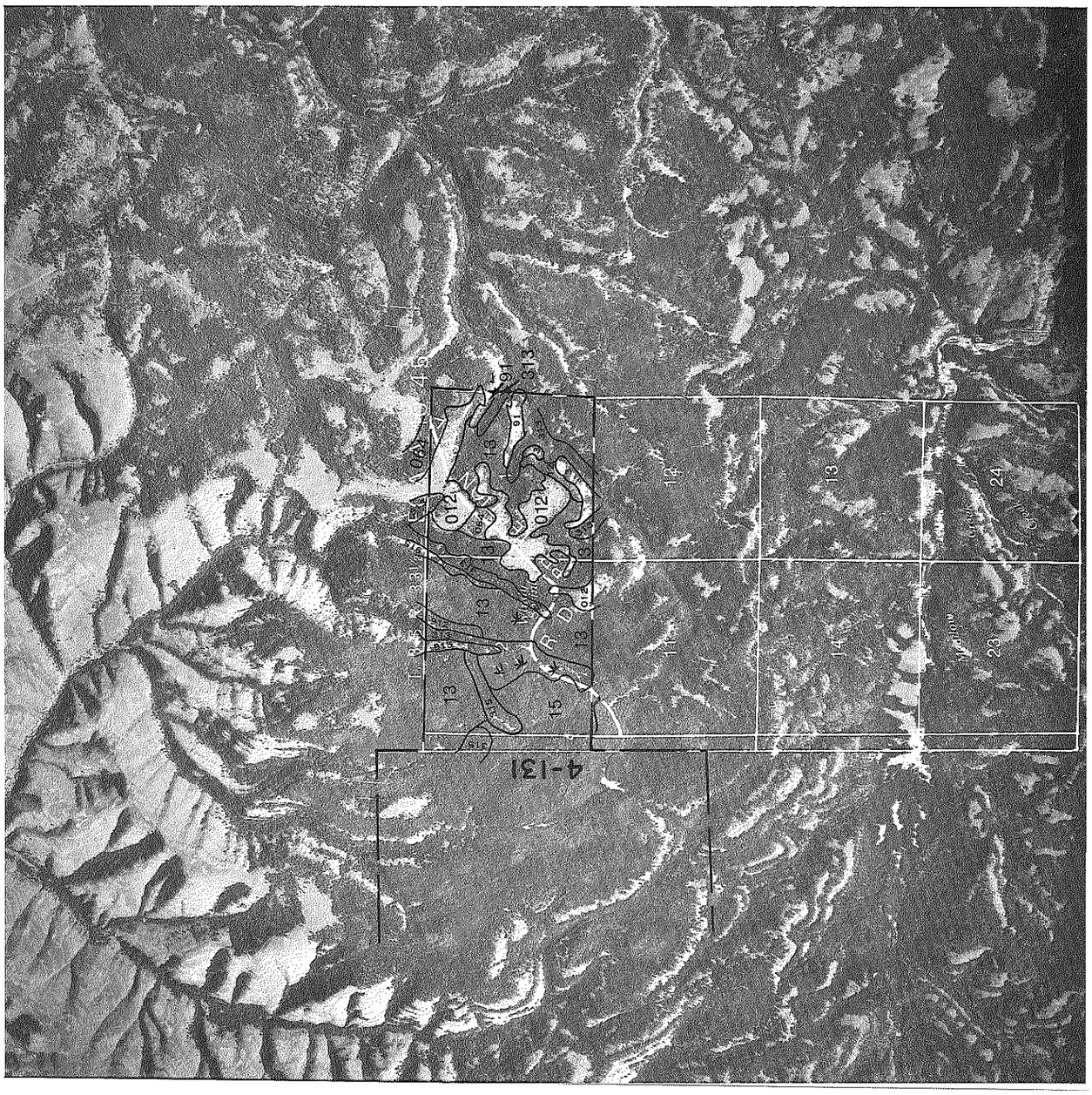

4-86
4-129


4-131
4-84
4-101
4-127

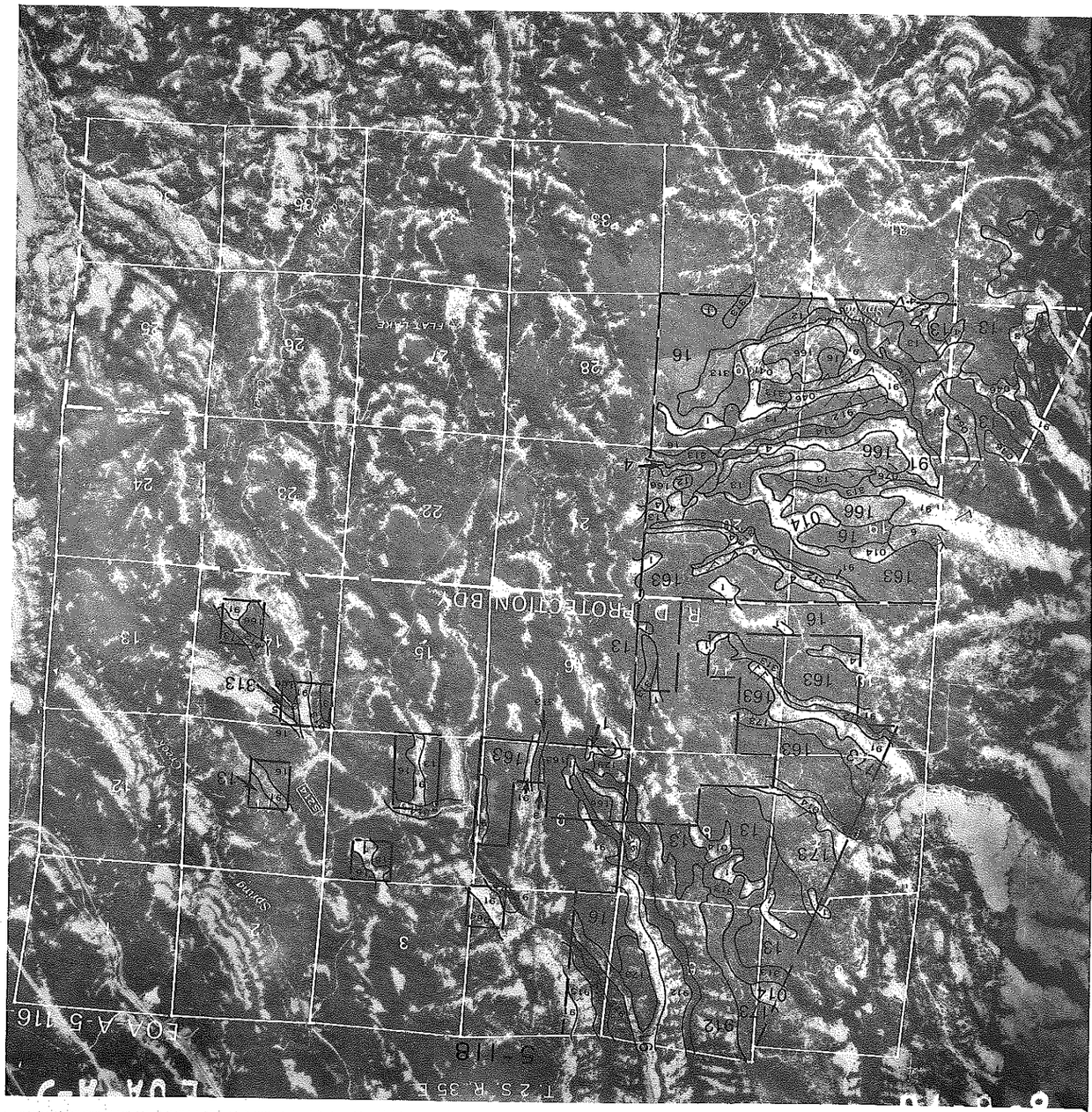

T. 46 R. 33½ E EOA A 10 48
5-30
4-129

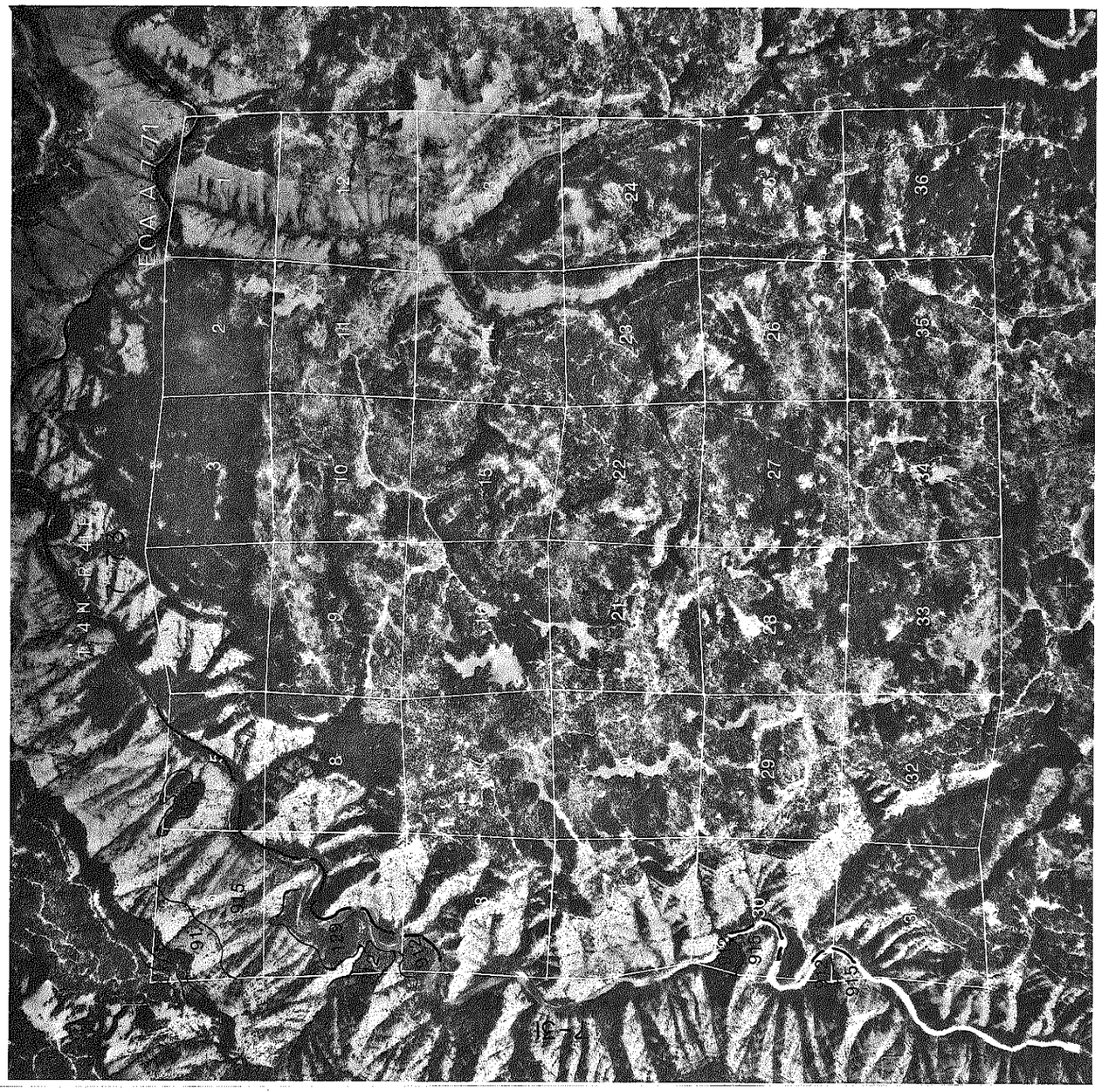

EOA A 4 86
T 3 S R 31 E
4-131
4-41
4-84


EOA A 4 41
T 3 S R 31 E
4-86
4-84


4-131
T 33 N
R 38 E
Warm Springs Creek
Warm Springs Creek
Warm Springs Creek

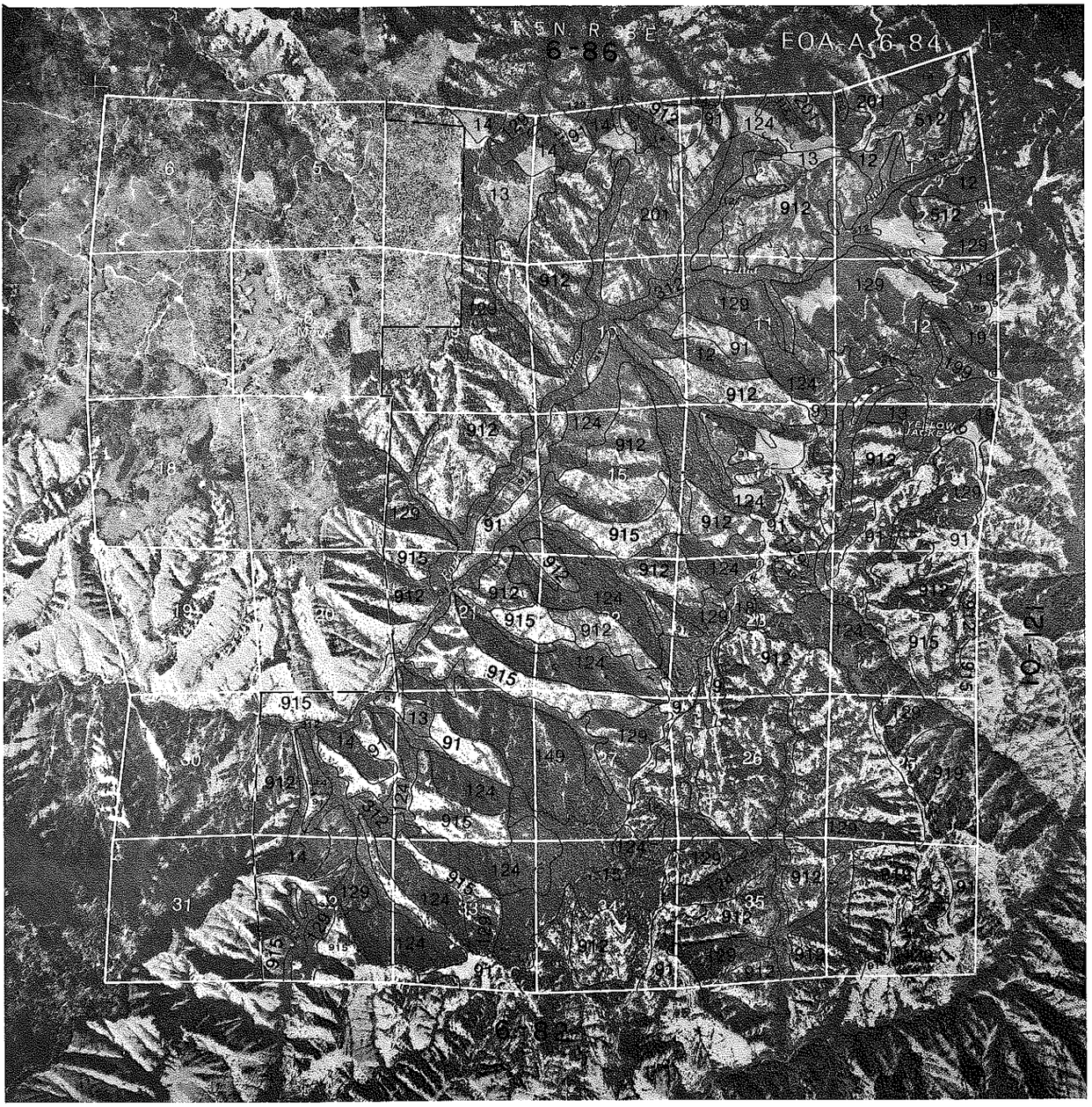
Northern Half


R D PROTECTION BDY.
T 2 S. R. 35 E.
S-118
LOA-A-5116

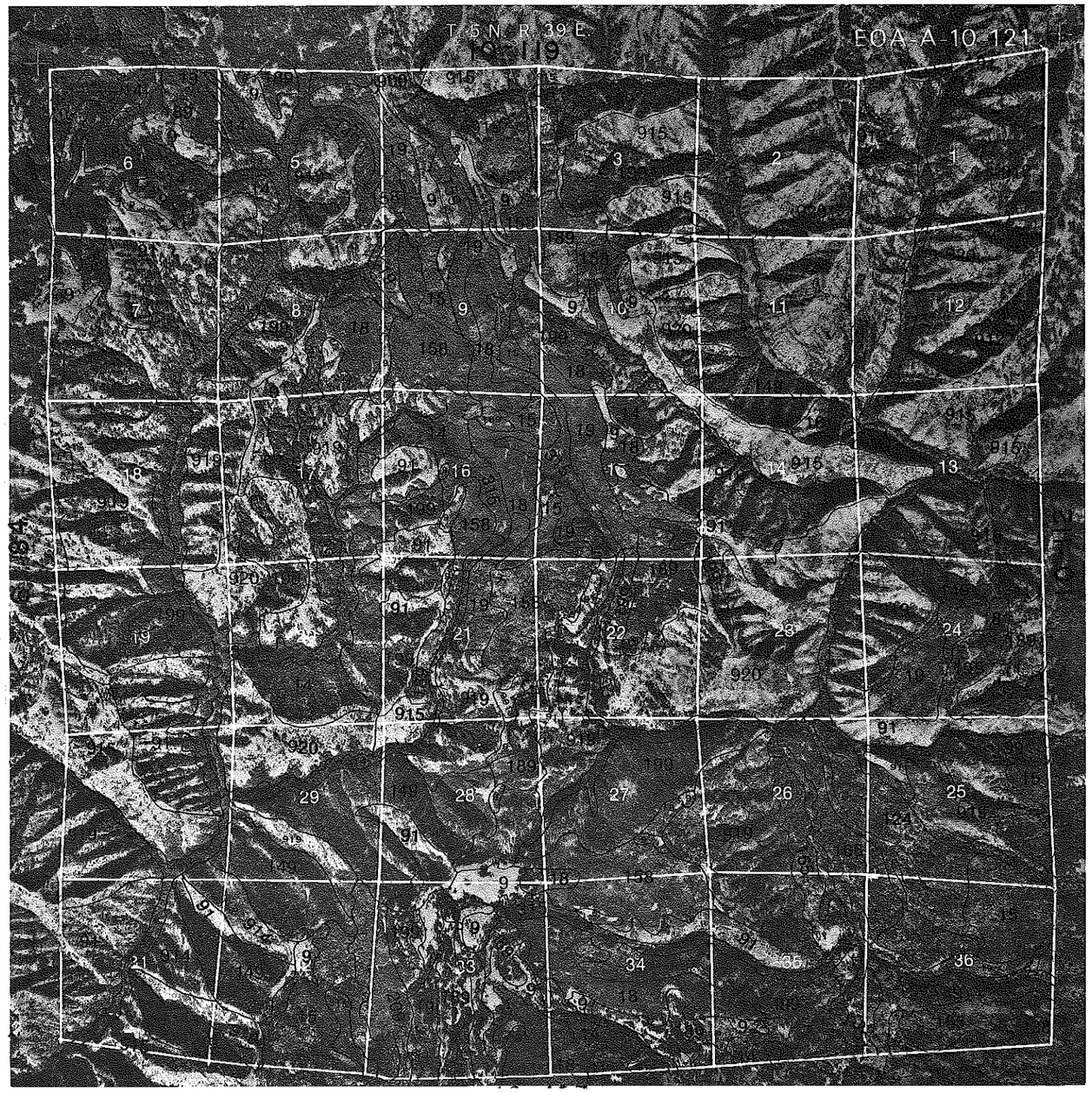

EOA A 7 71
R 4 N R 4 E T 6 S
12-2

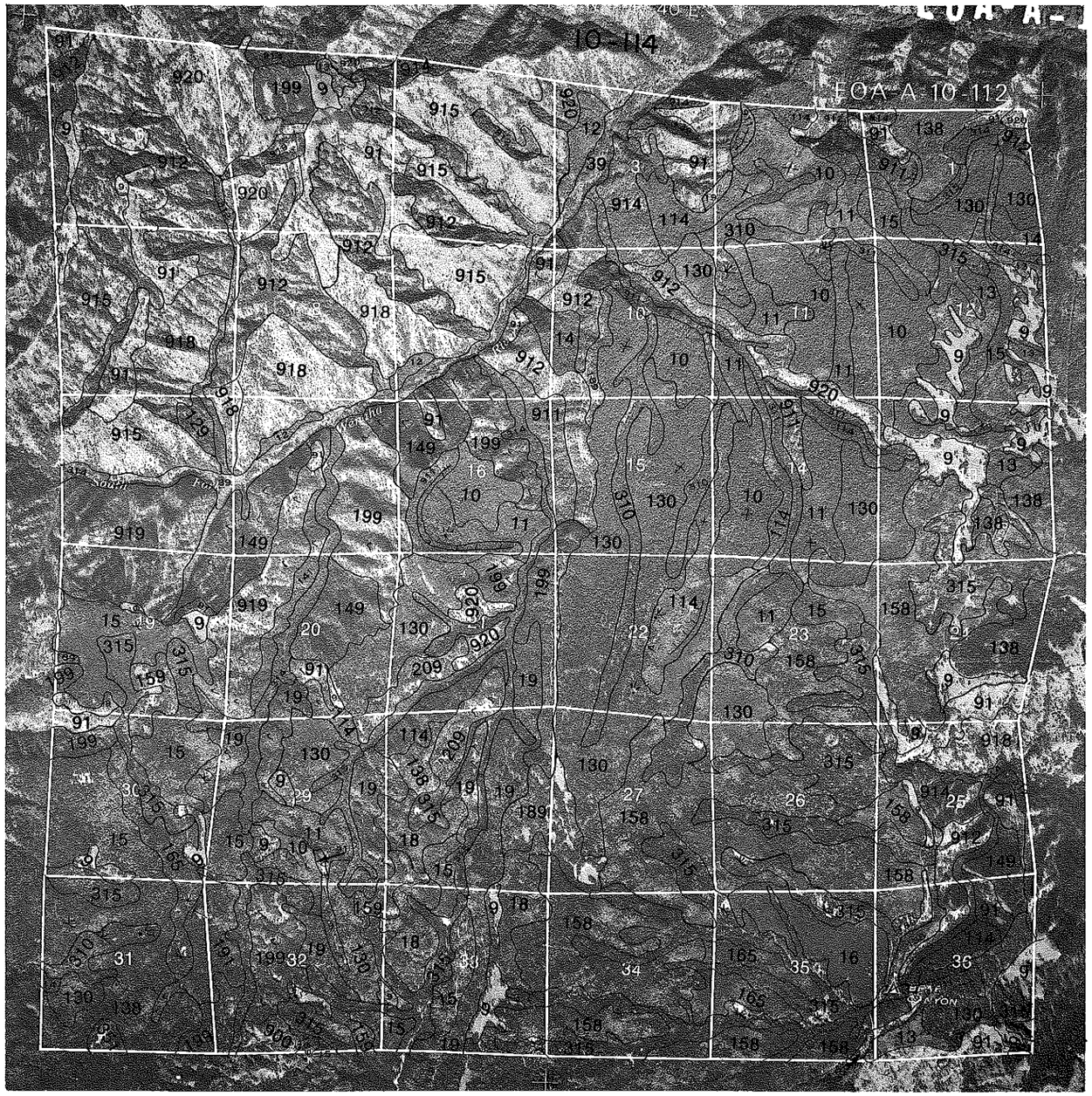

EOA
10-112
10-123
T 30

T 5 N R 38 E
6-86
FOA-A 6-84

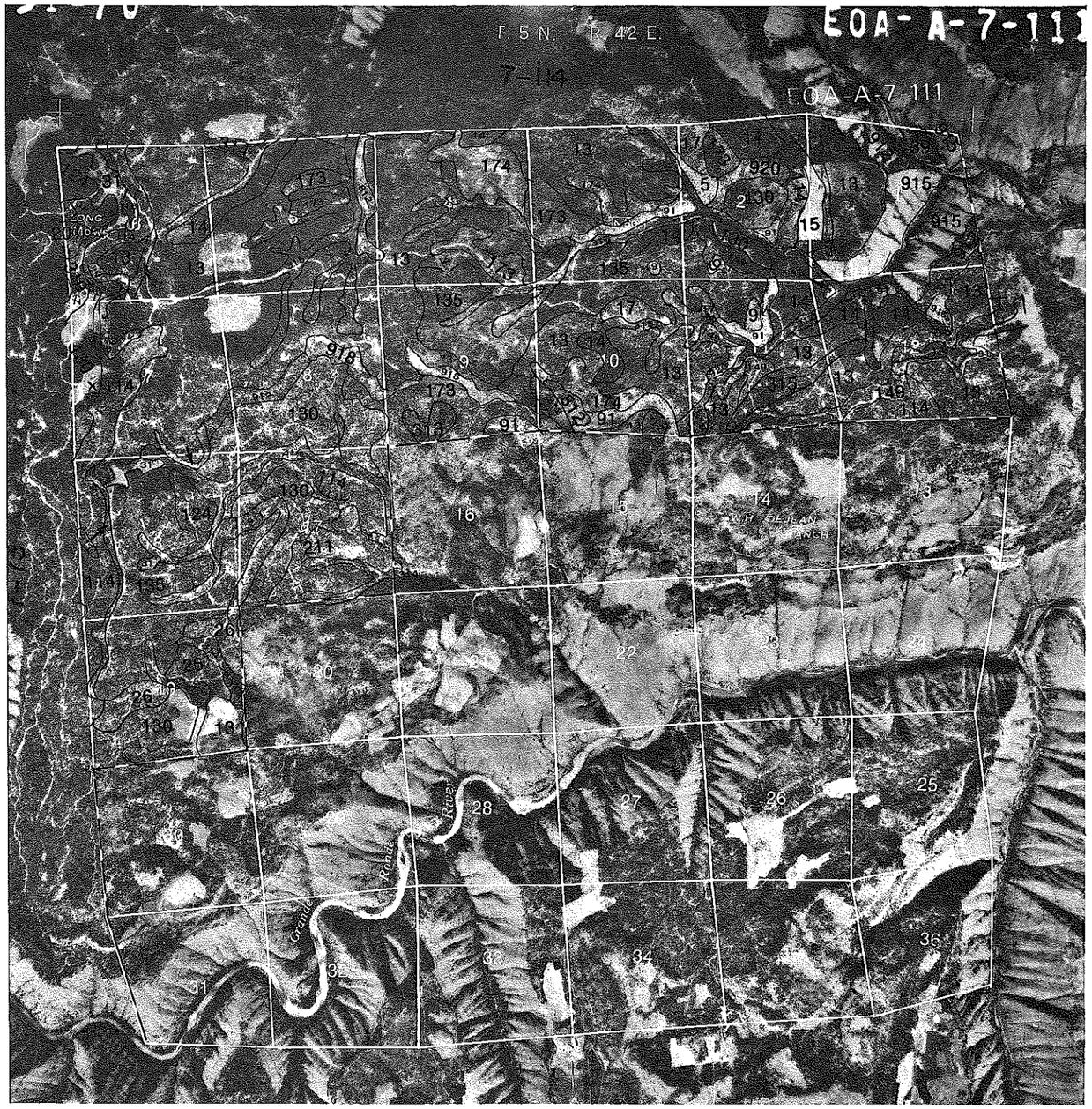


T 5 N R 39 E
10-119
FOA-A 10-121

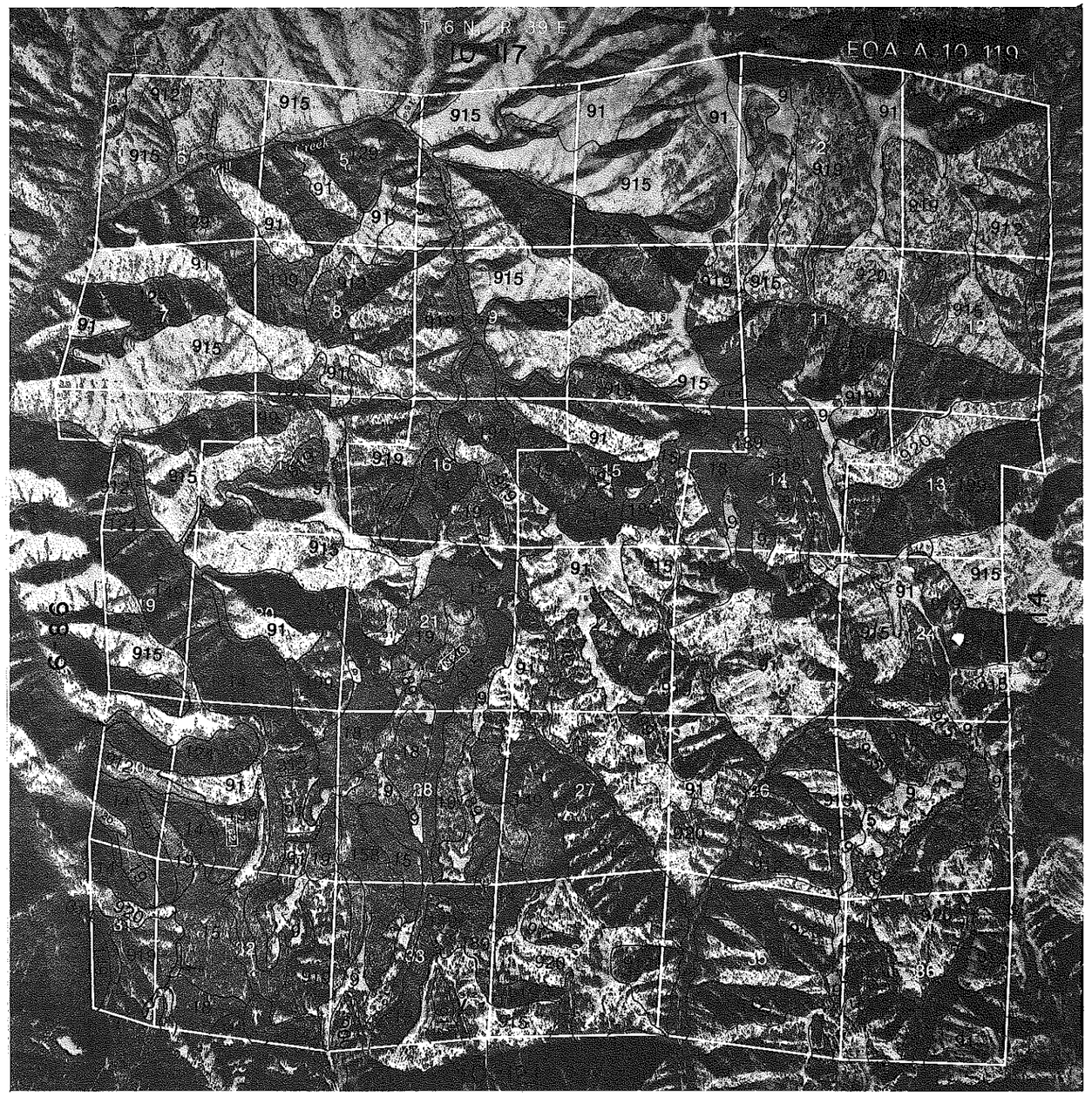


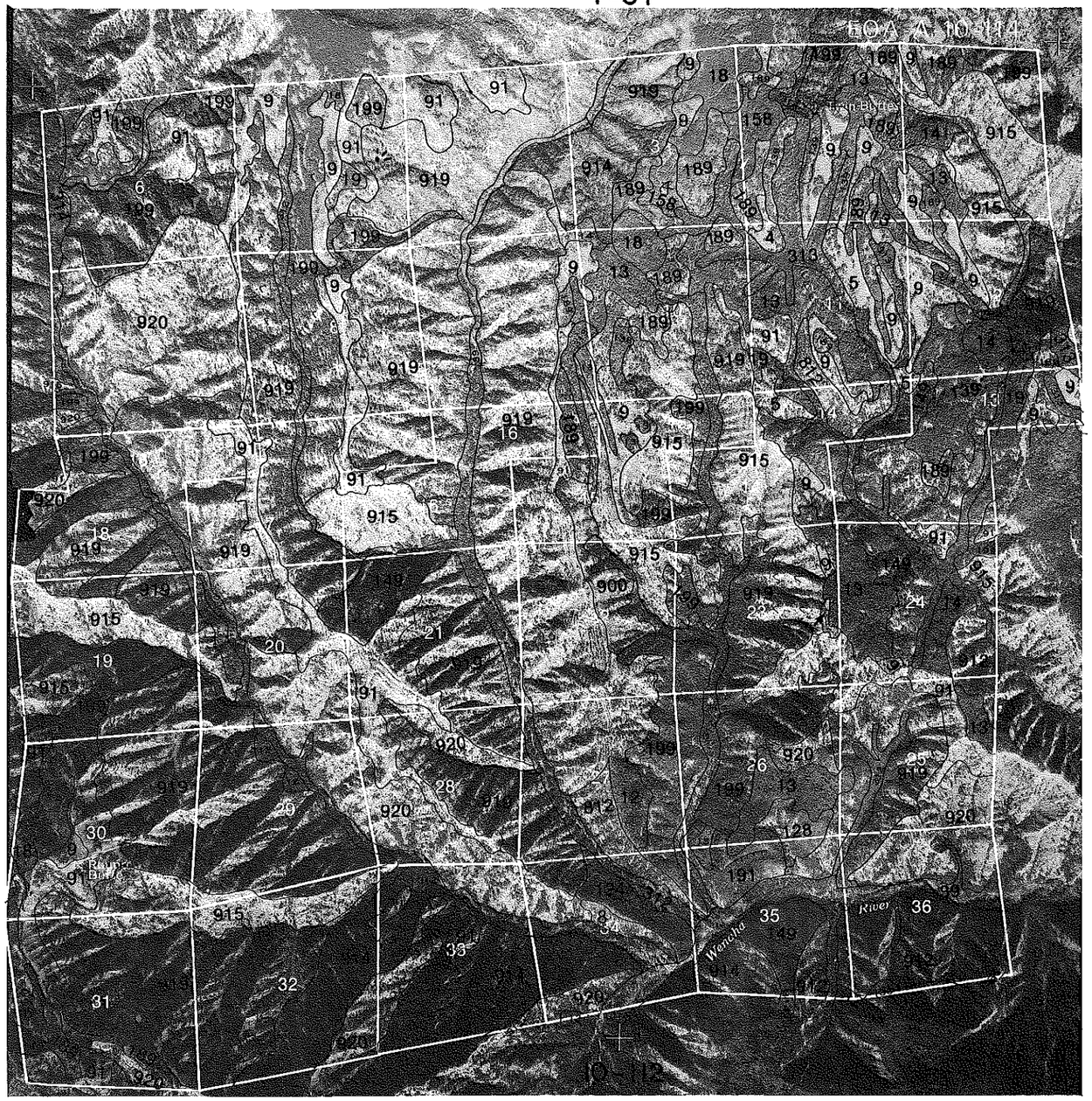

EOA-A-
10-114
EOA-A-10-112


T 5 N R 41 E
EOA-A-7-73
7-75
EOA A 7-73
10-112
7-7

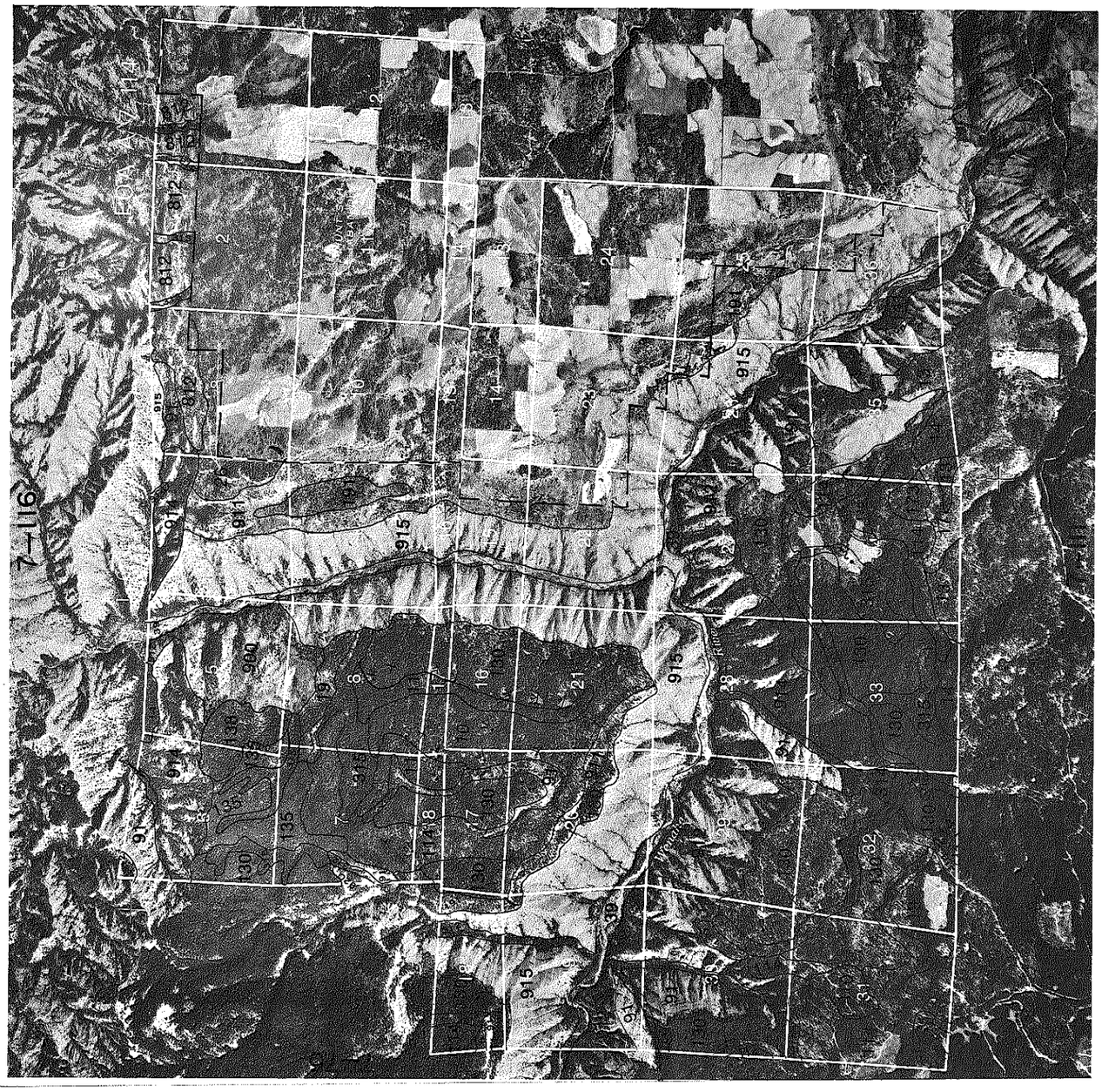

T 5 N R 42 E
7-114
EOA-A-7-111
EOA-A-7-111
Grande Ronde River
Snake River
LONG HOLLOW
MAY CREEK
13
14
15
16
17
18
22
24
25
26
27
28
30
31
32
34
36

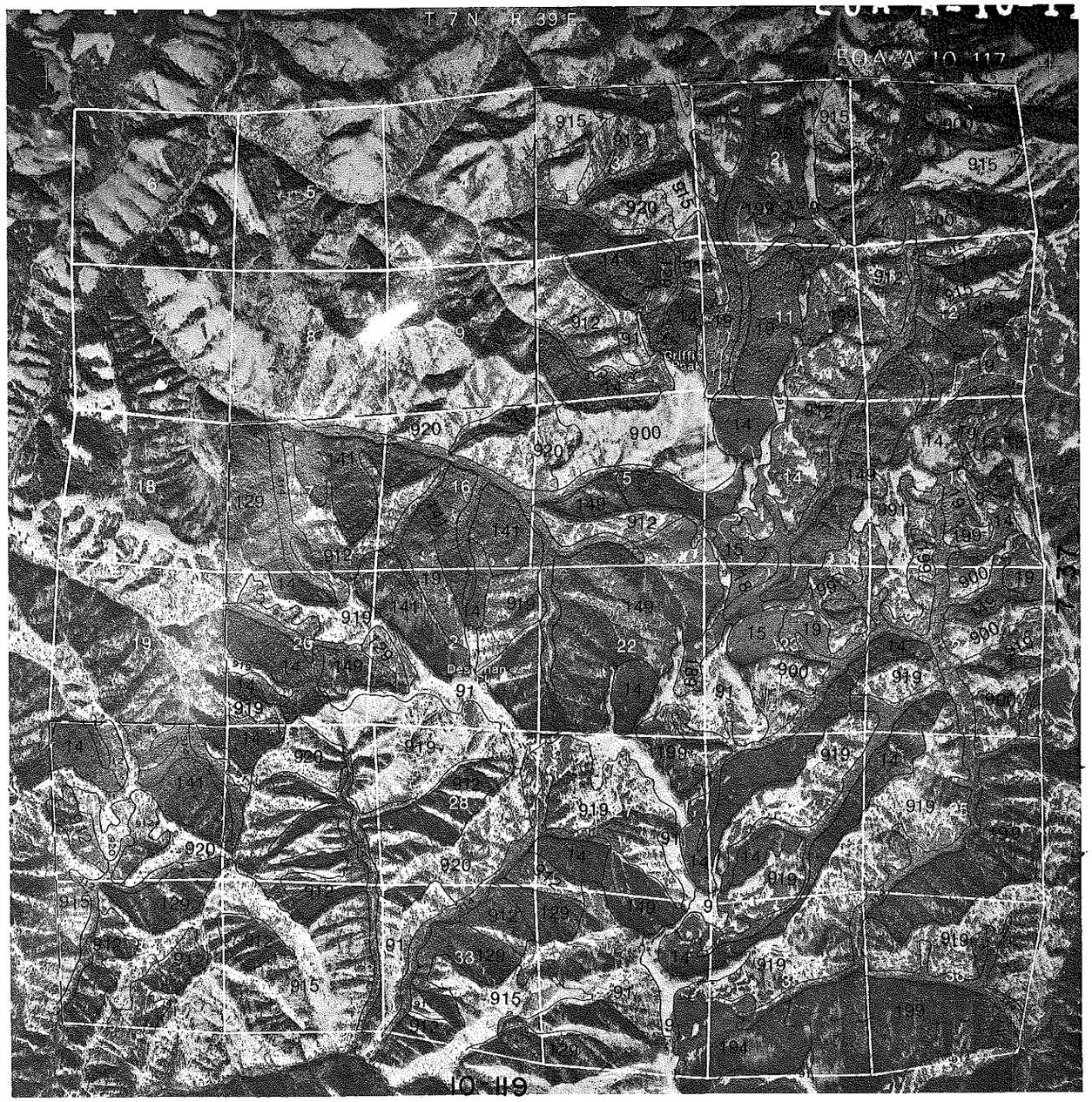

EQA A 6 86

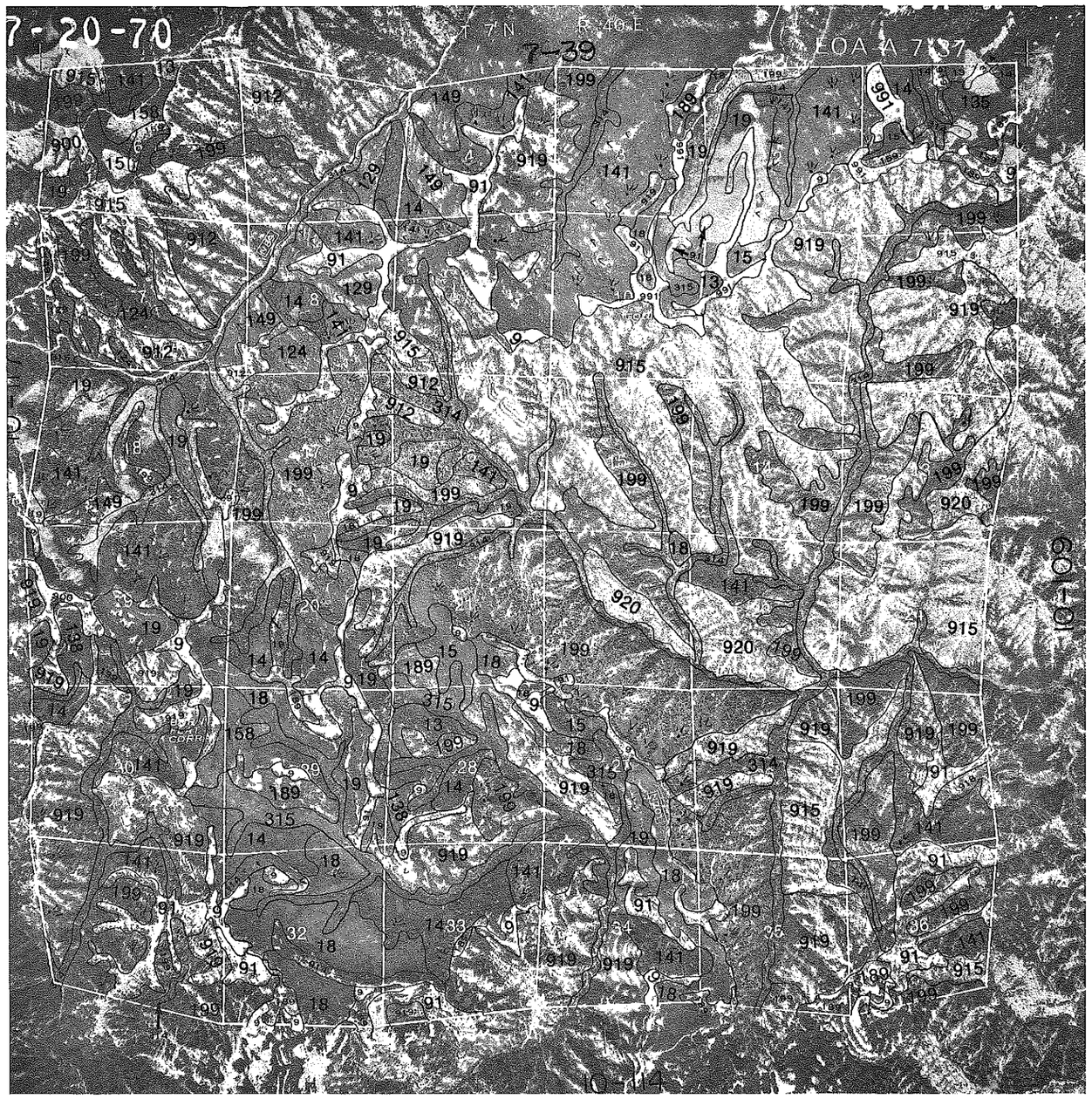

T 6 N R 39 E
EQA A 10 119

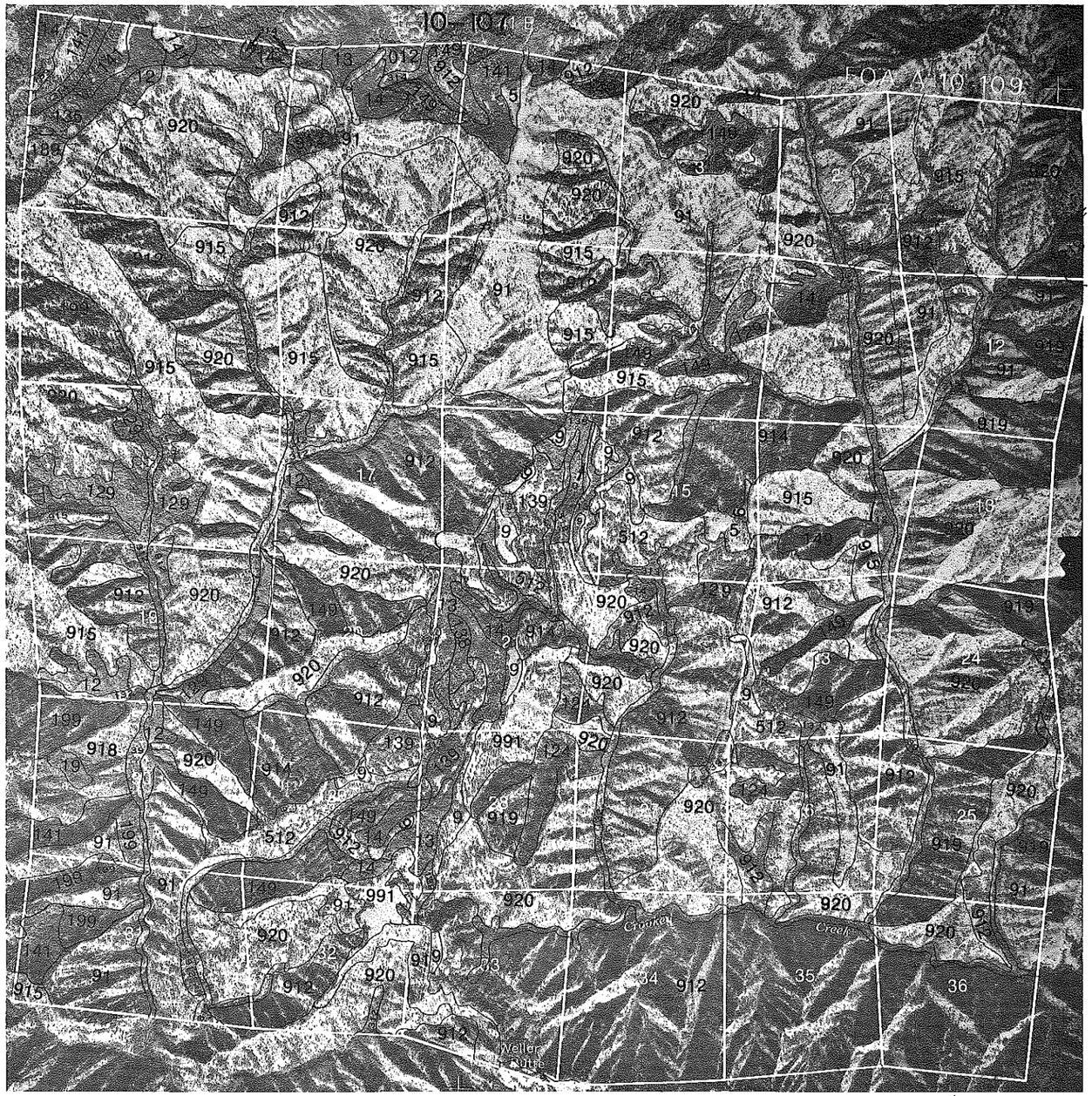

EOA A-10-114
Transmitter
Wenatchee
River
10-112

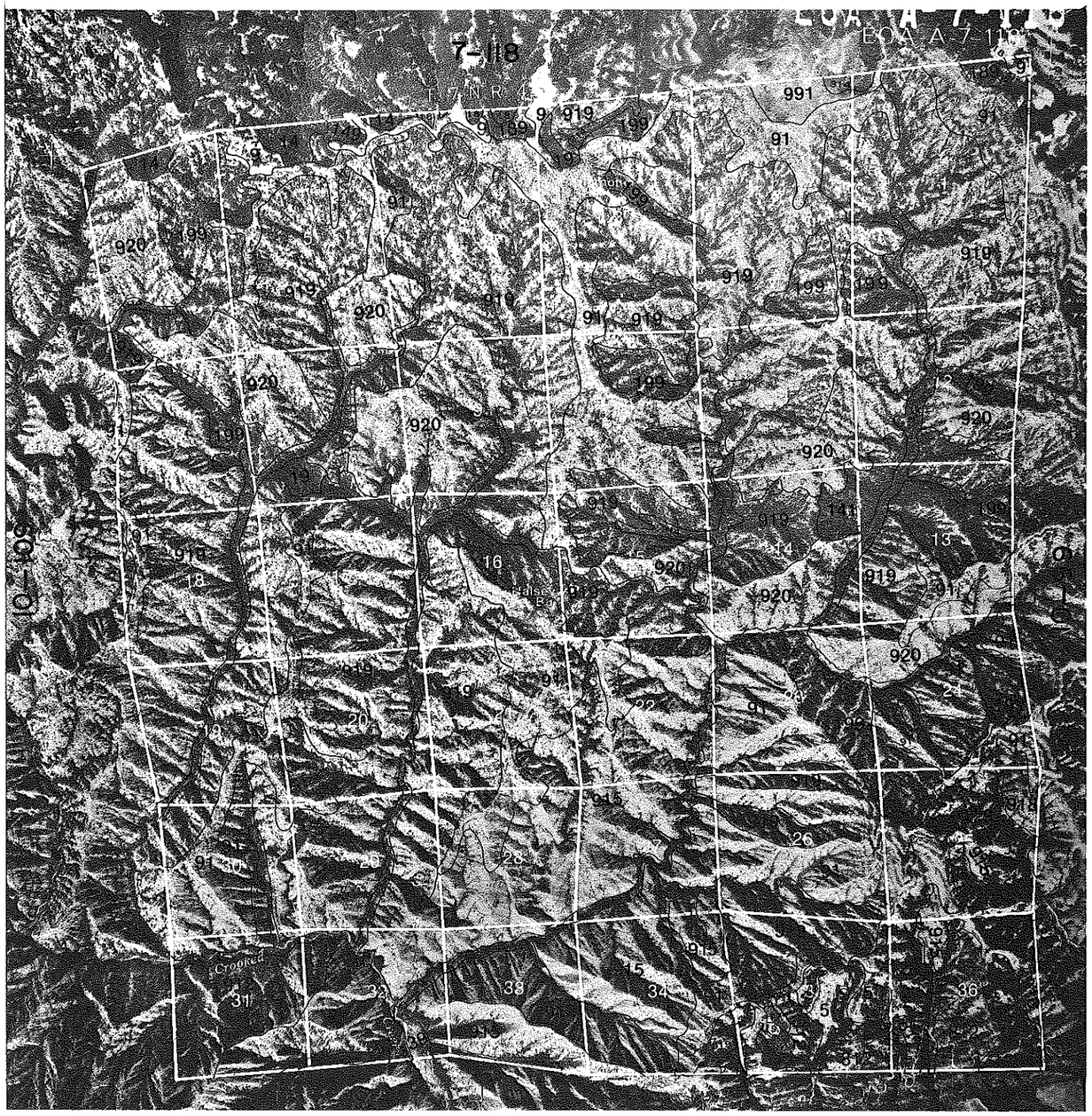

10-109
EOA A-7-75
7-14

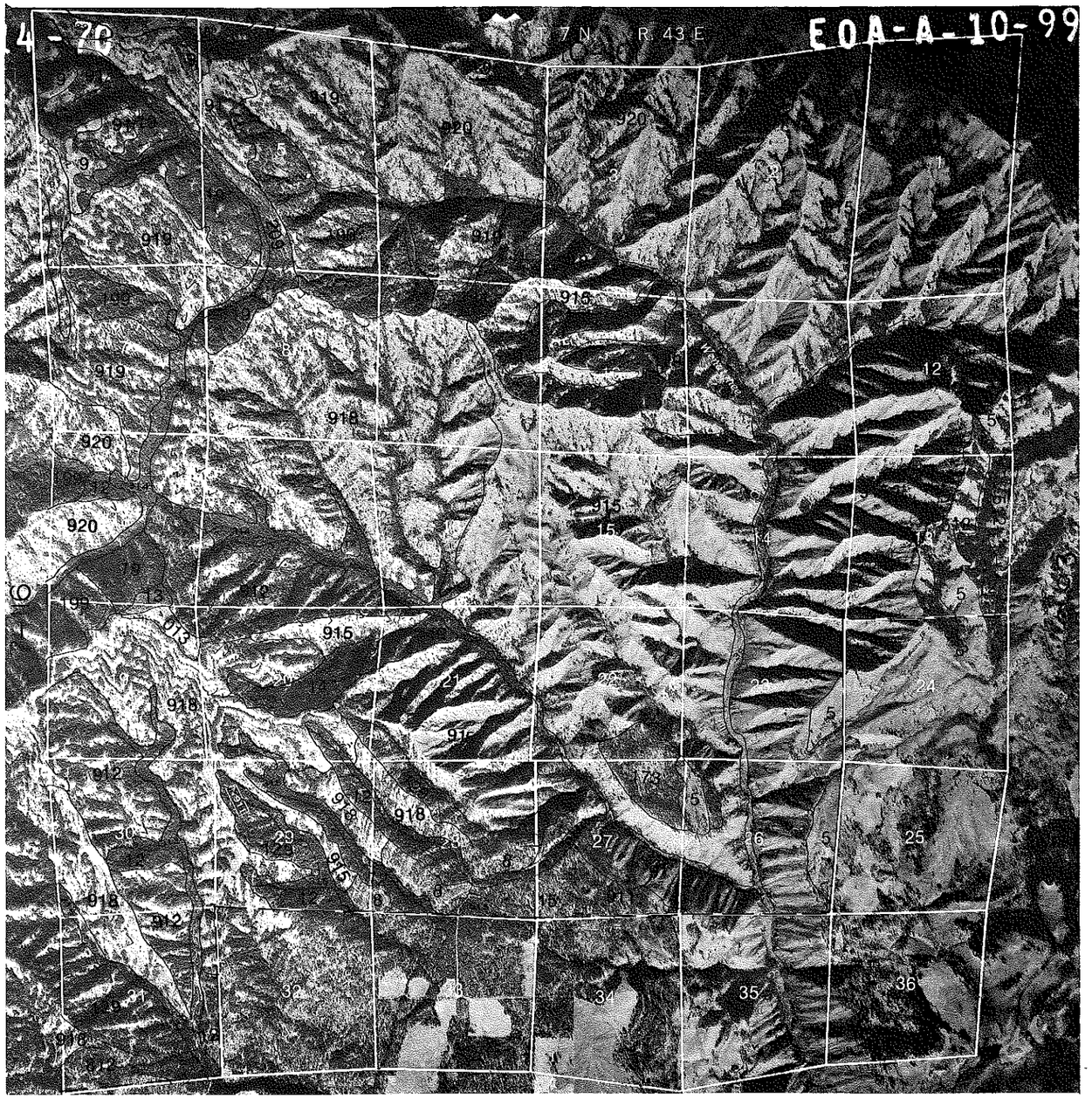

7-116

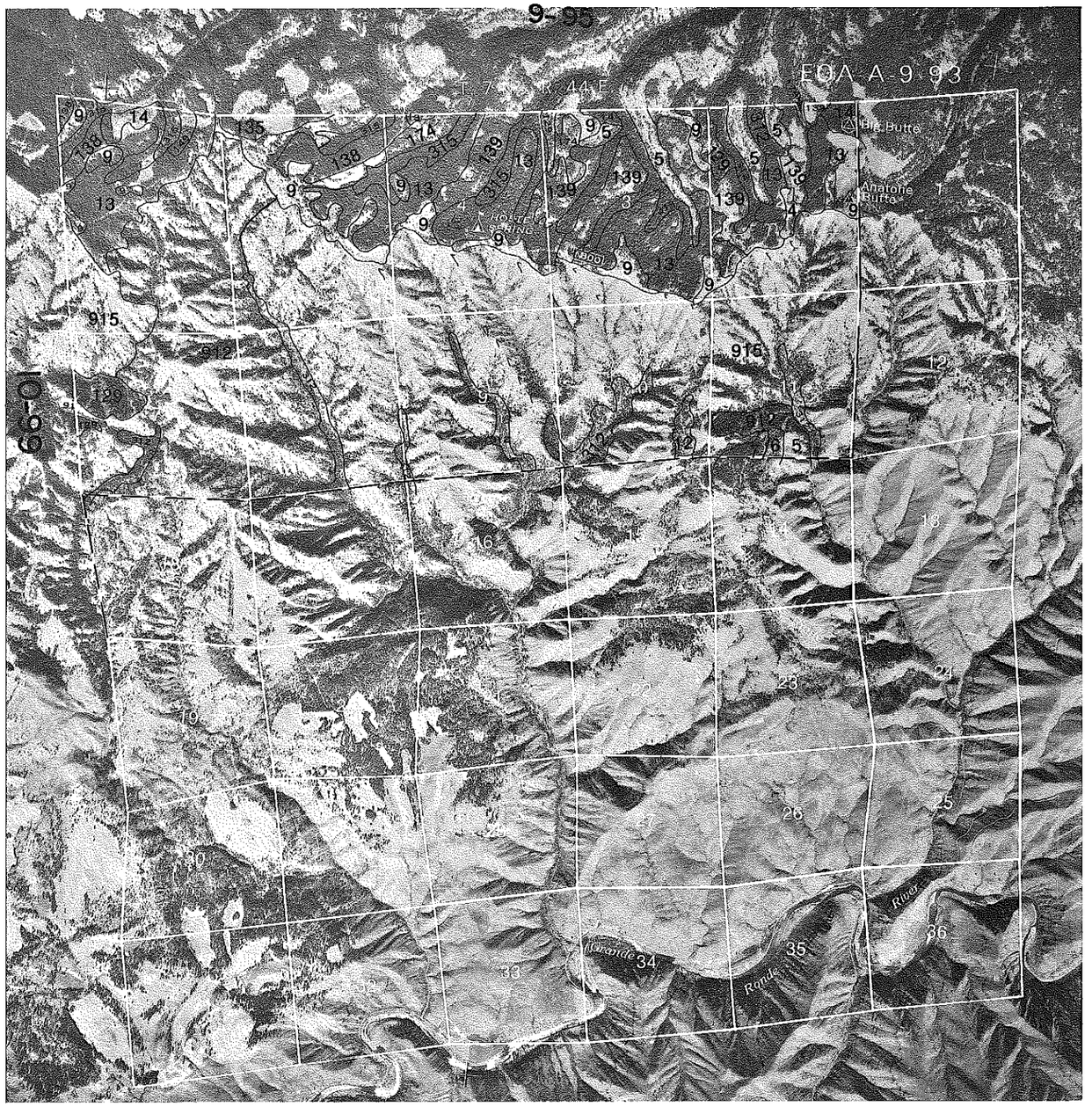

T 7 N R 39 E
EOA A 10 117
Dewman
10-119


7-20-70
T 7 N R 40 E
7-39
EOA A 7137
10-114

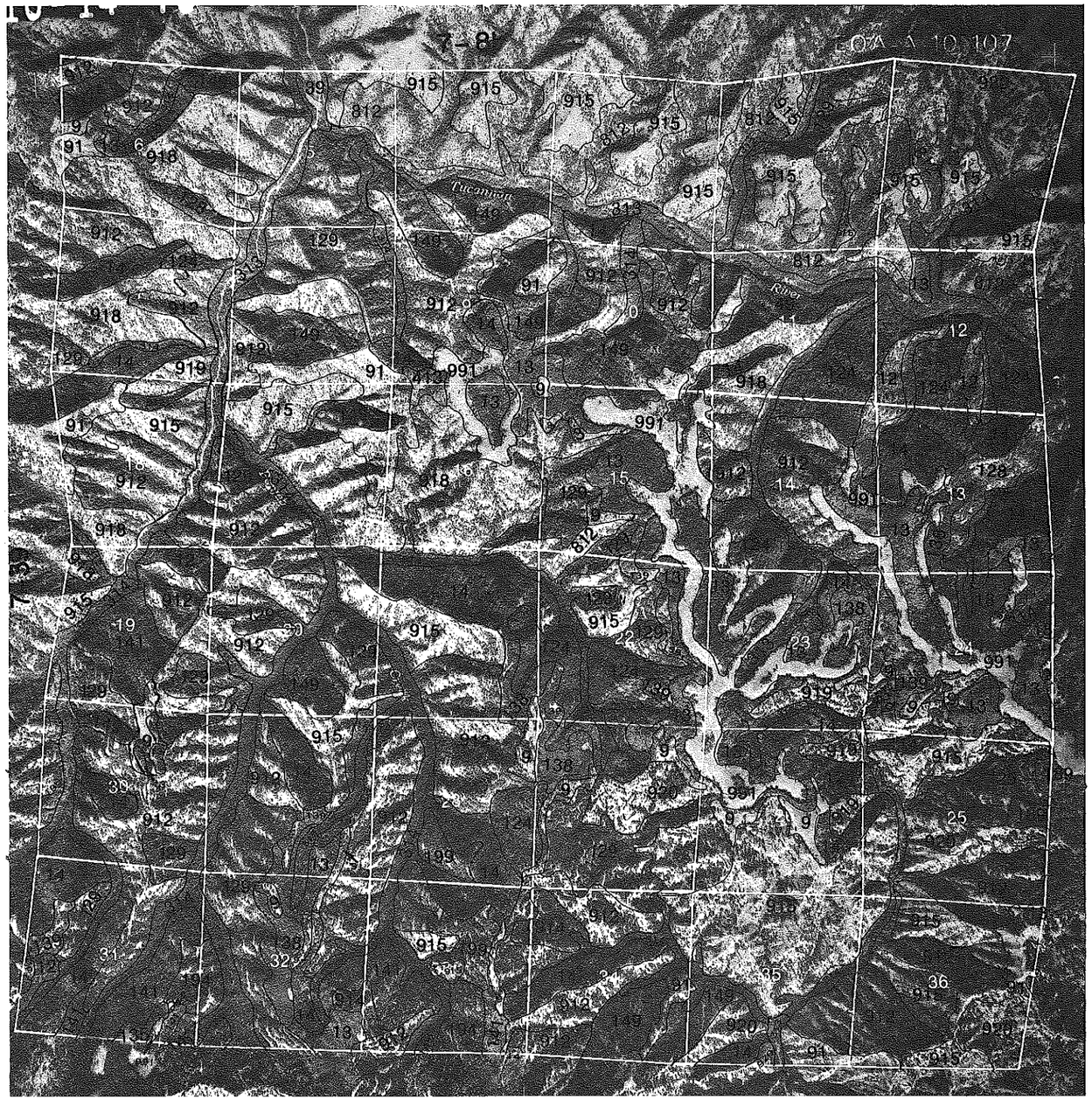

T 10 R 107 E
T 10 R 108 E
T 10 R 109 E
920
915
912
991
919
914
918
512
Crooked
Creek
Weller
Butte
25
26
27
28
29
30
31
32
33
34
35
36


T 7 R 118
T 7 R 119
920
919
991
Crooked
Creek
25
26
31
32
33
34
35
36


EOA-A-10-99
7 N. R. 43 E.
919
920
915
918
912
913
914
916
917
Big Butte
Anatone Butte
Rattlesnake Ridge
Ronde River
Grande
Ronde
River


9-95
EOA-A-9-93
7 N. R. 44 E.
915
916
Big Butte
Anatone Butte
Rattlesnake Ridge
Ronde River
Grande
Ronde
River


7-41
FOA A 39
7-01

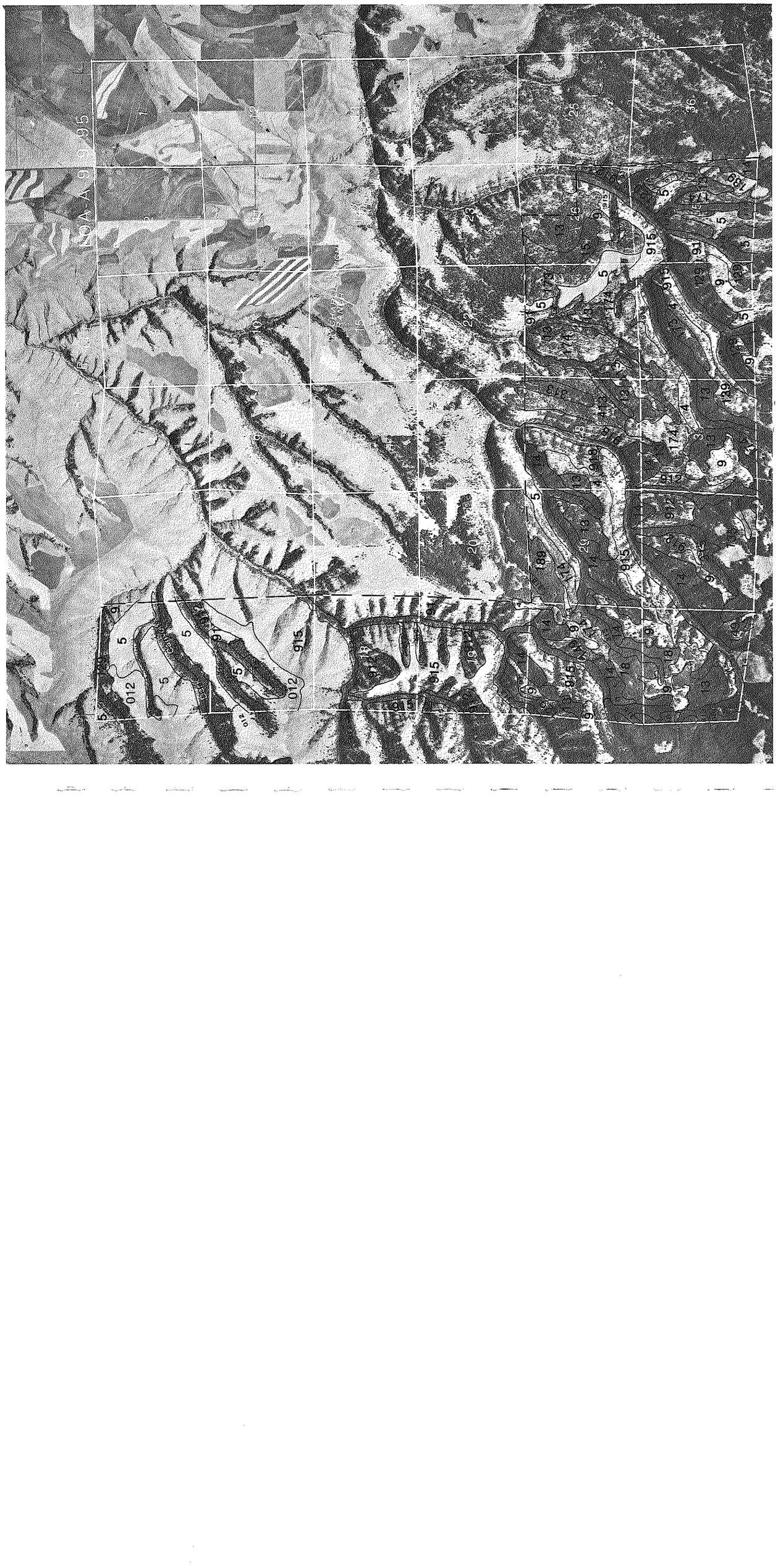

7-8
FOA A 10 107

T 8 N R 42 E

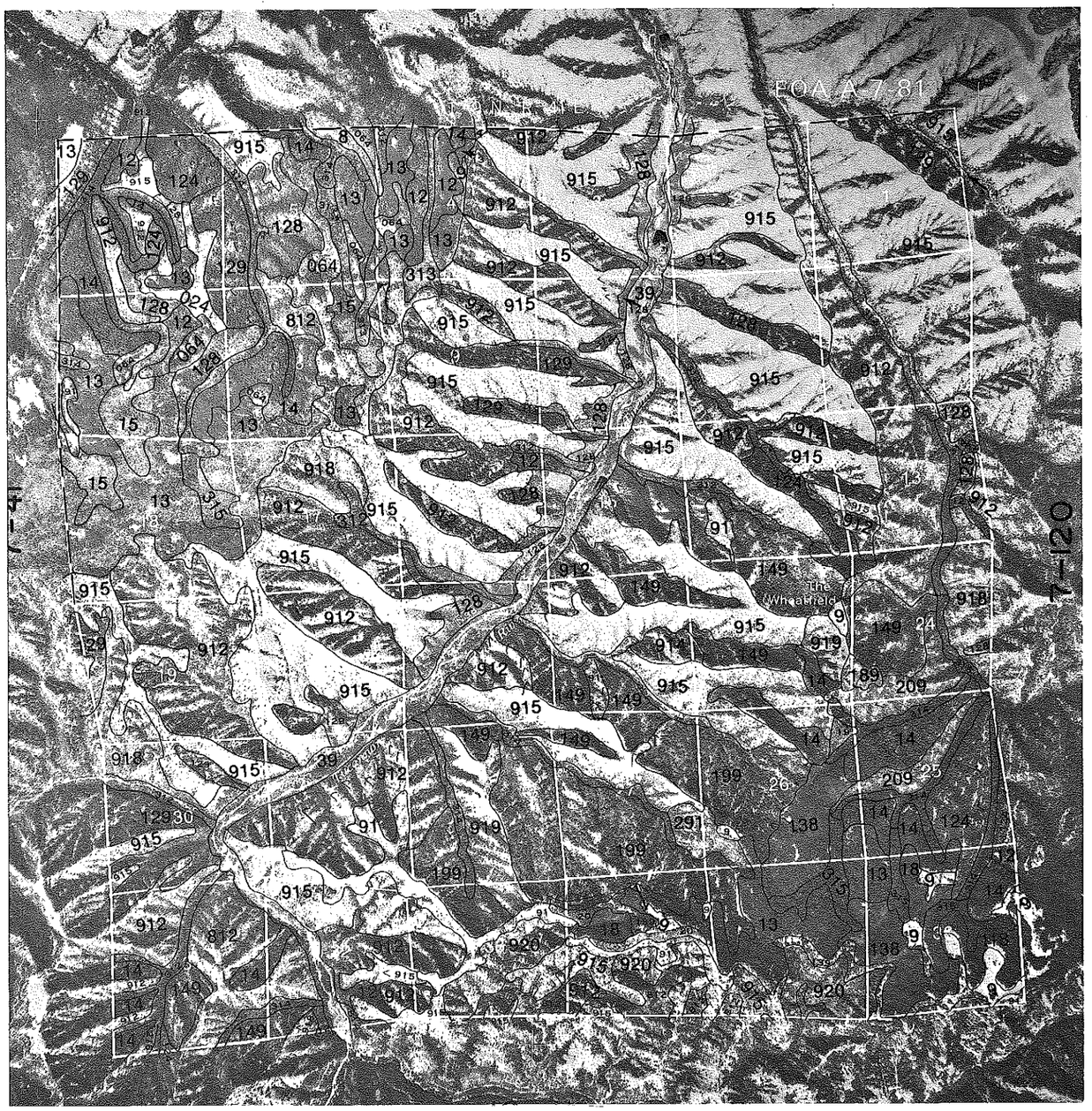
EOA A 7-118

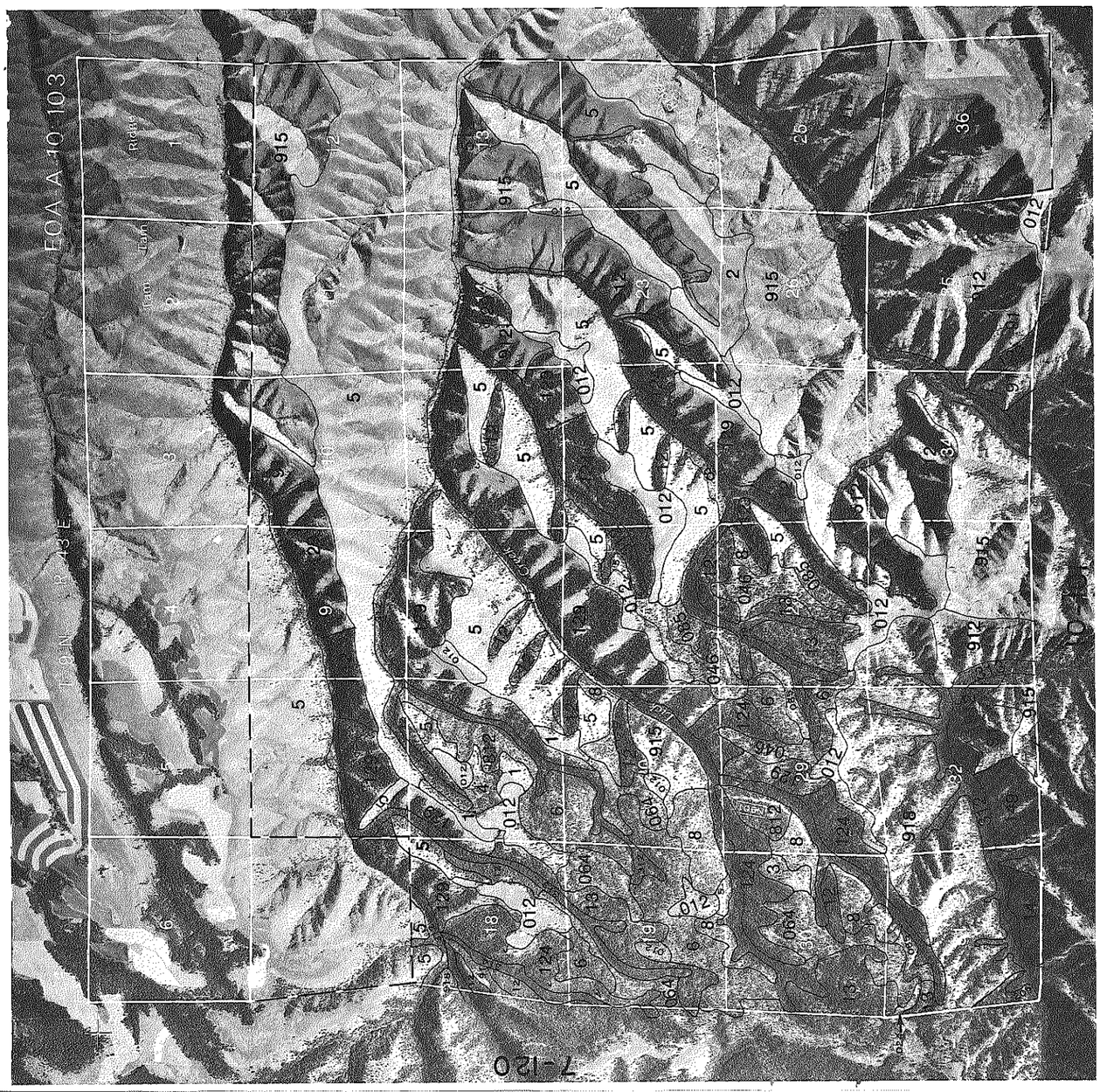
T 8 N R 43 E

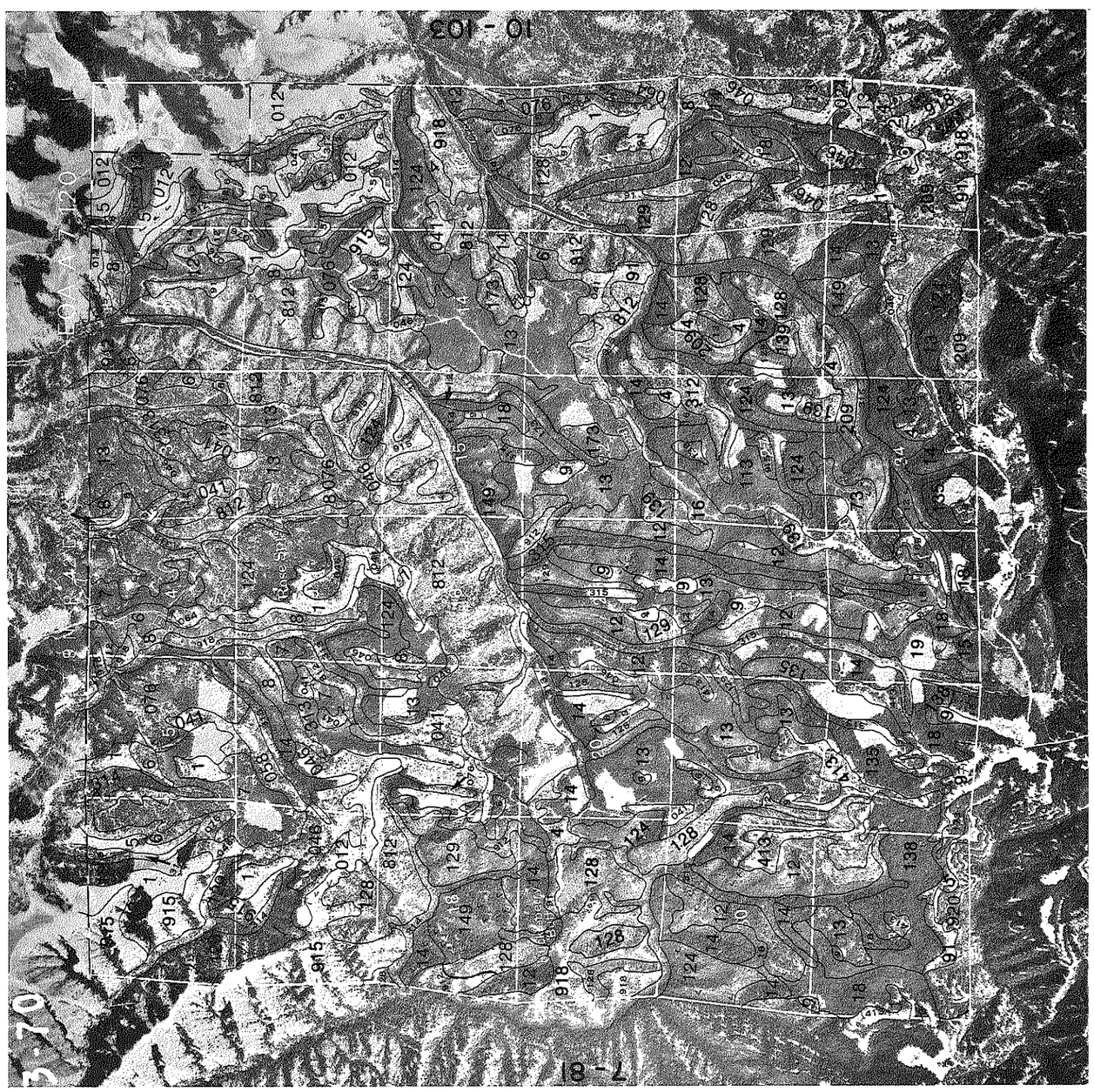
EOA A 10-101


NOAA 9 9 9 15
Wilcox
Gothenburg
Lexington
Cozad
Elwood
Overton
Sumner
Eddyville
Kearney
Minden
Holdrege
Axtell
Funk
Bertrand
Alma
Oxford
Orleans
Arapahoe
Cambridge
McCook
Indianola
Culbertson
Trenton
Stratton
Hayes Center
Hayes
Hitchcock
Red Willow
Frontier
Gosper
Phelps
Kearney
Adams
Clay
Nuckolls
Thayer
Jefferson
Saline
Fillmore
Franklin
Harlan
Furnas
Harlan
Webster
Nuckolls
Thayer
Jefferson
Saline
Fillmore
Franklin
Harlan
Furnas
Harlan
Webster


T 13 N R 40 E
FOA A-7 41
Border Area
Border Area
Sweet
Border Area


FOA A-7 81
Wheatfield
T-120


EOA A-10-103
7-120


10 - 103
7-81

Mapping Unit Data Sheets with Summaries of Management Interpretations

Unit No. 1

Plant Community Type *Bluegrass scabland*

Stiff sage scabland

Physiographic Position *Scabland plateau and mesa tops, ridge crests*

Geologic Materials *Basalt and andesite flows, metavolcanics*

Aspect *All*

Slope *2-20*

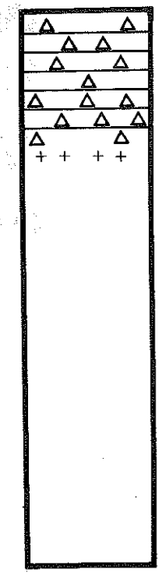
Present Erosion *Surface rill and sheet*

Major Drainage Dissection *Slight*

Ground Cover	*10-20%*	**Overstory**	*0-5%*
Rock Outcrops	*40%*	**Understory**	*5-10%*

Estimated Water Holding Capacity *2.5-5"*

Profile



Description

Litter Layer
0-½" at 20-40% cover
0- 4" Very dark brown gravelly loam - silt loam, sticky and slightly plastic surface cobble.
4-10" Dark brown very gravelly silt loam to silty clay loam, sticky and plastic, fine sub-angular blocky.

Range
6-16" Very shallow to shallow gravelly to very gravelly loams to fine silty clay loam. Very fractured cubic basalt.

Lithic Argixerolls; clayey-skeletal, montmorillonitic, mesic

Inclusions
2—Deep soils, bunchgrass on gentle slopes
3—Juniper and low sagebrush scabland
91—Rock outcrops and surface rocks
4—Shallow scabland, Ponderosa pine-wheatgrass
6—Shallow to moderately deep soils, Ponderosa pine residual soils

Remarks
—Very shallow to shallow soil with a high percentage of gravel.
—Scabland unit of very low moisture storage capacity, high runoff, easily displaced and dislodged, and very slow to heal over or revegetate.
—High degree of frost action, with considerable soil displacement and channeling.
—Low grazing potential because of the low moisture storage potential, however heavily used by wildlife.
—This soil is very soft when saturated and compactable when moist.

Complexes
012—Bisket scabland, hummocky irregular surface
013—Juniper and sagebrush scabland with the bluebunch scabland
014—Scabland and poor quality pine types

ENGINEERING

Unified Class. *Surface*	*GM*
Unified Class. *Subsoil*	*GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None; some deep excavations may give interflow pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Shallow soil, very high surface runoff*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil*	*Steep*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Very stable*
Considerations for Cutbank Stability Problems	*N/A*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack of fines; excessive drainage*
Suggestions for Road Waste and Fill Slope Seeding	*Chip & cover with slash*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Shallow to bedrock*
Suggestions for Cutbank Seeding	*Use drought tolerant species*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow soils, hot, dry site*
Suggested Tree Planting Species	*Juniper, Ponderosa pine*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe surface run-off; little or no shade*
Suggested Slash Disposal	*Unsuited*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too rocky, no shade, no water*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Rocky, trails will conc. runoff*
Considerations for Trail Improvements & Protection	*Use rock as guide*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*No soil*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Encourage surface shade and protection*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface*	*Sand, silt*
Expected Sediment Size *Subsoil*	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Poor forage & shade*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow, hot dry site, frost heave*

Unit No. 2

Plant Community Type *Bunchgrass on deep soil*

Juniper bunchgrass

Juniper big sagebrush

Physiographic Position *Mesa and tablelands, gentle bench slopes*

Geologic Materials *Basalts, andesite and metavolcanics*

Aspect *All*

Slope *1-8%*

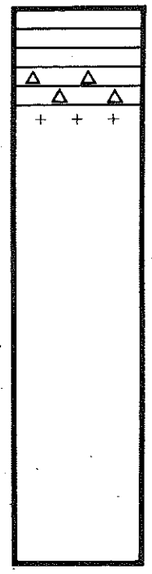
Present Erosion *Moderate rill and sheet erosion*

Major Drainage Dissection *Slight*

Ground Cover	*40-80%*	**Overstory**	*10%*
Rock Outcrops	*20%*	**Understory**	*10%*

Estimated Water Holding Capacity *6-8"*

Profile



Description

½" Grass litter
0- 2" Brown loam, very friable, sli. platy
2- 8" Lt. brown loam, friable, weak coarse platy, non-sticky, non-plastic
8-14" Brown, gravelly loam, slightly sticky weak sub-angular blocky
14"+ Fractured basalts

Range

10-16" Loam to silt loam volcanic ash, over
2-10" Gravelly to very gravelly silt loams. Fractured, cubic basalts.

Litic Vitrandept, medial over clayey, skeletal, mesic

Inclusions

1— Very shallow, bunchgrass scabland
3— Shallow Juniper sage bunchgrass scabland

Timbered associations
4— Shallow scabland, ponderosa pine-wheatgrass
6— Shallow to moderately deep, ponderosa pine on residual soils

Remarks

— Hummocky, generally shallow volcanic ash mantle over residual basalts.
— Stable bunchgrass but surface disturbance and overgrazing readily promotes accelerated erosion.
— Some revegetation possible on carefully chosen sites, good forage potential.
— Frost action very active on areas lacking cover.
— Rapid infiltration when moist but slow when dry.

Complexes

024— Shallow pine type included or along the fringes
029— Bisket and higher elevation dry-moist meadows

ENGINEERING

Unified Class. ***Surface***	*SM-ML*
Subsoil	*GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Suited*
Limit of Bedrock for Roadrock	*Competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Range Consideration*
Method of Excavation	*Blast & some ripping*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil***	*Flat*
Bedrock	*Steep*
Probability of Cutbank Failure	*Very stable*
Considerations for Cutbank Stability Problems	*N/A*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Amt. of fines*
Suggestions for Road Waste and Fill Slope Seeding	*Covering of chips or slash*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Slope & exposure*
Suggestions for Cutbank Seeding	*Leave rough & seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Seed source, grass comp., soil moisture*
Suggested Tree Planting Species	*Ponderosa pine*
Waterbar Interval	*5-10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Range destruction; severe surface erosion*
Suggested Slash Disposal	*Unsuited*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Limited shade associated with scabland*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Very susceptible to trampling*
Considerations for Trail Improvements & Protection	*Provide surface mulch*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Too shallow*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Check runoff, maintain cover*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt*

RANGE AND WILDLIFE

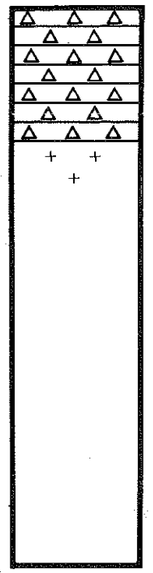
Limitations for Domestic Livestock and Wildlife Use	*Good early use*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Game use, amt. of scabland-soil moist.*

Unit No. 3

Plant Community Type	*Juniper - stiff sage scabland*
	Curlleaf mountain mahogany
	Bluegrass scabland
	Juniper - bunchgrass
Physiographic Position	*Narrow ridge crest and upper ridge sideslope*
Geologic Materials	*Metavolcanics, surface flow volcanics of andesite and basalts*
Aspect	*All*
Slope	*2-30%*
Present Erosion	*Moderate to severe rill and sheet erosion*
Major Drainage Dissection	*Slight*

Ground Cover	*0-50%*	**Overstory**	*0-50%*
Rock Outcrops	*20%*	**Understory**	*10-20%*
Estimated Water Holding Capacity	*5"*		

Profile



Description

0-½" Litter layer, very gravelly, cobbly surface; 30% good ground cover
0- 2" Dark brown, very gravelly and cobbly silt loam, sli. sticky, fine sub-angular blocky
2-14" Brown gravelly silt loam, sli. sticky, very fine sub-angular blocky
14"+ Fractured basalts and scorria

Range

10-20" Very gravelly cobbly silt loams

Lithic Argixerolls, loamy skeletal, mixed, mesic

Inclusions

1—Shallow scabland
91—Rock outcrops
Timbered Associations
4—Scabland, ponderosa pine, grasses
6—Ponderosa pine, pinegrass, residual soils

Remarks

- *Generally a very shallow to shallow, gravelly loam residual soil, sagebrush scabland with juniper and curlleaf mahogany*
- *Very low growth potential for fiber or forage because of limited moisture storage and aspect.*
- *Heavy spring wildlife use*
- *Severe frost heave on the exposed surface*
- *Road construction tends to concentrate runoff which readily dissects and erodes the soil surface and channels through the better land units*

Complexes

034—Juniper scabland and non-commercial pine

ENGINEERING

Unified Class.	***Surface***	*GM*
	Subsoil	*GM*
Suit. as Topsoil Source		*Unsuited*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Unsuited*
Suit. Bedrock for Roadrock		*Good*
Limit of Bedrock for Roadrock		*Some soft interflow material*
Est. of Roadrock Thickness		*Very thin*
Consid. for Road Location & Construction		*High surface runoff*
Method of Excavation		*Rip and blast*
Cutbank & Ditch Erosion Potential		*Low*
Susceptibility to Cutbank Sloughing & Raveling		*Low*
Est. Cutslope Ratio	***Soil***	*Steep*
	Bedrock	*Steep*
Probability of Cutbank Failure		*Very stable*
Considerations for Cutbank Stability Problems		*N/A*
Failure Potential on Waste & Fill		*Low*
Erosion Potential on Road Waste and Fills		*Low*
Suitability of Road Waste & Fill Slopes to Seeding		*Poor*
Limitations to Road Waste and Fill Slope Seeding		*Lack fines, exposure*
Suggestions for Road Waste and Fill Slope Seeding		*N/A*
Suitability of Cutbank Seeding		*Low*
Limit of Cutbank Seeding		*No fines or ground cover*
Suggestions for Cutbank Seeding		*Drought species*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Very shallow soils; NCFL*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Severe surface runoff & erosion*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rough, rocky, hot & dry*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Surface gravel & cobble*
Considerations for Trail Improvements & Protection	*Hand cleared*
Suitability for Sewage Filter Field	*Unsuitable*
Soil Limitations to Sewage Filter Field	*Too shallow*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Trap & retard surface runoff*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size	***Surface*** *Silt*
	Subsoil *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage potential, water*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High in spring & late fall*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Shallow, harsh site*

Unit No. 4

Plant Community Type	*Ponderosa pine - wheatgrass*
	Ponderosa pine - fescue
	Ponderosa pine - bitterbrush - Ross sedge
Physiographic Position	*Ridge top; gentle side slopes*
Geologic Materials	*Basalts*
Aspect	*Southern*
Slope	*2-15%*
Present Erosion	*Sheet*
Major Drainage Dissection	*Slight*

Ground Cover	*50-70%*	**Overstory**	*50%*
Rock Outcrops	*10%*	**Understory**	*20%*
Estimated Water Holding Capacity	*5-7"*		

Inclusions

3—Juniper, sage scabland
6—Ponderosa pine, pinegrass residual soils

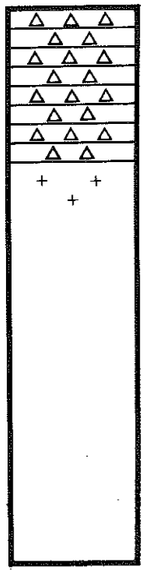
Remarks

—Almost all pine but on very shallow soil, a poor site for growth potential. Once the few old growth trees are removed, the site is very marginal to non-commercial forest land.
—Very shallow soils, generally very gravelly with low moisture holding capacity, poor ground cover and poor regeneration potentials.
—Frost heave on all open ground; severely over grazed and disturbed in the wet seasons (spring). Moderate infiltration when moist, slow when dry thus inducing overland flow during intense summer storms.

Complexes

041—Ponderosa pine, bunchgrass, scabland with shallow blue bunchgrass scabland
043—Ponderosa pine, bunchgrass, scabland with juniper and curlleaf mahogany
046—Ponderosa pine, scabland with better site pine
413—Irregular landtype with scabland pine on fringes

Profile



Description

½" Organic litter and needles
0- 4" Dark brown, gravelly silt loam, very fine sub-angular blocky, sli. sticky
4-14" Brown, very gravelly silt loam, weak blocky structure
14"+ Cubic basalt

Range

10-24" Very gravelly silt loam

Ultic Haploxeroll, fine, loamy, mixed, frigid

ENGINEERING

Unified Class.	***Surface***	*GM*
	Subsoil	*GM-GC*
Suit. as Topsoil Source		*Unsuited*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Unsuited*
Suit. Bedrock for Roadrock		*Good*
Limit of Bedrock for Roadrock		*Competent*
Est. of Roadrock Thickness		*Thin*
Consid. for Road Location & Construction		*Poor timber*
Method of Excavation		*Some rippability, blast*
Cutbank & Ditch Erosion Potential		*Low*
Susceptibility to Cutbank Sloughing & Raveling		*Low*
Est. Cutslope Ratio	***Soil***	*Steep*
	Bedrock	*Steep*
Probability of Cutbank Failure		*Very stable*
Considerations for Cutbank Stability Problems		*Overland flow*
Failure Potential on Waste & Fill		*Low*
Erosion Potential on Road Waste and Fills		*Low*
Suitability of Road Waste & Fill Slopes to Seeding		*Poor*
Limitations to Road Waste and Fill Slope Seeding		*Limited fines*
Suggestions for Road Waste and Fill Slope Seeding		*Cover with chipped slash*
Suitability of Cutbank Seeding		*Poor*
Limit of Cutbank Seeding		*Shallow soils, frost heave & dry*
Suggestions for Cutbank Seeding		*None; control surface wash*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow soils, low water holding cap.*
Suggested Tree Planting Species	*Ponderosa pine*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Shade removal; severe erosion, poor regeneration*
Suggested Slash Disposal	*Lop & scatter, leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rocky, little shade, no available water*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Off road; high-low*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Rockiness*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Too shallow*

EROSION AND HYDROLOGY

Natural Stability		*Very stable*
Nature of Mass Movement		*N/A*
Expected Mass Movement from Man's Activity		*Unchanged*
Surface Soil Erosion Potential		*Severe*
Subsoil Erosion Potential		*Moderate*
Suggestions for Controlling Subsoil Erosion		*Keep cover; control frost action*
Water Yield Class		*III*
Bedrock Hydrologic Characteristics		*I*
Hydrologic Group		*D*
Sedimentation Yield Potential		*Moderate*
Expected Sediment Size	***Surface***	*Sand, silt*
	Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Spring forage*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow soils, cover, frost heave*

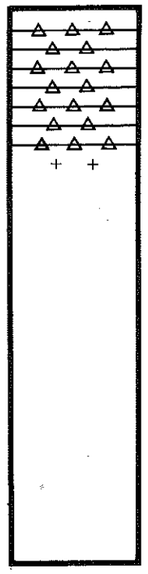
Unit No. 5

Plant Community Type	*Bunchgrass on shallow soils, steep slopes*
	Juniper, stiff sage scabland, bunchgrass
	Curlleaf mountain mahogany
	Ponderosa pine, wheatgrass
Physiographic Position	*Very steep talus and colluvial ridge side slopes*
Geologic Materials	*Basalts, metavolcanics, andesites*
Aspect	*Generally southern*
Slope	*30-70%*
Present Erosion	*Moderately high sheet and rill erosion*
Major Drainage Dissection	

Ground Cover	*40-70%*	**Overstory**	*10%*
Rock Outcrops	*20%*	**Understory**	*60%*

Estimated Water Holding Capacity *5"*

Profile



Description

½" Organic litter, gravelly, cobbly surface
0- 3" Dark brown very gravelly loam, weak fine granular, sli. sticky
3-14" Brown loam-silt loam, very gravelly, weak fine sub-angular blocky; sli. sticky, sli. plastic
14"+ Basaltic colluvium over fractured, cubic basalts

Range

10-30" of very gravelly colluvium

Lithic Argixeroll, loamy-skeletal, mixed, mesic

Inclusions

8—Pine, pinegrass, shallow residual soils
24—Pine, pinegrass, residual soil with pyroclastic interflows
91—Rock outcrops and talus

Remarks

—Total profile may be shallow to deep, gravelly colluvium and some talus sideslopes. Generally shallow, open grassland with inclusions of sagebrush, juniper and pine.
—Rockfall and soil displacement hazards.
—Steep slopes with low moisture retention capabilities and subject to overland flow.

Complexes

512—Shallow grassland and mixed conifer pinegrass on colluvial slopes
524—Shallow grassland and mixed conifer sites with rock outcrop and talus
547—Grassland colluvium with "pillows" of white fir, lodgepole; basaltic and metavolcanic rock outcrops
567—Grassland, juniper scabland with some stringers of mixed conifer; pine on basaltic and tuffaceous rock outcrops

ENGINEERING

Unified Class. *Surface*	*GM-GP*
Unified Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited (talus slopes)*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Interflows, some pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Rockfall, talus slides*
Method of Excavation	*Blade talus, blast rock outcrops*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil*	*Steep*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Cover: slash & chips Frost heave*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack fines, exposure*
Suggestions for Road Waste and Fill Slope Seeding	*Cover with chipped slash*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Raveling, exposure to frost heave*
Suggestions for Cutbank Seeding	*Cut slopes less than 5 ft.; use chips*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Basically a non-commercial site*
Suggested Tree Planting Species	*Ponderosa Pine*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Accelerated surface runoff; low regeneration success*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Dry, steep, rockfall*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steepness; rockfall*
Considerations for Trail Improvements & Protection	*Water concentration; many switchbacks*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Debris & talus slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe to critical*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Restrain runoff*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface*	*Sand, silt*
Expected Sediment Size *Subsoil*	*Silt*

RANGE AND WILDLIFE

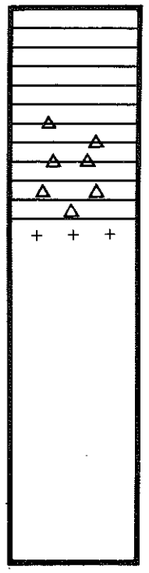
Limitations for Domestic Livestock and Wildlife Use	*Steep, rocky, sparse cover*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow, steep, dry site*

Unit No. 6

Plant Community Type	*Ponderosa pine, douglas fir, elk sedge*
	Ponderosa pine, fescue
	Mixed conifer, pinegrass, residual soil
	Mixed conifer, pinegrass, ash soil
Physiographic Position	*Gentle ridge systems, undulating lands*
Geologic Materials	*Surface flow basalt and andesites*
Aspect	*All to southern*
Slope	*2-20%*
Present Erosion	*Sheet with some rill and gully erosion*
Major Drainage Dissection	*Slight*

Ground Cover	*60-80%*	**Overstory**	*70%*
Rock Outcrops	*-0-*	**Understory**	*20%*
Estimated Water Holding Capacity	*7-9"*		

Profile



Decription

1" Needles and duff
0- 2" Dark brown, loam, weak, platy, friable; n-pls, sli. sticky
2-10" Lt. brown, very weak moderately platy, friable, n-pls, sli. sticky
10-20" Brown loam, very weak massive; n-pls, sli. sticky, friable
20"+ High fractured cubic basalts

Range

4-14" Silt loam volcanic ash over
10-20" Very gravelly silt loams to light clay loams, buried soils

Ultic Argixeroll, loamy-skeletal, mixed, frigid

Inclusions

3—Juniper scabland
4—Ponderosa Pine, wheatgrass, shallow soil
7—Volcanic ash, mixed conifer, pinegrass

Remarks

—Soils are generally a thin volcanic ash mantle over a basaltic residual subsoil; very thin organic horizon that is easily dislodged or displaced; soils are compactable when moist.
—Some "rock rivers" present where concentrated runoff from the scab unit, spurs, logging slash and trails has removed all surface soils.
—There is deep litter fall accumulations around the tree base; where exposed or disturbed, surface erosion has removed litter and soil on the gentle slopes, leaving hummocks.
—The regeneration that is present exists only in the shaded portions of the landscape and northern shade of the overstory.

Complexes

064—Mixed conifer, pinegrass with scabland pine

ENGINEERING

Unified Class. *Surface*	*SM-ML*
Unified Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some pyroclastic interflow materials*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Runoff from roads*
Method of Excavation	*Rip surface - blast*
Cutbank & Ditch Erosion Potential	*Low to moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil*	*Flat*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Gentle ground*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Cover; amt. of fines*
Suggestions for Road Waste and Fill Slope Seeding	*Cover with 2" chipped slash*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Shallowness, exposure*
Suggestions for Cutbank Seeding	*Fall seed, rough surface, some cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate to high*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade is important, pinegrass, moisture*
Suggested Tree Planting Species	*Ponderosa Pine*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Surface displacement & compaction Loss of moist. storage*
Suggested Slash Disposal	*Lop & scatter, windrow parallel to slope*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Basically dry site*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*N/A*
Considerations for Trail Improvements & Protection	*Check water concentrations*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Soil too shallow over bedrock*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Scatter slash, disperse surface waters*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface*	*Silt*
Expected Sediment Size *Subsoil*	*Silt*

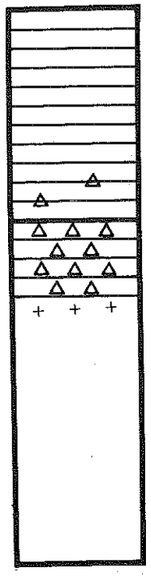
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*None*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Associated scab & shallow areas*

Unit No. 7

Plant Community Type	*Mixed conifer - pinegrass, ash soil*		
	Ponderosa pine - Douglas fir - elk sedge		
	Mixed conifer - pinegrass, residual soil		
	Lodgepole - pinegrass - grouse huckleberry		
Physiographic Position	*Gentle plateau, protected slopes along drainways*		
Geologic Materials	*Surface flow basalts and andesites*		
Aspect	*All to generally northern*		
Slope	*2-25%*		
Present Erosion	*Sheet and rill along the timbered fringe*		
	Slight rill; severe where roads or trails bisect a unit		
Major Drainage Dissection	*Moderately dissected*		
Ground Cover	*95%*	**Overstory**	*85-95%*
Rock Outcrops	*0*	**Understory**	*10-50%*
Estimated Water Holding Capacity	*8-12"*		

Profile



Description

2" Litter, duff
0- 2" Dark brown, silt loam, very weak coarse platy, very friable; n-pls, n-sticky
2- 7" Light brown, silt loam structureless, very friable; n-pls, n-sticky
7-20" Light yellow brown, silt loam, very friable, structureless, n-plastic, n-sticky
20-26" Brown very gravelly silt loam, sli. firm, fine sub-angular blocky, sli. sticky, sli. plastic
26"+ Fractured basalt

Range

20-36" Volcanic ash over
4-14" Gravelly silt loam residual

Typic Vitrandept, medial over loamy skeletal, mixed, frigid

Inclusions

1— Scabland, very shallow soils
4— Ponderosa pine on shallow residual soil, along fringes
6— Ponderosa pine on residual soil, along fringes and ridge crests

Remarks

— Moderately deep soil (20-40") with a volcanic ash mantle over a buried gravelly residual horizon. The surface horizon varies in thickness with slope, aspect and elevation.
— This unit may be next to or have within it inclusions of 321 and ephemeral streams.
— Growth potential is good.
— Severe runoff and erosion along fringe, where the shallow scabland joins the timber.
— Roads and trails collect and concentrate runoff which easily channels the volvanic ash surface. Runoff should be retarded and dispersed.
— Volcanic ash tends to be non-wettable with burning; burning stimulates lodgepole by reducing the sites biological and chemical mass. Lodgepole in cooler sites of poor air drainage.
— Used as thermal cover and travel ways by big game especially along the drainways and Unit 376.

Complexes

076— Mixed conifer, ash and residual soils
376— Drainage ways with ash on protected aspects, residual on exposed aspects and dry-moist meadows within the channel

ENGINEERING

Unified Class. ***Surface***	*ML*
Subsoil	*GM-ML*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Pyroclastic interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very good pine & fir site*
Method of Excavation	*Rip surface & blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil***	*Flat*
Bedrock	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*N/A*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Surface cover, rill erosion*
Suggestions for Road Waste and Fill Slope Seeding	*Cover with chipped slash*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Surface runoff, frost heave*
Suggestions for Cutbank Seeding	*Left cover, apply cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*High*
Limitations to Regeneration	*Shade, moisture, compaction*
Suggested Tree Planting Species	*Douglas fir, larch, Ponderosa pine*
Waterbar Interval	*5 feet*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Stream siltation, rill & gully erosion*
Suggested Slash Disposal	*Lop & scatter; some controlled burn*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Ash soils, regeneration, water*
Treatment to Increase Suitability	*Rotate use; water development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*Gravel path*
Suitability for Sewage Filter Field	*Well*
Soil Limitations to Sewage Filter Field	*Distance to streams*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small slumps*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard surface runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silts, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, down timber and slash*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*None*

Unit No. 8

Plant Community Type *Ponderosa pine - fescue*

Mixed conifer - pinegrass, residual soil

Ponderosa pine - wheatgrass

Physiographic Position *Ridgecrests and upper ridge side slopes*

Geologic Materials *Basalts, andesites*

Aspect *Generally southern*

Slope *25-55%*

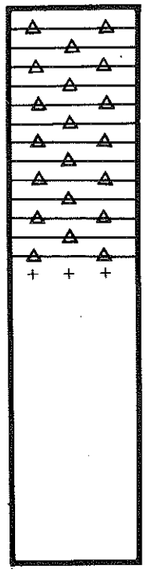
Present Erosion *Some sheet and rill; some areas of severe rill and gully erosion*

Major Drainage Dissection *Moderate*

Ground Cover	*30%*	**Overstory**	*60%*
Rock Outcrops	*10%*	**Understory**	*10%*

Estimated Water Holding Capacity *5-8"*

Profile



Description

1" Litter and duff
0- 6" Very dark brown, very gravelly loam, sli. hard; sli. sticky, sli. plastic, very fine angular blocky.
6-24" Dark brown, gravelly silt loam, hard, sticky and sli. plastic, very fine angular blocky
24"+ Colluvial basaltic material

Range

14-30" Gravelly to very gravelly loam colluvium; some volcanic ash influence

Ulitic Agrixeroll, loamy skeletal, mixed, frigid

Inclusions

5—Bunchgrass, scabland
12—Mixed conifer - pinegrass, residual soils, east and west exposure
91—Rock outcrops

Remarks

—Colluvial soils on steep, generally southern aspects. Moderately deep soil with a high percentage of gravel and angular cobble.
—Poor to fair ground cover conditions. Grazing has had severe impact on many units.
—Easily dislodged and displaced.
—Poor regeneration potential; thermal exposure and moisture limiting, high evaporation losses.
—Some sharp, convex ridges.
—Sidecast of waste road material is a problem.
—Dry ravel and frost heave active, also prone to overland flow during intense storms when soils are dry.

Complexes

812—Mixed aspects, SE and SW
085—Steep colluvial slope, mixed pine—grassland fringe, stringers

ENGINEERING

Unified Class. *Surface*	*GM*
Unified Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*May lack fines*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Sidecast, water removal*
Method of Excavation	*Blade, rip & blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil*	*Steep*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Keep cuts less than 10 feet*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack fines*
Suggestions for Road Waste and Fill Slope Seeding	*Use slash as mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, shallow soils*
Suggestions for Cutbank Seeding	*Drought resistant mix*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Moisture storage, thermal exposure*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*5 - 10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement, disturbance of ground cover*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, rocky, dry*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Rocky, steep*
Considerations for Trail Improvements & Protection	*Water bars*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Steepness, shallow soil*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchange*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Slow & retard runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface*	*Silt*
Expected Sediment Size *Subsoil*	*Silt*

RANGE AND WILDLIFE

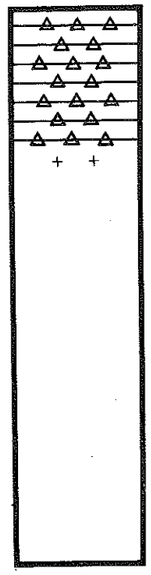
Limitations for Domestic Livestock and Wildlife Use	*Steep; water availability*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Moisture limitations*

Unit No. 9

Plant Community Type	*Bluegrass scabland*
	Dry meadow
	Moist meadow
	Bunchgrass on shallow soils
Physiographic Position	*Ridgecrests and gentle ridge sideslopes*
Geologic Materials	*Surface volcanic flows*
Aspect	*All*
Slope	*2-15%*
Present Erosion	*Sheet and rill; considerable frost action spring and fall*
Major Drainage Dissection	*Slight*

Ground Cover	*30%*	**Overstory**	*5%*
Rock Outcrops	*5%*	**Understory**	—
Estimated Water Holding Capacity	*2.5-5"*		

Profile



Description

½" Duff layer
0- 4" Very dark brown, very gravelly silt loam, fine medium sub-angular blocky, hard, sticky, plastic
4-14" Dark brown very gravelly light silty clay loam, fine medium sub-angular blocky, hard, very sticky and plastic.
14"+ Fractured cubic basalt

Range

10-20" Very gravelly silt loams to silty clay loams—residual soil

Lithic Haploxeroll, loamy skeletal, mixed, frigid

Inclusions

13—Concave positions, white fir - forb
17—Hummocky or shallow areas, residual soil - mixed conifer

Remarks

—Shallow, gravelly silt loam residual soils developed on the surface flows volcanics. Lateral subsurface springs along the upper fringe of these units.
—Used heavily by wildlife early in spring.
—Any surface disturbance is just about permanent; does not heal easily; a exposed harsh site.
—Concentrated runoff creates severe erosion.
—Higher elevation scabland and dry meadows.
—Related to #1 except these are wetter and have a much shorter growing season.

Complexes

Included in other units

ENGINEERING

Unified Class. *Surface*	*GM*
Subsoil	*GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Hard, competent except scoria & breccias*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Elevated, well drained*
Method of Excavation	*Blast & some ripping*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Low*
Considerations for Cutbank Stability Problems	*Disperse surface runoff*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Soil*
Suggestions for Road Waste and Fill Slope Seeding	*Seed and cover with chips*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Lack of soil, exposure*
Suggestions for Cutbank Seeding	*Small varieties*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low (NCFL)*
Limitations to Regeneration	*Shallow soils; low water holding cap.*
Suggested Tree Planting Species	*None*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe erosion from disturbance, compaction*
Suggested Slash Disposal	*Lop & scatter adjacent timber*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Fragile soil, rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Wet, rocky*
Considerations for Trail Improvements & Protection	*Waterbars, gravel*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Very shallow*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse & retard runoff, cover*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

RANGE AND WILDLIFE

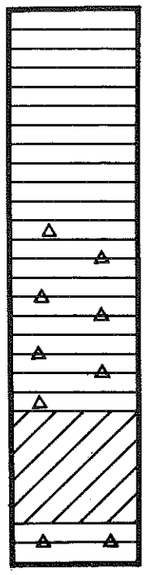
Limitations for Domestic Livestock and Wildlife Use	*Early use only, lack perennials*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Moderate when wet*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Severe exposure, very shallow soils*

Unit No. 10

Plant Community Type	*White fir - twin flower*
	White fir - huckleberry
	Lodgepole - huckleberry
Physiographic Position	*Gentle side slope and toe slope*
Geologic Materials	*Thick pyroclastics between lava and old lacustrine deposits*
Aspect	*North, northeast and northwest*
Slope	*2-35%*
Present Erosion	*Full canopy, no erosion; exposed sheet and rill*
Major Drainage Dissection	*Moderate*

Ground Cover	*100%*	**Overstory**	*80%*
Rock Outcrops	*5%*	**Understory**	*20%*
Estimated Water Holding Capacity	*16-30"*		

Profile



Description

3" Litter and duff
0- 3" Dark brown silt loam, very weak platy
3- 6" Brown silt loam, very weak to platy
6-25" Lt. yellow brown massive
All are soft, very friable, n-sticky, n-plastic
25-40" Dark gray brown slightly gravelly silt loam, mottled, sli. hard to firm, sli. sticky, sli. plastic
40-55" Dark reddish brown silty clay loam, mottled, firm to hard, sticky, plastic
55-60"+ Dark reddish brown gravelly silt loam, mottled, sli. sticky, sli. plastic

Range
20-40" Surface volcanic ash
10-20" Buried colluvium
30-60" SiL-SiCL bedded materials, mottled

Typic Vitrandept, medial over clayey, mixed, frigid

Inclusions
13—Optimum site, white fir forb
15—Buried subsoils, generally stable
16—Cooler, lodgepole communities

Remarks
—Gentle northern aspects, ridge toe slopes and lower side slopes, dissected by wet drainways. Generally heavy clay loams with some instability visible.
—Surface compaction hazard and cut slope failure potential.
—Subsoils are generally wet or moist year round being recharged by sub-surface lateral flow.
—Ash soils tend to be non-wettable after burning.
—Highly competitive brush, especially after burning.
—Presents of old lacustrine or thick pyroclastic material

Complexes
Included in other units within the Northern Blue Mountains
310—Gentle drainway, tends to be brushy

ENGINEERING

Unified Class. ***Surface***	*ML-OL*
Subsoil	*OH-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Scoria, breccia - fair Lacustrine - unsuited Basalt-andesite-good*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Many slumps & seeps, heavy clay subsoils*
Method of Excavation	*Some ripping, blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil***	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 ft. avoid under cutting, drain road surface*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Heavy clays, gravels, slope wash*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after construction*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Sloughing*
Suggestions for Cutbank Seeding	*Seed early, follow up if necessary*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Good*
Limitations to Regeneration	*Burning, brush, frost heave*
Suggested Tree Planting Species	*Spruce, fir, larch*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Loss of organic & topsoil horizons, compaction*
Suggested Slash Disposal	*Leave fines, YUM*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Wet, heavy subsoils*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Wet spots, wind throw*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Low*
Soil Limitations to Sewage Filter Field	*Slow internal drainage*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Block slumps (small)*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Use slash to retard runoff*
Water Yield Class	*I - III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Logging residue, forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Over harvest, brush invasion*

Unit No. 11

Plant Community Type *White fir - twinflower - forb*

White fir - big huckleberry

Physiographic Position *Steep side slopes, faulted ridges*

Geologic Materials *Surface flow volcanics, pyroclastic interflows and mixed lacustrine sediments*

Aspect *Northern*

Slope *25-60%*

Present Erosion *Undisturbed, none; harvest areas, sheet and rill erosion some gullies*

Major Drainage Dissection *Moderate*

Ground Cover	*100%*	**Overstory**	*80%*
Rock Outcrops	*10%*	**Understory**	*20%*

Estimated Water Holding Capacity *14-30"*

Inclusions

12—Drier, east and west aspects
19—Cool, east and west aspects
14—Cool, northern aspects
91, 92—Rock outcrops, lacustrine sediments and pyroclastics
Includes—thinleaf alder

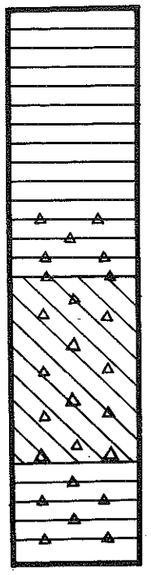
Remarks

—Side to toe slope position, very complex micro relief with springs and seeps as well as rock outcrops and surface boulders.
—Evidence of many slumps and rotational slipouts.
—To lessen the risk of mass failure option stocking should remain on site for root strength and utilize the available subsoil moisture for growth, drying the slip plane.
—Volcanic ash mantle is easily disturbed and displaced.
—Slash burning tends to stimulate brush re-growth, increase water repellency and hot burns have reduced productivity for many years.
—Good big game cover especially along springs and drainways.

Complexes

114—Northern aspects, good site but some unstable areas (11)
311—Steep, V-shaped channel with unstable or potentially unstable toe slopes (11)

Profile



Description

2" Litter and duff
0- 5" Very dark brown silt loam co. platy, n-pls, n-sti, soft and friable
5-19" Lt. brown silt loam, massive n-pls, n-sti, soft and friable
19-27" Brown very gravelly silt loam, weak angular blocky, sli. sticky, sli. plastic, firm
27-47" Lt. gray brown gravelly silty clay loam, med. mod. sub-angular blocky; sticky plastic, very hard when dry
47"+ Mixed colluvial materials to greater than 10 ft.

Range

16-30" Volcanic ash mantle
5-20" Gravelly colluvium
20-60"+ Bedded clay loam sediments and pyroclastics and other colluvial material; very variable profile

Typic Vitrandept, medial over clayey, mixed frigid

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*GM-OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Soft breccia, incompetent pyroclastics*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Unstable, many fault scarps, seeps*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Avoid deep cuts, seeps, headlands*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Surface water, heavy snows*
Suggestions for Road Waste and Fill Slope Seeding	*Seed soon after construction*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness, sloughing, expanding clays*
Suggestions for Cutbank Seeding	*Maintain surface vegetation*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Hot burns*
Suggested Tree Planting Species	*Fir, larch, spruce*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Mass movement, slumps, increased early runoff*
Suggested Slash Disposal	*Leave fines, Y.U.M.*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness, displacement*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Mass failure, wet spots*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Clay subsoils & perched watertables*

EROSION AND HYDROLOGY

Natural Stability	*Very unstable*
Nature of Mass Movement	*Block faults, slumps*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain veg. cover*
Water Yield Class	*III - I*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt, clay*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Brush, steepness, forage*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Overstory, lack grasses*

Unit No. 12

Plant Community Type *Mixed conifer - pinegrass, ash soil*

Mixed conifer - pinegrass, residual soil

Physiographic Position *Steep ridge side slopes, colluvial side slopes*

Geologic Materials *Basalt and andesite flows with breccias*

Aspect *East and west*

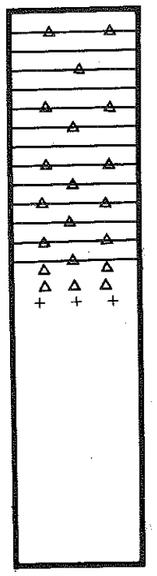
Slope *25-65%*

Present Erosion *Drainway erosion, where harvested severe sheet and rill erosion*

Major Drainage Dissection *Slight*

Ground Cover	*90%*	**Overstory**	*70-80%*
Rock Outcrops	*10%*	**Understory**	*30%*

Estimated Water Holding Capacity *9-12"*



Description

2" Litter and duff
0- 3" Very dark brown gravelly loam, very weak angular blocky, friable, n-pls, n-sti.
3-17" Brown gravelly loam, friable, n-pls, n-sti, weak, very fine angular blocky
17-27" Light brown very gravelly loam, n-sti, n-pls, structureless
26" Colluvium and fractured basalt

Range

4-18" Volcanic ash influenced colluvial surface
10-30" Gravelly loam colluvium

Ultic Haploxeroll, loamy skeletal, mixed, mesic

Inclusions

91 — Rock out crops or shallow bench exposures
5 — Bunchgrass, shallow soils
14 — White fir - twinflower - huckleberry
— Include Ponderosa pine - Douglas fir - nine bark

Remarks

— Colluvial slope shows some down hill soil creep.
— Occurs in step-like form, being residual on shallow interflow faces and ash on resultant colluvial toe slope below.
— Slash left on-site retards erosion and adds organic matter to the nitrogen cycle.
— Surface ash would easily erode if over disturbed or cover burnt off.
— Many seeps from the interflow materials.
— Logs should be suspended over the ridge crest or rim to prevent gouging and concentrating surface water.

Complexes

124 — East and west exposures with better north slope soils
128 — More southern or shallow colluvial sites
129 — Step-like stringers with bunchgrass and rock outcrops
312 — Steep, V-shaped drainways

ENGINEERING

Unified Class. *Surface*	*ML-GM*
Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Talus source*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Overburden, soft pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Talus slopes, seeps, ravel, steep*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil*	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Where possible keep less than 10', avoid seeps*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Limited soils, very gravelly*
Suggestions for Road Waste and Fill Slope Seeding	*Leave rough, fertilize & cover if necessary*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steep, gravelly ravel*
Suggestions for Cutbank Seeding	*Maintain surface vegetation*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade or soil cover desiccation*
Suggested Tree Planting Species	*Pine, fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Greatly increased water yield, severe erosion*
Suggested Slash Disposal	*Lop & scatter; windrow on contour*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep, rockfall & ravel*
Considerations for Trail Improvements & Protection	*Maintenance*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Steepness*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Talus or debris slide*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Retard runoff*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface*	*Silt*
Subsoil	*Silt*

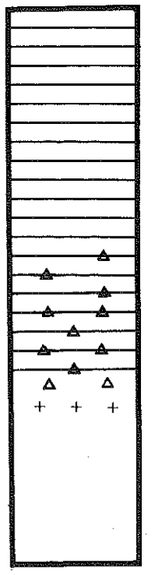
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cover & some forage*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Modest soil depth, steepness, cover*

Unit No. 13

Plant Community Type	*White fir - twinflower - forb*		
	White fir - huckleberry		
	Mixed conifer - pinegrass, ash soil		
Physiographic Position	*Undulating ridge top*		
Geologic Materials	*Basalt and andesite surface flows*		
Aspect	*All*		
Slope	*2-30%*		
Present Erosion	*Slight sheet erosion in production areas; rill and gullies adjacent to roads*		
Major Drainage Dissection	*Slight*		
Ground Cover	*100%*	**Overstory**	*50%*
Rock Outcrops	*5%*	**Understory**	*50%*
Estimated Water Holding Capacity	*12-20"*		

Profile



Description

3" Litter and duff
0- 2" Very dark brown silt loam, weak platy, very friable, n-pls, n-sticky Thin A2 horizon may be present
2-19" Light brown silt loam, weak co. platy, very friable, n-pls, n-sti.
19-26" Light gray to pale yellow brown, structureless, very friable, n-pls, n-sti.
26-36" Brown gravelly silt loam, very weak fine sub-angular blocky, friable, n-pls, sli. sticky
36"+ Gravel and cobble with fines over fractured basalt

Range
20-34" Volcanic ash mantle
8-20" Gravelly silt loam residual

Typic Vitrandept, medial over loamy, skeletal, mixed, frigid

Inclusions

15— White fir forb, buried subsoil
16— White fir - lodgepole, cool site, cold air drainage
17— Mixed conifer, residual soil, southern aspect
10— Toe slope positions, wet areas, somewhat unstable

Remarks

— Old stands, closed canopy, no ground vegetation.
— Partial harvest has good regeneration, however clearcuts are very poor plus sheet and rill soil erosion; these situations may be the result of burning.
— Heavy textured subsoils along drainways and small meadow patches. Compaction hazard when moist, puddled or mud conditions when wet.
— Ash soils easily gouged and disturbed.
— Slash, yard unmerchantable material, lop and scatter tomahawk concentrations, ground litter is needed.
— Cutbanks will slough readily if laid back.

Complexes

130— Generally moderately stable toe slopes and drainway positions
133— Ridgecrest, hummocky site with juniper and mahogany and poorer mixed conifer along the fringe.
135— Best site in complex with the cooler #15 which has a buried subsoil
138— Higher elevation cool sites, gentle northern aspects
139— Ridgecrests with good fir between scabland and residual soil timber on unit fringes
313— Drainway with toe slope units in association with the alluvial bottom and meadows

ENGINEERING

Unified Class. *Surface*	*ML*
Subsoil	*GM*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some scoria & breccia*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Many seeps, increase runoff, heavy snow pack*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Retard surface run-off, maintain veg. cover*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Heavy snow road runoff*
Suggestions for Road Waste and Fill Slope Seeding	*Seed right after construction*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Sloughing if laid back If steep, seedcatch*
Suggestions for Cutbank Seeding	*Lay back, leave rough Seed when finished*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*None unless full canopy is removed*
Suggested Tree Planting Species	*Fir, spruce, larch*
Waterbar Interval	*15 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Hot fire poor regen. sheet & rill erosion, brush*
Suggested Slash Disposal	*Lop & scatter, YUM, tomahawk concen.*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Good water, windthrow, previous slash*
Treatment to Increase Suitability	*Yarding some logs*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Windthrow, seeps*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Good*
Soil Limitations to Sewage Filter Field	*Some gravelly clay subsoils*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Soil creep*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Maintain veg. on surface*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Previous slash*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Need partial overstory*

Unit No. 14

Plant Community Types	*White fir - forb twinflower*
	White fir - huckleberry
	White fir - grouse huckleberry
Physiographic Position	*Steep ridge sideslope*
Geologic Materials	*Andesite and basalt flows*
Aspect	*Generally north*
Slope	*30-65%*
Present Erosion	*Sheet, some small rills*
Major Drainage Dissection	*Moderate*

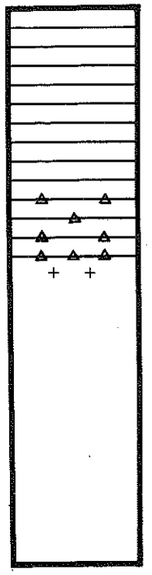
Ground Cover	*80-90%*	**Overstory**	*70%*
Rock Outcrops	*10%*	**Understory**	*30%*
Estimated Water Holding Capacity	*12-17"*		

Inclusions
91—Rock outcrops
11—Unstable toe slopes
314—Narrow stream channels
12—Mixed conifer east and west exposures
19—Cooler site, east and west exposures

Remarks
—Some colluvial slope movement
—Ground water intercept likely with roads
—Harvest will probably increase slope instability and will increase the surface runoff
—Irregular relief, probably need full suspension
—Generally good thermal cover
—Deep to extremely deep toe slopes
—Includes some alder patches

Complexes
141—Steep aspects with cooler, higher elevation soils
149—Timbered stringers or steep aspects with rock outcrops
314—Steep V-shaped drainways with brush and spruce along the streams

Profile



Description
3" Duff and litter
0- 2" Dark brown silt loam, very weak co. platy, very friable, n-pls, n-sti.
2- 6" Light brown silt loam structureless, very friable n-pls, n-sti.
6-20" Light yellow brown, structureless, very friable; n-sti, n-pls.
20-25" Brown gravelly silt loam, very fine angular blocky, n-pls, sli. sticky
25"+ Gravel and cobble with fines over basalt colluvium

Range
18-30" Volcanic ash silt loam mantle
12-24" Gravelly silt loam colluvial

Typic Vitrandepts, medial over loamy, mixed, mesic

ENGINEERING

Unified Class. *Surface*	*ML*
Subsoil	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Good timber site, steep, access*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Side cast, seeps, steep drainways*
Method of Excavation	*Blast & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 10 ft. seeps & springs*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Exposure, talus portions*
Suggestions for Road Waste and Fill Slope Seeding	*Early establishment*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steep, surface ravel*
Suggestions for Cutbank Seeding	*Leave vertical and maintain ground cov.*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Overstory removal & brush take over*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Over harvest, increase surface runoff & site deterioration*
Suggested Slash Disposal	*Cable YUM Lop & scatter fines*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Too steep, closed canopy*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Steepness, springs & seeps*
Considerations for Trail Improvements & Protection	*Hand construction & maintenance*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Small slipouts & toe slope slumps*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Divert water off road, retard flow*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep forage, blow down*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Blow down, steepness, spring develop.*

Unit No. 15

Plant Community Type	*White fir - grouse huckleberry*
	Sub-alpine fir - huckleberry
	Lodgepole - huckleberry
Physiographic Position	*Gentle north slope on ridge top or crest*
Geologic Materials	*Surface volcanics; breccia, scoria of basalts and andesites*
Aspect	*Generally northern*
Slope	*2-20%*
Present Erosion	*Natural none; following harvest rill and gullies from roads and landings*
Major Drainage Dissection	*Slight*

Ground Cover	*100%*	**Overstory**	*100%*
Rock Outcrops	*2%*	**Understory**	*10%*
Estimated Water Holding Capacity	*12-20+"*		

Inclusions

13—Best fir site, good thermal and moisture regime
18—Cooler position and more effective precipitation
10—Moderately unstable, toe slope position

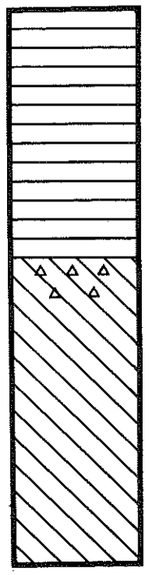
Remarks

—Generally 20-40" of volcanic ash overlying a gravelly silt loam to silty clay loam residual horizon
—Cool, moist site, heavy snowfall and short growing season
—Generally full canopy with very little grasses or forbs; where harvested by tractor soil disturbed to the C horizon
—If clearcut, high surface soil erosion hazard and low chances of regeneration
—Slash, coarse material should be Y.U.M. or left unburned; fines left on site for protection and nutrients
—Volcanic ash soils are subject to non-wettability when burned

Complexes

158—Cooler aspect, frost pocket conditions
159—High elevation complex of fir and subalpine fir types
315—Gentle drainway, cool wet; buried subsoils
351—Springs and seeps; very brushy

Profile



Description

2" Duff and litter
0- 2" Very dark brown silt loam. Very weak to platy, very friable, n-pls, n-sti, occasional surface stones.
2-11" Brown silt loam, very weak platy, very friable, n-pls, n-sti.
11-26" Light yellow brown, very friable, n-pls, n-sti, structureless.
26-30" Dark gray brown, cobbly silty clay loam, strong coarse subangular blocky to columnar. Extra firm, very plastic, very sticky
30-60" Gray brown clay loam strong coarse platy, bedded with thin lenses of sand; extra firm, very plastic, very sticky, mottled; depth to bedrock, variable.

Range

20-30" Volcanic ash mantle
5-10" Colluvial horizon
30-60" Bedded clay pyroclastic or sedimentary deposits

Typic Vitrandept, medial over clayey, mixed, mesic

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*CL-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Some breccia and interflows*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Ash soil surface, clay subsoils, wet areas*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Moderate*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Leave rough & seed; roll grade, protect surface vegetation*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Heavy snows, short season*
Suggestions for Road Waste and Fill Slope Seeding	*Leave rough, seed early*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Sloughing, cool site*
Suggestions for Cutbank Seeding	*Leave rough, seed & follow up*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Cool, moist, frost pocket, compaction*
Suggested Tree Planting Species	*Fir, spruce*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Poor regen. on clear cut, compaction, burning, brush*
Suggested Slash Disposal	*Lop & scatter fines; yard unmerchantable*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Water, fragile soil & veg., dense timber*
Treatment to Increase Suitability	*Develop water system, manage stand*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Moderate*
Limitations for Trails	*Windthrow*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Shallow to bedrock or clay*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Adjacent very large faults or failures*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain cover, retard & disperse runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt, clay*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, good escape cover*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Cool, moist, thick cover*

Unit No. 16

Plant Community Type *Lodgepole, pinegrass - grouse huckleberry*

Lodgepole, grouse huckleberry

Physiographic Position *Toe slope and gentle sideslopes*

Geologic Materials *Surface flow volcanics*

Aspect *Generally northern*

Slope *2-20%*

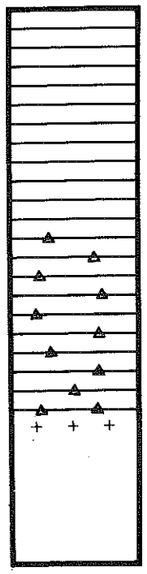
Present Erosion *Widely spaced deep rills from concentrated runoff*

Major Drainage Dissection *Slight*

Ground Cover	*90-100%*	**Overstory**	*70-90%*
Rock Outcrops	*0-5%*	**Understory**	*30%*

Estimated Water Holding Capacity *10-14"*

Profile



Description

1" Litter and duff
0- 1" Dark brown silt loam very friable, very weak co. platy
1- 3" Brown silt loam, very friable, very weak co. platy
3-22" Light yellow brown, very friable, silt loam structureless All are n-pls, n-sti.
22-40" Dark brown to gray brown, heavy gravelly silt loam, sli. mottled, sli. sticky, sli. plastic, weak fine sub-angular blocky
40"+ Fractured volcanics

Range

20-34" Volcanic ash mantle over
10-40" Gravelly silt loam to light silty clay loams

Typic Cryandept; medial over clay, mixed

Inclusions

10—Moderately stable toe slopes
15—Fir type with buried subsoils of heavy texture

Remarks

—Cold air drainage and frost pockets
—Good regeneration in places
—Ash soils have weak aggregate stability and easily disturbed by machines with dust hazard and non-wettability
—Slash should be left on site to abate the frost and retard surface runoff
—Burning induces non-wettability and retards regeneration

Complexes

163—Lodgepole pinegrass in association with the better white fir sites
165—Cooler site of lodgepole grouse huckleberry and cool fir site
166—Hummocky relief with lodgepole pinegrass in association with mixed conifer - pinegrass types

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Adjacent to drainway*
Method of Excavation	*Rip & some blasting*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Very stable*
Considerations for Cutbank Stability Problems	*Protect ground cover*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Light soil, lack fines*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early, mulch*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Slope, roughness*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Frost heave, cold soils*
Suggested Tree Planting Species	*Lodgepole, W. larch*
Waterbar Interval	*8-10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance, sedimentation, burning*
Suggested Slash Disposal	*Leave on site, crush*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Water, small timber, windthrow*
Treatment to Increase Suitability	*Development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Windthrow*
Considerations for Trail Improvements & Protection	*Maintenance*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Shallow soil, field limited*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Maintain ground cover*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

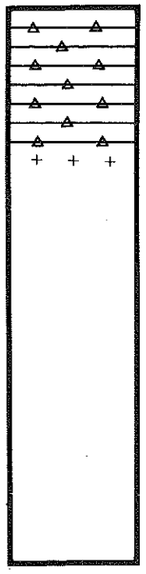
Limitations for Domestic Livestock and Wildlife Use	*Timber stand; plant species*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Tree seedlings*

Unit No. 17

Plant Community Type	*Ponderosa pine - fescue*
	Ponderosa pine - Douglas fir - elk sedge
	Mixed conifer - pinegrass - residual soil
	Lodgepole - pinegrass - grouse huckleberry
Physiographic Position	*Upper ridge side slopes*
Geologic Materials	*Volcanic flows - basalt and andesites*
Aspect	*Southern*
Slope	*5-30%*
Present Erosion	*Sheet and rills - heavy rills where grazed or disturbed*
Major Drainage Dissection	*Slight*

Ground Cover	*20-60%*	**Overstory**	*50%*
Rock Outcrops	*5%*	**Understory**	*30%*
Estimated Water Holding Capacity	*5-7"*		

Profile



Description

1" Litter and duff
0- 6" Dark brown gravelly silt loam, sli. sticky, n-pls, very weak, angular blocky
6-14" Light brown gravelly silt loam, sli. sticky, n-pls, very weak, fine angular blocky
14"+ Fractured volcanics

Range

6-22" Gravelly silt loam colluvial material

Dystric Xerochrepts, loamy skeletal, mixed, frigid

Inclusions

9— Scabland, dry meadows
18— Ash mantle, east and west slopes; mixed conifer to fir - lodgepole cool sites

Remarks

— Fairly fragile site when disturbed or over exposed
— Some previously managed areas have been type converted to scabland
— Slash should be left on site to reduce the effects of temperature extremes
— Easily displaced or dislodged
— Higher elevation, cooler site with more moisture than Unit 6

Complexes

173— Ridgecrest complex of shallow residual soils and ash soil, fir types with inclusions of meadow-scabland and marginal timber types
174— Fairly poor site of shallow residual soils, non-commercial forest and juniper, curlleaf mahogany scabland

ENGINEERING

Unified Class. *Surface*	*ML-GM*
Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Culvert placement, disperse flows*
Method of Excavation	*Blast & rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Shallow cuts*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack fines, exposure*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch for moisture retention*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Shallow soils*
Suggestions for Cutbank Seeding	*Leave rough, mulch if necessary*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Exposure, type of harvest, moisture*
Suggested Tree Planting Species	*Larch, Ponderosa pine*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance & displacement*
Suggested Slash Disposal	*Lop & scatter; some crushing*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Lack water, shallow rocky site*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Rocky*
Considerations for Trail Improvements & Protection	*Water diversion*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Shallow soils*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

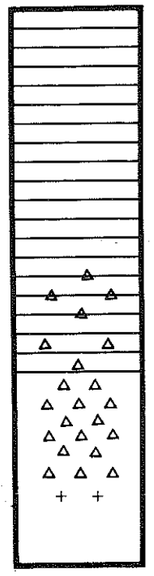
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Rocky, shallow soils*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Moisture*

Unit No. 18

Plant Community Type	*Sub-alpine fir - big huckleberry*
	White fir - grouse huckleberry
	Sub-alpine fir - grouse huckleberry
	Lodgepole - grouse huckleberry
Physiographic Position	*Cool ridge tops and uplands; gentle sideslopes*
Geologic Materials	*Surface flow volcanics, breccia and interflows*
Aspect	*Generally all*
Slope	*2-25%*
Present Erosion	*Natural conditions - none; rills and small gullies where exposed*
Major Drainage Dissection	*Slight*
Ground Cover	*95%* **Overstory** *90%*
Rock Outcrops	*5%* **Understory** *10-30%*
Estimated Water Holding Capacity	*10-14"*

Profile



Description

1" Litter and duff
0- 2" Dark brown silt loam, very weak co. platy
2- 7" Brown silt loam, weak coarse platy
7-27" Light yellow brown, silt loam, structureless
All are n-pls, n-sti, very friable
27-36" Brown gravelly loam, sli. sti, n-pls, very weak fine angular blocky, friable
36-50" Brown extremely gravelly loam
50"+ Residual fractured basalts

Range

14-40" Volcanic ash mantle depending on position, silt loam
10-30" Gravelly loam to silt loam buried residual

Typic Cryandept, medial over loamy, mixed

Inclusions

15— Toe slope position with buried subsoils; fir site
17— Mixed conifer to Ponderosa pine types on southern shallow, residual slopes
9— Scablands, moist-dry meadows
10— Wet, heavy textured subsoils that are unstable and generally heavy brush and alder

Remarks

— Generally a very cool, moist site with a fairly short growing season and late season snow pack
— Very slow soil profile development and vegetative response
— Difficult to regenerate without ground cover and canopy cover
— Burning severely sets back the site growth
— Disturbed areas easily erode

Complexes

180— Cool toe slope positions with unstable subsoils (10) and includes some of the better fir sites (13, 15)
189— Ridge crests with scabland - dry meadows (9) and shallow, residual slopes (17)

ENGINEERING

Unified Class. ***Surface***	*ML*
Subsoil	*CL-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some breccia, scoria & interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Ash surface, some clay subsoils*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope ***Soil***	*Moderate*
Ratio ***Bedrock***	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Protect surface cover*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Microclimate*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Cool site*
Suggestions for Cutbank Seeding	*Leave rough, seed*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Fair*
Limitations to Regeneration	*Microclimate & exposure*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5-10' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Compaction, over exposure*
Suggested Slash Disposal	*Lop & scatter fines; whole tree yard*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Fragile site, cool*
Treatment to Increase Suitability	*Develop water, stand management*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Wet areas, wind throw*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Shallow to silty clays and bedrock*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Slumps*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff, maintain ground cover*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected ***Surface*** **Sediment** ***Subsoil*** **Size**	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

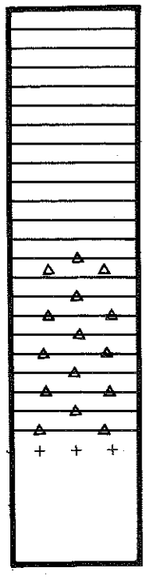
Limitations for Domestic Livestock and Wildlife Use	*Cool, late opening*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Cool, short season site*

Unit No. 19

Plant Community Type	*Sub-alpine fir - big huckleberry*
	White fir - grouse huckleberry
	Sub-alpine fir - grouse huckleberry
Physiographic Position	*Steep upper ridge sideslope*
Geologic Materials	*Surface flow volcanics*
Aspect	*Eastern and western*
Slope	*25-65%*
Present Erosion	*Sheet and rill in managed areas, none naturally*
Major Drainage Dissection	*Moderate to high*

Ground Cover	*100%*	**Overstory**	*80%*
Rock Outcrops	*5-10%*	**Understory**	*20%*
Estimated Water Holding Capacity	*12-15"*		

Profile



Description

2" Organic litter and duff
0- 2" Dark brown, very friable silt loam, very weak co. platy
2-10" Brown silt loam, very friable, structureless
10-26" Light yellow brown, friable silt loam, structureless
All n-pls, n-sti.
26-45" Brown very gravelly silt loam colluvium, friable, very weak fine sub-angular blocky, sli. sti, n-pls.
45"+ Colluvium

Range

12-30" Volcanic ash mantle over
20-40" Colluvial with fines

Typic Cryandept, medial over loamy skeletal, mixed

Inclusions

14—Steep northern aspects
91—Rock outcrops
919—Extremely rocky with dense alder patches

Remarks

—Cool, higher elevation sites with short growing season
—Regeneration difficulties from thermal exposure, frost heave and heavy snow accumulations
—High susceptibility to brush revegetation with alder making up a significant proportion of the present understory
—Slow soil development and nutrient release because of the cool site

Complexes

191—Steep side and toe slope positions that are moderately stable to unstable (11)
194—Dissected ridges with north headwalls (14) and east/west facing sideslopes
199—Complex of timbered stringers and rock outcrops (91)

ENGINEERING

Unified Class. *Surface*	*ML*
Unified Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Pyroclastic interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Snow, heavy late snow melt*
Method of Excavation	*Rip, blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil*	*Steep*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep banks less than 10 feet*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Cool site, short season*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after disturbance*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Short season*
Suggestions for Cutbank Seeding	*Leave rough, seed after disturbance*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Sub-alpine zone, cold site short season*
Suggested Tree Planting Species	*True fir*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Burning, overland flow, displacement, brush take over*
Suggested Slash Disposal	*Lop & scatter; leave all fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, cold*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep, snow zone*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Soil creep, talus or debris slides*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard surface runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface*	*Silt*
Expected Sediment Size *Subsoil*	*Silt*

RANGE AND WILDLIFE

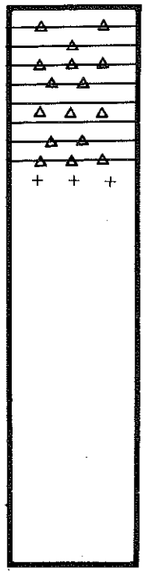
Limitations for Domestic Livestock and Wildlife Use	*Snow zone*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Short season*

Unit No. 20

Plant Community Type	*Ponderosa pine - Douglas fir - elk sedge*
	Lodgepole - pinegrass - grouse huckleberry
	Sub-alpine fir - white bark pine - sedge
	Sub-alpine fir - grouse huckleberry
Physiographic Position	*High elevation - upper ridge system*
Geologic Materials	*Surface flow volcanics, breccias*
Aspect	*Southern*
Slope	*30-65%*
Present Erosion	*Moderate sheet and rill where disturbed*
Major Drainage Dissection	*Moderate*

Ground Cover	*30-70%*	**Overstory**	*60%*
Rock Outcrops	*30%*	**Understory**	*20%*
Estimated Water Holding Capacity	*5-8"*		

Profile



Description

1" Duff and litter
0- 5" Dark brown gravelly loam, n-sti, n-pls, very fine, very weak, sub-angular blocky friable
5-15" Brown very gravelly loam, n-sti, n-pls, fine, very weak sub-angular blocky, friable
15"+ Colluvial basalts

Range
10-40" Gravelly loam colluvium

Ultric Haploxeralf, loamy skeletal, mixed, cryic

Inclusions
9— Wet-dry meadow
91— Rock outcrop
19— Timbered east/west slopes

Remarks
— Cold site, heavy snows and late runoff
— Difficult to regenerate, frost heave and short growing season
— Sub alpine at highest elevations with pine-fir-lodgepole on the more exposed sites
— Disturbance hazard with severe erosion potential
— Rock outcrop and surface colluvium

Complexes
201— Steep colluvial mixed conifer (20) with steep, east-west, better sites (12) and rock outcrops (91)
209— Higher elevation and cooler steep (20) with sub-alpine east-west slopes (19) and rock outcrops (91)
211— Generally along faulted features of southern aspect mixed conifer (20) and unstable slopes (11) with inclusions of stable unit (12)
291— Marginal site with Unit 20 and rock outcrops (91), inclusions of Unit 19 and 12

ENGINEERING

Unified Class. ***Surface***	*GM-ML*
Subsoil	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Heavy snow, late runoff, sidecast*
Method of Excavation	*Blade, rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil***	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Limit to less than 10 ft.*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Amount of fines, short season*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after disturbance*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Shallow soil layer, ravel*
Suggestions for Cutbank Seeding	*Leave rough, seed early, follow-up*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Cool site, limited moisture*
Suggested Tree Planting Species	*Spruce, fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement, disturbance and slow recovery*
Suggested Slash Disposal	*Limb, lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Cool, steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Poor*
Limitations for Trails	*Late season, snow, rockfall*
Considerations for Trail Improvements & Protection	*Outsloped drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Talus or debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard surface runoff*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slope, snow zone*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Very steep, rocky, short season*

Unit No. 21

Plant Community Type	*Mixed conifer - pinegrass, ash soil*
	White fir - twin flower - forb
	White fir - huckleberry
	Lodgepole - pinegrass - grouse huckleberry
Physiographic Position	*Gentle ridge tops and gentle side slopes*
Geologic Materials	*Surface flow volcanics with pyroclastic interflow materials*
Aspect	*Northern*
Slope	*2-30%*
Present Erosion	*Sheet and rill erosion on harvested units*
Major Drainage Dissection	*Slight*

Ground Cover	*100%*	**Overstory**	*80-90%*
Rock Outcrops	*-0-*	**Understory**	*20-70%*
Estimated Water Holding Capacity	*12-20''*		

Inclusions

23—Southern aspect mixed conifer to Ponderosa pine on residual soils
3—Juniper - scabland, generally along fringes and ridge crests
4—Ponderosa pine - wheatgrass in association with Unit 23

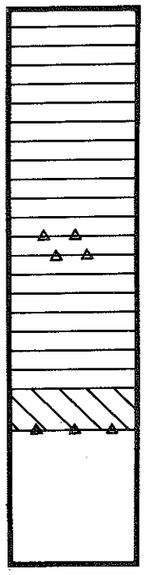
Remarks

- *Aspen, yew and alder may be present within the drainways*
- *Generally moderately deep ash which is easily disturbed, susceptible to erosion with cover removed and tends to be hydrophobic from hot slash burning*
- *Excellent wildlife cover*
- *Litter and small fines needed to protect soil surface, enhance fertility and aid moisture infiltration*
- *Highly productive site; ability to intercept, infiltrate and store moisture is essential*
- *Some lateral subsoil moisture perched on heavy textured buried horizon*

Complex

321—Gentle toe slopes and adjacent drainway; alder, yew and aspen present; highly productive unit includes 21, 23, 30, 39
212—Volcanic ash (21) and residual soil mixed conifers (23) with some inclusions of marginal pine (4) along the fringes
213—A hummocky irregular complex of volcanic ash soils (21), residual soil (23), marginal pine on shallow residual (4) and juniper scabland (3)

Profile



Description

2'' Litter and duff
0- 4'' Dark brown silt loam, friable, weak coarse platy
4-15'' Brown silt loam, friable, very weak coarse platy
15-22'' Pale yellow brown, silt loam structureless, very friable All n-pls, n-sti.
22-26'' Light brown silt loam with rock fragments
26-36'' Gray brown, heavy silt loam, massive, sli. sti, n-pls.
36-40'' Dark reddish gray brown silty clay loam, sticky, plastic Fine, mod, subangular blocky
40''+ Basalt rubble

Range

20-40'' Volcanic ash mantle over
20-40'' Buried residual horizons from pyroclastics

Typic Vitrandept, medial over clayey, skeletal, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*SM-ML*
Class. *Subsoil*	*ML-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very good timber site, mod. deep to deep soils*
Method of Excavation	*Mostly blast some ripping of surface*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Moderate*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Roll the grade, avoid wet areas*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Length of slope, exposure*
Suggestions for Road Waste and Fill Slope Seeding	*Surface cover*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Exposure, bladed smooth*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*High*
Limitations to Regeneration	*Adequate shade & seed source*
Suggested Tree Planting Species	*Larch, Douglas fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Rill erosion, hot burning, exposure, compaction*
Suggested Slash Disposal	*Lop & scatter, some broadcast burn*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Heavy timber, moist site*
Treatment to Increase Suitability	*Slash - removal or cut up*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Wet spots, dense lodgepole thickets*
Considerations for Trail Improvements & Protection	*Dead fall*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Restricted permeability near drainways*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small slumps*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain root & organic stability*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected Sediment *Surface*	*Silts*
Size *Subsoil*	*Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage type*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Heavy timber, canopy closure*

Unit No. 22

Plant Community Type *White fir - twin flower - forb*

White fir - huckleberry

Mixed conifer - pinegrass - ash soil

Physiographic Position *Steep ridge sideslopes*

Geologic Materials *Basalts and interflow materials*

Aspect *Northern*

Slope *25-65%*

Present Erosion *Moderate gully erosion; few small surface slumps along toe slopes*

Major Drainage Dissection *Moderate*

Ground Cover	*80-90%*	**Overstory**	*70-90%*
Rock Outcrops	*10%*	**Understory**	*60-90%*

Estimated Water Holding Capacity *10-20"+*

Inclusions

5 — Steep bunchgrass scabland
24 — Steep colluvial slope - mixed conifer pinegrass on residual soils, occurs on ridge crests, exposed areas and southern aspects
67 — Similar to 21 except the basalts give way to tuffaceous and/or pyroclastic materials which yields a buried horizon of high expanding clays
91 — Rock outcrops or talus
322 — Drainways and ephemeral drainages

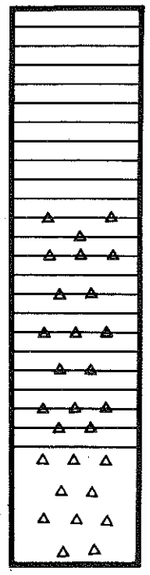
Remarks

— The toe slopes and lower portions of this are subject to slumping because of the deep to very deep colluvial nature of the materials
— Potential severe erosion hazard on the surface ash materials; present gully erosion with some evidence of soil mantle creep
— In some areas this unit lays above a tuff unit, especially on Heppner District along the steep slopes

Complexes

224 — Generally dissected unit with protected aspects (21) and colluvial slopes (24) including rock outcrops (91)
229 — Step-like appearance along northern exposure with bands of unit 21 separated by rocky outcrops (91) and bunchgrass (5) and 24 occurring along the outside timbered fringe
322 — Steep sided stream channel and ephemeral drainways, units 22 and 24 dominating with 321 and 39 in the stream bottom

Profile



Description

2" Duff and litter
0- 2" Very dark brown silt loam, weak coarse platy
2- 7" Brown to lt. brown silt loam, very weak co. platy
7-14" Light yellow brown, structureless silt loam
14-24" Light yellow gray, silt loam structureless All are n-pls, n-sti, very friable
24-44" Brown very gravelly silt loam to silty clay loam, fine mod. sub-angular blocky, sticky, sli. pls.
44"+ Scorria breccia weathered colluvium

Range

20-40" Volcanic ash mantle
10-40"+ Mixed colluvial materials from basalts and pyroclastic interflows

Typic Vitrandept, medial over loamy, skeletal, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*ML-SM*
Class. *Subsoil*	*ML-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Suited*
Limit of Bedrock for Roadrock	*Mixed with fine; deep overburden*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Steep, small slumps, ground water intercept*
Method of Excavation	*Blade, rip, some blasting*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Cuts less than 10 ft. Roll the grade*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Slope, cover, amount of fines*
Suggestions for Road Waste and Fill Slope Seeding	*Check surface runoff & lenth of fill*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness, mixed gravelly soils*
Suggestions for Cutbank Seeding	*Keep cuts shallow*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Seed source*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*High surface erosion, small slumps, side cast if roaded*
Suggested Slash Disposal	*Lop, scatter, leave fines, cool burn conc.*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Downed timber, springs, slope*
Considerations for Trail Improvements & Protection	*Spring development*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small surface slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Surface veg., protection*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment *Surface*	*Silt*
Size *Subsoil*	*Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness, good cover*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Overstory, slope*

Unit No. 23

Plant Community Type	*Ponderosa pine - Douglas fir, elk sedge*
	Ponderosa pine, fescue
	Mixed conifer - pinegrass, residual soil
Physiographic Position	*Gentle ridge tops and sideslopes*
Geologic Materials	*Basalt and andesite*
Aspect	*Southern*
Slope	*2-30%*
Present Erosion	*Sheet and rill with small gullies in some harvested units*
Major Drainage Dissection	*Moderate*

Ground Cover	*70%*	**Overstory**	*50-80%*
Rock Outcrops	*5%*	**Understory**	*10-60%*
Estimated Water Holding Capacity	*5-7"*		

Inclusions

4 — Non-CFL Ponderosa pine - fescue - wheatgrass generally along timbered fringe or other exposed aspects
3 — Juniper or sage - scabland
31 — Some dry-moist meadow types

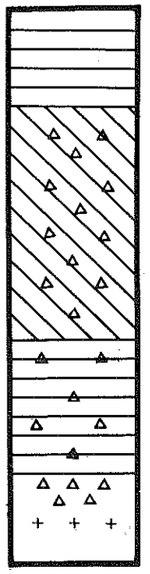
Remarks

— Generally shallow soils of limited moisture storing capacity; organic litter and duff needed to abate rainfall impact and optimize infiltration
— Disturbance and tractor piling can severely damage soil surface and structure thus reducing infiltration and growth potential
— Some hummocky micro relief, last remnants of volcanic ash mantle
— Shade important to cooler micro-climate, as the site can be very hot and droughty

Complexes

231 — Gentle slope hummocky complex with islands of 21, separated by Unit 23 and fringe Units 3 and 4
233 — Unique complex on gentle upland slopes, hummocky residual stands (23) in association with juniper (3) and NCFL (4) separated by dry-moist meadow soils Unit 31
234 — Marginal site, mostly juniper (3) and NCFL (4) in association with Unit 23
323 — Dry, southern exposure or severe harvested drainages, mostly shallow pine type 23 and NCFL Unit 4 on the sideslopes and 39 in the bottom; inclusions of alluvial type 321

Profile



Description

1" Duff and litter
0- 7" Black silt loam, strong med. platy, firm, n-pls, slightly sticky
7-14" Very dark brown, silt loam, mod. platy, firm, sli. sticky, sli. plastic
14-34" Dark brown gravelly silt clay loam, mod. co. sub-angular blocky, pl, sti.
34-49" Dark brown gravelly silt loam to clay loam, mod. fine sub-angular blocky, pls, sti.
49"+ Rubble

Range

10-30" Surface loams to clay loams over
10-20" Buried horizons of fine texture

Typic Argixeroll, clayey skeletal, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*ML-SM*
Unified Class. *Subsoil*	*SM-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Adjacent scablands, some springs*
Method of Excavation	*Blade, rip, some blasting*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil*	*Flat*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 10 ft.*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack soil & shade*
Suggestions for Road Waste and Fill Slope Seeding	*Use slash or straw if necessary*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Shade and soil depth in places*
Suggestions for Cutbank Seeding	*Straw mulch if necessary*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade, W.H.C. compaction*
Suggested Tree Planting Species	*Pine, Douglas fir*
Waterbar Interval	*15 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Rill & gully erosion, slow regen., grass, compaction*
Suggested Slash Disposal	*Leave fines, lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Available water*
Treatment to Increase Suitability	*Develop site*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Rocky, scabland inclusions*
Considerations for Trail Improvements & Protection	*Surface runoff*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Shallow soils*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Retard surface flow, veg. protection*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface*	*Silt*
Expected Sediment Size *Subsoil*	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Water, light forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Pinegrass compet. Warm, dry site*

Unit No. 24

Plant Community Type	*Mixed conifer - pinegrass - residual soil*
	Ponderosa pine - Douglas fir - elk sedge
	Ponderosa pine - fescue
	Ponderosa pine - wheatgrass
Physiographic Position	*Steep exposed ridge side slopes, talus, colluvial materials*
Geologic Materials	*Basalts, andesites, metavolcanics and pyroclastic material*
Aspect	*Southern*
Slope	*30-65%*
Present Erosion	*Moderate sheet and rill*
Major Drainage Dissection	*Moderate to highly dissected*

Ground Cover	*60-80%*	**Overstory**	*60-80%*
Rock Outcrops	*10-15%*	**Understory**	*70%*
Estimated Water Holding Capacity	*5-10"*		

Inclusions

5 — Shallow gravelly colluvial bunchgrass sideslopes
91 — Rock outcrops and talus

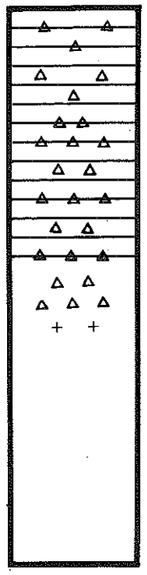
Remarks

— Generally fairly open pine with modest regeneration
— Toe slopes are deep to very deep colluvium of loose unconsolidated material
— Fairly shallow gravelly soils; thus limited moisture storage capacity; shade is a big factor in establishing regeneration; effective rooting depth is generally within 20-30" of surface
— Some down slope colluvial movement
— Sidecast would travel downslope, probably to stream
— Some steep, sharp pitches to near 100% slope

Complexes

242 — Partially protected aspects, units 24 and 22 with inclusions of rock outcrops (91).
245 — Further transition to timbered Unit 24 with bunchgrass (5) and inclusions of rock outcrops (91)
249 — Step-like timbered strips (24) separated by rock outcrops (91) and bunchgrass (5)

Profile



Description

1" Litter and duff
0- 5" Brown gravelly loam, weak granular, n-pls; n-sti.
5-14" Light brown gravelly silt loam, fine sub-angular blocky, sli-sti, very pls, firm
14-26" Dark reddish brown gravelly silt loams to silty clay loam, fine, med. sub-angular blocky, sticky, sli. pls.
26"+ Colluvium

Range

20-40" Mixed colluvium of gravelly loams over very gravelly silty clay loams

Typic Argixeroll, loamy skeletal, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*SM-GM*
Unified Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Possible tuffaceous interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Steep, rockfall, side cast materials*
Method of Excavation	*Blade, rip & blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil*	*Steep*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep cuts less than 10 ft.; ground water intercept*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack of fines, dry, exposed*
Suggestions for Road Waste and Fill Slope Seeding	*Use slash or mulch if necessary*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, frost, loose gravelly materials*
Suggestions for Cutbank Seeding	*Straw mulch or chips, if necessary*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Dry site, soils gravelly*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*10 ft.*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Slow to regen., surface runoff & erosion, displacement*
Suggested Slash Disposal	*Lop and scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, dry*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Water conc. in trails, some rockfall*
Considerations for Trail Improvements & Protection	*Relieve surface runoff*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Talus or debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Check & retard runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface*	*Sand, silt*
Expected Sediment Size *Subsoil*	*Sand, silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, water availability*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Dry, southern exposure, limited capabil.*

Unit No. 26

Plant Community Type *Mixed conifer - pinegrass, residual soil*

Ponderosa pine - Douglas fir - elk sedge

Mixed conifer - pinegrass, ash soil

Physiographic Position *Ridge side slopes*

Geologic Materials *Volcanic surface flows, pyroclastics, lacustrine*

Aspect *Generally southern*

Slope *2-35%*

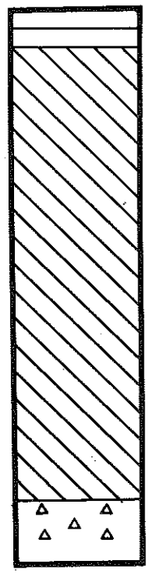
Present Erosion *Sheet and rill erosion where exposed*

Major Drainage Dissection *Slight*

Ground Cover	*80%*	**Overstory**	*80%*
Rock Outcrops	*5%*	**Understory**	*40%*

Estimated Water Holding Capacity *7-10"*

Profile



Description

1" Duff and litter
0- 5" Very dark brown to black silty clay loam, med. mod. platy, firm, hard when dry, plastic, sticky
5-20" Dark gray brown silty clay loam, mod. fine sub-angular blocky, very firm, very plastic, very sticky
20-54" Gray brown silty clay loam, sticky coarse prismatic, very plastic, very sticky
54"+ Breccia and basalt fragments, soft

Range

0-10" Volcanic ash surface horizons sometimes gravelly
20-60" Pyroclastic materials generally fine textures, some gravel and cobble

Ultic Palexeroll, fine montmorillonitic, frigid

Inclusions

4 — Ponderosa pine - wheatgrass and fescue

Remarks

- *Compaction from ground equipment will contribute to slow regeneration, subsoils are sticky and plastic clays and gravelly clays*
- *Frost heave spring and fall*
- *Moderate available moisture and shallow rooting depths*
- *Volcanic ash mantle generally severely eroded*
- *Basalts mixed with sedimentary deposits; sometimes the surface volcanics mask the pyroclastic and sedimentary materials*

Complexes

ENGINEERING

Unified Class. *Surface*	*ML-GC*
Class. *Subsoil*	*GM-OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Fair - poor*
Limit of Bedrock for Roadrock	*Breaks down easily, mixed with basalts*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Soft plastic clays & subsoils*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Low - high*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 10 ft. Avoid seeps*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Fertility, exposure*
Suggestions for Road Waste and Fill Slope Seeding	*Seed, fertilize, mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Ravel, slope; clay subsoils*
Suggestions for Cutbank Seeding	*Leave rough, seed, follow up*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow, droughty, compaction, expo.*
Suggested Tree Planting Species	*Ponderosa pine*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Exposure, compaction, erosion*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Water, rocky, heavy clay subsoils*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Rocky areas, soft clay*
Considerations for Trail Improvements & Protection	*Gravel, drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Mostly fault action, slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain ground cover, avoid compaction*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt clay*
Sediment *Subsoil*	*Silt clay*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Moisture, frost heave*

Unit No. 30

Plant Community Type *Dry meadow*

Moist meadow

Wet meadow

Quaking aspen meadow

Physiographic Position *Alluvial Depositional Meadows*

Geologic Materials *Tuffs, tuffaceous sandstones, pyroclastics and other soft rock*

Aspect *All*

Slope *1-6%*

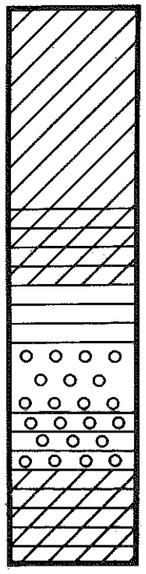
Present Erosion *Some areas of stream channel erosion*

Major Drainage Dissection *Slightly dissected*

Ground Cover	*90-100%*	**Overstory**	*0*
Rock Outcrops	*0*	**Understory**	*0*

Estimated Water Holding Capacity *20-30"*

Profile



Description

½" Organic horizon
0- 8" Black silty clay, mod. strong platy, sti, pls, very firm
8-16" Dark brown silty, clay loam, med. st. columnar, very firm, very sticky, very plastic
16-30" Blue-gray clay, massive very firm, very sticky, very plastic
30-38" Light gray silt loam, n-sti, n-pls, platy
38-42" Light reddish yellow, fine sandy loam, mottled, granular
42-48" Dark reddish brown heavily mottled loam, platy
48-60" Blue gray clay mottled, massive
60"+ Pyroclastics

Range
Extremely variable, generally at least 40", well developed profile of very fine textures

Xeric Argiolboll, fine montmorillonitic, frigid

Inclusions
39— Streambed gravels along drainways
66— Lodgepole - pinegrass - grouse huckleberry
46— Lodgepole - pinegrass - grouse huckleberry

Remarks
— These units produce heavy thick forage
— There are many springs and seeps which surface in the meadows or along the fringes
— Soils are very cold and wet; tree establishment will probably have poor success; likewise over cutting adjacent to the meadows will enlarge the frost pocket influence
— Soil illustrates a fluctuating water table
— Road construction would eliminate forage area and require deep open subgrade with good drainage and probably still have soft spots
— Compaction is a severe problem as well as streambank trampling by cattle

Complexes
Within drainway units

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*OL-ML* / *OH-CH*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Soft tuffs, break down rapidly to fines*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Deep heavy soil, drainage & seep subgrade needed*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Keep cuts to a min., control runoff*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Heavy texture, slick surface*
Suggestions for Road Waste and Fill Slope Seeding	*Seed & mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Slope & swelling nature of soils*
Suggestions for Cutbank Seeding	*Protect surface cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Cold soil, frost heave, sod, comp., grazing*
Suggested Tree Planting Species	*Lodgepole, spruce, fir*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Compaction*
Suggested Slash Disposal	*None*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Sticky plastic clays, water, shade*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Soft, wet areas*
Considerations for Trail Improvements & Protection	*Gravel paths, stream crossings*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Deep, clay, high watertable*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard adjacent unit runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*D*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Clay*

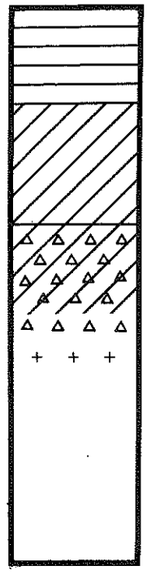
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Wet early*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Climate, heavy textured soils*

Unit No. 31

Plant Community Type	*Dry meadows*
	Moist meadows
	Wet meadows
	Quaking aspen meadows
Physiographic Position	*Upland meadows and drainage ways*
Geologic Materials	*Basalts and interflow materials, metavolcanics*
Aspect	*All*
Slope	*1-5%*
Present Erosion	*Moderate sheet and rill; depending on grazing use*
Major Drainage Dissection	*Slight*
Ground Cover	*80%* — **Overstory** *0-10%*
Rock Outcrops	*5%* — **Understory** *10%*
Estimated Water Holding Capacity	*10-20"*

Profile



Description

2" *Organic horizon*
0- 8" *Very dark brown fine silt loam, sticky, sli. pls, med. platy*
8-20" *Brown silty clay loam fine mod. sub-angular blocky, very sticky, plastic*
20-30" *Dark brown very gravelly silty clay loam, sticky, plastic, very fine subangular blocky*
30"+ *Weathered basalts*

Range
30-50" in depth with a buried silty clay loam subsoil

Cumulic Cryaquoll, fine silty, mixed, non-calcareous

Inclusions
39—Alluvial stream channel
7—Lodgepole - pinegrass - grouse huckleberry

Remarks
- *This unit is a non-commercial forest type but is usually susceptible to surface erosion from adjacent units*
- *Heavy forage production unit*
- *Good ground cover except on livestock units*
- *Stream channel trampling and displacement*
- *Road construction should avoid this unit*

Complexes
Within drainway units

ENGINEERING

Unified Class. ***Surface***	*ML-OL*
Subsoil	*OL-OH*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Fractured, mod. competent*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Drainage needed, heavy subsoils, seeps*
Method of Excavation	*Blade, rip, blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil***	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Low*
Considerations for Cutbank Stability Problems	*Maintain surface sod cover*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Surface runoff*
Suggestions for Road Waste and Fill Slope Seeding	*Seed as soon as possible*
Suitability of Cutbank Seeding	*Good if laid back*
Limit of Cutbank Seeding	*Heavy subsoils*
Suggestions for Cutbank Seeding	*Scarify*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Sod cover, frost, grazing*
Suggested Tree Planting Species	*None*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Compaction*
Suggested Slash Disposal	*None*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Water, flood, fragile soils adjacent*
Treatment to Increase Suitability	*Road rock, development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Muddy, stream crossings*
Considerations for Trail Improvements & Protection	*Gravel*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Slow permeability*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Waterbars*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*None*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Present grasses & sod cover*

Unit No. 34

Plant Community Type	*Moist meadows*
	Wet meadows
	Quaking aspen meadows
Physiographic Position	*Concave ridgecrests and valley bottoms*
Geologic Materials	*Metavolcanics - diorites - granitics*
Aspect	*All*
Slope	*0-5%*
Present Erosion	*Man-caused rill and small gully*
Major Drainage Dissection	*None*

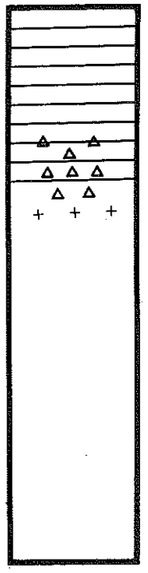
Ground Cover	*90%*	**Overstory**	*10%*
Rock Outcrops	*0*	**Understory**	*10%*
Estimated Water Holding Capacity	*10-20"*		

Inclusions
None

Remarks
— Soft fragile lands
— Generally surrounded by lodgepole, sub-alpine fir and whitebark pine
— Heavily grazed
— High elevation meadows, cold and short growing seasons
— Some depressions are peat bogs

Complexes
Within drainway units

Profile



Description

4" Organic matter or peat
0- 5" Black silt loam, weak co. platy, sli. sti, n-pls.
5-20" Light yellow brown silt loam, structure-less, n-pls, n-sti.
20-25" Dark reddish brown, very gravelly fine silt loam, sli. sti, sli. pls, weak fine sub-angular blocky
25"+ Metavolcanics

Range
Extremely variable
Thick organic horizon over 20-30" ash

Cumulic Cryaquoll, fine loamy, mixed, non-calcareous

ENGINEERING

Unified Class. *Surface*	*PT-ML*
Unified Class. *Subsoil*	*ML-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Soft easily fractured*
Est. of Roadrock Thickness	*Very thick*
Consid. for Road Location & Construction	*Wet, plastic claysub-soils, wildlife & unique habitat*
Method of Excavation	*Rip & blade*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope *Soil*	*Flat*
Ratio *Bedrock*	*Flat*
Probability of Cutbank Failure	*High*
Considerations for Cutbank Stability Problems	*Not suited for roads*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Short season*
Suggestions for Road Waste and Fill Slope Seeding	*Seed, mulch*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Excessive moisture*
Suggestions for Cutbank Seeding	*Not suited for roads*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Very cold, wet site*
Suggested Tree Planting Species	*Spruce*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Habitat destroyed compact., disturb.*
Suggested Slash Disposal	*None*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Wet, cold*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Poor*
Limitations for Trails	*Wet, easily trampled*
Considerations for Trail Improvements & Protection	*Avoid meadows*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*watertable*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Low*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Keep traffic off*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II - III*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface*	*Silt*
Expected Sediment Size *Subsoil*	*Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Wet, late season*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Wet, short season, compaction*

Wet (water table) plastic clay subsoils, wildlife & unique

Unit No. 39

Plant Community Type *Quaking aspen meadow*

Moist meadow

Physiographic Position *Creek and stream bottom*

Geologic Materials *Alluvium*

Aspect *All*

Slope *1-5%*

Present Erosion *Generally high water and severe channel erosion*

Major Drainage Dissection

Ground Cover	*0-50%*	**Overstory**	*0*
Rock Outcrops	*50%*	**Understory**	*0*

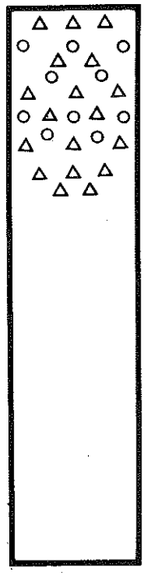
Estimated Water Holding Capacity *5-20"*

Includes
30, 31 — Meadow lands
321 — Drainway complex
376 — Drainway complex

Remarks
— Gravelly, cobbly alluvial stream bottom
— Severely affected by man's activities
— Flood potential yearly
— Accelerated streambank erosion due to cattle trampling
— Generally rehabitation work should be initiated on damaged area and grazing systems altered

Complexes
None

Profile



Description
0 Organic horizon
0-14" Brown, extremely cobbly and gravelly fine sandy loam, granular, n-sti, n-pls.
14" Cobble, gravel

Range
10-60" Alluvial fill depending on channel and condition

Typic Haploxeroll, sandy skeletal, mixed, mesic

ENGINEERING

Unified Class. *Surface*	*GW-GM*
Class. *Subsoil*	*GW*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Round hard materials*
Est. of Roadrock Thickness	*Very thick*
Consid. for Road Location & Construction	*Floods, culvert or bridge size*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Flat*
Ratio *Bedrock*	*Flat*
Probability of Cutbank Failure	*High*
Considerations for Cutbank Stability Problems	*Bridge across*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Fines*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Fines*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Stream channel flooding, grazing*
Suggested Tree Planting Species	*Aspen, alder*
Waterbar Interval	*None*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement*
Suggested Slash Disposal	*None*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Flooding*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Poor*
Limitations for Trails	*River crossings, rounded gravel*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Flooding*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*Flooding*
Expected Mass Movement from Man's Activity	*None*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Harvest method rehabilitate*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*A*
Sedimentation Yield Potential	*Low*
Expected *Surface*	*Sa Si gr*
Sediment *Subsoil*	*gr*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Flood plane*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Flooding*

Unit No. 40

Plant Community Type *Alpine sagebrush*

Sub-alpine fir - Whitebark pine - sedge

Alpine fleeceflower

Alpine sedge

Physiographic Position *Ridgecrest or gentle slope position*

Geologic Materials *Granodiorites*

Aspect *All*

Slope *2-15%*

Present Erosion *Sheet and moderate rill - man caused*

Ground Cover	*50-80%*	**Overstory**	*20%*
Rock Outcrops	*20%*	**Understory**	*20%*

Estimated Water Holding Capacity *6-8"*

Inclusions

41 — Sub-alpine fir, grouse huckleberry on northern or protected aspects
93 — Granite - diorite
94 — Meta-volcanics

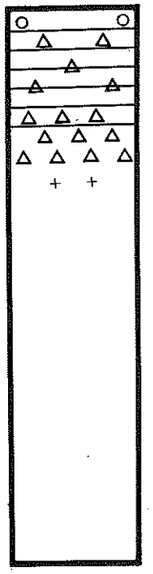
Remarks

— Fragile soils, limited ground cover, easily dislodged and displaced
— Cold soils and very short growing season
— Big game summer range

Complexes

441 — Alpine scabland and sub-alpine fir - grouse huckleberry (41) on gentle slope and ridge crest with metamorphic and diorite rock outcrops

Profile



Description

½" Litter and duff
0- 2" Dark grayish brown fine sandy loam, n-sti, n-pls, granular
2-14" Light grayish brown gravelly loam, n-sti, n-pls, granular
14-18" Brown loam, extremely gravelly, n-sti, n-pls.

Range

12-30" Loams to gravelly loams

Dystric Cryochrept, loamy skeletal, mixed

ENGINEERING

Unified Class.	***Surface***	*GM-GP*
	Subsoil	*GM-GC*
Suit. as Topsoil Source		*Unsuited*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Unsuited*
Suit. Bedrock for Roadrock		*Fair*
Limit of Bedrock for Roadrock		*Breaks down easily*
Est. of Roadrock Thickness		*Thick*
Consid. for Road Location & Construction		*Wet spots, high elev. unique habitat*
Method of Excavation		*Blade*
Cutbank & Ditch Erosion Potential		*Low*
Susceptibility to Cutbank Sloughing & Raveling		*High*
Est. Cutslope Ratio	***Soil***	*Flat*
	Bedrock	*Steep*
Probability of Cutbank Failure		*High*
Considerations for Cutbank Stability Problems		*Roll the grades, keep cuts less than 5 ft.*
Failure Potential on Waste & Fill		*Low*
Erosion Potential on Road Waste and Fills		*High*
Suitability of Road Waste & Fill Slopes to Seeding		*Fair*
Limitations to Road Waste and Fill Slope Seeding		*Cool*
Suggestions for Road Waste and Fill Slope Seeding		*Seed when disturbed*
Suitability of Cutbank Seeding		*Poor*
Limit of Cutbank Seeding		*Ravel, shallow*
Suggestions for Cutbank Seeding		*Very shallow cuts*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Non-commercial*
Limitations to Regeneration	*Alpine zone*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Dislodgement & displacement - range damage*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*High elevation, short season*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Limited use because of short season*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Limited soil, shallow depth*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*Snow slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff, improve ground cover*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size	***Surface*** *Silt*
	Subsoil *Silt clay*

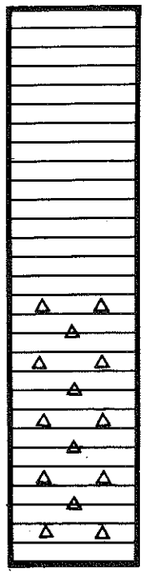
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Big game range*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Short season, heavy game use*

Unit No. 41

Plant Community Type	*Sub-alpine fir - grouse huckleberry*		
	White fir - grouse huckleberry		
	Lodgepole - grouse huckleberry		
Physiographic Position	*Toe and lower slopes*		
Geologic Materials	*Glacial drift*		
Aspect	*Northern*		
Slope	*5-30%*		
Present Erosion	*None*		
Major Drainage Dissection	*Slight*		
Ground Cover	*95%*	**Overstory**	*75%*
Rock Outcrops	*10%*	**Understory**	*20%*
Estimated Water Holding Capacity	*10-18"*		

Profile



Description

2" Duff and litter
0- 6" Dark brown silt loam weak co. platy
6-18" Light brown silt loam structureless
18-34" Light yellow brown silt loam, structureless
All are n-sti, n-pls, very friable
34-60"+ Brown gravelly silt loam, granular, n-sti, n-pls, friable

Range

30-50" Volcanic ash mantle over
30-60" Colluvial outwash

Typic Cryandept, medial over loamy, skeletal, mixed

Inclusions

40— Sub-alpine scabland
93— Granodiorites

Remarks

— Generally cool and moist
— Presence of glacial outwash
— Fair regeneration potential to spruce, lodgepole, white fir
— Wet seeps and meadows
— Some deep buried plastic clays
— Big game summer range

Complexes

419— Volcanic ash and glacial drift (41), overlying tuffaceous material (66)
449— Glacial drift along toe slopes (41) overlying meta volcanics and meta sedimentary material (49)
472— Glacial drift deposits along toe slopes (41) that overlie soft unstable soil of tuffaceous origin (72)

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Rounded cobble & stone*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Wet, buried soils, watertable*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*Cuts less than 5 ft.*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Cobble & stone, cold site*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after disturbance, mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Ravel*
Suggestions for Cutbank Seeding	*Keep vertical, protect face*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cold site, wet*
Suggested Tree Planting Species	*Spruce*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Stream siltation; temperature*
Suggested Slash Disposal	*Hand pile, burn small conc.*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Wet, cool season, high water*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Hgh*
Trail Suitability	*Well*
Limitations for Trails	*Wet, windthrow, heavy snow*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Shallow soil, frost, restricted*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Snow & debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Trap & retard surface runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt clay*
Size	

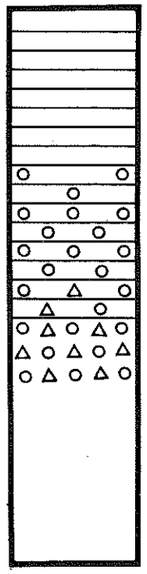
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cool closed canopy*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Brush, wildlife use, short season*

Unit No. 42

Plant Community Type	*Sub-alpine fir - grouse huckleberry*
	White fir - grouse huckleberry
	Sub-alpine fir - white bark pine - sedge
Physiographic Position	*High elevation - upper ridge sideslopes*
Geologic Materials	*Glacial drift - granites*
Aspect	*Northern*
Slope	*30-70%*
Present Erosion	*Natural areas none; rill and small gullies where disturbed*
Major Drainage Dissection	*Moderate to high*
Ground Cover	*100%* **Overstory** *80%*
Rock Outcrops	*10%* **Understory** *30%*
Estimated Water Holding Capacity	*10-14"*

Profile



Description

2" Litter and duff
0- 5" Dark brown to brown very friable loam, very weak coarse platy
5-12" Light yellow brown, very friable loam, structureless
12-32" Light grayish brown to brown coarse sandy loam, loose, granular All non-sticky, non-plastic
32"+ Loose unconsolidated

Range

1- 3" Organic horizon
18-30" Silt loam, volcanic ash mantle
30" Stones and boulders to deep unconsolidated outwash

Typic Cryandept, medial over loamy, skeletal, mixed

Inclusions

43—Steep southern aspects, residual soils
94—Meta-volcanic and meta-sedimentary rock

Remarks

—Lateral sub-soil moisture
—Cold, high elevation site with very short growing season
—Brush hazard in some wet areas
—Surface mantle easily dislodged and displaced as well as slow to heal
—Some surface granite stone/boulder floaters

Complexes

427—Glacial drift deposit or outwash (42) overlaying tuffaceous materials (67)
451—High elevation glacial drift in association with metamorphic materials (51)

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*ML* *GP-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Rounded cobble & stone, moderately competent*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Unconsolidated side slopes, steep, sidecast*
Method of Excavation	*Blast, rip and blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Roll grade if possible*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Slope, rain impact*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, seed heavily*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, steepness*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool site, heavy snow, alpine zone*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*12 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement, ground cover removal, burning*
Suggested Slash Disposal	*Whole tree yard, leave fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness, cold site*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Heavy snow, windthrow*
Considerations for Trail Improvements & Protection	*Clearing*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steepness*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Mantle creep, rotational slipouts*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Minimum exposure*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** ***Subsoil***	*Silt* *Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cold, thermal cover*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Thermal cover, windthrow*

Unit No. 43

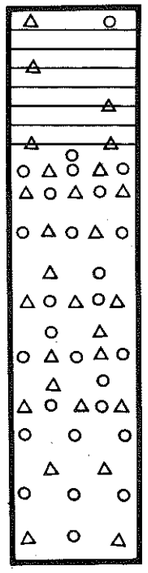
Plant Community Type	*Mixed conifer - pinegrass, residual soil*
	Lodgepole - pinegrass - grouse huckleberry
	Ponderosa pine - Douglas fir - elk sedge
Physiographic Position	*Upper ridge side slopes*
Geologic Materials	*Glacial drift*
Aspect	*Southern*
Slope	*30-65%*
Present Erosion	*Rill*
Major Drainage Dissection	*Moderate*
Ground Cover	*90%*
Overstory	*60-80%*
Rock Outcrops	*10%*
Understory	*10-50%*
Estimated Water Holding Capacity	*2.5 - 5"*

Inclusions
42 — Steep north slope cool site
93 — Metamorphic rock outcrops

Remarks
— Grazed heavily by wildlife, easily dislodged and displaced
— Rather severe erosion potential, soils tend to be light and lack structural development
— Occasional "floaters" of granodiorite
— Irregular slope form — concave — convex
— Droughty in exposed areas, slash could be utilized to modify the micro-climate and entrap runoff
— Volcanic ash mantle mostly eroded away but has influenced the colluvial soil

Complexes
437 — Steep southern slope with glacial drift (43) in association with metamorphic materials (47) and rock outcrops (93)

Profile



Description

1" Litter and duff surface cobble and stones
0- 4" Very dark brown, loam, very friable, very weak coarse platy to structureless, n-sti, n-pls.
4-14" Dark brown loam, very friable, structureless, trace of gravel and cobble, n-sti, n-pls.
14"+ Loose weathered diorite to 150"+

Range

1- 2" Organic matter
6-14" Ash influenced colluvium loam to sandy loam with some gravel
10-30" Colluvial light colored sandy loam, gravelly Cobble and stone unconsolidated outwash

Ultic Haploxerall, loamy skeletal, mixed, cryic

ENGINEERING

Unified Class. *Surface*	*SM-GM*
Unified Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Moderately competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Ravel, loose colluvium, sidecast*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize exposure, maintain ground cover*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Droughty*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch to retain moisture*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Ravel, moisture storage*
Suggestions for Cutbank Seeding	*Shallow cuts, leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Moisture, frost heave*
Suggested Tree Planting Species	*Fir, pine, larch*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Cover disturbance, over exposure*
Suggested Slash Disposal	*Leave fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, no water*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*Runoff*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Limit exposure*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment *Surface* Size	*Silt*
Expected Sediment *Subsoil* Size	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slope, slash, windthrow*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Heavy wildlife use*

Unit No. 46

Plant Community Type *Mixed conifer pinegrass - residual soil*

Ponderosa pine - Douglas fir - elk sedge

Lodgepole - pinegrass - grouse huckleberry

Physiographic Position *Ridge crests; gentle side slopes*

Geologic Materials *Mixed meta-volcanic materials*

Aspect *All aspects to southern*

Slope *2-35%*

Present Erosion *Surface rill and sheet but high potential erosion*

Major Drainage Dissection *Moderately dissected*

Ground Cover	*60-90%*	**Overstory**	*80%*
Rock Outcrops	*5%*	**Understory**	*0-30%*

Estimated Water Holding Capacity *6-12"*

Inclusions

3—Very shallow bluegrass scabland
93—Metamorphic rock outcrop
49—Better site, volcanic ash over residual, mixed conifer

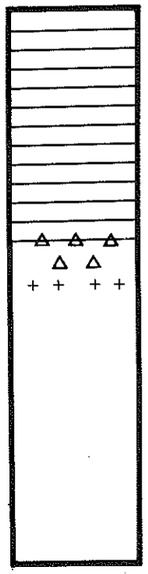
Remarks

—Where presently logged, the surface has been 75-90% uprooted or destroyed, the potential hazard for accelerated runoff is very high
—These metavolcanic materials are basalt-like in character being hard and competent
—Soil are: low in organic matter; lack aggregate stability, easily disturbed and displaced; tend to be non-wettable when dry
—Fir understory should be preserved
—Some gully erosion where water has concentrated or sub-surface flow converted to surface flow
—Volcanic ash generally stripped away, hummocky fairly shallow, fragile site, low in organic material and water holding capacity

Complexes

346—Alluvial 321 in the bottom with 46 and 47 on toe slopes with inclusions of Unit 3 on the upper slopes
463—Marginal site with Unit 46 in association with scabland Unit 3, and occasional rock outcrops
466—Transition unit between the metavolcanic type 46 and tuffaceous Units 46 and 49
469—Aspect complex of Units 46 and 49

Profile



Description

1- 2" Litter and duff
0- 3" Dark brown silt loam, very friable, weak medium platy, n-sti, n-pls.
3-14" Light yellow brown, silt loam, very friable, structureless, n-sti, n-pls.
14-20" Pale brownish yellow structureless, silt loam, n-pls, n-sti.
20"+ Rock fragments

Range

1- 2" Organic matter
10-20" Volcanic ash mantle
2-20" Buried residual

Typic Vitrandept, medial over loamy skeletal, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*ML-SM*
Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Uniformity, surface flows mod. competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*High erosion hazard, some springs*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope *Soil*	*Flat*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Avoid the seeps, maintain surface cover*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Shade, soil, fertility*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilization, chipped slash cover*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Fertility*
Suggestions for Cutbank Seeding	*Maintain native cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Seed source, disturbance, cool site*
Suggested Tree Planting Species	*Western larch, fir*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe erosion, loss of storage capacity, site fertility*
Suggested Slash Disposal	*Hand windrow, lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Water, fragile soils*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Lodgepole blow down*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Soils too shallow*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small slipouts around springs*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Water bars; windrow slash*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*Moderate*
Expected Sediment *Surface*	*Silt*
Size *Subsoil*	*Silt, clay*

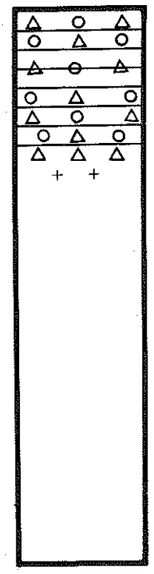
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, windthrow*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Cool site, shallow and droughty*

Unit No. 47

Plant Community Type	*Mixed conifer - pinegrass, residual soil*		
	Ponderosa pine - Douglas fir - elk sedge		
	Ponderosa pine - fescue		
	Lodgepole - pinegrass - grouse huckleberry		
Physiographic Position	*Sharp steep ridge side slopes*		
Geologic Materials	*Meta-volcanic*		
Aspect	*Southern*		
Slope	*30-60%*		
Present Erosion	*Moderate to high sheet and rill*		
Major Drainage Dissection	*Moderate*		
Ground Cover	*80%*	**Overstory**	*60-80%*
Rock Outcrops	*15%*	**Understory**	*50-70%*
Estimated Water Holding Capacity	*5-8''*		

Profile



Description

1'' Litter and duff sparse cover, 15% rock outcrop
0- 2'' Brown, gravelly sandy loam, granular, loose, n-sti, n-pls.
2-14'' Pale brown, very gravelly cobble fine sandy loam, loose, granular, n-sti, n-pls.
14''+ Colluvium and fractured rock

Range

0- 1'' Organic matter
10-20'' Gravelly sandy loams shallow to extremely deep colluvial deposits

Ultic Haploxeroll, medial over loamy skeletal, mixed, frigid

Inclusions

5— Scabland - bunchgrass, juniper and mountain mahogany
93— Metamorphic rock outcrops

Remarks

— These steep slopes are susceptible to surface ravel and rockfall when disturbed; road construction sidecast could cause permanent scars
— Vegetation has the slope in equilibrium but harvest could start severe accelerated erosion
— Thin organic horizon, low water holding capacity
— Soil is easily dislodged and displaced
— Heavy elk use during summer months

Complexes

473— Southern exposure timber with scabland Units 3, 5, and metamorphic rock outcrops
475— Unit 47 in association with steep granitic material (57) with inclusions of Unit 5 and rock outcrops
476— Unit 47 in association with (68) on pyroclastics with scabland (77) and rock outcrops
479— Unit 47 in association with outcrops and scabland (77)

ENGINEERING

Unified Class. *Surface*	*ML-GM*
Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Fractured breaks down*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Sidecast material*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Avoid wet areas, minimize cut height*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Soil depth, thermal effects*
Suggestions for Road Waste and Fill Slope Seeding	*Drought resist species, chip slash cover*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Dry, open slope, moisture, thin soils*
Suggestions for Cutbank Seeding	*Use native species*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Micro climate, slope, moisture*
Suggested Tree Planting Species	*Ponderosa pine*
Waterbar Interval	*6-8' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Slow regen., loss of productivity by burning*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep, water availability*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steepness, displacement*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Slip outs*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Disperse surface runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment *Surface*	*Silt*
Size *Subsoil*	*Silt*

RANGE AND WILDLIFE

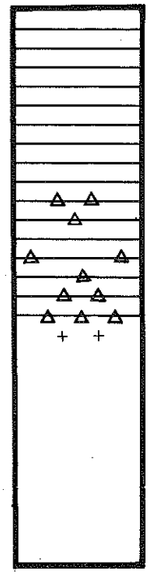
Limitations for Domestic Livestock and Wildlife Use	*Forage, steepness*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Site fertility, moisture*

Unit No. 48

Plant Community Type	*White fir - grouse huckleberry*
	Lodgepole - huckleberry
Physiographic Position	*Protected steep ridge side slopes*
Geologic Materials	*Meta-volcanics*
Aspect	*Northern*
Slope	*20-60%*
Present Erosion	*Rill and gully erosion where vegetation is removed*
Major Drainage Dissection	*Slight*

Ground Cover	*60-90%*	**Overstory**	*70-90%*
Rock Outcrops	*10%*	**Understory**	*40-70%*
Estimated Water Holding Capacity	*10-14"*		

Profile



Description

2"	*Litter and duff, some rock outcrops*
0- 3"	*Dark brown very friable silt loam, weak, medium platy, n-pls, n-sti.*
3- 9"	*Brown, very friable silt loam, structureless, n-pls, n-sti.*
9-18"	*Light gray, silt loam, very friable, structureless, n-pls, n-sti.*
18-30"	*Dark gray brown, gravelly stoney silt loam, friable to firm, sli. sti, n-pls.*
30"+	*Fractured, platy rock*

Range

1- 2"	*Organic matter*
20-30"	*Volcanic ash mantle*
20"+	*Residual, some very deep, concave positions*

Typic Vitrandept, medial over loamy skeletal, mixed, frigid

Inclusions

91, 94— Rock outcrops
22— White fir - twinflower forb, ash/pyroclastics
47— Shallow-residual/colluvial soils, mixed conifers

Remarks

— Surface soils lack structure and aggregate stability; however, the grass understory stabilizes, loose fir understory and productivity by burning in Lp types
— Drainways heavy to brush and alder with some quaking aspen meadows
— Frost heave and cool air drainage, lop and scatter the slash

Complexes

348— Steep sloped drainways with Units 48, 47 along the side slope and meadow Units 30, 31 in the bottom with 322
442— An interface of Units 48 and 42
486— Unit 48 in association with tuffs (67) and rock outcrops
487— An aspect association of 48 and 47 with outcrops
489— Unit 48 in complex with mostly rock outcrops and scabland 77 and 5

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*GM-GL*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Fractured, may overlie tuffaceous sediments*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Avoid seeps, control surface runoff*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep cuts less than 10 ft., avoid seeps*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Amt. of soil, cover, fertility*
Suggestions for Road Waste and Fill Slope Seeding	*If needed, fertilize, chip slash*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness*
Suggestions for Cutbank Seeding	*Maintain native surface cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool site, limited fertility*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Siltation of streams, lodgepole regen.*
Suggested Slash Disposal	*Yard unmerchant., lop tops-scatter fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Wind throw Steepness*
Considerations for Trail Improvements & Protection	*Waterbars needed*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Mantle failure, soil creep*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard runoff, don't conc. runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt, clay*
Size	

RANGE AND WILDLIFE

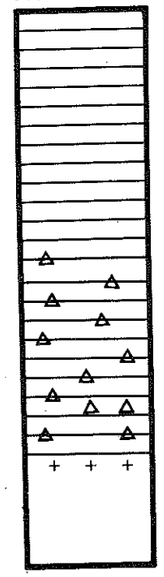
Limitations for Domestic Livestock and Wildlife Use	*Steep, forest canopy*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Steepness*

Unit No. 49

Plant Community Type	*White fir - grouse huckleberry*
	Lodgepole - huckleberry
	Lodgepole - grouse huckleberry
Physiographic Position	*Lower side slope and toe slope*
Geologic Materials	*Meta-volcanic*
Aspect	*Northern*
Slope	*2-30%*
Present Erosion	*Slight rill and sheet*
Major Drainage Dissection	*Slight to severe*

Ground Cover	*90%*	**Overstory**	*90%*
Rock Outcrops	*5%*	**Understory**	*10-50%*
Estimated Water Holding Capacity	*7-12"*		

Profile



Description

2" Organic horizon and litter
0- 4" Brown, silt loam, sli. sticky, non-plastic, weak, coarse, platy
4-10" Lt. brown silt loam, structureless
10-18" Lt. yellow brown silt loam, structureless, sli. sticky and non-plastic
18-42" Brown, gravelly to very gravelly silt loam, sli. sticky; very fine sub-angular blocky

Range
Volcanic ash layer 12-22" thick
Buried soil 10-30" thick

Typic Vitrandept, medial over loamy skeletal, mixed, frigid

Inclusions
3— Scabland, juniper, mountain mahogany
4— Shallow, marginal residual soils; lodgepole - grouse huckleberry, pine - fescue

Remarks
— Potential stream siltation
— Some lodgepole-grouse huckleberry stands are the result of previous fire and have low fertility; organic matter, nitrogen, cation exchange capacity
— Lodgepole-type ground cover very thin and easily dislodged
— Slash and fines should be left on site to abate frost heave, retard runoff and eventually improve fertility
— Some areas of severely dissected side slopes adjacent to drainways

Complexes
496— Toe slope position with 49 and Unit 66 (buried subsoils) associated with inclusions of meadow-type, Unit 30

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Fractured, mod. competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Discharge into streams, seeps*
Method of Excavation	*Rip and blasting*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Flat*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Control overland flow*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Frost, fertility*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, fertilize*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Frost*
Suggestions for Cutbank Seeding	*Scarify*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool air drainage, some frost heaving*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Slow regen., stream siltation via surface erosion*
Suggested Slash Disposal	*Burn concentrations, crush*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Fragile soils, cool, water*
Treatment to Increase Suitability	*Site development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Good*
Limitations for Trails	*Windthrow*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too close to water-way - soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Slipouts around wet areas*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff, surface vegetation*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Windthrow, forage potential*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Cool site, limited moisture*

Unit No. 50

Plant Community Type	*Sub-alpine fir - white bark pine*
	Alpine fescue - sage
	Ponderosa pine - Douglas fir - elk sedge
Physiographic Position	*Steep upper ridge side slopes*
Geologic Materials	*Meta-volcanics - serpentine*
Aspect	*Southern*
Slope	*30-65%*
Present Erosion	*Severe sheet and rill*
Major Drainage Dissection	*Moderate to highly*

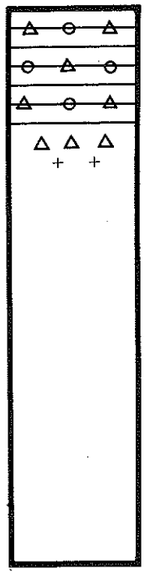
Ground Cover	*20-60%*	**Overstory**	*30%*
Rock Outcrops	*25%*	**Understory**	*30%*
Estimated Water Holding Capacity	*3-6"*		

Inclusions
94—Metamorphic rock outcrops

Remarks
—Big game summer use—heavy trampling and displacement
—Sub-alpine zone, harsh site, very short growing season and cold soils
—Heavy, late snow pack
—Severe erosion in many areas, revegetation difficult
—Non-commercial forest land

Complexes
None

Profile



Description
½" Litter and duff
25% rock outcrops
0- 4" Dark grayish brown gravelly loam, granular, n-sti, n-pls.
4-10" Brown to light brown gravelly loam, n-sti, n-pls, structureless
10"+ High fractured rock

Range
0- 1" Litter and duff
10-20" Gravelly colluvium

Lithic Ultic Haploxerall, loamy skeletal, mixed, cryic

ENGINEERING

Unified Class. *Surface*	*GM-SM*
Class. *Subsoil*	*GM-SM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Breaks down, moderately competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Snow & debris, slides, end haul*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize cuts*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack soil, cold short season*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Thin soils, poor fertility, cold*
Suggestions for Cutbank Seeding	*Shallow cuts - vertical*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Cold soils, fertility, short season*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*12 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance, non-commercial timber*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Rockfall, heavy snow, steep*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Snow and debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Limit exposure*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*C*
Sedimentation Yield Potential	*Low*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cold, heavy snow, elevation*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Fertility and heavy elk use*

Unit No. 51

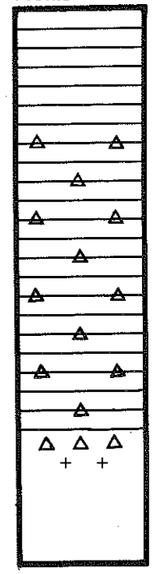
Plant Community Type	*Sub-alpine fir - whitebark pine - sedge*
	Sub-alpine fir - grouse huckleberry
	White fir - grouse huckleberry
	Lodgepole - grouse huckleberry
Physiographic Position	*Upper ridge side slope*
Geologic Materials	*Meta-volcanics*
Aspect	*Northern*
Slope	*25-60%*
Present Erosion	*Slight sheet*
Major Drainage Dissection	*Moderate to high*
Ground Cover	*90-100%* **Overstory** *60-90%*
Rock Outcrops	*10%* **Understory** *10-50%*
Estimated Water Holding Capacity	*8-12"*

Inclusions
94— Rock outcrops, meta-volcanic
93— Granitic rock
48— Lower elevation white fir types

Remarks
— Very cold site and short growing season
— Surface easily dislodged and displaced, revegetation time is slow
— Current heavy big game summer use
— Late snow pack
— Marginal to non-commercial timber, potential very severe land impacts from man's management

Complexes
519— Steep, partially timbered association of Unit 51 and rock outcrops (94) with inclusions of glacial drift Unit 42

Profile



Description
2" Litter and duff 10% surface rock outcrop
0- 6" Dark brown loam, very weak coarse platy, n-pls, n-sti, very friable
6-14" Pale brown loam, n-pls, n-sti, very friable, structureless
14-44"+ Brown gravelly, cobbly silt loam, sli. sti, n-pls, weak very fine sub-angular blocky
44"+ Sharp angular rocks

Range
1- 3" Organic horizons
8-18" Volcanic ash mantle
10-30" Buried colluvium depth variable 10-20% surface rock outcrop

Typic Vitrandept, medial over loamy skeletal, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*ML*
Subsoil	*GM-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Moderately competent*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Heavy snow, end haul*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Roll grade if possible*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Very cold, lack of soil*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, steepness, cold site*
Suggestions for Cutbank Seeding	*Roughen, fertilize, mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Very cold site, short season*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Burning, gouging, disturbance*
Suggested Slash Disposal	*Yard unmerchant. Whole tree yard*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very cold, short season, heavy snow*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Moderate*
Limitations for Trails	*Snows, windthrow*
Considerations for Trail Improvements & Protection	*Thin & clearing*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Talus & debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Retard runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II - III*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Elevation, heavy snow pack*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Cold soils, short season, elk use*

Unit No. 52

Plant Community Type *Alpine - fleece flower*

Alpine - sagebrush

Alpine - fescue

Physiographic Position *Ridgecrest and gentle slopes*

Geologic Materials *Meta-volcanics*

Aspect *All*

Slope *2-15%*

Present Erosion *Severe sheet and rill*

Major Drainage Dissection *Slight*

Ground Cover	*0-40%*	**Overstory**	*30%*
Rock Outcrops	*15%*	**Understory**	*-0-*

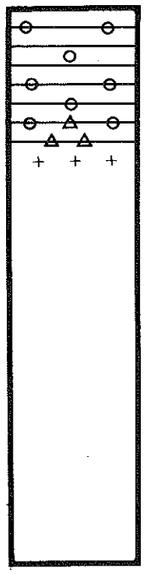
Estimated Water Holding Capacity *3-6"*

Inclusions
34 – High alpine meadows

Remarks
– Very cold and exposed ridge top and gentle slope
– Heavy big game summer use
– Poor ground cover conditions, easily dislodged
– Very slow to heal because of cool, short season and inherent soil fertility
– Very fragile site, abused by man's recreation

Complexes
None

Profile



Description
½" Duff and litter
0-13" Light brown, fine sandy loam with gravel, loose, n-sti, n-pls.
13"+ Fractured rock

Range
Sparse organic cover
10-18" Volcanic ash influenced, light sandy loams, some ash hummocks

Lithic Dystric Cryochrept, loamy, skeletal, mixed

ENGINEERING

Unified Class. *Surface*	*SM-GM*
Class. *Subsoil*	*GM-GW*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Moderately competent*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Fragile, unique site, high runoff, snow*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil*	*Flat*
Bedrock	*Steep*
Probability of Cutbank Failure	*Low*
Considerations for Cutbank Stability Problems	*Build on ground; surface*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Grazing disturbance, cold site*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize, chip mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Cold, harsh site, animal trampling*
Suggestions for Cutbank Seeding	*Build on ground surface*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Non-timber type*
Suggested Tree Planting Species	*N/A*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*Non-CFL, not rated*
Type of Damage	*N/A*
Suggested Slash Disposal	*N/A*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Cold, late snow*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Snow pack, soft, wet meadows*
Considerations for Trail Improvements & Protection	*Well marked, drained*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Soil depth & extent*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Re-establish vegetative cover*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II - III*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface*	*Silt*
Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Snow, elevation*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Heavy big game use, fragile site*

Unit No. 53

Plant Community Type *Sub-alpine fir - Whitebark pine - sedge*

Sub-alpine fir - grouse huckleberry

Alpine sagebrush

Physiographic Position *Ridge crest and upper ridge side slope*

Geologic Materials *Meta-volcanics*

Aspect *East and west*

Slope *5-30%*

Present Erosion *Slight sheet, rill where exposed*

Major Drainage Dissection *Slight*

Ground Cover	*70-95%*	**Overstory**	*60-90%*
Rock Outcrops	*10%*	**Understory**	*40%*

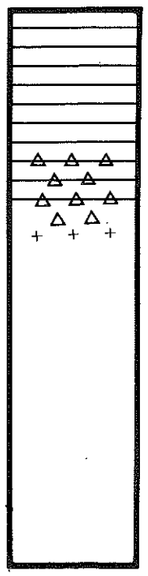
Estimated Water Holding Capacity *5-8"*

Inclusions
52 — Alpine scabland soils
34 — Alpine meadows

Remarks
— Thin ash mantle remnant on cold soils with very short growing season
— Heavy snow pack, 60-80 snow free days
— Thermal big game cover
— Heavy big game use
— Some thick brush

Complexes
None

Profile



Description

2" Litter and duff 10% boulder and stones
0- 3" Brown silt loam, weak mod. platy, n-pls, n-sti, very friable
3-12" Light yellow brown, silt loam, very weak coarse platy, n-pls, n-sti, very friable
12-18" Pale brown yellow, silt loam structureless, n-pls, n-sti, very friable
18"+ Brown, very gravelly silt loam, slightly sticky, n-pls, very fine, moderate subangular blocky, firm

Range

1- 2" Organic matter
6-20" Volcanic ash mantle
10-30" Buried residual subsoils over fractured platy rock

Dystric Cryochrept, loamy, skeletal, mixed

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*SM-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Moderately competent*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Heavy snow, drainage*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Roll grade, minimize the cut*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Cold, soil fertility*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize & mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, snow*
Suggestions for Cutbank Seeding	*Roughen, fertilize, mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Sub-alpine, cold*
Suggested Tree Planting Species	*N/A*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*Non-CFL; not rated*
Type of Damage	*N/A*
Suggested Slash Disposal	*N/A*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Cold, high elevation*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Snow drifts, late season use*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Shallow soil*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Minimum exposure*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II - III*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

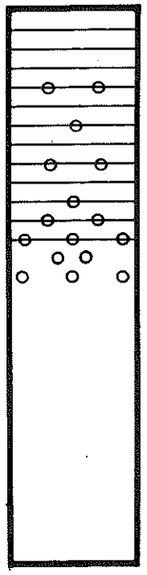
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Elevation; late & early snow*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Cold site, heavy big game use*

Unit No. 56

Plant Community Type	*Ponderosa pine - Douglas fir - elk sedge*		
	Ponderosa pine - fescue		
	Mixed conifer - pinegrass, residual soil		
Physiographic Position	*Ridgecrest and steep ridge sideslopes*		
Geologic Materials	*Granitics*		
Aspect	*Southern*		
Slope	*2-30%*		
Present Erosion	*Sheet and rill*		
Major Drainage Dissection	*Moderate*		
Ground Cover	*50-70%*	**Overstory**	*60-90%*
Rock Outcrops	*10-30%*	**Understory**	*0-70%*
Estimated Water Holding Capacity	*8-12"*		

Profile



Description

1" Litter and duff
0- 4" Dark brown loam, loose, very friable, granular to very coarse weak platy, n-sti, n-pls.
4-22" Brown loam to sandy loam, very friable, loose granular, n-sti, n-pls.
22"+ Weathered diorite

Range

1- 2" Needles and duff
10-30% rock outcrops
10-24" Ash influenced surface horizons
24-40" Weathered sandy diorite

Ultic Haploxeroll, loamy, skeletal, mixed, frigid

Inclusions

60 – Steep phase of 56
93 – Granite outcrops

Remarks

– Soils are very loose and friable, easily dislodged and displaced
– Slash should be left on site to protect the soil surface and aid regeneration
– Heavy big game use on these warm open slopes
– Surface vegetation holds the soils in-place; with harvest and disturbance this root mass deteriorates and stability decreases
– Shade factor very important; as within the stand in the shade, surface soil temperature was 76 degrees while on the disturbed area 106 degrees

Complexes

568 – Association of weathered granodiorites (56) and shallow tuffaceous sandstone Unit 88

ENGINEERING

Unified Class. *Surface*	*SM*
Class. *Subsoil*	*SP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Breaks down readily*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*High ravel; no side casting*
Method of Excavation	*Rip & blast large blocks*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Maintain surface vegetation; cut less than 10 ft.*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Exposure; dry & no surface cover*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize, chip slash in place*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*High ravel*
Suggestions for Cutbank Seeding	*Make as shallow cuts as possible*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade is necessary, moisture retention*
Suggested Tree Planting Species	*Pine, larch*
Waterbar Interval	*5-15 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Severe soil erosion, site deterioration*
Suggested Slash Disposal	*Maintain surface cover & protection*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Water source*
Treatment to Increase Suitability	*Develop water source*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Shallow soils, narrow area*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Avoid surface disturbance*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Fine sand*
Sediment *Subsoil*	*Sand*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cover, slash, windthrow*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Steepness, stand density, W.H.C.*

Unit No. 57

Plant Community Type *Mixed conifer - pinegrass, ash soil*

Ponderosa pine - Douglas fir - ninebark

Ponderosa pine - Douglas fir - elk sedge

Physiographic Position *Steep colluvial side slopes*

Geologic Materials *Older granitics and associated intrusions*

Aspect *East and west*

Slope *25-60%*

Present Erosion *Some sheet; exposed areas, rills and some gullies in roads*

Major Drainage Dissection *Moderately dissected*

Ground Cover	*70-90%*	**Overstory**	*50-90%*
Rock Outcrops	*5-10%*	**Understory**	*50-70%*

Estimated Water Holding Capacity *10-14"*

Inclusions

84—White fir types on tuffaceous sediments or sandstones
58—Deep northern aspect—white fir types
93—Diorite and granite outcrops

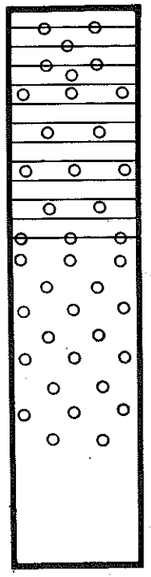
Remarks

—Fair timber site if ground cover (vegetative or aerial shade) is maintained because of the rapid infiltration. This open pore system also allows rapid desication if exposed. The exposed granitics tend to seal over by cementation of the silicates.
—Harvest residue should be left on site to protect the soil surface and aid regeneration.
—Winter and early spring big game use
—Brushy draws and drainway, alder, maple and some aspen

Complexes

576—The eastern and western aspects of Unit 57 with Unit 60 on the southern slopes with diorite rock outcrops (93)

Profile



Description

2" Duff and litter 5% rock outcrop
0- 3" Very dark brown very fine sandy loam, very friable to loose, granular, n-sti, n-pls.
3- 8" Dark brown fine sandy loam, very friable to loose structureless, n-sti, n-pls.
8-22" Brown fine sandy loam to sandy, loose, granular, n-sti, n-pls.
22-44" Weathered diorite

Range

1- 3" Duff and needle some stone and rock outcrop
10-24" Ash influenced colluvium
20-40" Weathered coarse sandy diorite

Typic Cryandept, medial over loamy, skeletal, mixed

ENGINEERING

Unified Class. *Surface*	*ML-SM*
Class. *Subsoil*	*SW-SC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Breaks down readily, incompetent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Springs, lateral moisture flow*
Method of Excavation	*Blade, rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Cuts less than 10 ft. Keep water off face*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Moisture, surface cover*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize, cover with chip slash*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*High ravel*
Suggestions for Cutbank Seeding	*Maintain sod grasses*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Shade, roads cutting off lateral moisture*
Suggested Tree Planting Species	*Pine, Douglas fir*
Waterbar Interval	*5 - 15 ft. as needed*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement*
Suggested Slash Disposal	*Lop & scatter, dispose of concentration*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, fragile site*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Slope, windthrow*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris slides, some small slumps*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Avoid surface disturbance*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*III - II*
Hydrologic Group	*A*
Sedimentation Yield Potential	*Moderate*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Crown density, steep*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Steepness, big game utilization*

Unit No. 58

Plant Community Type	*White fir - huckleberry*
	White fir - twinflower - forb
	Mixed conifer - pinegrass, ash soil
Physiographic Position	*V-shaped drainways and side canyons; steep*
Geologic Materials	*Intrusive granite and granodiorites*
Aspect	*Northern*
Slope	*15-70%*
Present Erosion	*Moderate rill*
Major Drainage Dissection	*Moderate; 3-6 drainages/mile*

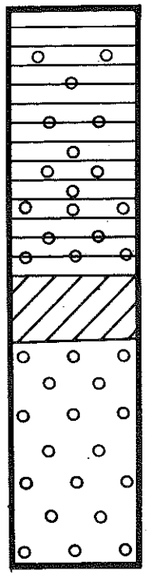
Ground Cover	*90%*	**Overstory**	*90%*
Rock Outcrops	*15%*	**Understory**	*0-100%*
Estimated Water Holding Capacity	*14-20"*		

Inclusions
93 — Granite rock outcrops

Remarks
- *Wet-moist toe slope position, many springs, extra lateral moisture flows, some buried sandy clay loam development*
- *Many trees with warped trunks, small slumps and soil movements observed, will probably flow when saturated and root structure removed*
- *Good to excellent growth potential but harvest will probably need to be aerial to prevent log gouging and disturbance*
- *The brush, alder, yew in the drainways could be a problem*
- *Big game use*

Complexes
584 — Steep, northern aspect complex of Unit 58 and tuffaceous sandstone Unit 84

Profile



Description

2" Duff and litter
0- 4" Very dark brown, loam, weak fine platy, loose n-pls, n-sti.
4-10" Dark brown, fine sandy loam to loam, very weak, coarse platy, n-sti, n-pls.
10-27" Brown, sandy loam, loose, granular, n-sti, n-pls.
27-37" Dark reddish brown, sandy clay loam, mod. coarse columnar, very sti, very pls, extremely hard when dry, very firm when moist
37-80" Brown to reddish brown mottled, weathered diorite

Range
1- 4" Organic horizons
20-36" Ash or ash influenced surface horizons
10-40" Buried subsoil clay lenses
80"+ Weathered diorites

Typic Vitrandept, medial over loamy, skeletal, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*SW-SC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Breaks down to sand readily; erodes*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Springs, heavy subsoils, slumps*
Method of Excavation	*Blade, rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Cuts less than 5 ft. Maintain sod structure support*
Failure Potential on Waste & Fill	*Mod. to high*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Trampling ravel*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize, mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Slough & ravel*
Suggestions for Cutbank Seeding	*Fertilize & mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Brush, over stocking*
Suggested Tree Planting Species	*Douglas fir, white fir, spruce*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Springs, rock outcrops, small slumps, and slipouts*
Suggested Slash Disposal	*Controlled burns on concentrations*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Slope, dense timber*
Treatment to Increase Suitability	*Site development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Brushy draws, steep slopes*
Considerations for Trail Improvements & Protection	*Out sloped*
Suitability for Sewage Filter Field	*Low*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slumps & slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain surface root structure*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silts*
Sediment *Subsoil*	*Silts & clay*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Brush, steep*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Elk use, steep with dense cover*

Unit No. 59

Plant Community Type *Juniper - stiff sage scabland*

Ponderosa pine - wheatgrass

Ponderosa pine - fescue

Physiographic Position *Truncated very steep sideslopes and scarps*

Geologic Materials *Granite and granodiorites*

Aspect *Southern*

Slope *40-80%*

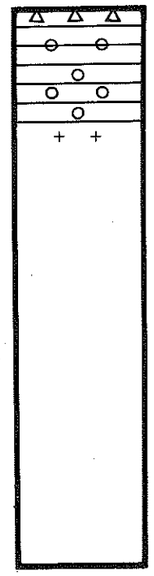
Present Erosion *High sheet and rill erosion*

Major Drainage Dissection *Highly*

Ground Cover	*30-50%*	**Overstory**	*10-20%*
Rock Outcrops	*30-50%*	**Understory**	*10-20%*

Estimated Water Holding Capacity *3-5"*

Profile



Description

50% rock outcrops
½" Litter and duff
0- 1" Dark brown fine sandy loam, granular loose, n-sti, n-pls.
1-12" Brown fine sandy loam, granular, loose, n-sti, n-pls.

Range

30-70% rock outcrop
0- 1" Organic matter
10-20" Fine sandy loam colluvial

Ultic Haploxerall, loamy skeletal, mixed, lithic

Inclusions

93—Rock outcrops
60—Mixed conifer site

Remarks

—Non-commercial timber producing site
—Shallow soils with high runoff, low retention; estimated 50% surface gravel, cobble and rock outcrops
—Very little surface vegetation, very open, exposed slope
—Rockfall hazard is high if roads or surface disturbance occurs
—Very poor regeneration
—Heavy big game use

Complexes

593—Very steep complex of Unit 59 and rock outcrops 93 with some minor inclusions of Unit 60
596—Unit 59 and 60 with rock outcrops 93

ENGINEERING

Unified Class. *Surface*	*GW-GP*
Class. *Subsoil*	*GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Rapid break down*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, extreme ravel & sidecast hazard*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Limit roads to minimum exposure*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Cover, excessively drained*
Suggestions for Road Waste and Fill Slope Seeding	*Cover with chipped slash*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Soil too shallow*
Suggestions for Cutbank Seeding	*Keep surface veg. intact, don't round*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Exposure; very shallow soils*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*Every 5 vertical foot*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Gully erosion; no regen. with shade removed*
Suggested Slash Disposal	*Leave on site & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, scabland*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Low*
Limitations for Trails	*Steep and very rocky*
Considerations for Trail Improvements & Protection	*Costly construction*
Suitability for Sewage Filter Field	
Soil Limitations to Sewage Filter Field	

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Talus slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain ground cover & root strength*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Very high*
Expected *Surface*	*Fine sands*
Sediment *Subsoil*	*Sand*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Domestic livestock - unsuitable; over use*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Steepness, shallow soils, bitterbrush*

Unit No. 60

Plant Community Type *Ponderosa pine - Douglas fir - elk sedge*

Mixed conifer - pinegrass, residual soil

Ponderosa pine - fescue

Physiographic Position *Steep side slopes*

Geologic Materials *Intrusive granitic materials*

Aspect *Southern*

Slope *30-70%*

Present Erosion *Sheet and rill with some gullies in disturbed areas*

Major Drainage Dissection *Moderate*

Ground Cover	*40-80%*	**Overstory**	*50-70%*
Rock Outcrops	*10-20%*	**Understory**	*0-50%*

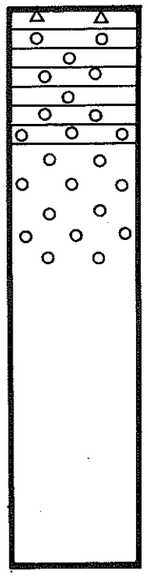
Estimated Water Holding Capacity *6-10"*

Inclusions
93—Granodiorite outcrops

Remarks
—Delicate balance between vegetation and soil erosion should be maintained
—Shade is very important on this site, over exposure warms the site, dries the grasses and exposes the site to erosion. Regeneration starts well in the spring but left unshaded, will not survive the summer heat.
—Slash should be left on site and scattered
—Heavy big game use, winter and spring
—Some areas of no regeneration because of the dense mat of pine needles

Complexes
657—Southwest and eastern exposures with Units 60 and 57
659—Southern exposure of Unit 60, scabland 59 and rock outcrop 93

Profile



Description

20% rock outcrop
2" Needles and duff
0- 4" Dark brown fine sandy loam, loose, very weak med. platy, n-pls, n-sti.
4-14" Brown fine sandy loam, loose, granular n-sti, n-pls.
14-30" Coarse sandy weathered diorite

Range

Rock outcrops
1- 2" Duff and needles
20-30" FSL colluvium

Ultic Haploxeroll, loamy, skeletal, mixed

ENGINEERING

Unified Class. *Surface*	*SP-SM*
Class. *Subsoil*	*SP-SM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Breaks down easily Light weight*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Ravel, side cast materials*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Not over 10 ft. Good surface veg.*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Dry site*
Suggestions for Road Waste and Fill Slope Seeding	*Dry site, erosion seed mix*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*High ravel & slough*
Suggestions for Cutbank Seeding	*Sod & deep root grasses*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Pinegrass, exposure & shade*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*5-15' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Soil loss, gully erosion, over exposure*
Suggested Slash Disposal	*Lop & scatter, leave on site*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Steep, water*
Treatment to Increase Suitability	*Spring development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep*
Considerations for Trail Improvements & Protection	*Well drained*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Veg. cover, little surface disturbance*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Sand*
Sediment *Subsoil*	*Sand, silt*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness, light use*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Steepness, shallow-mod. deep soils*

Unit No. 66

Plant Community Type	*Mixed - conifer - pinegrass, ash soil*
	White fir - huckleberry
	White fir - twinflower - forb
Physiographic Position	*Ridge and fault scarp side slopes, toe slopes*
Geologic Materials	*Pyroclastic materials, tuffaceous rock, basalt colluvium*
Aspect	*Northern*
Slope	*5-35%*
Present Erosion	*Slight sheet and rill where disturbed and exposed*
Major Drainage Dissection	*Moderate*
Ground Cover	*80-95%* **Overstory** *75-95%*
Rock Outcrops	*5%* **Understory** *20-90%*
Estimated Water Holding Capacity	*16-20"*

Inclusions

69—Shallow, residual soils generally mixed conifer
30—Moist meadows
72—Unstable toe slope

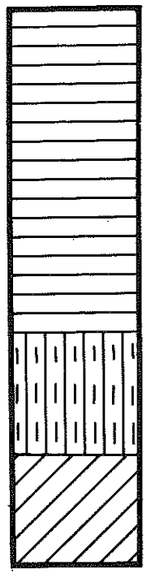
Remarks

- *Many seeps and springs from interbedded tuffaceous materials*
- *Cutbanks will slough and ravel with some slipouts; deep cutbanks will have a high probability of failure*
- *Trees illustrate active land movement in toe slopes*
- *Toe slope position outlet for lateral soil moisture; maple, alder and yew present, especially in drainways*
- *Because of the heavy soil texture, considerable soil compaction could result under moist soil conditions, particularly on disturbed sites such as landings and skid trails*
- *Subsoils are high expanding clays, 2 to 1, 3 to 1, and from laboratory analysis high in organic matter*
- *Sub-soils may include some gravelly colluvial horizons*

Complexes

366—Gentle drainways and alluvial stream bottoms; side slope Units 66, 69 with alluvial Units 30, 39
662—Generally toe slope position, Unit 66 with unstable Unit 72
669—Diverse aspect with Units 66 and 69
674—Mid to upper slope position, Unit 66 and Unit 74 which generally has a gravelly, colluvial subsoil with inclusions of mahogany or juniper scabland
675—Slump basins with Unit 66 and residual Unit 75
697—Lower slopes with Unit 66, 69 and deep grassland 70

Profile



Description

2" Litter and duff
0- 4" Dark brown silt loam, very weak coarse platy, very friable, n-sti, n-pls.
4-10" Brown silt loam, structureless, very friable, n-sti, n-pls.
10-20" Lt. yellow brown, silt loam, structureless, very friable, n-sti, n-pls.
20-36" Lt. yellow gray, silt loam, structureless, v. friable, n-sti, n-pls.
36-50" Brown, silt loam to clay loam, strong med. sub-angular blocky, hard when dry, firm, pls, sti., mottled
50"+ Dark gray brown, clay loam, very strong co, sub-angular blocky, very hard when dry, ext. firm, heavily mottled, v. pls, v. sti.

Range

1- 3" Organic matter
20-40" Thick volcanic ash mantle
20-60" Buried clay subsoils

Typic Vitrandepts, medial over clayey, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*CH-OH-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Altered tuffs, break easily under traffic*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Some very deep clays, ground water intercept.*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Protect surface veg. Cuts less than 10 ft.*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Ravel & erosion, low fertility*
Suggestions for Road Waste and Fill Slope Seeding	*Left rough, use slash to retard runoff, fertilize*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Ravel, ground water, heavy subsoils*
Suggestions for Cutbank Seeding	*Leave rough, use mulch if necessary*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Crown density, spacing, compaction*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Compaction, ground water intercept, stream siltation*
Suggested Slash Disposal	*Burn concentrations, scatter & pile*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Heavy timber, wet, heavy textured subsoil*
Treatment to Increase Suitability	*Develop springs, gravel paths & road*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*Brush removal*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Heavy subsoils, lateral seeps*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Land slide & slipouts along clay lenses*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard runoff, disperse flow*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt, clay*
Size	

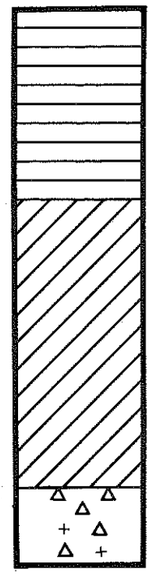
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Wet, muddy*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Crown density, slash*

Unit No. 67

Plant Community Type	*White fir - twinflower - forb*		
	White fir - huckleberry		
	Mixed conifer - pinegrass, ash soil		
	White fir - grouse huckleberry		
Physiographic Position	*Side slopes to large slumps and steep ridge side slopes, geologic*		
	breaks		
Geologic Materials	*Tuffaceous sediments, mixed meta-volcanic; some basalt colluvium*		
Aspect	*Northerly and protected slopes*		
Slope	*30-65%*		
Present Erosion	*Some rill and small gully erosion where soil is exposed*		
Major Drainage Dissection	*Moderate*		
Ground Cover	*50-95%*	**Overstory**	*70-90%*
Rock Outcrops	*5-10%*	**Understory**	*20-70%*
Estimated Water Holding Capacity	*12-16"*		

Profile



Description

2" Litter and duff
0- 4" Very dark, silt loam, weak co. platy, very friable, n-pls, n-sti.
4-10" Brown silt loam, structureless, very friable, n-pls, n-sti.
10-18" Light yellow brown silt loam, very friable, structureless, n-pls, n-sti.
18-50" Light yellow reddish brown gravelly, cobbly, silty clay loam strong coarse, sub-angular blocky, v-pls, v-sti, ext. hard, very firm when moist
50"+ Mixed tuffaceous colluvium

Range

2- 4" Litter and duff
12-26" Volcanic ash horizon

30-60" Colluvial

Typic Vitrandept, medial over clayey, mixed, frigid

Inclusions

92— Tuff and interflow rock outcrops
91— Surface basalt flows
68— Shallow steep pine types

Remarks

— Heavy alder and Pacific yew around seeps and along drainways
— Evidence of active land movement; vegetative removal could yield temporary water yield increase and induce mass movement; toe slopes generally wet and deeper soil development
Good regeneration and growth potential
— Ash surface subject to log gouging and displacement
— Surface soils lack aggregate stability, thus when exposed or denuded will puddle and erode easily
— Because of the heavy textures compaction could result under moist conditions

Complexes

367— Steep drainways; Unit 67, 68 with meadow 30 and stream bottom 39, 366 with inclusions of rock 91, 92
672— Intermediate complex between Units 67 and 22 with rock outcrop inclusions 91, 92
678— Units 67 and 65 on steep slopes with tuffaceous rock outcrops
748— Steep Units of 67 and 48 with 92 and 94 outcrops

ENGINEERING

Unified Class. *Surface*	*ML*
Unified Class. *Subsoil*	*OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Breaks down readily, interbedded clays*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Clay lenses, water intercept, slumps*
Method of Excavation	*Rip, blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Keep less than 10 ft. Maintain surface veg., min. exposure*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Steep slope, ravel, fertility*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, fertilize if required*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness, raveling cutbank*
Suggestions for Cutbank Seeding	*Protect upslope veg., leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Disturbance, surface erosion*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*10 ft.*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Slumps & landslips, erosion off roads, road failures*
Suggested Slash Disposal	*Steep, hand pile, lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Heavy snow pack, steep, soil displac.*
Considerations for Trail Improvements & Protection	*Yearly maintenance*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Small land slipouts, to massive failure*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Limit exposure, maintain surface veg.*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Expected Sediment Size *Subsoil*	*Silt, clay*

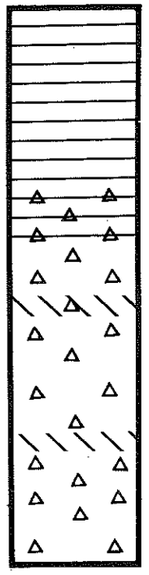
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Rock bluffs, slope, brush*

Unit No. 68

Plant Community Type	*Mixed conifer - pinegrass, residual soil*		
	Ponderosa pine - Douglas fir - elk sedge		
	Ponderosa pine - fescue		
	Lodgepole - pinegrass - grouse huckleberry		
Physiographic Position	*Steep colluvial ridge side slopes and scarp debris slopes*		
Geologic Materials	*Altered tuff, tuffs, mixed colluvium and interflow materials*		
Aspect	*Southern*		
Slope	*25-60%*		
Present Erosion	*Surface sheet and rill; old spur roads gullied*		
Major Drainage Dissection	*Moderately dissected*		
Ground Cover	*70-90%*	**Overstory**	*50-70%*
Rock Outcrops	*5-10%*	**Understory**	*30-80%*
Estimated Water Holding Capacity	*8-10"*		

Profile



Description

1" Duff and litter
0- 4" Dark brown, silt loam very weak coarse platy, very friable, n-pls, n-sti.
4-16" Brown silt loam, structureless, very friable, n-pls, n-sti.
16-26" Light yellow brown, gravelly heavy silt loam, sli-sti, sli-pls, firm, slightly hard when dry
26-30" Tuffaceous colluvium with lenses of clay loam extremely variable

Range

1- 2" Organic matter
10-18" Volcanic ash and ash influenced colluvium
20-60"+ Gravelly clay loam tuffaceous colluvium

Ultic Haploxeralt, clayey skeletal, mixed, frigid

Inclusions

92 — Tuff rock outcrops
91 — Basalt rock outcrops or other volcanic rock
67 — Fir type, deep moist site
80 — Similar plant community on tuffaceous sandstones

Remarks

— Where truncated by construction or streams, these units are unstable because of their unconsolidated nature
— There are bedded clay lenses and resistant rock
— effective rooting depth generally 20-30"
— There are seeps and lenses of lateral water movement
— Burning should be kept out of the lodgepole to maintain fertility
— Steep slopes, severe rill erosion potential on all trails or with log to ground contact
— Maintaining a high level of good ground cover is very important for erosion control and site protection against frost heaving

Complexes

677 — Steep marginal to NCFL type with Units 68 and scabland juniper-mahogany 77
684 — Fringe unit of tuffaceous material 68 and pyroclastics 24 with scabland
689 — Steep and rocky, Unit 68 with 91, 92 and 94 with 77 and 24 inclusions

ENGINEERING

Unified Class.	***Surface***	*ML-GM*
	Subsoil	*GM-GC*
Suit. as Topsoil Source		*Unsuited*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Unsuited*
Suit. Bedrock for Roadrock		*Poor*
Limit of Bedrock for Roadrock		*Incompetent, breaks down easily, many fines*
Est. of Roadrock Thickness		*Thin*
Consid. for Road Location & Construction		*Seeps, ravel, cutbank instability*
Method of Excavation		*Blade, rip*
Cutbank & Ditch Erosion Potential		*Moderate*
Susceptibility to Cutbank Sloughing & Raveling		*High*
Est. Cutslope Ratio	***Soil***	*Steep*
	Bedrock	*Steep*
Probability of Cutbank Failure		*Moderately stable*
Considerations for Cutbank Stability Problems		*Cut less than 10 ft. avoid seeps*
Failure Potential on Waste & Fill		*Moderate*
Erosion Potential on Road Waste and Fills		*High*
Suitability of Road Waste & Fill Slopes to Seeding		*Fair*
Limitations to Road Waste and Fill Slope Seeding		*Ravel, erosion, shade, soil*
Suggestions for Road Waste and Fill Slope Seeding		*Mulch, leave rough, fertilize*
Suitability of Cutbank Seeding		*Poor*
Limit of Cutbank Seeding		*Ravel, exposure, dry site*
Suggestions for Cutbank Seeding		*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade, exposure*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4-8' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Surface erosion, burning, too hot for regen.*
Suggested Slash Disposal	*Lop & scatter, hand pile*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Water, too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Displacement, some rockfall hazard*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steep*

EROSION AND HYDROLOGY

Natural Stability		*Moderately stable*
Nature of Mass Movement		*Landslide & slumps*
Expected Mass Movement from Man's Activity		*Increased*
Surface Soil Erosion Potential		*Severe*
Subsoil Erosion Potential		*Moderate*
Suggestions for Controlling Subsoil Erosion		*Maintain vegetation, restrict exposure*
Water Yield Class		*II*
Bedrock Hydrologic Characteristics		*II*
Hydrologic Group		*B*
Sedimentation Yield Potential		*High*
Expected Sediment Size	***Surface***	*Silt*
	Subsoil	*Silt, clay*

RANGE AND WILDLIFE

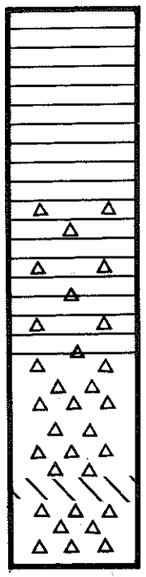
Limitations for Domestic Livestock and Wildlife Use	*Steepness*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Dry site, steepness*

Unit No. 69

Plant Community Type	*Mixed conifer - pinegrass, residual soil*
	Ponderosa pine - Douglas fir - elk sedge
	Ponderosa pine - wheatgrass
	Ponderosa pine - fescue
Physiographic Position	*Toe slopes and gentle ridge side slopes*
Geologic Materials	*Altered tuffs, mixed colluvial and interbedded materials*
Aspect	*Southern*
Slope	*5-35%*
Present Erosion	*Sheet and rill; deeper rills off old skid trails and erosion from higher units*
Major Drainage Dissection	*Moderately*

Ground Cover	*50-70%*	**Overstory**	*60%*
Rock Outcrops	*5%*	**Understory**	*0-70%*
Estimated Water Holding Capacity	*5-10"*		

Profile



Description

1"	*Litter and duff*
0- 2"	*Dark brown silt loam, loose, v. friable, structureless, n-pls, n-sti.*
2- 4"	*Pale yellow brown silt loam, v. friable, structureless, n-pls, n-sti.*
4-19"	*Lt. yellow gray silt loam, v. friable, v. weak coarse platy, n-pls, n-sti.*
19-36"	*Lt. gray brown gravelly heavy silt loam to clay loams, weak fine sub angular blocky, sli. hard, friable, n-pls, n-sti.*
36"+	*Gray tuff with clay lenses*

Range

1- 2"	*Organic matter*
10-18"	*Volcanic ash influenced surface horizons*
20-50"	*Gravelly cobbly clay loam, tuff colluvium Tuffaceous material extremely variable*

Ultic Haploxeralf, clayey skeletal, mixed, frigid

Inclusions

66 -- Deep, heavy textured tuffs, concave position, ash soils
91 or 92 — Rock outcrops
4 & 3 — Shallow scabland units, particularly along rim or ridgecrest, on volcanic rocks
73 — Scabland - tuffaceous materials

Remarks

- *Some heavy textured sub-soils; these induced lateral soil water movement; this clay lens, if extensive, limits rooting depth and development*
- *Generally dry site with some junipers, thus shade is important for regeneration; most logging slash should be left on site by lop and scatter with either some cool burn or crushing; follow-up after the fines are on the ground*
- *Soils will take some disturbance; however, seep areas have generally heavy textures and will compact*
- *Compaction hazard on surface soils under moist conditions*

Complexes

693 — Generally pine type Unit 69 with juniper-scabland Unit 73

ENGINEERING

Unified Class. *Surface*	*ML-GM*
Class. *Subsoil*	*GM-CL-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Incompetent, weathers to clay*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Seeps, heavy sub-soils, potential "soft" spots*
Method of Excavation	*Rip, blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope *Soil*	*Moderate*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable to mod. stable*
Considerations for Cutbank Stability Problems	*Minimize the cut*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Heavy texture, fertility*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, top soil, fertilize if necessary*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, smoothness, exposure*
Suggestions for Cutbank Seeding	*Leave rough, some mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade, organic litter, compaction rooting*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Site deteriorate to juniper-pine, compaction*
Suggested Slash Disposal	*Lop & scatter, crush heavy concentrations*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Water development open*
Treatment to Increase Suitability	*Water sites*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Muddy areas of heavy clay*
Considerations for Trail Improvements & Protection	*Gravel, drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Fault scarps, small slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard surface water Maintain veg. cover*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt, clay*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Dry site, low regen.*

Unit No. 70

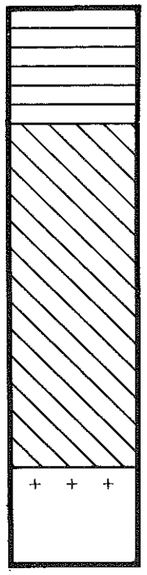
Plant Community Type	*Bunchgrass on deep soil*		
	Ponderosa pine - fescue		
	Ponderosa pine - blue wild rye		
	Juniper - bunch grass		
Physiographic Position	*Gentle toe slope*		
Geologic Materials	*Tuffaceous sediments and pyroclastics*		
Aspect	*All*		
Slope	*2-20%*		
Present Erosion	*None except rills in roads and trails*		
Major Drainage Dissection	*Slight*		
Ground Cover	*90%*	**Overstory**	*30%*
Rock Outcrops	*5%*	**Understory**	*30%*
Estimated Water Holding Capacity	*8-16"*		

Inclusions
66—Timbered toe slope position
69—Timbered mixed conifer

Remarks
—Generally southern aspects with 100% sod cover
—High expanding clay subsoils limit root development and moisture infiltration
—Extremely susceptible to compaction
—Very sticky and plastic organic silt and clay subsoils make for difficult road building, easily puddled into unstable condition
—Low fiber productivity, yet good grazing use

Complexes
None

Profile



Description
1" Duff and grass litter
0- 4" Black organic silt loam, st. med. platy, sli. hard, firm when moist, very sti, slightly pls.
4- 9" Very dark brown, heavy organic silt loam, st. co. platy, slightly hard, firm, very sti, slightly pls.
9-11" Dark gray, clay loam, hard when dry, very firm, st. med. sub-angular blocky, sticky, plastic
11-44" Dark reddish brown, silty clay loam, very hard when dry, very firm when moist, strong coarse prismatic, pls, sti.
44"+ Tuffaceous material

Range
1- 2" Duff and litter
30-60"+ Strongly developed residual soils

Vertic Argixeroll, fine montmorollonitic, mesic

ENGINEERING

Unified Class.	***Surface***	*ML-OL*
	Subsoil	*OL-OH*
Suit. as Topsoil Source		*Unsuited*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Suited*
Suit. Bedrock for Roadrock		*Unsuited*
Limit of Bedrock for Roadrock		*Clay matrix, incompetent material*
Est. of Roadrock Thickness		*Thick*
Consid. for Road Location & Construction		*Deep subsoils of high expanding clays*
Method of Excavation		*Rip*
Cutbank & Ditch Erosion Potential		*Moderate*
Susceptibility to Cutbank Sloughing & Raveling		*Low*
Est. Cutslope Ratio	***Soil***	*Flat*
	Bedrock	*Steep*
Probability of Cutbank Failure		*Stable*
Considerations for Cutbank Stability Problems		*No need for cut-banks, unstable if more than ten ft.*
Failure Potential on Waste & Fill		*High*
Erosion Potential on Road Waste and Fills		*High*
Suitability of Road Waste & Fill Slopes to Seeding		*Good*
Limitations to Road Waste and Fill Slope Seeding		*Expanding clays, sealing*
Suggestions for Road Waste and Fill Slope Seeding		*Seed after disturbance & mulch*
Suitability of Cutbank Seeding		*Fair*
Limit of Cutbank Seeding		*Sealing clays, moisture content*
Suggestions for Cutbank Seeding		*Roughen*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Sod, subsoils limit rooting depth*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*12 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Compaction*
Suggested Slash Disposal	*Leave on site, possible cool burning*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Water, shade, livestock*
Treatment to Increase Suitability	*Develop water, maintain canopy, fence*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Soft, very slick mud*
Considerations for Trail Improvements & Protection	*Drainage, gravel*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Very restricted permeability*

EROSION AND HYDROLOGY

Natural Stability		*Stable*
Nature of Mass Movement		*Regional land movement*
Expected Mass Movement from Man's Activity		*Unchanged*
Surface Soil Erosion Potential		*Low*
Subsoil Erosion Potential		*Low*
Suggestions for Controlling Subsoil Erosion		*Maintain ground cover*
Water Yield Class		*I*
Bedrock Hydrologic Characteristics		*II*
Hydrologic Group		*C*
Sedimentation Yield Potential		*High*
Expected Sediment Size	***Surface***	*Silt clay*
	Subsoil	*Silt clay*

RANGE AND WILDLIFE

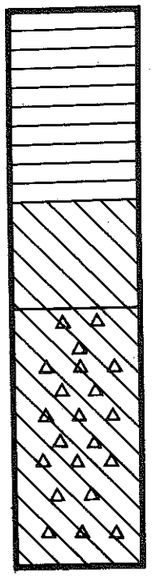
Limitations for Domestic Livestock and Wildlife Use	*None*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Present sod, wildlife use*

Unit No. 71

Plant Community Type	*Lodgepole - pinegrass - grouse huckleberry*
	Ponderosa pine - Douglas fir - elk sedge
	Mixed conifer - pinegrass, residual soil
Physiographic Position	*Mid-slope slump basin; hummocky, undulating*
Geologic Materials	*Tuff and conglomerate*
Aspect	*Southern*
Slope	*2-30%*
Present Erosion	*Some slight-moderate surface rill and gully*
Major Drainage Dissection	*Slight*

Ground Cover	*90-100%*	**Overstory**	*50-80%*
Rock Outcrops	*5%*	**Understory**	*50-90%*
Estimated Water Holding Capacity	*6-9"*		

Profile



Description

1" Litter and duff
0- 3" Dark brown silt loam, weak co. platy, soft, very friable, sli. sti, n-pls.
3-18" Brown silt loam, very weak co. platy, soft, very friable, n-sti, n-pls.
18-30" Dark reddish brown, clay loam, st. med. angular blocky, pls, sti, very hard, firm
30-60"+ Reddish brown, gravelly and cobbly clay loam, med. co. prismatic, pls, sti, very hard, firm

Range

1- 2" Organic matter
10-18" Volcanic ash influenced surface horizons
14-60"+ Residual clay loams from tuffaceous material

Ultic Haploxeralf, clayey skeletal, mixed, frigid

Inclusions

70—Deep grasslands
91, 92—Volcanic or tuffaceous rock outcrops
72—Wet unstable northern aspects and concave positions

Remarks

—Generally, soft unstable area with many wet meadows, seeps in a mixed conglomerate of heavy clay loam materials
—Some brush patches
—Major road construction would have a high failure potential
—Irregular hummocky to gentle rolling topography
—Very deep deposits
—Expand clay subsoils restrict root development and moisture availability

Complexes

None

ENGINEERING

Unified Class. *Surface*	*SM*
Unified Class. *Subsoil*	*OL-OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Soft unstable and incompetent*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Deep plastic clay, wet subsoils*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Ground water intercept, drainage*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Clays seal off, fertility*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after disturbance, mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Expanding clay, slough, slope*
Suggestions for Cutbank Seeding	*Roughen*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cold wet soils, rooting depth, compact.*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Compaction, increased instability*
Suggested Slash Disposal	*Leave tops & fines on site*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Cool, wet, unstable*
Treatment to Increase Suitability	*Deep drainage, spring development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Brush, sticky mud, wet spots*
Considerations for Trail Improvements & Protection	*Gravel paths drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Water table, restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Deep rotational slips, mantle creep*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Low*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment *Surface*	*Silt clay*
Size *Subsoil*	*Silt clay*

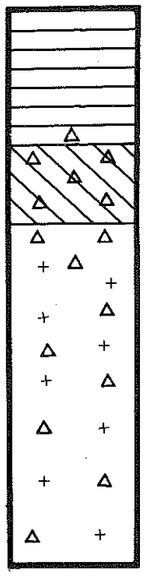
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Wet, soft, brushy*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Wildlife use, compaction, wet areas*

Unit No. 72

Plant Community Type	*Lodgepole - pinegrass - grouse huckleberry*		
	Lodgepole - grouse huckleberry		
	Lodgepole - big huckleberry		
	White fir - grouse huckleberry		
Physiographic Position	*Concave toe slope positions*		
Geologic Materials	*Tuffaceous sediments, pyroclastics*		
Aspect	*Northern*		
Slope	*2-30%*		
Present Erosion	*Sheet and rill where ground cover removed*		
Major Drainage Dissection	*Slight*		
Ground Cover	*90-100%*	**Overstory**	*80-100%*
Rock Outcrops	*5%*	**Understory**	*10-60%*
Estimated Water Holding Capacity	*10-16"*		

Profile



Description

1" Litter and duff
0- 5" Very dark brown silt loam, some gravels, mod. med. platy soft, friable, sli. sti, n-pls.
5-12" Dark brown gravelly silt loam, st. fine angular blocky, sti, slightly pls, hard, firm
12-20" Light brownish gray gravelly clay loam, st. med. angular blocky hard, very firm, pls, sti.
20-120"+ Light brownish yellow tuff, mottled lenses

Range

1- 3" Organic matter
12-30" Volcanic ash horizons
20-100"+ Tuffaceous residual buried subsoils generally clay loam textures

Typic Vitrandept, medial over clayey, mixed, frigid

Inclusions
30—Meadows

Remarks
—Irregular surface relief, undulative to gently rolling
—Cold soils and cold air drainage
—Low site fertility, slash burning would aggravate
—Wet unstable area
—Roads will require deep back slope drainage as well as thick sub-base of coarse material

Complexes
None

ENGINEERING

Unified Class. *Surface*	*ML-OL*
Class. *Subsoil*	*OL-OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Very soft & unstable sediments*
Est. of Roadrock Thickness	*Very thick*
Consid. for Road Location & Construction	*Slumps, meadows, deep soft subsoils*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Cut no greater than 5 ft., intercept drains*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Expanding or puddling clays*
Suggestions for Road Waste and Fill Slope Seeding	*Minimize waste, roll the grade*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Sloughing subsoils seal off*
Suggestions for Cutbank Seeding	*Roughen, seed after construction*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Cold air drainage, fertility*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Increased instability, slash burning*
Suggested Slash Disposal	*Yard unmerchantable; leave tops-fines*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Cold, wet site, unstable, big game cover*
Treatment to Increase Suitability	*Intense develop. incl. drainage*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Wet, windthrow, thick brush*
Considerations for Trail Improvements & Protection	*Thining*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Watertable*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Soil mantle creep, rotational movement*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Retard runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Clay*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cold, wet, windthrow*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Prime big game cover*

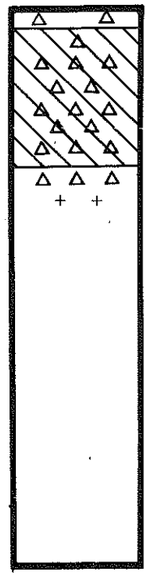
Unit No. 73

Plant Community Type	*Bunchgrass, shallow soil*
	Curl leaf - mountain mahogany
	Juniper - bunchgrass - scabland
	Ponderosa pine - wheatgrass
	Lodgepole - grouse huckleberry
Physiographic Position	*Remnant ridges, slump scarps*
Geologic Materials	*Tuff; welded and altered, conglomerates, meta-volcanic*
Aspect	*All*
Slope	*5-40%*
Present Erosion	*Moderate sheet and rill, severe small rills along trails*
Major Drainage Dissection	*Moderate*

Ground Cover	*20-50%*	**Overstory**	*0-30%*
Rock Outcrops	*20%*	**Understory**	*0-30%*

Estimated Water Holding Capacity *3-6"*

Profile



Description

½" Organic litter
30% rock outcrop
0- 3" Very dark brown very cobbly loam, slightly sti, n-pls, friable
3-16" Dark brown very gravelly cobbly silty clay loam, st. fine angular blocky, hard, firm, sti, slightly pls.

Range

10-50% rock outcrop
0- 1" Organic matter
20-40" Gravelly loams to clay loams, residual material extremely variable profile

Typic Haploxeroll, loamy skeletal, mixed, mesic, shallow

Inclusions

91, 92— Rock outcrops
66— Shallow pine type
70— Heavy textured, grasslands

Remarks

- *Some areas have shallow ash over welded tuffs while others have a very shallow gravelly residual soil over mixed materials*
- *Presence of gravelly clay sub-soils*
- *Lack of good ground cover and high runoff potentials*
- *Some high expanding clays with scabland surface rocks, the less stable ash mantle has been eroded away*
- *Considerable frost action on exposed surfaces*

Complexes

730— Gentle grassland (70) with adjacent, severely eroded scabland Unit 73
738— Very shallow scabland Unit 73 with shallow lodgepole-Ponderosa pine Unit 88
373— Bunchgrass unit with meadow land (30) and grassland (73)

ENGINEERING

Unified Class. ***Surface***	*GM-ML*
Subsoil	*GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor - fair*
Limit of Bedrock for Roadrock	*Incompetent rock clay lenses*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Clay lenses, ground water interception*
Method of Excavation	*Rip & blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope ***Soil***	*Steep*
Ratio ***Bedrock***	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 10 ft. ditch seeps & springs*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Amount of fines, exposure*
Suggestions for Road Waste and Fill Slope Seeding	*Seed right after construction*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, exposed rock, percent of slope*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow soils, exposure, frost heaving*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Ground cover, disturbance & erosion*
Suggested Slash Disposal	*Lop & scatter all slash*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rocky, limited water & shade*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Rocky, concentrated runoff*
Considerations for Trail Improvements & Protection	*Diversions & waterbars*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Restricted soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Massive movement; slides & slumps*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse surface runoff*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C*
Sedimentation Yield Potential	*Moderate*
Expected ***Surface***	*Silt*
Sediment ***Subsoil***	*Silt, clay*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Harsh site, minimal forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow moisture reserve*

Unit No. 74

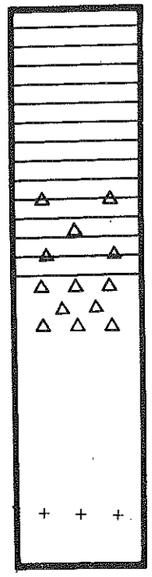
Plant Community Type	*White fir - twinflower - forb*		
	White fir - huckleberry		
	Mixed conifer - pinegrass, ash soil		
	Lodgepole - pinegrass - grouse huckleberry		
Physiographic Position	*Slump trough, hung valley side slopes*		
Geologic Materials	*Tuff, welded, altered; basalt colluvium*		
Aspect	*Generally north and east*		
Slope	*5-30%*		
Present Erosion	*Slight sheet, rills where exposed*		
Major Drainage Dissection	*Parallel moderate*		
Ground Cover	*100%*	**Overstory**	*80-100%*
Rock Outcrops	*5%*	**Understory**	*0-100%*
Estimated Water Holding Capacity	*10-16"*		

Inclusions
73 — Shallow - pine bunchgrass - juniper scabland
66 — Dense closed canopy

Remarks
— High hung valleys, well drained through the highly fractured tuffs and conglomerates
— In untouched stands 100% overstory fir with very little sun getting to the ground and very little ground vegetation, thick organic horizon
— Compaction hazard under moist conditions
— Several springs and seeps
— Potential fill failure in the soft sediments

Complexes
743 — Marginal complex of Unit 74 and juniper scabland Unit 73, some rock outcrops
746 — Tuffaceous Unit 74 and meta-volcanic Unit 46 with inclusions of 73 and 81

Profile



Description

1" Litter and duff
0- 2" Dark brown silt loam, loose, very friable, very weak platy, n-pls, sli-sti.
2- 7" Light brown silt loam, loose very friable, structureless, n-pls, n-sti.
7-20" Light yellow brown silt loam, loose, very friable, structureless, n-pls, n-sti.
20-28" Brown gravelly heavy silt loam, weak sub-angular blocky, slightly hard, firm, n-pls, slightly sti.

Range

1- 3" Organic matter
14-30" Volcanic ash mantle
10-40" Residium from breccia, tuff textures to clay loam, depth variable

Typic Vitrandept, medial over clayey, mixed, frigid

ENGINEERING

Unified Class.	***Surface***	*ML*
	Subsoil	*GC-CH*
Suit. as Topsoil Source		*Unsuited*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Suited*
Suit. Bedrock for Roadrock		*Poor*
Limit of Bedrock for Roadrock		*Soft rock, weathers easily*
Est. of Roadrock Thickness		*Thin*
Consid. for Road Location & Construction		*Clay subsoils, springs, soft fills*
Method of Excavation		*Blade & rip*
Cutbank & Ditch Erosion Potential		*Moderate*
Susceptibility to Cutbank Sloughing & Raveling		*Moderate*
Est. Cutslope Ratio	***Soil***	*Steep*
	Bedrock	*Steep*
Probability of Cutbank Failure		*Moderately stable*
Considerations for Cutbank Stability Problems		*Keep less than 10 ft. Avoid seeps*
Failure Potential on Waste & Fill		*Moderate*
Erosion Potential on Road Waste and Fills		*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding		*Good*
Limitations to Road Waste and Fill Slope Seeding		*Timely seeding, roughness*
Suggestions for Road Waste and Fill Slope Seeding		*Seed after construction*
Suitability of Cutbank Seeding		*Fair*
Limit of Cutbank Seeding		*Steepness, roughness & exposure*
Suggestions for Cutbank Seeding		*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*High*
Limitations to Regeneration	*Slash disposal methods*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Compaction, regeneration loss*
Suggested Slash Disposal	*Y.U.M., scatter*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Slope, water*
Treatment to Increase Suitability	*Site development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Deadfall*
Considerations for Trail Improvements & Protection	*Maintenance*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Slow permeability*

EROSION AND HYDROLOGY

Natural Stability		*Moderately stable*
Nature of Mass Movement		*Small slumps & slipouts*
Expected Mass Movement from Man's Activity		*Unchanged*
Surface Soil Erosion Potential		*Moderate*
Subsoil Erosion Potential		*Moderate*
Suggestions for Controlling Subsoil Erosion		*Maintain cover, disperse runoff*
Water Yield Class		*I*
Bedrock Hydrologic Characteristics		*II*
Hydrologic Group		*B*
Sedimentation Yield Potential		*Moderate*
Expected Sediment Size	***Surface***	*Silt*
	Subsoil	*Clay*

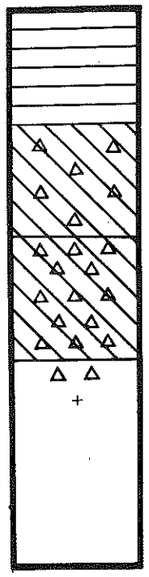
RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slash, forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Canopy, cool site*

Unit No. 75

Plant Community Type	*Mixed conifer - pinegrass - ash soil*		
	Ponderosa pine - Douglas fir - elk sedge		
Physiographic Position	*Slump basin gently rolling to undulating*		
Geologic Materials	*Altered tuff*		
Aspect	*All*		
Slope	*2-30%*		
Present Erosion	*Slight*		
Major Drainage Dissection	*Low*		
Ground Cover	*90-100%*	**Overstory**	*60-90%*
Rock Outcrops	*0-5%*	**Understory**	*80-100%*
Estimated Water Holding Capacity	*12-20"*		

Profile



Description

2" Litter and duff
0- 3" Dark brown silt loam, weak co. platy, soft, very friable, n-pls, n-sti.
3-10" Light brown silt loam, structureless, soft, very friable, n-pls, n-sti.
10-20" Dark reddish brown gravelly silty clay loam, st, friable, angular blocky, sli. pls, sti, hard, very firm
20-36" Reddish brown very gravelly silty clay loam, weak, very fine angular blocky, sti, sli. pls, hard, firm
36" Fractured tuff

Range

1- 3" Organic matter
10-28" Volcanic ash horizons
20-40" Tuffaceous residium

Ultic Haploxerolf, fine montmorillonitic, frigid

Inclusions

66—Volcanic ash over residual, white fir types
70—Grassland on deep residual soils
73—Juniper - mountain mahogany - bunchgrass - scabland

Remarks

—Excellent growth potential for trees and grazing
—Heavy soils would need some sub-base and surface gravels
—Seasonal logging should be considered; subsoil generally moist-wet year round
—Imperfectly to poorly drained subsoils

Complexes

None

ENGINEERING

Unified Class.	***Surface***	*ML*
	Subsoil	*OL-OH-GC*
Suit. as Topsoil Source		*Suited*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Suited*
Suit. Bedrock for Roadrock		*Unsuited*
Limit of Bedrock for Roadrock		*Soft incompetent rock*
Est. of Roadrock Thickness		*Thin*
Consid. for Road Location & Construction		*Deep, plastic silt and clay subsoils*
Method of Excavation		*Rip and blade*
Cutbank & Ditch Erosion Potential		*Moderate*
Susceptibility to Cutbank Sloughing & Raveling		*Moderate*
Est. Cutslope Ratio	***Soil***	*Steep*
	Bedrock	*Steep*
Probability of Cutbank Failure		*Moderately stable*
Considerations for Cutbank Stability Problems		*Minimize exposure, keep water off cut face*
Failure Potential on Waste & Fill		*Moderate*
Erosion Potential on Road Waste and Fills		*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding		*Good*
Limitations to Road Waste and Fill Slope Seeding		*Sealing clays*
Suggestions for Road Waste and Fill Slope Seeding		*Mulch after construction*
Suitability of Cutbank Seeding		*Fair*
Limit of Cutbank Seeding		*Slope, sloughing sealing clays*
Suggestions for Cutbank Seeding		*Roughen, protect ground cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*High*
Limitations to Regeneration	*Compaction, slash treatment, disturb.*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*12 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Compaction, heavy disturbance*
Suggested Slash Disposal	*Leave fines*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Seasonal use, water*
Treatment to Increase Suitability	*Gravel roads, drainage, spring develop.*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability		*Stable*
Nature of Mass Movement		*Slump basins and landslides*
Expected Mass Movement from Man's Activity		*Increased*
Surface Soil Erosion Potential		*Moderate*
Subsoil Erosion Potential		*Low*
Suggestions for Controlling Subsoil Erosion		*Use slash to retard & disperse runoff*
Water Yield Class		*I*
Bedrock Hydrologic Characteristics		*I*
Hydrologic Group		*C*
Sedimentation Yield Potential		*High*
Expected Sediment Size	***Surface***	*Silt*
	Subsoil	*Silt, clay*

RANGE AND WILDLIFE

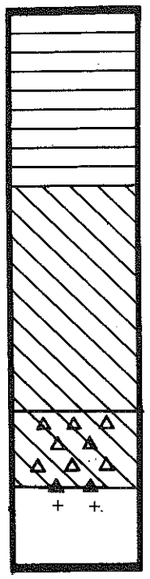
Limitations for Domestic Livestock and Wildlife Use	*Slash*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Canopy cover, water development*

Unit No. 76

Plant Community Type	*White fir - huckleberry*
	White fir - grouse huckleberry
	Lodgepole - huckleberry
Physiographic Position	*Slump scarps, concave position, rolling relief*
Geologic Materials	*Sedimentary and pyroclastics*
Aspect	*Northern*
Slope	*25-60%*
Present Erosion	*Rill and gully where exposed*
Major Drainage Dissection	*Moderate*

Ground Cover	*90-100%*	**Overstory**	*70-100%*
Rock Outcrops	*10%*	**Understory**	*10-50%*
Estimated Water Holding Capacity	*10-17"*		

Profile



Description

2" Litter and duff
0- 5" Dark brown silt loam, v. friable, soft, weak co. platy, n-pls, n-sti.
5-14" Brown silt loam structureless, soft, very friable, n-pls, n-sti.
14-18" Light yellow brown, structureless, soft, very friable, n-sti, n-pls.
18-40" Dark reddish brown clay loam, coarse sub-angular blocky, very sti, very pls, extra hard, very firm, mottled
40-50" Dark reddish brown very gravelly clay loam, st. fine sub-angular blocky, pls, sti, hard, very firm, mottled
50"+ Tuffaceous material

Range

1- 4" Organic matter
14-28" Volcanic ash horizon
20-50" Clay loam residual lenses, extremely variable—deep tuffaceous material

Typic Vitrandept, medial over clayey, mixed, frigid

Inclusions

91-92—Basalt or tuffaceous rock outcrops
67—Stable position, better micro-climate
30—Soft bogs and wet meadows

Remarks

—Very irregular and rolling surface relief
—Evidence of mantle failure and creep
—Heavy brush concentrations
—Small trapped meadows and wet areas
—Cool air drainage and wet soils that generally remain moist year round
—Very poor road location
—Maintain vigorous canopy cover to utilize subsoil moisture and lessen the risk of mass failure

Complexes

767—Upper slope position with Unit 76 and better site 67

ENGINEERING

Unified Class. ***Surface***	*ML*
Subsoil	*OL-OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Clay matrix, wet & porous, incompetent*
Est. of Roadrock Thickness	*Very thick*
Consid. for Road Location & Construction	*Unstable, deep unconsolidated colluvium*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil***	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Very unstable*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Slope, rock, clay, microclimate*
Suggestions for Road Waste and Fill Slope Seeding	*Seed and mulch after construction*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steep, slough instability*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Cool & wet, micro-climate*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Increased instability, burning*
Suggested Slash Disposal	*Yard unmerchantable*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Unstable, wet*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Fair*
Limitations for Trails	*Steep, brush, wet unstable*
Considerations for Trail Improvements & Protection	*Drainage, stand thining*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Landslide, rotational movement*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain good ground cover, utilize slash*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slope, brush, steep pitches*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Steep, cool, moist; big game cover*

Unit No. 77

Plant Community Type	*Juniper - bunchgrass*
	Curlleaf mountain mahogany
	Ponderosa pine - fescue
	Ponderosa pine - Douglas fir - elk sedge
Physiographic Position	*Upper ridge crest, fault scarps, intrusions*
Geologic Materials	*Tuffaceous and pyroclastic, surface flow volcanics*
Aspect	*Southern*
Slope	*30-100%*
Present Erosion	*Sheet and small rills*
Major Drainage Dissection	

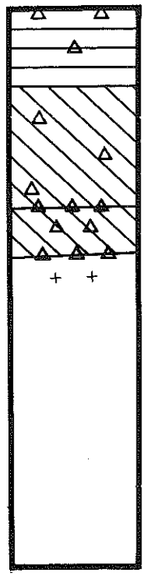
Ground Cover	*70%*	**Overstory**	*30%*
Rock Outcrops	*30%*	**Understory**	*0%*
Estimated Water Holding Capacity	*3-6"*		

Inclusions
91—Basalt, andesite
92—Tuffaceous sediments

Remarks
—Occurs generally along faulted ridges or fault scarps
—Very steep, harsh site
—Non-commercial timber because of extremely low regeneration and growth potential

Complexes
None
Occurs by itself or in other units

Profile



Description
½" Duff and litter
30% rock outcrops
0- 6" Dark brown silt loam, med. mod. platy, friable, n-pls, n-sti.
6-18" Very dark brown cobbly silty clay loam, strong med. angular blocky, sti, slightly pls, hard, firm
18-22" Dark brown very gravelly silty clay loam

Range
0- 1" Organic litter
10-24" Residual soil developed from tuffaceous material Loams to clay loams

Typic Haploxeroll, loamy skeletal, mixed, mesic

ENGINEERING

Unified Class.	***Surface***	*GM*
	Subsoil	*GM*
Suit. as Topsoil Source		*Unsuited*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Unsuited*
Suit. Bedrock for Roadrock		*Poor*
Limit of Bedrock for Roadrock		*Soft, porous incompetent*
Est. of Roadrock Thickness		*Thin*
Consid. for Road Location & Construction		*Very steep, end hall, rockfall hazard*
Method of Excavation		*Rip*
Cutbank & Ditch Erosion Potential		*Low*
Susceptibility to Cutbank Sloughing & Raveling		*High*
Est. Cutslope Ratio	***Soil***	*Steep*
	Bedrock	*Steep*
Probability of Cutbank Failure		*Moderately stable*
Considerations for Cutbank Stability Problems		*None*
Failure Potential on Waste & Fill		*Low*
Erosion Potential on Road Waste and Fills		*Low*
Suitability of Road Waste & Fill Slopes to Seeding		*Poor*
Limitations to Road Waste and Fill Slope Seeding		*No fines*
Suggestions for Road Waste and Fill Slope Seeding		*None*
Suitability of Cutbank Seeding		*Poor*
Limit of Cutbank Seeding		*No soil mantle, too steep*
Suggestions for Cutbank Seeding		*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Very shallow harsh site, temp. extremes*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Non-commercial*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very rocky & steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Low*
Limitations for Trails	*Very steep, harsh; rockfall*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Very steep, very shallow*

EROSION AND HYDROLOGY

Natural Stability		*Stable*
Nature of Mass Movement		*Rockfall, talus slide*
Expected Mass Movement from Man's Activity		*Greatly increase*
Surface Soil Erosion Potential		*Very severe*
Subsoil Erosion Potential		*Low*
Suggestions for Controlling Subsoil Erosion		*None*
Water Yield Class		*III*
Bedrock Hydrologic Characteristics		*II*
Hydrologic Group		*D*
Sedimentation Yield Potential		*Low*
Expected Sediment Size	***Surface***	*Silt*
	Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow, harsh, rocky site*

Unit No. 80

Plant Community Type	*Ponderosa pine - Douglas fir - elk sedge*
	Mixed conifer - pinegrass, residual soil
	Ponderosa pine - wheatgrass
	Ponderosa pine - fescue
Physiographic Position	*Steep upper ridge side slopes*
Geologic Materials	*Tuffaceous sandstone and sediments*
Aspect	*Southern*
Slope	*25-60%*
Present Erosion	*Sheet*
Major Drainage Dissection	*Moderate*

Ground Cover	*40-80%*	**Overstory**	*50-70%*
Rock Outcrops	*20%*	**Understory**	*10-40%*
Estimated Water Holding Capacity	*3-6"*		

Inclusions

77— Bunchgrass - scabland - juniper - mountain mahogany
92— Tuffaceous sediments
95— Tuffaceous sandstones

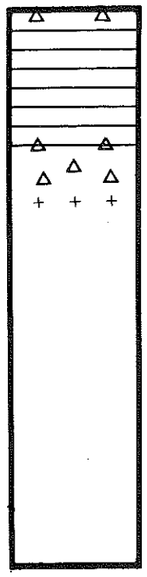
Remarks

— General lack of good ground cover; lack of fine slash and only a thin duff mantle
— Site is very hot and dry, low effective precipitation; very little soil profile development
— Very severe erosion potential on soils that are very easily dislodged and displaced
— Very poor regeneration except in shaded, protected sites

Complexes

877— Southern colluvial slope with bunchgrass - scabland Unit 77 on tuffaceous and pyroclastic materials
895— Steep southern colluvial slope with bunchgrass scabland Unit 77 with tuffaceous sandstone outcrops (95)

Profile



Description

1" Litter and duff
10% rock outcrop
0- 2" Dark brown loam, very weak coarse platy, very friable, n-pls, n-sti.
2- 5" Light brown loam, very friable, structureless, n-pls, n-sti.
5-14" Yellow brown loam, very friable, structureless, n-pls, n-sti.
14"+ Gravelly residium

Range

Rock outcrops
1- 2" Organic matter
10-20" Thin volcanic ash influenced horizons over colluvium

Ultic Haploxerall, coarse loamy, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*SM-GM*
Unified Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Sand-clay matrix readily breaks down*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*End hall, steep, rock fall*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil*	*Moderate*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize cut exposure*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Fine material*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, sloughing, thin soil mantle*
Suggestions for Cutbank Seeding	*Seed when moist*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Exposure & moisture regime*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Gouging, displacement, poor regeneration*
Suggested Slash Disposal	*Scatter & leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, hot, dry site*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steepness and displacement hazard*
Considerations for Trail Improvements & Protection	*Well drained*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Surface debris slides*
Expected Mass Movement from Man's Activity	*Increase*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain good infiltration*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface*	*Silt*
Expected Sediment Size *Subsoil*	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slope, water availability*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Moist. regime, early big game use*

Unit No. 81

Plant Community Type	*White fir - grouse huckleberry*
	Lodgepole - big huckleberry
	Lodgepole - pinegrass - grouse huckleberry
Physiographic Position	*Undulating ridgecrest and gentle side slopes*
Geologic Materials	*Tuffaceous sediments, weathered meta-volcanics*
Aspect	*All*
Slope	*2-20%*
Present Erosion	*Sheet and rill along drainways—rills on roads and trails*
Major Drainage Dissection	*Slight*

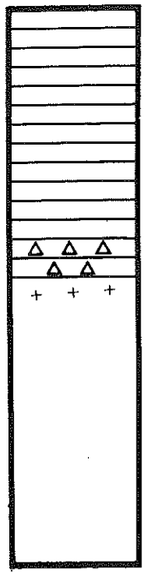
Ground Cover	*80-95%*	**Overstory**	*80%*
Rock Outcrops	*0-2%*	**Understory**	*30-50%*
Estimated Water Holding Capacity	*10-14"*		

Inclusions
82—Toe slopes or concave positions, ash mantle over buried clay subsoils
66—Better fir site, deep soils

Remarks
- *Fair organic horizon, generally thin*
- *Burning destroys the organic horizon which is needed to cycle nutrients on the site, thus impairs site fertility until it can be replaced. Burning also increases non-wettability of ash soils and increases surface erosion.*
- *Ash lacks soil structure, thus easily detached and dislodged*
- *Cool site, cold air drainage and cold soils*
- *Some heavy textured subsoils*
- *Heavy snowpack, thus overland flow during runoff*

Complexes
818—Ridgecrest and southern aspect Unit 88, which generally lack the buried soil horizons

Profile



Description
2" Litter and duff
0- 8" Dark brown silt loam weak med. platy, very soft, very friable, n-pls, n-sti.
8-22" Light yellow brown, loose, very friable, structureless, n-pls, n-sti.
22-26" Brown sandstone residium

Range
1- 3" Organic matter
14-24" Volcanic ash mantle
10-20" Residium

Typic Vitrandept, medial over loamy, mixed, frigid

ENGINEERING

Unified Class. *Surface* *Subsoil*	*ML* *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Soft, weathers, breaks down easily*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Clay subsoils, overland flow*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope *Soil* Ratio *Bedrock*	*Moderate* *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 ft.*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Cool site, dust*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness, ravel, frost*
Suggestions for Cutbank Seeding	*Roughen*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool site, exposure, seed source*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Over exposure, slow regeneration, burning*
Suggested Slash Disposal	*Lop & scatter; pile concentrations*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Water, windthrow*
Treatment to Increase Suitability	*Dust abatement; water development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Wind throw*
Considerations for Trail Improvements & Protection	*Thining*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Some shallow soil areas*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Good ground cover*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected *Surface* Sediment *Subsoil* Size	*Silt* *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Plant community*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Regrowth of overstory, cool site*

Unit No. 82

Plant Community Type	*Lodgepole - grouse huckleberry*
	White fir - grouse huckleberry
	Sub-alpine fir - grouse huckleberry
Physiographic Position	*Swales and trapped basins*
Geologic Materials	*Tuffaceous materials*
Aspect	*Generally all*
Slope	*2-10%*
Present Erosion	*Minor amount of disturbance around "wallows"*
Major Drainage Dissection	*Slight*

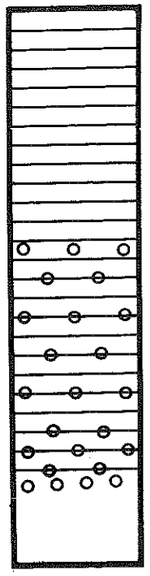
Ground Cover	*90%*	**Overstory**	*80-90%*
Rock Outcrops	*-0-*	**Understory**	*30%*
Estimated Water Holding Capacity	*12-20"*		

Inclusions
30—Moist - wet meadows
87—Northern to toe slope aspects

Remarks
—Prime big-game cover and habitat area
—Soils are wet year round—severe compaction and disturbance hazard
—Very cool wet site will be difficult to regenerate

Complexes
382—Gentle drainway with toe slope Units 82 and 87 in association with meadow land 30

Profile



Description
1" Litter and duff
0- 2" Dark brown silt loam, weak co. platy, soft, v. friable, n-pls, n-sti.
2-10" Light yellow brown silt loam, structureless, soft, v. friable, n-pls, n-sti.
10-22" Yellow brown silt loam, structureless, loose, v. friable, n-pls, n-sti.
22-32" Brown cemented sandy loam, slightly mottled, platy hard, firm, n-pls, n-sti.
32-49" Light yellow reddish brown sandy loam, mottled, strongly cemented, hard, very firm, n-pls, n-sti, some thin clay lenses

Range
1- 3" Organic matter
18-30" Volcanic ash horizons fluctuating water table
20-40" Weathered sandstone, sandy clay loam lenses

Aquic Vitrandept, medial over clayey, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*OL-CH*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Soft, incompetent; some harder materials*
Est. of Roadrock Thickness	*Very thick*
Consid. for Road Location & Construction	*Wet, soft unstable soils, springs*
Method of Excavation	*Blade & ripping*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Above ground roads or trails*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Wet, soft soils, expanding clays*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after construction, mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Sloughing, heavy subsoils*
Suggestions for Cutbank Seeding	*Protect surface cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Frost, watertable*
Suggested Tree Planting Species	*Fir, spruce*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Very high*
Type of Damage	*Deep disturbance, compaction*
Suggested Slash Disposal	*Burn concentrations, tree length yard*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Watertable, cool site, spring & seeps*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Poor*
Limitations for Trails	*Wet, windthrow*
Considerations for Trail Improvements & Protection	*Gravel path, drainage, thining*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Seasonal watertable*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Land slips on wet lenses*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain ground cover, retard runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*D*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Clay*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Wet, forest canopy*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Cool, wet soils, big game cover*

Unit No. 83

Plant Community Type *Lodgepole - pinegrass - grouse huckleberry*

Mixed conifer - pinegrass, ash soil

Physiographic Position *Benchland, undulating to gently rolling*

Geologic Materials *Tuffaceous sediments and volcanic flow rock*

Aspect *All*

Slope *2-35%*

Present Erosion *Some rill erosion along trails and drainways*

Major Drainage Dissection *Slight*

Ground Cover	*90%*	**Overstory**	*90%*
Rock Outcrops	*5%*	**Understory**	*20%*

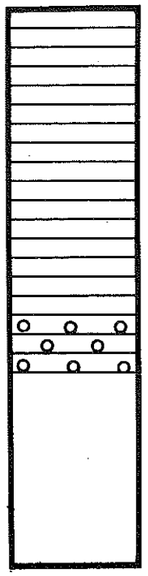
Estimated Water Holding Capacity *10-16"*

Inclusions
85—Fir type, better fertility
30—Meadow type and dry drainways on very gentle ground

Remarks
—Deep, soft tuffaceous sediments under ash mantle
—Good wildlife escapement cover
—Cool soils and cool air drainage; frost pockets
—The ash mantle along the gentle drainways has been eroded away exposing the residual soil—generally 10-20" of gravelly clay loam; very firm and hard when dry

Complexes
None

Profile



Description
1" Litter and duff
0- 2" Dark brown silt loam, co. weak platy, soft, very friable, n-pls, n-sti.
2-12" Light yellow brown silt loam, structureless, soft, very friable, n-pls, n-sti.
12-26" Pale yellow silt loam, structureless, soft very friable, n-pls, n-sti.
26-32" Brown cemented sandy loam, platy, slightly hard, firm, n-pls, n-sti.

Range
1- 3" Organic matter
20-30" Volcanic ash mantle
10-40" Sandstone residium

Typic Vitrandept, medial over loamy, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*GM-CL*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Breaks down readily*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Good site, gen. heavy slash*
Method of Excavation	*Rip & blade*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope *Soil*	*Flat*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Low*
Considerations for Cutbank Stability Problems	*Keep less than 10 ft.*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Rill erosion, cool, low fertility*
Suggestions for Road Waste and Fill Slope Seeding	*Leave rough, use slash for cover*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Rill erosion, cool site*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Fair*
Limitations to Regeneration	*Cool site, low fertility*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Severe disturbance, exposure, burning*
Suggested Slash Disposal	*Lop & scatter, crush after needle drop*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Water supply, small overstory trees*
Treatment to Increase Suitability	*Development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Dense stand, wind fall*
Considerations for Trail Improvements & Protection	*Thining*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Soil depth and variability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Trashy rough, surface litter*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Low*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt*
Size	

RANGE AND WILDLIFE

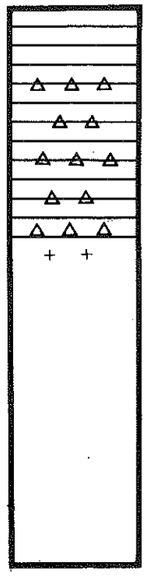
Limitations for Domestic Livestock and Wildlife Use	*Dense stand & slash*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Overstory, wind-throw, escape cover*

Unit No. 84

Plant Community Type	*White fir, huckleberry*
	White fir, grouse huckleberry
	Lodgepole - big huckleberry
Physiographic Position	*Ridge or steep side slope*
Geologic Materials	*Tuffaceous sediments and some volcanic rock*
Aspect	*Northern*
Slope	*25-60%*
Present Erosion	*Sheet and rill on exposed areas*
Major Drainage Dissection	*Slight*

Ground Cover	*85-95%*	**Overstory**	*80%*
Rock Outcrops	*10-30%*	**Understory**	*20%*
Estimated Water Holding Capacity	*5-15"*		

Profile



Description

2" Litter and duff
30% rock outcrops
0- 1" Very dark brown silt loam, soft, v. friable, v. weak, co. platy, n-pls, n-sti.
1- 3" Light gray brown, silt loam, soft, v. friable, structureless, n-pls, n-sti.
3- 6" Brown silt loam, soft v. friable, structureless, n-pls, n-sti.
6-23" Light brown gravelly loam, soft, v. friable, structureless, n-pls, n-sti.
23"+

Range

1- 3" Organic matter
14-26" Volcanic ash mantle
10-30" Gravelly colluvium

Typic Vitrandept, medial over loamy, mixed, frigid

Inclusions

92, 91 — Rock outcrops and debris
67 — Fir types on pyroclastic or tuffaceous sediments

Remarks

- *Generally sharp, steep ridgecrest slope*
- *Cable suspended, tree length yard to minimize log to ground contact; gouging*
- *Heavy winter snowpack and runoff*
- *With vegetation removed, surface soils easily detached and eroded, very little ground vegetation with the closed canopy*
- *Cold air drainage, frost heave potential on new seedlings*

Complexes

848 — East-west complex of Unit 84 with 80 and rock outcrops 95
891 Very steep complex of Unit 84 and rock outcrop Units 91, 95

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML-GM* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Sediments break down readily*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Lateral water flow, deep tuffs, snow pack*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Snow pack, make less than 10 ft.*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Shallow soil, snow pack*
Suggestions for Road Waste and Fill Slope Seeding	*Use chips or slash for cover*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steep, shallow, loose soils*
Suggestions for Cutbank Seeding	*Protect surface vegetation*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cold soils, air drainage, snow pack*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Rill and gully erosion on roads & trails, log gouging*
Suggested Slash Disposal	*Lop & scatter, tree length yard*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Windfall, rock*
Considerations for Trail Improvements & Protection	*Runoff protection*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slipouts along scarps*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Use slash to retard surface flow*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Cool site, lodgepole thickets*

Unit No. 85

Plant Community Type	*White fir - grouse huckleberry*
	White fir - huckleberry
	Lodgepole - huckleberry
Physiographic Position	*Undulating to gently rolling plateau*
Geologic Materials	*Tuffaceous sediments and sandstones*
Aspect	*All, generally northern*
Slope	*5-35%*
Present Erosion	*Gully erosion through the ash mantle*
Major Drainage Dissection	*Slight*

Ground Cover	*100%*	**Overstory**	*90%*
Rock Outcrops	*5%*	**Understory**	*10%*
Estimated Water Holding Capacity	*14-18"*		

Inclusions

84—Some sharp pitches and steep slopes
83—Lodgepole, generally toe slope positions

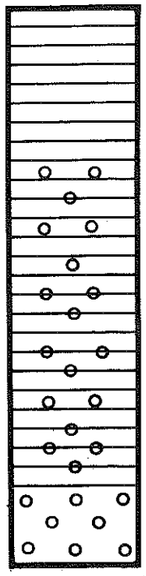
Remarks

—Good overstory protection, however lacks the understory or ground vegetation to protect the soil surface if the overstory is completely removed
—Probably good percentage of cull logs in the white fir but the stand has good second growth which could provide the site protection
—Surface has very weak aggregate stability and is readily gullied with running water
—Some Pacific yew along drainways
—Cold soils and cold air drainage are likely to cause damage and frost heave seedlings

Complexes

869—A transition unit of 84 and pyroclastic sediments in 69, including Unit 89

Profile



Description

2"	*Duff and litter*
0- 4"	*Dark brown to brown silt loam, med. platy, soft, very friable, n-pls, n-sti.*
4-11"	*Light brown silt loam, weak co. platy, soft, v. friable, n-pls, n-sti.*
11-24"	*Light yellow brown, soft, v. friable, structureless, n-pls, n-sti.*
24-30"	*Light yellow gray, silt loam, structureless, very friable, n-pls, n-sti.*
30-37"	*Brown sandy loam, slightly cemented, platy, sli. sti, n-pls, firm*
37-48"	*Light yellow brown, sandy loam st. co. platy, strongly cemented, n-pls, sli. sti, firm when moist*
48"+	*Light brownish yellow sandy loam, co. platy, weakly cemented, n-pls, sli. sti.*

Range

2- 3"	*Organic matter*
20-30"	*Volcanic ash mantle*
20-30"	*Tuffaceous sandstone residual*

Typic Vitrandept, medial over clayey, mixed, frigid

ENGINEERING

Unified Class. *Surface* *Subsoil*	*ML* *GM GC MH*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Weathers & breaks down to fines readily*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Lateral flow, wet spots, soft rock*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil* Ratio *Bedrock*	*Steep* *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 10 ft., maintain vegetative soil cover*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Surface erosion, slope wash*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize, use chipped slash*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Snow pack, frost heave*
Suggestions for Cutbank Seeding	*Shallow cuts, leave rough, fertilize*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*High*
Limitations to Regeneration	*Frost heave, root damage*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe soil erosion on surface soils*
Suggested Slash Disposal	*Lop & scatter, chip or crush*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*No water developed, heavy timber*
Treatment to Increase Suitability	*Develop site, some drainage*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Lodgepole windthrow*
Considerations for Trail Improvements & Protection	*Thining*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slipouts along uplifted ridges*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Scatter slash, divert water*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected *Surface* Sediment *Subsoil* Size	*Silt* *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Dense, no forage*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Well*
Limitations to Range Seeding	*Canopy cover, frost heave*

Unit No. 86

Plant Community Type *Lodgepole - pinegrass - grouse huckleberry*

Lodgepole - big huckleberry

Physiographic Position *Gentle sideslopes adjacent to meadows*

Geologic Materials *Tuffaceous sediment and soft rock*

Aspect *All*

Slope *2-30%*

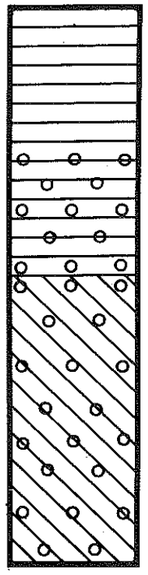
Present Erosion *Some slight rill and gully*

Major Drainage Dissection *Slight*

Ground Cover	*70-90%*	**Overstory**	*80-90%*
Rock Outcrops	*0%*	**Understory**	*40-60%*

Estimated Water Holding Capacity *12-16"*

Profile



Description

2" Litter and duff
0- 1" Dark brown silt loam, weak platy, soft, v. friable, n-pls, n-sti.
1- 7" Light gray brown silt loams, med. weak crumb, soft, friable, n-pls, n-sti.
7-16" Light yellow brown silt loam, weak very coarse sub-angular blocky sli. hard, firm
16-33" Yellow brown loam, strong platy, sli. hard, firm, n-pls, sli. sti, cemented (very fine sandy loam with a clay binder)
33-74"+ Light yellow reddish gray, sandy clay loam, strong coarse sub-angular blocky, mottled, sli. pls, sti, sli. hard, firm

Range

1- 3" Organic matter
14-20" Volcanic ash mantle
10-30" Gravelly loam buried residual

Typic Vitrandept, medial over clayey, mixed, mesic

Inclusions

30—Deep meadow soils
71—Unstable toe slopes
87—Fir, spruce type, deep soils

Remarks

—Cool, wet timber site generally overstocked with lodgepole
—Potential for frost heave and cold site regeneration problems
—High erosion and siltation hazard from the surface ash mantle
—Likely to encounter soft wet seep areas
—Underlying clay subsoil and sedimentary soft rock are poor road construction base or materials

Complexes

None

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*GC-CH*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Soft rock*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Soft base, poor material*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Moderate*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Roll the grade, minimize cut & fill*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Surface erosion; freeze-thaw*
Suggestions for Road Waste and Fill Slope Seeding	*Seed right after disturbance, use chips*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Water lenses, slough & ravel*
Suggestions for Cutbank Seeding	*Leave rough, seed immediately*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Lodgepole, cold site, scarcity seed sources*
Suggested Tree Planting Species	*Douglas fir, larch, spruce*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Accelerated erosion, siltation, compaction*
Suggested Slash Disposal	*Chip, lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Heavy lodgepole, heavy subsoils, wet spots*
Treatment to Increase Suitability	*Gravel through out, need drainage*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Windthrow, wet areas*
Considerations for Trail Improvements & Protection	*N/A*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Heavy subsoils, some watertables*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Small slumps*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Surface protection, runoff diversion*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Clay*
Size	

RANGE AND WILDLIFE

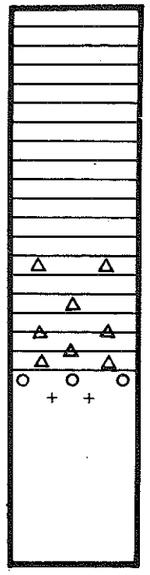
Limitations for Domestic Livestock and Wildlife Use	*Too many stems/ acre*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Lodgepole regen., closeness meadows*

Unit No. 87

Plant Community Type	*White fir - grouse huckleberry*
	Lodgepole - grouse huckleberry
	White fir - huckleberry
	Lodgepole - big huckleberry
Physiographic Position	*Toe Slopes and concave positions along drainways*
Geologic Materials	*Tuffaceous sediments*
Aspect	*East, west*
Slope	*2-30%*
Present Erosion	*Gully erosion in places*
Major Drainage Dissection	*Slight*

Ground Cover	*70-90%*	**Overstory**	*80-100%*
Rock Outcrops	*5%*	**Understory**	*10-40%*
Estimated Water Holding Capacity	*10-14"*		

Profile



Description

2" Litter and duff
0- 5" Dark yellow brown loam, med, mod, platy, soft, very friable, n-pls, n-sti.
5-12" Yellow brown loam, soft, very friable, structureless, n-pls, n-sti.
12-28" Pale yellow brown, loam, structureless, soft, friable, n-pls, n-sti, mottled
28-36" Brown gravelly loam, sli. hard, very firm, sli. sti., n-pls, platy
36" Cemented tuffaceous sandstone

Range

2- 4" Organic matter
18-34" Volcanic ash mantle
30-60"+ Tuffaceous sandstone, weathered, mottled

Typic Vitrandept, medial over clayey, mixed, frigid

Inclusions

85—Fir, side slopes
30—Deep, heavy textured meadows
82—Timbered meadow type soils and positions, concave

Remarks

—Very weak aggregate stability on surface soils and very little structure
—Very little understory or grasses to hold soil in place, thus severe erosion potential
—Directly adjacent to intermittent streams, thus the siltation hazard
—Likely to encounter interflow springs and seeps
—Includes some Pacific yew
—Some sharp pitches
—Cold air drainage and frost pockets, frost heave on planted regeneration
—Heavy snowpack and potential overland flow conversion

Complexes

872—Gentle drainways and toe slope position, Units 87 and 82

ENGINEERING

Unified Class.	***Surface***	*ML*
	Subsoil	*GM-CL-CH*
Suit. as Topsoil Source		*Unsuited, too close to streams*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Unsuited*
Suit. Bedrock for Roadrock		*Unsuited*
Limit of Bedrock for Roadrock		*Soft, breaks down easily*
Est. of Roadrock Thickness		*Thick*
Consid. for Road Location & Construction		*Runoff waters, drainage*
Method of Excavation		*Rip*
Cutbank & Ditch Erosion Potential		*High*
Susceptibility to Cutbank Sloughing & Raveling		*Moderate*
Est. Cutslope Ratio	***Soil***	*Moderate*
	Bedrock	*Steep*
Probability of Cutbank Failure		*Moderately stable*
Considerations for Cutbank Stability Problems		*Overland flow, lateral flow*
Failure Potential on Waste & Fill		*Moderate*
Erosion Potential on Road Waste and Fills		*High*
Suitability of Road Waste & Fill Slopes to Seeding		*Good*
Limitations to Road Waste and Fill Slope Seeding		*Surface runoff*
Suggestions for Road Waste and Fill Slope Seeding		*Fertilize, use road construction slash*
Suitability of Cutbank Seeding		*Fair*
Limit of Cutbank Seeding		*Overland flow, lateral flow, sloughing*
Suggestions for Cutbank Seeding		*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cold air drainage*
Suggested Tree Planting Species	*Douglas fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Stream siltation, severe stream and bank erosion*
Suggested Slash Disposal	*Lop & scatter, crush whole tree yard*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Access, cold site, windthrow lodgepole*
Treatment to Increase Suitability	*N/A*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Wet spots, snow pack, wind throw*
Considerations for Trail Improvements & Protection	*Waterbars, yearly maintenance*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Too close to stream*

EROSION AND HYDROLOGY

Natural Stability		*Stable*
Nature of Mass Movement		*None*
Expected Mass Movement from Man's Activity		*Unchanged*
Surface Soil Erosion Potential		*High*
Subsoil Erosion Potential		*Moderate*
Suggestions for Controlling Subsoil Erosion		*Moderate cut, retain understory, retard runoff*
Water Yield Class		*I*
Bedrock Hydrologic Characteristics		*II*
Hydrologic Group		*A*
Sedimentation Yield Potential		*High*
Expected Sediment Size	***Surface***	*Silt*
	Subsoil	*Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cover, lack of forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Well*
Limitations to Range Seeding	*Cold site, slash, water quality*

Unit No. 88

Plant Community Type *Lodgepole - pinegrass - grouse huckleberry*

Lodgepole - big huckleberry

Lodgepole - grouse huckleberry

Physiographic Position *Undulating sideslopes*

Geologic Materials *Tuffaceous sediments and surface volcanic flow rock*

Aspect *Southern*

Slope *2-35%*

Present Erosion *Rill and gully erosion from concentrated runoff*

Major Drainage Dissection *Slight*

Ground Cover	*75-90%*	**Overstory**	*80-90%*
Rock Outcrops	*5-15%*	**Understory**	*20%*

Estimated Water Holding Capacity *7-11"*

Inclusions

73 — Very shallow scabland

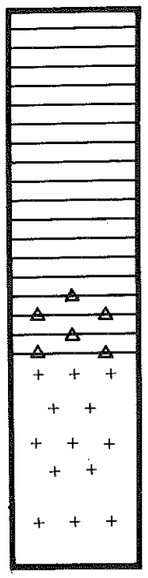
Remarks

- *Cool air drainage*
- *Some clay or plastic silt subsoils*
- *Limited understory and ground vegetation would enhance the possibility of surface erosion potential and frost heave of planted stock. Slash should be used to abate these hazards by lop and scatter then crush. Burning would further increase the frost problem, possible non-wetability*
- *Some severe erosion on exposed areas*

Complexes

853 — Dissected lower slope positions with Units 88, 83, 85 and rock outcrops 92, 95
867 — Dissected slopes and lower side slopes with Units 88, 86, 87
894 — Upper ridgecrest and side slopes with lodgepole 88, mixed conifer 89 and shallow pine-bunchgrass 4

Profile



Description

10% rock outcrops
1" Litter and duff
0- 3" Brown silt loam, weak platy, soft, very friable, n-pls, n-sti.
3-18" Light yellow brown silt loam, structureless, soft, v. friable, n-sti, n-pls.
18-26" Light gray silt loam, structureless, soft, very friable, n-pls, n-sti.
26-32" Brown gravelly silt loam, weak fine subangular blocky, n-pls, sli. sticky, soft, friable
32-65" Cemented tuffaceous sandstones

Range

1- 3" Organic matter 10-30% rock outcrops
10-30" Volcanic ash horizons
10-20" Sandstone residual soils

Andic Xerochrept, coarse silty, mixed, mesic

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *CL-CH*
Suit. as Topsoil Source	*Unsuited; soil depth & site*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Soft rock weathers to clay readily*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Avoid deep cuts and fills*
Method of Excavation	*Rip, may need some blasting*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Less than 10 ft. cut, lateral flow in places*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Exposure, soil*
Suggestions for Road Waste and Fill Slope Seeding	*Use slash for cover & protection*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Ravel, surface runoff, cold site*
Suggestions for Cutbank Seeding	*Fertilize; protect with chipped slash*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Moisture regime, fertility, frost*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*4-8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe erosion with siltation in adjacent meadows & streams*
Suggested Slash Disposal	*Crush or lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Generally small timber; lack water*
Treatment to Increase Suitability	*Site development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Thick lodgepole*
Considerations for Trail Improvements & Protection	*Stand management*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Shallow soils*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Avoid runoff conc., retard runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Thick timber*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Well*
Limitations to Range Seeding	*Wildlife cover, timber stand*

Unit No. 89

Plant Community Type	*White fir, grouse huckleberry*
	Mixed - conifer - pinegrass, ash soil
	White fir - huckleberry
Physiographic Position	*Gently sloping anticlinal ridge, gently rolling*
Geologic Materials	*Tuffaceous sandstone, some andesite on the surface*
Aspect	*Generally all*
Slope	*5-40%*
Present Erosion	*Moderate gully erosion*
Major Drainage Dissection	*Slight*

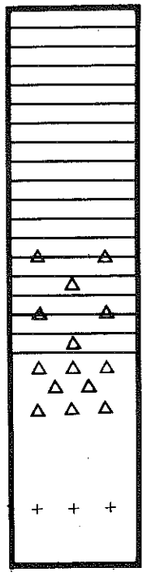
Ground Cover	*85-95%*	**Overstory**	*80%*
Rock Outcrops	*5-10%*	**Understory**	*20-40%*
Estimated Water Holding Capacity	*7-12"*		

Inclusions
83—Lodgepole on gently rolling upland slopes, shallow soils
86—Lodgepole on gentle sideslopes, buried subsoils

Remarks
—Mixed stand, uneven aged
—Present gully erosion, severe erosion potential on the ash surface with the vegetation cover removed
—Includes some surface flow volcanics, andesite

Complexes
None

Profile



Description

2" Duff and litter
0- 1" Very dark brown silt loam, weak platy, soft, v. friable, n-pls, n-sti.
1- 2" Light gray, silt loam, weak platy, soft, v. friable, n-pls, n-sti.
2-10" Very light brown silt loam, weak coarse platy, loose, very friable, n-pls, n-sti.
10-22" Light yellow brown silt loam, weak, very coarse platy, loose, very friable, n-sti, n-pls.
22-30" Light yellow gray, silt loam, structureless, loose, very friable, n-pls, n-sti.
30-35" Light brown gravelly silt loam, weak subangular, blocky, soft, friable, n-pls, sli. sti.
35" Tuff

Range
1- 3" Organic matter
12-30" Volcanic ash mantle
10-20" Tuffaceous residium

Typic Vitrandept, medial over loamy, mixed, frigid

ENGINEERING

Unified Class. *Surface*	*ML*
Class. *Subsoil*	*GM-CL-CH*
Suit. as Topsoil Source	*Unsuited Some small supplies*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Soft tuff, break to fines; some andesite materials*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Soft, heavy clay subsoils in cuts*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope *Soil*	*Steep*
Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Soft clay interflows, less than 10 ft. cuts*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Friable soil surface, erosion, cover*
Suggestions for Road Waste and Fill Slope Seeding	*Leave rough, use slash for chips*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Ravel, surface runoff, steepness*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Overstory removal, seeds & shade*
Suggested Tree Planting Species	*Pine, Douglas fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Site conversion, hotter and dryer*
Suggested Slash Disposal	*Lop & scatter Leave fines*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Water*
Treatment to Increase Suitability	*Develop springs & storage*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Retard surface runoff and channeling*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected *Surface*	*Silt*
Sediment *Subsoil*	*Silt, clay*
Size	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Heavy timber & slash*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Slash, shade and available moisture*

Unit No. 90

Plant Community Type *Brush - alder, willow, maple*

Physiographic Position *Alluvial bottoms - dredged*

Geologic Materials *Mixed outwash*

Aspect *All*

Slope *1-5%*

Present Erosion *Severe streambank erosion*

Major Drainage Dissection *Slight*

Ground Cover	*10-30%*	**Overstory**	*-0-*
Rock Outcrops	*5-10%*	**Understory**	*-0-*

Estimated Water Holding Capacity

Inclusions
321 — Gentle - drainway bottomlands
322 — Steep V-shaped portions

Remarks
— Since logging, much larger volumes are being discharged, thus the unstable stream conditions
— Streambanks are scoured yearly
— Crossings should be bridged
— Temporary crossings will probably washout yearly
— Some heavy wildlife and cattle use

Complexes
None

ENGINEERING

Unified Class. *Surface*	*GW-GP*
Unified Class. *Subsoil*	*GW-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Round alluvial cobble and stone*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Flood plain*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope *Soil* Ratio *Bedrock*	*Flat*
Probability of Cutbank Failure	*Very unstable*
Considerations for Cutbank Stability Problems	*Building on the surface*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*No soil*
Suggestions for Road Waste and Fill Slope Seeding	
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel*
Suggestions for Cutbank Seeding	

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*NCFL*
Limitations to Regeneration	*Dredged, alluvium*
Suggested Tree Planting Species	*N/A*
Waterbar Interval	*N/A*
Harvest Potential Impact on Soil Resource	*N/A*
Type of Damage	*N/A*
Suggested Slash Disposal	*N/A*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Historic value, flooding, rocky*
Treatment to Increase Suitability	*Intensive development*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Very rocky*
Considerations for Trail Improvements & Protection	
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Watertable, flood plain*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Flooding*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Low*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*N/A*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*A*
Sedimentation Yield Potential	*Moderate*
Expected *Surface* Sediment *Subsoil* Size	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Rock, cobble*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Fines*

Unit No. 91

Plant Community Type *None*

Physiographic Position *Fault scarps, steep dissected side slopes and canyon walls*

Geologic Materials *Surface basalts and interflow materials, andesites, meta-volcanics*

Aspect *All aspects*

Slope *5-100%*

Present Erosion *Very high runoff*

Major Drainage Dissection

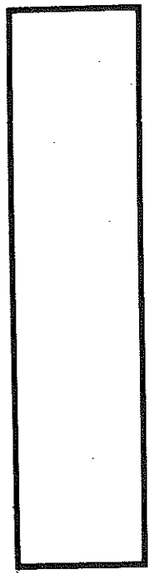
Ground Cover

Overstory

Rock Outcrops *100%*

Understory

Estimated Water Holding Capacity



Remarks

- *Rock outcrops and talus slopes*
- *Non-commercial timber site*
- *Recreation site very hazardous even for trails*
- *This is a miscellaneous unit and not described in detail*
- *It represents the rock outcrops, basalt flows, cap rock exposures and exposed talus rock*
- *Elgin-Lookinglass area; basalt and andesite are interbedded with older lacustrine deposits. The resistant basalt layers mask the softer sedimentary deposits.*

Complexes

900—Extreme dissected Units 91, 92 and 12, with inclusions of 5, 11, 14, 312 and dense alder
911—Unstable slopes basalt/sedimentary 91 with Unit 11 with inclusions of 12, 14, and 19
912—Basalt rock with Unit 12, inclusions of 14, 19 and 20
914—Northern aspects, rock outcrops, Unit 14 and Unit 12 along the fringes, some alder patches
915—Southern aspects, rock with shallow bunchgrass Unit 5 with timbered inclusions of Unit 8, 12, 19, 20 and 24
918—Southern aspect, rock with timbered Units 8 and 12, includes Unit 5
919—Highly dissected and brush dominated in places, rock with Unit 19 and inclusions of 20
920—Southern aspect, rock outcrop with Units 20 and 5, inclusions of 12 and 19
922—Steep canyon side slopes, Units 91, 22 and 24
924—Steep dissected canyon side slopes dominated by Unit 91 with 24 and 5
991—Very shallow, severely eroded site; Units 9 and 91

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	
Suit. as Topsoil Source	
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Talus and debris Steep rockfall hazard*
Est. of Roadrock Thickness	
Consid. for Road Location & Construction	*Very steep, sidecast problems, ravel*
Method of Excavation	*Blast & rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Too steep, talus & debris slope*
Failure Potential on Waste & Fill	*Sidecast hazard*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Unsuited*
Limitations to Road Waste and Fill Slope Seeding	
Suggestions for Road Waste and Fill Slope Seeding	
Suitability of Cutbank Seeding	*Unsuited*
Limit of Cutbank Seeding	
Suggestions for Cutbank Seeding	

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	
Susceptibility to Pinegrass Revegetation	
Potential for Regeneration	*Non-CFL*
Limitations to Regeneration	
Suggested Tree Planting Species	
Waterbar Interval	
Harvest Potential Impact on Soil Resource	
Type of Damage	
Suggested Slash Disposal	

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	
Treatment to Increase Suitability	
Soil and Site Damage Susceptibility	
Susceptibility to Dust	
Susceptibility to Muddiness	
Trail Suitability	
Limitations for Trails	
Considerations for Trail Improvements & Protection	
Suitability for Sewage Filter Field	
Soil Limitations to Sewage Filter Field	

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Rockfall*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*N/A*
Subsoil Erosion Potential	*N/A*
Suggestions for Controlling Subsoil Erosion	*N/A*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size ***Surface*** ***Subsoil***	*N/A* *N/A*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Unsuited*
Susceptibility to Soil Compaction	*N/A*
Susceptibility to Soil Displacement	*N/A*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Rock outcrop*

Unit No. 92

Plant Community Type *None*

Physiographic Position *Fault scarps, very steep faulted ridges*

Geologic Materials *Altered tuffs and tuffaceous materials*

Aspect *All aspects*

Slope *5-100%*

Present Erosion *Very high runoff, severe sheet erosion*

Major Drainage Dissection

Ground Cover | **Overstory**

Rock Outcrops *100%* | **Understory**

Estimated Water Holding Capacity

Remarks

- *Sedimentary rock with silt and clay sized particles for matrix*
- *Easily penetrated by water and air*
- *Subject to ice wedging*
- *Includes lenses of high expanding montmorillinite clays which are slip planes*
- *Unstable landforms*
- *Readily weathers when exposed*

Complexes

925— Steep sideslopes, southern aspect, tuffaceous material with Units 5 and 77 with some inclusions of Unit 68
927— Steep, northern aspects, tuffaceous material with Unit 67 and minor amounts of 68
928— Steep, southern aspects, tuffaceous material with timbered Unit 68 and scabland Unit 77
997— Rocky scabland, dissected tuffs, breccias and basalts with scabland 77 and 5

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	
Suit. as Topsoil Source	
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Incompetent, readily weathers when exposed*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Unstable material*
Method of Excavation	
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	
Probability of Cutbank Failure	*Very stable*
Considerations for Cutbank Stability Problems	
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	
Limitations to Road Waste and Fill Slope Seeding	
Suggestions for Road Waste and Fill Slope Seeding	
Suitability of Cutbank Seeding	
Limit of Cutbank Seeding	
Suggestions for Cutbank Seeding	

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	
Susceptibility to Pinegrass Revegetation	
Potential for Regeneration	
Limitations to Regeneration	*Rock outcrop, Non commercial*
Suggested Tree Planting Species	
Waterbar Interval	
Harvest Potential Impact on Soil Resource	
Type of Damage	
Suggested Slash Disposal	

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep, rock outcrop*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	
Susceptibility to Dust	
Susceptibility to Muddiness	
Trail Suitability	*Low*
Limitations for Trails	*Rock outcrops 100% slopes*
Considerations for Trail Improvements & Protection	
Suitability for Sewage Filter Field	
Soil Limitations to Sewage Filter Field	

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Rotational slipouts, failures along faults*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	
Subsoil Erosion Potential	
Suggestions for Controlling Subsoil Erosion	
Water Yield Class	
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** ***Subsoil***	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*100% slope, rock outcrops*
Susceptibility to Soil Compaction	
Susceptibility to Soil Displacement	
Potential for Range Improvements through Seeding	
Limitations to Range Seeding	

Unit No. 93

Plant Community Type *None*

Physiographic Position *Rock outcrops, fault scarps*

Geologic Materials *Intrusive granitics and granodiorites*

Aspect *All*

Slope *5-100%*

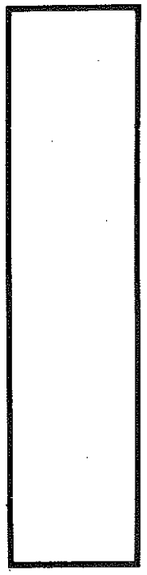
Present Erosion *Sheet*

Major Drainage Dissection *Moderate*

Ground Cover **Overstory**

Rock Outcrops *100%* **Understory**

Estimated Water Holding Capacity



Remarks

- *Hard dense rock, weakly fractured*
- *Weathers to coarse sandy soils*
- *Weathered surface rock tends to be unstable*
- *Can be very hard and massive*

Complexes

935— High elevation granitic-metamorphic rock outcrops and sub-alpine Unit 50
958— Steep, northern aspect, granitic outcrops with white fir Unit 58
960— Steep southern aspect, granitic rock with forested Unit 60 and generally scabland Unit 59

ENGINEERING

Unified Class. *Surface* *Subsoil*	
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Large dense boulders or soft debris*
Est. of Roadrock Thickness	
Consid. for Road Location & Construction	*Rock outcrop*
Method of Excavation	*Blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	
Est. Cutslope Ratio *Soil* *Bedrock*	
Probability of Cutbank Failure	*Low*
Considerations for Cutbank Stability Problems	*Low*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	
Limitations to Road Waste and Fill Slope Seeding	
Suggestions for Road Waste and Fill Slope Seeding	
Suitability of Cutbank Seeding	
Limit of Cutbank Seeding	
Suggestions for Cutbank Seeding	

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	
Susceptibility to Pinegrass Revegetation	
Potential for Regeneration	
Limitations to Regeneration	*Non-CFL*
Suggested Tree Planting Species	
Waterbar Interval	
Harvest Potential Impact on Soil Resource	
Type of Damage	
Suggested Slash Disposal	

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*100% slope, rock outcrop*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	
Susceptibility to Dust	
Susceptibility to Muddiness	
Trail Suitability	*Poor*
Limitations for Trails	
Considerations for Trail Improvements & Protection	
Suitability for Sewage Filter Field	
Soil Limitations to Sewage Filter Field	

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Rockfall, talus and debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	
Subsoil Erosion Potential	
Suggestions for Controlling Subsoil Erosion	
Water Yield Class	
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	
Sedimentation Yield Potential	
Expected Sediment Size *Surface* *Subsoil*	

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Rock, slope*
Susceptibility to Soil Compaction	
Susceptibility to Soil Displacement	
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*100% rock.*

Unit No. 94

Plant Community Type *None*

Physiographic Position *Upper ridge side slope*

Geologic Materials *Meta-volcanic - metamorphic rock*

Aspect *All*

Slope *0-100+*

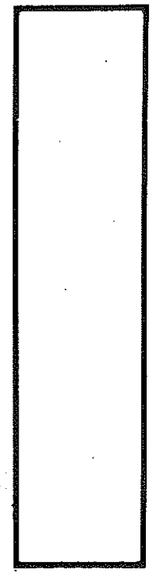
Present Erosion *Sheet*

Major Drainage Dissection *Slight*

Ground Cover | **Overstory**

Rock Outcrops *100%* | **Understory**

Estimated Water Holding Capacity



Inclusions
94 – Rock outcrop and colluvial, talus materials

Remarks
– Steep, rocky
– Very little retention or storage of moisture
– Tends to be platy
– Sharp angular talus, some glassy deposits
– Moderately competent for construction use

Complexes
947 – Steep southern aspect, rock outcrops with pine Unit 47 and bunchgrass Unit 5
948 – Steep northern aspect, outcrops with fir Unit 48, Units 47 and 5
951 – High elevation, rock outcrops with sub-alpine Unit 51 with inclusion of 42

ENGINEERING

Unified Class.	***Surface*** ***Subsoil***
Suit. as Topsoil Source	
Sand or Gravel Source	
Suit. as Clay Source	
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Sharp fractures, some glassy minerals*
Est. of Roadrock Thickness	
Consid. for Road Location & Construction	*Rock*
Method of Excavation	*Blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio	***Soil*** ***Bedrock***
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	
Limitations to Road Waste and Fill Slope Seeding	
Suggestions for Road Waste and Fill Slope Seeding	
Suitability of Cutbank Seeding	
Limit of Cutbank Seeding	
Suggestions for Cutbank Seeding	

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	
Susceptibility to Pinegrass Revegetation	
Potential for Regeneration	
Limitations to Regeneration	*Rock outcrop*
Suggested Tree Planting Species	
Waterbar Interval	
Harvest Potential Impact on Soil Resource	
Type of Damage	
Suggested Slash Disposal	

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*100% rock outcrop*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	
Susceptibility to Dust	
Susceptibility to Muddiness	
Trail Suitability	
Limitations for Trails	
Considerations for Trail Improvements & Protection	
Suitability for Sewage Filter Field	
Soil Limitations to Sewage Filter Field	

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Talus and debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	
Subsoil Erosion Potential	
Suggestions for Controlling Subsoil Erosion	
Water Yield Class	
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	
Sedimentation Yield Potential	
Expected Sediment Size	***Surface*** ***Subsoil***

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*100% rock*
Susceptibility to Soil Compaction	
Susceptibility to Soil Displacement	
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*100% slope & rock outcrop*

Unit No. 95

Plant Community Type *None*

Physiographic Position *Faulted ridges and side slopes*

Geologic Materials *Tuffaceous sandstones*

Aspect

Slope

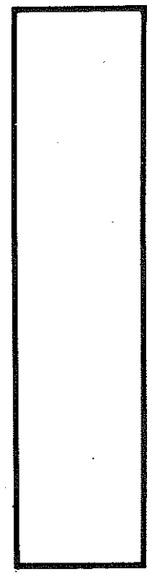
Present Erosion *Sheet*

Major Drainage Dissection

Ground Cover | **Overstory**

Rock Outcrops *100%* | **Understory**

Estimated Water Holding Capacity



Remarks

- *Open and porous, easily weathered by water*
- *Frost wedging*
- *Failure potential on road waste and fills*
- *Easily eroded*
- *Unstable materials*
- *Includes some high expanding clay lenses*

ENGINEERING

Unified Class.	***Surface*** ***Subsoil***
Suit. as Topsoil Source	
Sand or Gravel Source	
Suit. as Clay Source	
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Soft incompetent*
Est. of Roadrock Thickness	
Consid. for Road Location & Construction	*100% slope*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio	***Soil*** *Steep* ***Bedrock*** *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Minimize cuts*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	
Suggestions for Road Waste and Fill Slope Seeding	
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	
Suggestions for Cutbank Seeding	

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	
Susceptibility to Pinegrass Revegetation	
Potential for Regeneration	*Low*
Limitations to Regeneration	*100% rock*
Suggested Tree Planting Species	
Waterbar Interval	
Harvest Potential Impact on Soil Resource	
Type of Damage	
Suggested Slash Disposal	

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*100% rock*
Treatment to Increase Suitability	
Soil and Site Damage Susceptibility	
Susceptibility to Dust	
Susceptibility to Muddiness	
Trail Suitability	
Limitations for Trails	
Considerations for Trail Improvements & Protection	
Suitability for Sewage Filter Field	
Soil Limitations to Sewage Filter Field	

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Faulted structures*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	
Subsoil Erosion Potential	
Suggestions for Controlling Subsoil Erosion	
Water Yield Class	
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	
Sedimentation Yield Potential	
Expected Sediment Size	***Surface*** ***Subsoil***

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*100% rock*
Susceptibility to Soil Compaction	
Susceptibility to Soil Displacement	
Potential for Range Improvements through Seeding	
Limitations to Range Seeding	

Complex Mapping Unit Interpretations

Unit No. 012

ENGINEERING

Unified Class. *Surface* / *Subsoil*	GM-OL / OH-GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Some pyroclastics
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Some deep clay; control surface runoff
Method of Excavation	Rip surface, blast
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio *Soil* / *Bedrock*	Flat / Steep
Probability of Cutbank Failure	Low
Considerations for Cutbank Stability Problems	Surface subject to freeze-thaw
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Lack fines
Suggestions for Road Waste and Fill Slope Seeding	Cover with chipped slash
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Shallow scab soils
Suggestions for Cutbank Seeding	Leave rough and provide cover

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Low
Limitations to Regeneration	Shallow soils Freeze-thaw
Suggested Tree Planting Species	Ponderosa pine
Waterbar Interval	5' vertical
Harvest Potential Impact on Soil Resource	Non-forest
Type of Damage	Severe rill erosion
Suggested Slash Disposal	Lop and scatter on site

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Rocky - no water or shade
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	High
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	Hummocky Easily eroded
Considerations for Trail Improvements & Protection	Gravel path
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Soil depth

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	N/A
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Severe to very severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Surface cover
Water Yield Class	III
Bedrock Hydrologic Characteristics	I
Hydrologic Group	C-D
Sedimentation Yield Potential	Low
Expected Sediment Size *Surface* / *Subsoil*	Silt / Silt clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Heavy use Light forage
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Moderate
Limitations to Range Seeding	Wildlife use heavy in early spring

Unit No. 013

ENGINEERING

Unified Class. *Surface* / *Subsoil*	GM / GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Pyroclastic interflows
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Shallow-high runoff
Method of Excavation	Rip and blast
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio *Soil* / *Bedrock*	Steep / Steep
Probability of Cutbank Failure	Very stable
Considerations for Cutbank Stability Problems	N/A
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Exposure
Suggestions for Road Waste and Fill Slope Seeding	N/A
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Moisture-exposure
Suggestions for Cutbank Seeding	Drought species

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Non-forest
Limitations to Regeneration	Moisture, soil depth
Suggested Tree Planting Species	None
Waterbar Interval	5' vertical
Harvest Potential Impact on Soil Resource	Severe
Type of Damage	Surface runoff and erosion
Suggested Slash Disposal	Leave on site

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Rocky, water, shade
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	High
Susceptibility to Muddiness	Low
Trail Suitability	Moderate
Limitations for Trails	Rocky
Considerations for Trail Improvements & Protection	None
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Soil depth

EROSION AND HYDROLOGY

Natural Stability	Very stable
Nature of Mass Movement	N/A
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Retard runoff
Water Yield Class	III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	D
Sedimentation Yield Potential	Low
Expected Sediment Size *Surface* / *Subsoil*	Silt / Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Poor forage and shade
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Moisture, soil depth

Unit No. 014 and 041

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	GM / GM-GP
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	None; some pyroclastic flows
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Check conc. surface runoff
Method of Excavation	Rip, blast
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	Steep / Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	None
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Fines, shallow Lack cover
Suggestions for Road Waste and Fill Slope Seeding	Topsoil is needed
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Shallow soil depth, exposure
Suggestions for Cutbank Seeding	Drought species

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Very low
Limitations to Regeneration	Shallow soils Hot site, dry
Suggested Tree Planting Species	Pine
Waterbar Interval	5' vertical
Harvest Potential Impact on Soil Resource	Severe
Type of Damage	Accelerated erosion; no regeneration
Suggested Slash Disposal	Lop & scatter

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Shallow, dry Little shade
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	Rocky
Considerations for Trail Improvements & Protection	Rock lined Water bared
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Depth

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	N/A
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Surface cover and protection
Water Yield Class	III
Bedrock Hydrologic Characteristics	I
Hydrologic Group	D
Sedimentation Yield Potential	Moderate
Expected Sediment Size ***Surface*** / ***Subsoil***	Silt / Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Rocky, lack forage
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Wildlife - use soil moisture

Unit No. 024

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	ML-GM / GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Suited
Limit of Bedrock for Roadrock	Hard basalts
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Overland flow, disperse drainage
Method of Excavation	Blade, rip
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	Steep / Steep
Probability of Cutbank Failure	Very stable
Considerations for Cutbank Stability Problems	N/A
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Lack fines & droughty
Suggestions for Road Waste and Fill Slope Seeding	Seed soil areas only
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Soil Depth
Suggestions for Cutbank Seeding	Leave rough

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Low
Limitations to Regeneration	Grass, droughty site
Suggested Tree Planting Species	Pine
Waterbar Interval	8 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Disturbance, exposure, burning
Suggested Slash Disposal	Lop and scatter

RECREATION

Soil Suitability for Recreational Development	Poor
Limitations for Recreational Development	Rocky, dry; large trees
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Low
Susceptibility to Dust	Moderate
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	Rocky in places
Considerations for Trail Improvements & Protection	Concentrated runoff
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Soil depth

EROSION AND HYDROLOGY

Natural Stability	Very stable
Nature of Mass Movement	N/A
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Low
Suggestions for Controlling Subsoil Erosion	Disperse runoff, maintain cover
Water Yield Class	III
Bedrock Hydrologic Characteristics	I
Hydrologic Group	C
Sedimentation Yield Potential	Low
Expected Sediment Size ***Surface*** / ***Subsoil***	Silt / Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Dense pine thickets
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Droughty site and spring wildlife use

Unit No. 029

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML-GM* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some very hard rock*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Disperse road drainage*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Flat* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*N/A*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack fines*
Suggestions for Road Waste and Fill Slope Seeding	*Leave as is*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Soil depth*
Suggestions for Cutbank Seeding	*Seed only soil areas*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Non-forest, soil depth*
Suggested Tree Planting Species	*N/A*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Disturbance, gouging, perm. tracks*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Wet spring, short season*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Rocky, exposed*
Considerations for Trail Improvements & Protection	*Well drained*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Retard runoff*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cool site, higher elevation*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow soils, exposure, frost*

Unit No. 034 and 043

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*GM* / *GM-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Very thin*
Consid. for Road Location & Construction	*May lack fines*
Method of Excavation	*Rip surface* / *Blast sub-surface*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack of fines, cover*
Suggestions for Road Waste and Fill Slope Seeding	*Top soil if needed*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Soil depth, exposure*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Very low*
Limitations to Regeneration	*Hot, dry, shallow*
Suggested Tree Planting Species	*Pine, juniper*
Waterbar Interval	*5'*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*No regeneration* / *Critical erosion*
Suggested Slash Disposal	*Leave on site* / *Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rocky, dry*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Shallow, rocky soil*
Considerations for Trail Improvements & Protection	*Hand built*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Surface cover and protection*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Rock; lack of forage*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Wildlife cover for frost heave*

Unit No. 064 and 046

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	SM-GM GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	None
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Some rock outcrops
Method of Excavation	Rip surface and blast sub-surface
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Steep Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Some ravel Keep less than 10'
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Fines, exposure
Suggestions for Road Waste and Fill Slope Seeding	Cover with chipped slash
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Site exposure Shallow soils
Suggestions for Cutbank Seeding	Lay back & cover if needed

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low to moderate
Potential for Regeneration	Low
Limitations to Regeneration	Dry site, pinegrass shade, shallow soils
Suggested Tree Planting Species	Ponderosa Pine
Waterbar Interval	4-8' vertical
Harvest Potential Impact on Soil Resource	Moderate to high
Type of Damage	Accelerated soil erosion; site deterioration
Suggested Slash Disposal	Leave on site Lob & scatter or chip

RECREATION

Soil Suitability for Recreational Development	Poor
Limitations for Recreational Development	Sparse cover Dry site, rocks
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	High
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	Rocky areas
Considerations for Trail Improvements & Protection	Well designated
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Too shallow

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	N/A
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Retard surface runoff
Water Yield Class	II - III
Bedrock Hydrologic Characteristics	I - III
Hydrologic Group	C
Sedimentation Yield Potential	Moderate
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Rocky, sparse forage
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Poor
Limitations to Range Seeding	Shallow Exposed soils

Unit No. 413

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	ML-GM GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Suited
Limit of Bedrock for Roadrock	None
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Runoff, overland flow, snow
Method of Excavation	Rip
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Moderate Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	None
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Fines, exposure
Suggestions for Road Waste and Fill Slope Seeding	Mulch
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Frost, ravel, shallow
Suggestions for Cutbank Seeding	Leave rough

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Low
Limitations to Regeneration	Cool site, exposure
Suggested Tree Planting Species	Pine, fir
Waterbar Interval	8 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Disturbance, overland flow
Suggested Slash Disposal	Leave fines

RECREATION

Soil Suitability for Recreational Development	Poor
Limitations for Recreational Development	Sparse cover, fragile site
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	None
Considerations for Trail Improvements & Protection	None
Suitability for Sewage Filter Field	Fair
Soil Limitations to Sewage Filter Field	Soil depth, field length

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	N/A
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	High
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Disperse flow
Water Yield Class	III
Bedrock Hydrologic Characteristics	I
Hydrologic Group	B - D
Sedimentation Yield Potential	Moderate
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Water
Susceptibility to Soil Compaction	High
Susceptibility to Soil Displacement	Moderate
Potential for Range Improvements through Seeding	Fair
Limitations to Range Seeding	Shallow areas, water holding capacity

Unit No. 512

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	GM-ML GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Some lighter scoria
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Water conc., high runoff, no buffers
Method of Excavation	Blast & rip
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Moderate Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Dry ravel
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	No soil
Suggestions for Road Waste and Fill Slope Seeding	Provide drainage
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Shallow soils
Suggestions for Cutbank Seeding	Leave rough, seed where possible

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Low
Limitations to Regeneration	Surface erosion, moisture, harse site
Suggested Tree Planting Species	Larch, fir, pine
Waterbar Interval	10' vertical
Harvest Potential Impact on Soil Resource	Severe
Type of Damage	Severe runoff and soil erosion
Suggested Slash Disposal	Leave on site; crush

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Water, steep, rocky
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Poor
Limitations for Trails	Rocky
Considerations for Trail Improvements & Protection	Water bars
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Steep

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Faulting
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Severe
Suggestions for Controlling Subsoil Erosion	Retard and disperse runoff
Water Yield Class	III
Bedrock Hydrologic Characteristics	I
Hydrologic Group	B
Sedimentation Yield Potential	Low
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Rocky forage
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	Moderate
Potential for Range Improvements through Seeding	Poor
Limitations to Range Seeding	Shallow, harsh dry site

Unit No. 524

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	GM GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Some interflow
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Talus slides, rock fall, raveling
Method of Excavation	Rip & blade surface blast subsurface
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	Moderate
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Moderate Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Avoid deepcuts in loose talus
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Fines, moisture
Suggestions for Road Waste and Fill Slope Seeding	Cover with chips or slash
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Steep, raveling, lack fines, frost
Suggestions for Cutbank Seeding	Leave rough; use native seed

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Very low
Limitations to Regeneration	Harsh dry site
Suggested Tree Planting Species	Pine
Waterbar Interval	5' to slow runoff
Harvest Potential Impact on Soil Resource	High
Type of Damage	No moisture retention High runoff
Suggested Slash Disposal	If harvested, lop & scatter all slash

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Rocky, dry, no timber
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Moderate
Limitations for Trails	Rocky, rockfall; erosion potential
Considerations for Trail Improvements & Protection	Frequent water bars
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Steep

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Talus slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Grass slopes Retard runoff
Water Yield Class	III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	B
Sedimentation Yield Potential	Low
Expected Sediment Size ***Surface*** ***Subsoil***	Sand, silt Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Forage sparse, steep, rocky
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Fair
Limitations to Range Seeding	Heavy spring wildlife use, dry

Unit No. 547

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*GM-ML* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited; talus*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Moderately competent meta-volcanics*
Est. of Roadrock Thickness	*thin*
Consid. for Road Location & Construction	*Rockfall; sidecast hazard*
Method of Excavation	*Blade, ripping and blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Wet areas; soft interflows*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Low*
Limitations to Road Waste and Fill Slope Seeding	*Thin soils; exposures*
Suggestions for Road Waste and Fill Slope Seeding	*Cover if necessary*
Suitability of Cutbank Seeding	*Low*
Limit of Cutbank Seeding	*Thin soils; exposure; moisture*
Suggestions for Cutbank Seeding	*Use native seed*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low - moderate*
Limitations to Regeneration	*Moisture regime exposure*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4-8' vertical*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Accelerated erosion Site disturbance*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, hot, lacks water*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Rocky, hot*
Considerations for Trail Improvements & Protection	*Disperse runoff*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Steep, shallow*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris and talus slides*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Slow runoff*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, rocky, forage*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow soils, limited moisture storage*

Unit No. 567

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML-GM* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited (talus slopes)*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Soft pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Ravel, subsoil moisture*
Method of Excavation	*Blade and ripping*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Avoid seeps; cuts less than 10 feet*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Ravel, exposure, moisture*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Shallow soil, exposure, dry*
Suggestions for Cutbank Seeding	*Leave rough, native grasses*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Moisture, exposure*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4-8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Accelerated runoff, open canopy too much*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Water, too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Rockfall, rocky in places*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Steepness*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Debris and talus slides; slumpouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain vegetative and litter cover*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow, steep; moisture storage*

Unit No. 076

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*SM-ML* / *ML-GM*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Suited*
Limit of Bedrock for Roadrock	*Some pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Good timber site*
Method of Excavation	*Blast and rip surface materials*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Flat* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Maintain vegetative cover*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Exposure; depth of fill*
Suggestions for Road Waste and Fill Slope Seeding	*Seed when work is complete*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Height, exposure, surface runoff*
Suggestions for Cutbank Seeding	*Seed early; cover with chips*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*High*
Limitations to Regeneration	*Shade factor, pine grass, seed source*
Suggested Tree Planting Species	*Larch, Douglas fir, Ponderosa pine*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Severe surface exposure & runoff*
Suggested Slash Disposal	*Lob and scatter*

RECREATION

Soil Suitability for Recreational Development	*Good*
Limitations for Recreational Development	*Slash, water availability*
Treatment to Increase Suitability	*water development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Some dense lodgepole*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Well*
Soil Limitations to Sewage Filter Field	*Soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Contour brush piles; retard surface runoff*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Brush and slash*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Slash barriers, some cool sites*

Unit No. 376

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *ML-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Inner flow material*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Overburden, snow runoff*
Method of Excavation	*Blade & ripping*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 feet*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Length, cover*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Frost*
Suggestions for Cutbank Seeding	*Leave rough, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Frost pockets; ground cover*
Suggested Tree Planting Species	*Douglas fir, larch, Ponderosa pine*
Waterbar Interval	*5'+ vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Trail & landing erosion; stream sedimentation*
Suggested Slash Disposal	*Tree length yard; crush*

RECREATION

Soil Suitability for Recreational Development	*Good*
Limitations for Recreational Development	*Water runoff flows*
Treatment to Increase Suitability	*Water development, stream crossings*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Wind throw; stream crossings*
Considerations for Trail Improvements & Protection	*Gravel in places*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Soil depth; field size limited*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard surface runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Overstory; avoid concentrations*

Unit No. 085

ENGINEERING

Unified Class. *Surface*	*GM*
Unified Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*May lack fines; may need blasting*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Sidecast Runoff dispersal*
Method of Excavation	*Blade, ripping and blasting*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil*	*Steep*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Keep cuts less than 10 feet*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack of fines and moisture*
Suggestions for Road Waste and Fill Slope Seeding	*Leave as is, or mulch if needed*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Shallow soil; ravel*
Suggestions for Cutbank Seeding	*Leave rough & use droughty mixture*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Moisture regime, requires partial shade*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*5-10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement and disturbance of ground cover*
Suggested Slash Disposal	*Leave on site and scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, rocky, water*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Dry and hot, rocky, displacement*
Considerations for Trail Improvements & Protection	*Many waterbars*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Steepness, shallow soils*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris or talus slides*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse and retard runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface*	*Silt*
Expected Sediment Size *Subsoil*	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, dry, rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow, hot, dry site*

Unit No. 812

ENGINEERING

Unified Class. *Surface*	*ML-GM*
Unified Class. *Subsoil*	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Very hard and sharp*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Sidecast, seeps, ravel*
Method of Excavation	*Blade and ripping*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil*	*Steep*
Est. Cutslope Ratio *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep cuts less than 10 feet; avoid seeps*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Amount of soil, moisture, aspect*
Suggestions for Road Waste and Fill Slope Seeding	*Use chips for mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Exposure, moisture, steepness*
Suggestions for Cutbank Seeding	*Leave rough, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow harsh site with limited moisture*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Ground cover displacement, difficult regeneration*
Suggested Slash Disposal	*Leave on site and scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Water, steepness, limited shade*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Steep, some rock*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Steepness*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Slides*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate - high*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse concentrated runoff*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface*	*Silt*
Expected Sediment Size *Subsoil*	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cover, water availability*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Droughty soils and wildlife use*

Unit No. 310

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML-OL* / *GM-OH*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Position, over burden, soft sediments*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Slumps, seeps, lateral flow, clay subsoils*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 feet vertical*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Fertility, cover*
Suggestions for Road Waste and Fill Slope Seeding	*Seed & mulch early*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Steepness, sloughing*
Suggestions for Cutbank Seeding	*Leave rough, deep rooting species*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Cool, moist*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Stream siltation Loss of habitat*
Suggested Slash Disposal	*Tree length yard*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Water development Clay subsoils*
Treatment to Increase Suitability	
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Wet spots*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Close to drainway watertable*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slumps*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Low*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Good ground cover*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*A - C*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Drainway; brush*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Cool site, wet in places*

Unit No. 114

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Soft sedimentary formations*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Seeps; unstable slopes*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Minimum roads were necessary*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Expanding clays sloughing*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after construction, follow up*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness; expanding clays seal up*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Hot burns*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5-10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Mass movement*
Suggested Slash Disposal	*Leave the fines yard unmerchantable*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Steep; wet spots*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Windthrow, springs, slumps*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steep*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Slumps; rotational slipouts*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Slow runoff; avoid concentration*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep; brush & slash*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Crown closure*

Unit No. 311

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML-OL* / *OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Incompetent sedimentary and pyroclastics*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Unstable slope, springs & water course*
Method of Excavation	*Blade & ripping*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Minimum excavation, relief drains*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*None*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early and follow-up*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness; sloughing*
Suggestions for Cutbank Seeding	*Leave rough, seed & protect vegetation*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Hot burns and brush*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*4-8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Water quality; mass movement*
Suggested Slash Disposal	*Leave fines; remove unmerchantable*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Steep, narrow, cool and wet*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Seeps, springs, streams, with throw*
Considerations for Trail Improvements & Protection	*Bridges, drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Steep* *Close to streams*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Slumps & rotational slipouts*
Expected Mass Movement from Man's Activity	*Greatly increase*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse waters*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt,* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, brushy, stream*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*SMU, brush, heavy wildlife use*

Unit No. 124

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Good - basalts* *Poor - pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Small scarps and slumps, lateral flow*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Mod. high*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 feet rolling grade*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Amt. of soil; steepness*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early; short slopes*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness*
Suggestions for Cutbank Seeding	*Protect surface vegetation*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Ground disturbance*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe surface erosion*
Suggested Slash Disposal	*Yard unmerchantable, leave fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Steepness, windthrow*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable to to unstable*
Nature of Mass Movement	*Slumps along fault scarp*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Ground cover; avoid concentration*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt/clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Slash obstructions, tree regrowth*

Unit No. 128

ENGINEERING

Unified Class. ***Surface***	*GM-ML*
Subsoil	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Sidecast; surface drainage*
Method of Excavation	*Ripping*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil***	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	
Considerations for Cutbank Stability Problems	*Shallow cuts, rolling grade*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lacks soil, exposure*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch if necessary*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Soil depth, steepness, exposure*
Suggestions for Cutbank Seeding	*Use native seed, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shallow; limited moisture; exposure*
Suggested Tree Planting Species	*Pine, larch*
Waterbar Interval	*4-8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Concentrated runoff, site disturbance, over exposure*
Suggested Slash Disposal	*Leave on site and scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Water, rocky, steepness*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Steepness, rocky*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Soil creep*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff, protect surface cover*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep; water*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow site, moisture, limitations*

Unit No. 129

ENGINEERING

Unified Class. ***Surface***	*ML*
Subsoil	*GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Interflow materials*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Lateral flow, sidecast, rockfall*
Method of Excavation	*Blast & rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil***	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Surface water and percent harvest*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Cover, fines, steepness*
Suggestions for Road Waste and Fill Slope Seeding	*Cover with chips, fertilize*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Surface slough, steep, rocky subsoils*
Suggestions for Cutbank Seeding	*Leave rough, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Open slopes, cover and shade*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe runoff; log gouging and erosion*
Suggested Slash Disposal	*Lop & scatter; leave all fines on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Rock outcrops, steep*
Considerations for Trail Improvements & Protection	*Maintain*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Rocky slope*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Colluvial slump*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Minimize harvest slash to retard & slow runoff*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep forage & slash*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Rocky, steep, overstory*

Unit No. 312

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GM-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Extremely hard in places*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*S.M.U. water quality*
Method of Excavation	*Blast & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Deep colluvium, make minimum cuts*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*None*
Suggestions for Road Waste and Fill Slope Seeding	*Seed and mulch*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Slope*
Suggestions for Cutbank Seeding	*Roughen, seed & mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Cool air, drainage*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Water quality, S.M.U.*
Suggested Slash Disposal	*Y.U.M.*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep and narrow*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Moderate*
Limitations for Trails	*Wet spots, brush, stream crossings*
Considerations for Trail Improvements & Protection	*Gravel approaches, waterbars*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope & limited buffer*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Soil creep, rotational*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Brush wildlife cover*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Canopy closure*

Unit No. 130

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *CL-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Conditionally suited*
Suit. Bedrock for Roadrock	*Good, unsuited*
Limit of Bedrock for Roadrock	*Soft-lacustrine Hard-basalts*
Est. of Roadrock Thickness	*Thin - thick*
Consid. for Road Location & Construction	*Unstable area, clays, faults*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate to high*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 feet vertical; adequate drainage & culvert*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair - good*
Limitations to Road Waste and Fill Slope Seeding	*Cover, fertility*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Steepness, roughness, clay subsoils*
Suggestions for Cutbank Seeding	*Leave rough; seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Mod. to high*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Exposure, burning, compaction*
Suggested Tree Planting Species	*Douglas fir, larch*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Slumps, siltation, compaction*
Suggested Slash Disposal	*Tree length yard; yard unmerchantable*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Wet spots, slumps*
Treatment to Increase Suitability	*Water development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Wet spots; brush*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Very slow permeability*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slumps, deep seated faults*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B-C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, slash*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Alder takeover, closed canopy*

Unit No. 133

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML/GM* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Suited*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*High runoff, temperature extremes*
Method of Excavation	*Hard competent rock; blast & rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Retard overland flow*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Surface soils; thermal extremes*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize, organic cover, seed early*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Temperature extremes, shallow soils*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Harsh site, need over story, ground cover*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe runoff, channeling, slow recovery*
Suggested Slash Disposal	*Lob & scatter all slash parallel w/slope*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Fragile soils, shallow, easily detached*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Shallow rocky soils*
Considerations for Trail Improvements & Protection	*Avoid water concentrations*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Limited soil*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Minimal harvest; protect soil surface*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, water*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Harsh site; heavy wildlife use*

Unit No. 135

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *GM-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft breccias, incompetent pyroclastics*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Seeps, heavy subsoils*
Method of Excavation	*Ripping*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Roll grades; minimize cuts*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Short season, some clays*
Suggestions for Road Waste and Fill Slope Seeding	*Seed and lightly mulch*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Sloughing, smoothness*
Suggestions for Cutbank Seeding	*Leave rough; seed after work*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Cool positions; hot burns*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*15 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Lost regen. from burning, excessive site disturbance*
Suggested Slash Disposal	*Leave fines*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Cool, dense cover, water*
Treatment to Increase Suitability	*Site & water development*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*Gravel paths*
Suitability for Sewage Filter Field	*Good*
Soil Limitations to Sewage Filter Field	*Soil permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Maintain cover; avoid concentrated water*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slash Brush canopy*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Short season, canopy closure*

Unit No. 138

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *OL-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some breccia and pyroclastics*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Wet areas; heavy subsoils*
Method of Excavation	*Ripping*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Ground surface cover, roll grades*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Cool short season*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early; follow up*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Cool site*
Suggestions for Cutbank Seeding	*Roughen, mulch if necessary*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool site, frost heave*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5-10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Compaction, burning Complete micro-climate change*
Suggested Slash Disposal	*Leave fines*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Cool site, late season*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Snow; late season opening*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Slow permeabilities*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small slumps*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Good ground cover; disperse runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cool, late season*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Cool site, shorter growing season*

Unit No. 139

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*GM-ML* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Easily eroded; considerable runoff*
Method of Excavation	*Blast & rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Very stable*
Considerations for Cutbank Stability Problems	*N/A*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor - fair*
Limitations to Road Waste and Fill Slope Seeding	*Lack fines; shallow site, dry*
Suggestions for Road Waste and Fill Slope Seeding	*Cover*
Suitability of Cutbank Seeding	*Poor - fair*
Limit of Cutbank Seeding	*Shallow soils; exposure*
Suggestions for Cutbank Seeding	*Seed timbered sites*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Moisture, exposure, shallow site*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Accelerated erosion and scabland enlargement*
Suggested Slash Disposal	*Leave fines on site*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Rocky, narrow site*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Runoff concentration*
Considerations for Trail Improvements & Protection	*Waterbar*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Too shallow*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*Uplift or faults*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard runoff*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Low*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Wildlife travelways spring & fall*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Wildlife use, shallow soils*

Unit No. 313

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*MH* / *GW*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Fair if bottom is wide*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Too deep; Mixed deposits*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*High water, lateral waterflow, toe slopes unstable*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope ***Soil*** / Ratio ***Bedrock***	
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Keep less than 5 feet*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Surface runoff, cool site*
Suggestions for Road Waste and Fill Slope Seeding	*Seed soon after cons.*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Sloughing*
Suggestions for Cutbank Seeding	*Leave rough; seed after construction*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Brush invasion*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Stream siltation and stability; brush take-over*
Suggested Slash Disposal	*Yard whole tree; leave fines*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Width, Flood potential*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Poor*
Limitations for Trails	*Heavy brush, streams*
Considerations for Trail Improvements & Protection	*Bridges*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*S.M.U.*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small slipouts*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Good buffer; retard flow*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected ***Surface*** / Sediment ***Subsoil*** / Size	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Overstory, brush*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Overstory Closure & pollution*

Unit No. 141

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft pyroclastics and breccias*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Steep, sidecast, seeps, heavy snow*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope ***Soil*** / Ratio ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimal cuts; roll the grade*
Failure Potential on Waste & Fill	
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Short season; cold*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early, mulch if necessary*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness*
Suggestions for Cutbank Seeding	*Protect ground cover, minimal cuts*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool, short season; frost heave*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe exposure, burning, brush invasion*
Suggested Slash Disposal	*Leave on site for seedling protection*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Steepness*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Windthrow, very steep, heavy snow*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Soil creep*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse concentrated flows*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected ***Surface*** / Sediment ***Subsoil*** / Size	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Short season, cool*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Cool, canopy closure, brush*

Unit No. 149

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML-Rock* / *GM-GP*
Suit. as Topsoil Source	*Unsuited "Too steep"*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Suited*
Limit of Bedrock for Roadrock	*Steep, access problems, good timber site*
Est. of Roadrock Thickness	*Thin except toe slopes*
Consid. for Road Location & Construction	*Sidecast, rockfall, springs, steep drainages*
Method of Excavation	*Blast & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*Cuts less than 10 ft.*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Except 91 good*
Limitations to Road Waste and Fill Slope Seeding	*Exposure talus portions*
Suggestions for Road Waste and Fill Slope Seeding	*Early establishment*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steep, ravel*
Suggestions for Cutbank Seeding	*Good ground cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Exposure, excessive disturbance*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*15' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Gouging displacement disturbance*
Suggested Slash Disposal	*Cable YUM Lop & scatter fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep; rockfall hazard*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Rockfall, very steep in places*
Considerations for Trail Improvements & Protection	*Out sloped*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope rocky*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Toe slope slumps; talus & debris*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain cover*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B - D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep forage, slash*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Water, cull, rock outcrops*

Unit No. 314

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Access, some interflow*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Sidecast, stream, seeps, deep soil, soil creep*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Deep loose subsoils, some clay*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Steepness, surface ravel*
Suggestions for Road Waste and Fill Slope Seeding	*Leave rough; seed early*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steep*
Suggestions for Cutbank Seeding	*Shallow cuts, leave rough, follow up*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Good*
Limitations to Regeneration	*Brush*
Suggested Tree Planting Species	*Fir, larch, spruce*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Stream siltation; brush take-over on all clearcuts*
Suggested Slash Disposal	*YUM, leave fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness, narrow*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Streams, steepness, brush*
Considerations for Trail Improvements & Protection	*Small bridges & drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Closeness to streams*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slumps & slipouts; soil creep*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Veg. cover and retarded runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, heavy overstory, brush*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Overstory, stream pollution, brush*

Unit No. 158

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *CL-GC-GM*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Soft breccias and pyroclastics*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Frost, heavy snow, heavy subsoils*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Drainage and minimal cuts*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Short season; heavy snows*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early and mulch*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Short season; cool site*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Fair*
Limitations to Regeneration	*Burning, ground cover, frost*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Compaction, burning*
Suggested Slash Disposal	*Lop and scatter leaving the fines*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Cool fragile site, water*
Treatment to Increase Suitability	*Develop water*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Wet areas, snow, windthrow*
Considerations for Trail Improvements & Protection	*Good drainage*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Soil creep and small slipouts*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Good infiltration*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cool short growing season*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Heavy snow, big game use*

Unit No. 159

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *CL-GC-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft breccias*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Heavy runoff, heavy textured subsoils*
Method of Excavation	*Rip & blade*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Flat* / *Steep*
Probability of Cutbank Failure	*Low*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Soil material*
Suggestions for Road Waste and Fill Slope Seeding	*Seed and chip mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Shallow soil, rocky*
Suggestions for Cutbank Seeding	*Leave rough & mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow harsh site; exposure*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Fragile site, water*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Rocky scabland; heavy snow, soft*
Considerations for Trail Improvements & Protection	*Gravel paths*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Soil depth & extent*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Minimum disturbance, maintain good ground cover*
Water Yield Class	*I - III*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*B - D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Heavy use by wildlife*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow harsh site; short season, expos.*

Unit No. 315

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *ML-GM*
Suit. as Topsoil Source	*Unsuited because of position*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Soft interflows*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*High TM site; wet, springs, soft*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Moderate*
Considerations for Cutbank Stability Problems	*Roll grade; limit cuts*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*None*
Suggestions for Road Waste and Fill Slope Seeding	*Seed, mulch follow up*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*None*
Suggestions for Cutbank Seeding	*Leave rough; seed when work is done*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Good*
Limitations to Regeneration	*Brush, cool site*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Sedimentation, brush take over, compaction*
Suggested Slash Disposal	*Leave only small fines*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Wet, cool*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Large windfall, brush stream crossings*
Considerations for Trail Improvements & Protection	*Wet, stream crossings*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Close to streams*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Small slumps*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Limited disturbance; ground cover*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Low*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Brush, cool wet site, pollution*

Unit No. 351

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *CL*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Soft breccia & interflow*
Est. of Roadrock Thickness	*Very thick*
Consid. for Road Location & Construction	*Watertable; clay subsoils*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Flat* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Back slope subsoil, drainage*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Saturated soil*
Suggestions for Road Waste and Fill Slope Seeding	*Stabilizing mat*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Overland & subsoil flow*
Suggestions for Cutbank Seeding	*Stabilizing mat*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Brush, very wet*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance & displacement*
Suggested Slash Disposal	*Yard unmerchantable*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Water table; brush*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Unsuited*
Limitations for Trails	*Dense brush*
Considerations for Trail Improvements & Protection	*N/A*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*High water table*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Mud and debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Drainage*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Brush*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Dense brush & wildlife use*

Unit No. 163

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft breccias*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Seeps, heavy snow, runoff*
Method of Excavation	*Ripping*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Gentle cuts; rolling grade*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Lacking fines in places*
Suggestions for Road Waste and Fill Slope Seeding	*Seed and mulch*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Short season; sloughing*
Suggestions for Cutbank Seeding	*Leave rough, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Frost pockets; hot burning*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Disturbance of soil and residual stand*
Suggested Slash Disposal	*Leave all fines; spot pile fir type*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Cool, water, late season*
Treatment to Increase Suitability	*Water development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Windthrow; dense lodgepole stands*
Considerations for Trail Improvements & Protection	*Thinning, stocking*
Suitability for Sewage Filter Field	*Good*
Soil Limitations to Sewage Filter Field	*Some restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse winter runoff*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cool, short season*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Canopy closure, cool short season*

Unit No. 165

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*MI* / *CL-GM-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft breccia and pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Heavy textured subsoils, winter runoff*
Method of Excavation	*Ripping*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Avoid seeps and deep cuts*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Some clays, amount of fines*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early and follow up*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Smoothness*
Suggestions for Cutbank Seeding	*Roughen and follow up seeding*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Compaction, frost*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Over exposure to frost, residual stand*
Suggested Slash Disposal	*Leave slash for regeneration*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Water, cool site, fragile vegetation*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Windthrow, dense stands, muddy seeps*
Considerations for Trail Improvements & Protection	*Bridges, thinning*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Somewhat restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Rotational slipouts*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Divert runoff*
Water Yield Class	*I-II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage; brush*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Brush, cool site, short season*

Unit No. 166

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	SM-ML GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Some soft pyroclastics
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Runoff from roads
Method of Excavation	Rip & blade
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Flat Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Protect ground cover
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Soil depth, cover, rocky
Suggestions for Road Waste and Fill Slope Seeding	Seed, mulch, fertilize, protect
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Shallow soils
Suggestions for Cutbank Seeding	Leave rough, seed, mulch, fertilize

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Moderate
Limitations to Regeneration	Shade, exposure, moisture retention
Suggested Tree Planting Species	Ponderosa pine, Douglas fir
Waterbar Interval	5-10' vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Severe ground disturbance & exposure
Suggested Slash Disposal	Lop & scatter; crush

RECREATION

Soil Suitability for Recreational Development	Low
Limitations for Recreational Development	Water supplies; fragile vegetation
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	High
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	Windthrow; dense lodgepole stands
Considerations for Trail Improvements & Protection	Waterbars, thinning
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Shallow soil depth

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	None
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	High
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Scatter slash; retard runoff
Water Yield Class	II
Bedrock Hydrologic Characteristics	I
Hydrologic Group	B - C
Sedimentation Yield Potential	Moderate
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Dense, plant species
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Good
Limitations to Range Seeding	Some shallow areas

Unit No. 173

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	ML-GM GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Some soft interflow materials
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Disperse flows and winter runoff
Method of Excavation	Ripping
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Moderate Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Shallow cuts
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Exposed site; lack of fines
Suggestions for Road Waste and Fill Slope Seeding	Seed early and mulch
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Shallow areas, frost heave
Suggestions for Cutbank Seeding	Leave rough and mulch

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Moderate
Limitations to Regeneration	Ground cover and shade
Suggested Tree Planting Species	Fir, larch
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Disturbance, slash burning, exposure
Suggested Slash Disposal	Lop and scatter, leave on site

RECREATION

Soil Suitability for Recreational Development	Low
Limitations for Recreational Development	Fragile site, water unavailable
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	High
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	Dense timber
Considerations for Trail Improvements & Protection	Water concentrations
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Discontinuous soil Mantle

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	None
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Moderate
Subsoil Erosion Potential	Low
Suggestions for Controlling Subsoil Erosion	Retard runoff
Water Yield Class	III - I
Bedrock Hydrologic Characteristics	I
Hydrologic Group	B - D
Sedimentation Yield Potential	Low
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Cool, somewhat shallow
Susceptibility to Soil Compaction	High
Susceptibility to Soil Displacement	Moderate
Potential for Range Improvements through Seeding	Moderate
Limitations to Range Seeding	Rotation use on harsh sites, shallow areas

Unit No. 174

ENGINEERING

Unified Class. ***Surface***	*GM-ML*
Subsoil	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Scoria and breccia May be soft*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Shallow soils with overland flow potential*
Method of Excavation	*Ripping*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil***	*Moderate*
Bedrock	*Steep,*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Limited soil material*
Suggestions for Road Waste and Fill Slope Seeding	*Leave as is*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Shallow, limited moisture*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Moisture storage & rooting depth*
Suggested Tree Planting Species	*Larch, pine*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance, overland flow, cover elimination*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rocky, harsh site*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Rocky & exposed*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Shallow and discontinuous soil*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchange*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Cover and disperse runoff*
Water Yield Class	*III - II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Harsh site, spring forage*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Poor site of shallow soil, limited moisture*

Unit No. 180

ENGINEERING

Unified Class. ***Surface***	*ML-OL*
Subsoil	*OL-GC-OH*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Soft breccia and interflow materials*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Unstable areas, seeps, plastic clays*
Method of Excavation	*Rip & blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil***	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize cutbanks, roll the grade*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Plastic clays*
Suggestions for Road Waste and Fill Slope Seeding	*Seed, mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Sloughing, expanding clays, slope*
Suggestions for Cutbank Seeding	*Protect ground cover and leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Good*
Limitations to Regeneration	*Micro-climate*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Increased instability, hot burning, some compaction*
Suggested Slash Disposal	*Yard unmerchantable scatter fines*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Wet, unstable, cool*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Springs, wet and soft areas*
Considerations for Trail Improvements & Protection	*Bridges, drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Clay subsoils; watertable*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slumps, rotational Slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Limit exposure*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slash, seeps, brush*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Brush invasion, wet bog areas*

Unit No. 189

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM-ML* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some scoria & breccia*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Must retard and disperse surface runoff*
Method of Excavation	*Blast & ripping*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Retard overland flow*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Lack of soil, exposure*
Suggestions for Road Waste and Fill Slope Seeding	*Organic cover; seed early*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Soil depth, exposure, roughness*
Suggestions for Cutbank Seeding	*Leave rough, cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Exposure, cool & dry site, heavy snow*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Severe to critical*
Type of Damage	*Severe gully erosion, lack of regeneration, lost fertility*
Suggested Slash Disposal	*Lob & scatter all fines*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Fragile site, water development, access*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Windthrow*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Soils too shallow*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Faults*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Retard surface runoff, maintain cover*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, overstory - good cover*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Too high, heavy big game use*

Unit No. 191

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GM-OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Incompetent breccia and pyroclastics*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Unstable position, very wet, seeps*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Roll grade if possible, minimize cuts*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Heavy precipitation, slope wash, slope*
Suggestions for Road Waste and Fill Slope Seeding	*Seed heavy and follow up*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Slope, sloughing, expanding clay*
Suggestions for Cutbank Seeding	*Leave rough, add nitrogen fixers*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool and moist site, deep snow*
Suggested Tree Planting Species	*Supplement reproduction with fir, larch*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Increase instability, displacement*
Suggested Slash Disposal	*Leave fines; yard unmerchantable*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep and unstable*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Brush, springs, unstable areas*
Considerations for Trail Improvements & Protection	*Drainage, brush removal*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Slumps, mantle creep*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse snow melt*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Brush, late snow, wet, steep*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Brush, cold site and short season*

Unit No. 194

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Very hard basalts; pyroclastic interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Sidecast, steep; heavy snow*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Roll grade, minimize cut*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Slope, fines*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after construction*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness, ravel*
Suggestions for Cutbank Seeding	*Maintain ground cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Brush, burning, cool site, heavy snow*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Burning, brush take over, gully erosion*
Suggested Slash Disposal	*Yard unmerchantable lop & scatter fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, cool, brush*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Windthrow, steepness, heavy snow*
Considerations for Trail Improvements & Protection	*Clearing, good drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Mantle creep, slumps*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Reduce concentrated flows*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Snow, very steep, brush*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Steepness, brush*

Unit No. 199

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GW* / *GM-GW*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Very hard basalts*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, rockfall, sidecast*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Rockfall*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Rocky*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Thin soils*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Very steep & rocky*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement; root removal & slope stability*
Suggested Slash Disposal	*Yard unmerchantable*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Steep bluffs*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Very steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Rockfall, debris & snow slider*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Maintain cover & root systems*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Rocky, too steep*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Steep, rock outcrops*

Unit No. 201

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some extremely hard basalts*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Steep, sidecast, drainage, rockfall*
Method of Excavation	*Blade, rip & blasting*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Roll grade, avoid talus slopes*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Steep, amount of soil, rocky*
Suggestions for Road Waste and Fill Slope Seeding	*Seed soil areas*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness, ravel, shallow soil*
Suggestions for Cutbank Seeding	*Leave rough for seed catch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Limited moisture, cool, snow, wildlife*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement, ground cover, disturbance, lost infiltration*
Suggested Slash Disposal	*Leave all fines on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Slope, rockfall hazard*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steepness, rockfall & rock outcrops*
Considerations for Trail Improvements & Protection	*Well drained*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Rock & debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse flows*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B - D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slope, rock outcrops*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Short season, steep*

Unit No. 209

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM-ML* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Ravel, soft interflow rock*
Est. of Roadrock Thickness	*Very thin*
Consid. for Road Location & Construction	*Ravel, sidecast hazard*
Method of Excavation	*Rip & blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Protect surface vegetation*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Exposure, lack fines*
Suggestions for Road Waste and Fill Slope Seeding	*Seed soil areas*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, exposure, thin soil mantle*
Suggestions for Cutbank Seeding	*Leave rough, seed early, roll the grade*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Moisture storage; microclimate*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Ground disturbance; displacement*
Suggested Slash Disposal	*Lop & scatter leaving fines on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Shallow soil, steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep, rocky, rockfall hazard*
Considerations for Trail Improvements & Protection	*Well drained, outsloped*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Talus & debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain ground cover, disperse runoff*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Moisture*

Unit No. 211

ENGINEERING

Unified Class. ***Surface***	GM-ML
Subsoil	GM-OH-GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Fair
Limit of Bedrock for Roadrock	Incompetent pyroclastics and lacustrine
Est. of Roadrock Thickness	Thick
Consid. for Road Location & Construction	Unstable, springs, scarps
Method of Excavation	Blade & rip
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil***	Steep
Bedrock	Steep
Probability of Cutbank Failure	Unstable
Considerations for Cutbank Stability Problems	Rolling grade, sidecast, narrow roads
Failure Potential on Waste & Fill	High
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	
Limitations to Road Waste and Fill Slope Seeding	Some non-soil areas
Suggestions for Road Waste and Fill Slope Seeding	Seed right after construction
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Sloughing, ravel & steepness
Suggestions for Cutbank Seeding	Leave rough & follow-up; N-fixers

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Moderate
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Moderate
Limitations to Regeneration	Spotty soil, burning, cool site
Suggested Tree Planting Species	Fir, larch
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Displacement, increase instability, cover disturbance
Suggested Slash Disposal	Lop & scatter tops, leave fines on site

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Steep, unstable & rocky in places
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Low
Susceptibility to Dust	Low
Susceptibility to Muddiness	High
Trail Suitability	Fair
Limitations for Trails	Brush, soft wet areas unstable slopes
Considerations for Trail Improvements & Protection	Drainage, gravel paths
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Slope

EROSION AND HYDROLOGY

Natural Stability	Unstable
Nature of Mass Movement	Rotational slipouts; debris & talus slides
Expected Mass Movement from Man's Activity	Greatly increased
Surface Soil Erosion Potential	High
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Maintain cover; disperse flows
Water Yield Class	I - III
Bedrock Hydrologic Characteristics	I II
Hydrologic Group	B - D
Sedimentation Yield Potential	Low-High
Expected Sediment Size ***Surface***	Silt
Subsoil	Silt, clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Steepness, brush, rocky
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Fair
Limitations to Range Seeding	Slope, brush

Unit No. 291

ENGINEERING

Unified Class. ***Surface***	GM
Subsoil	GM-GP
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Soft interflow materials
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	100% slope in places; rock fall hazard
Method of Excavation	Blade, rip & blast
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil***	Steep
Bedrock	Steep
Probability of Cutbank Failure	Unstable
Considerations for Cutbank Stability Problems	No roads
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Mostly rock
Suggestions for Road Waste and Fill Slope Seeding	None
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Mostly rock, steep
Suggestions for Cutbank Seeding	Seed only soil areas

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Marginal to NCFL; low
Limitations to Regeneration	Harsh site, very shallow and rocky
Suggested Tree Planting Species	Fir, larch
Waterbar Interval	8 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Increased slope instability, severe disturbance
Suggested Slash Disposal	Leave scattered, perpendicular to slope

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Too steep; rockfall hazard
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Low
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Poor
Limitations for Trails	Rockfall hazard; steep
Considerations for Trail Improvements & Protection	None
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Too steep

EROSION AND HYDROLOGY

Natural Stability	Moderately stable
Nature of Mass Movement	Debris & talus slides; rockfall
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Low
Suggestions for Controlling Subsoil Erosion	Maintain cover
Water Yield Class	III
Bedrock Hydrologic Characteristics	I
Hydrologic Group	D
Sedimentation Yield Potential	Low
Expected Sediment Size ***Surface***	Silt
Subsoil	Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Too steep & rocky
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Poor
Limitations to Range Seeding	Very shallow & very rocky soil

Unit No. 212

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *ML-GM*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Inclusion of soft breccia & pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Good timber site, dust, clay subsoils*
Method of Excavation	*Blade, rip; blast subsurface*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Minimal cuts on a rolling grade*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good - fair*
Limitations to Road Waste and Fill Slope Seeding	*Shallow areas*
Suggestions for Road Waste and Fill Slope Seeding	*Use road slash*
Suitability of Cutbank Seeding	*Fair - good*
Limit of Cutbank Seeding	*Exposure, frost*
Suggestions for Cutbank Seeding	*Use chipped slash as cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Seed bed prep., cover*
Suggested Tree Planting Species	*Pine, fir, larch*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Site reduction, high runoff, hot burns*
Suggested Slash Disposal	*Some cool burn; lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Good*
Limitations for Recreational Development	*Water*
Treatment to Increase Suitability	*Slash clean-up*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Rocky scabland; inclusions*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Steepness, some shallow areas*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small slipouts*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Use slash on shallow soils*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Brush, slash forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Good*
Limitations to Range Seeding	*Crown closure*

Unit No. 213

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML-GM* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Competent, some soft interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Good timber site; some deep soil & wet spots*
Method of Excavation	*Rip surface - blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Flat* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Check surface runoff*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Fines, cover*
Suggestions for Road Waste and Fill Slope Seeding	*Use slash or chips to cover*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Shallow areas poor*
Suggestions for Cutbank Seeding	*Leave rough; cover shallow area*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shallow soil areas, soil moisture*
Suggested Tree Planting Species	*Larch, Douglas fir, Ponderosa pine*
Waterbar Interval	*15 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Enlarge scabland or shallow areas, hot burn*
Suggested Slash Disposal	*Cool burn; scatter slash on shallow area*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Slash, scabland, water*
Treatment to Increase Suitability	*Water development*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Good*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*Protect scabland units*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Irregular depth; restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small slipouts*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Ground cover; root stability*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*A - C*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Brush, slash, rocky*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Scabland inclusion*

Unit No. 321

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*SM* / *ML-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mixed materials; pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Stream, deep overburden*
Method of Excavation	*Blade & rip surface material, then blast*
Cutbank & Ditch Erosion Potential	*Moderate to high*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Check surface runoff*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Amount of ravel & length*
Suggestions for Road Waste and Fill Slope Seeding	*Seed as early as possible*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Height & ravel, frost action*
Suggestions for Cutbank Seeding	*Leave rough, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Brush*
Suggested Tree Planting Species	*Douglas fir, larch Ponderosa pine*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Loss of water quality, stream bank erosion*
Suggested Slash Disposal	*Leave fines, yard entire tree*

RECREATION

Soil Suitability for Recreational Development	*Good*
Limitations for Recreational Development	*Streams, some areas quite small*
Treatment to Increase Suitability	*Water development; stream crossings*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Heavy brush, soft wet areas*
Considerations for Trail Improvements & Protection	*Deadfall*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Stream; field size limited*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Side slope failure*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Retard runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*A - B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Channel stability, water quality*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Brush, avoid concentrations*

Unit No. 224

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*SM-GM* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited; some talus slopes*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Over burden; good competent rock*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Deep talus slopes; rockfall, sidecast*
Method of Excavation	*Blade, rip surface*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Moderate stable*
Considerations for Cutbank Stability Problems	*These are steep slopes; deep talus, exposure*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Fines, exposure, length of fill*
Suggestions for Road Waste and Fill Slope Seeding	*Leave rough; seed best areas*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steep, ravel, frost action*
Suggestions for Cutbank Seeding	*Roughen, seed after disturbance*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate to high*
Potential for Regeneration	*Low to moderate*
Limitations to Regeneration	*Shade, exposure, grass, seed*
Suggested Tree Planting Species	*Pine, larch, Douglas fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe runoff, site exposure*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness, water development*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Fair*
Limitations for Trails	*Steepness, rockfall, windthrow*
Considerations for Trail Improvements & Protection	*Out sloped*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steepness*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Talus slide*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain cover; disperse flows*
Water Yield Class	*III - II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Shallow pinegrass*

Unit No. 229

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML or Rock* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some soft pyroclastic or tuffaceous material*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Gen. very steep, rock outcrops, sidecast*
Method of Excavation	*Mostly rip & blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Water intercept; steep slopes*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Heavy snow pack, steep*
Suggestions for Road Waste and Fill Slope Seeding	*Keep roads out or to very minimum*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Too steep, slope wash, rock outcrops*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Steep slopes, rock outcrops*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Road impact, accelerated erosion thru timbered strips*
Suggested Slash Disposal	*Lob & scatter (too steep)*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep, rockfall hazard*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Rockfall hazard, very steep*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Talus & debris Slipouts*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Critical*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Need surface vegetation*
Water Yield Class	*I - III*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*B - D*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Too steep*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Rock outcrops steepness*

Unit No. 322

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*SM-GM* / *ML-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mixed basalts & interflow materials*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Steep, rockfall talus slopes*
Method of Excavation	*Deep overburden, blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Deep, loose slopes; keep cutbanks to minimum*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Steepness, surface erosion*
Suggestions for Road Waste and Fill Slope Seeding	*Cover with chips*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Ravel, exposure; surface runoff*
Suggestions for Cutbank Seeding	*Cover if possible*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Brush, overstocking*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Steep slopes, severe runoff, siltation, stream cutting*
Suggested Slash Disposal	*Lop & scatter, hand pile concentrations*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep & narrow, water quality*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep, brush, deadfall, rockfall*
Considerations for Trail Improvements & Protection	*Drainage, stream crossings*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too close to stream*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slipouts, slumps, talus slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Cover & root masses*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*A - B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Too steep & narrow*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Access, brush, water quality*

Unit No. 231

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft pyroclastics & breccias*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Clay subsoils, surface drainage*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Very stable*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Gravel, high expanding clays*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after opening when moist*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Little or no cutbanks*
Suggestions for Cutbank Seeding	*Maintain ground vegetation*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shallow sites, shade, ground cover*
Suggested Tree Planting Species	*Pine, larch*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Compaction, enlarge the scabland*
Suggested Slash Disposal	*Leave fines, hand pile concentrations*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Water availability*
Treatment to Increase Suitability	*Develop springs*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Discontinuous soil mantle*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Low*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Ground cover; maintain some slash*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Some shallow sites; limited moisture*

Unit No. 233

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM-GC* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Soft organic clays, surface water*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Very stable*
Considerations for Cutbank Stability Problems	*Maintain good ground cover*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Gravelly or heavy clay*
Suggestions for Road Waste and Fill Slope Seeding	*Seed when moist*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Shallow soils*
Suggestions for Cutbank Seeding	*Maintain ground cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow harsh sites, meadow soils*
Suggested Tree Planting Species	*Pine, larch*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe compaction & ground cover disturbance*
Suggested Slash Disposal	*Leave fines; lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Fragile site, rocky, dry*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Soft, heavy clays in places*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Low*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Avoid water concentrations*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, early big game use*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Limited moisture storage*

Unit No. 234

ENGINEERING

Unified Class. ***Surface***	*SM-GM*
Subsoil	*ML-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some clay, pyroclastics*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Some soft materials; runoff from scabs*
Method of Excavation	*Rip surface & some blasting*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope ***Soil***	*Flat*
Ratio ***Bedrock***	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Check overland runoff*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Shade, cover, runoff*
Suggestions for Road Waste and Fill Slope Seeding	*Chipped slash*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Shallow soils, exposure, soil moisture*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade, pinegrass, soil depth & moisture*
Suggested Tree Planting Species	*Ponderosa pine*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Enlarged scabland, regeneration destruction, compaction*
Suggested Slash Disposal	*Lop & scatter; leave fines on site*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Water supply, rock*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Rocky, hot*
Considerations for Trail Improvements & Protection	*Poor*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Soils too shallow*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Cover to retard runoff*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*Moderate*
Expected ***Surface*** Sediment ***Subsoil*** Size	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slash, forage*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Rotation system on shallow scabland*

Unit No. 323

ENGINEERING

Unified Class. ***Surface***	*ML-GM*
Subsoil	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Sidecast, culverts, sediment production*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope ***Soil***	*Moderate*
Ratio ***Bedrock***	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 ft.*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Amount of soil*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch cover*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Some shallow areas*
Suggestions for Cutbank Seeding	*Leave rough, mulch cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Competition shade, frost heave*
Suggested Tree Planting Species	*Ponderosa pine*
Waterbar Interval	*6-8' vertical*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Within SMU siltation, surface erosion*
Suggested Slash Disposal	*Whole tree yard; lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Narrow, high water, water development*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Windthrow, seasonal high water*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Shallow, S.M.U.*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Slipouts*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Retard runoff; maintain good ground cover*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*High*
Expected ***Surface*** Sediment ***Subsoil*** Size	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Creek bottom, access*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High (stream bank)*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Access, water quality*

Unit No. 242

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	GM / GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Soft pyroclastics
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Sidecast, ravel
Method of Excavation	Blade, rip, blast
Cutbank & Ditch Erosion Potential	moderate
Susceptibility to Cutbank Sloughing & Raveling	Moderate
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	Steep / Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Roll grade; avoid talus or debris areas
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Soil material, moisture
Suggestions for Road Waste and Fill Slope Seeding	Chip mulch if necessary
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Slope, thin soil
Suggestions for Cutbank Seeding	Leave rough; seed soil horizons

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	High
Potential for Regeneration	Moderate
Limitations to Regeneration	Moisture, exposure, effect. rooting depth
Suggested Tree Planting Species	Fir, pine, larch
Waterbar Interval	6 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Disturbance & displacement, increase exposure, burning
Suggested Slash Disposal	Lop & scatter, hand pile concentrations

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Water, too steep
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	High
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	Rocky slopes
Considerations for Trail Improvements & Protection	Drainage
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Too steep

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Talus or debris slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Low
Suggestions for Controlling Subsoil Erosion	Minimize cuts
Water Yield Class	II
Bedrock Hydrologic Characteristics	I
Hydrologic Group	B
Sedimentation Yield Potential	Moderate
Expected Sediment Size ***Surface*** / ***Subsoil***	Silt / Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Slash; steepness
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	High
Limitations to Range Seeding	Some shallow sites, slope

Unit No. 245

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	SM-GM / GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Some interflow, clay pyroclastics
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Deep debris, rockfall, talus slides
Method of Excavation	Blade & rip surface, blasting subsurface
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	Moderate
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	Moderate / Steep
Probability of Cutbank Failure	Mod. stable
Considerations for Cutbank Stability Problems	Deep, loose debris; maintain root stability
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Fines, exposure, surface runoff (rills)
Suggestions for Road Waste and Fill Slope Seeding	Seed when moist; cover & protect
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Ravel, shallow soils, generally steep
Suggestions for Cutbank Seeding	Maintain surface veg. above the cut

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	High
Potential for Regeneration	Low
Limitations to Regeneration	Dry site, pinegrass, shade, some scaring
Suggested Tree Planting Species	Ponderosa pine
Waterbar Interval	5' vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Accelerated erosion, poor regeneration
Suggested Slash Disposal	Leave fines, lop & scatter

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Steepness, no water, rocky outcrops
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	Moderate
Susceptibility to Muddiness	Low
Trail Suitability	Moderate
Limitations for Trails	Rockfall, soil displacement
Considerations for Trail Improvements & Protection	Some hand construction
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Slope

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Talus slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Maintain cover; retard runoff
Water Yield Class	II - III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	B
Sedimentation Yield Potential	Moderate
Expected Sediment Size ***Surface*** / ***Subsoil***	Silt / Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Steepness
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	Moderate
Potential for Range Improvements through Seeding	Moderate
Limitations to Range Seeding	Shallow areas, wildlife competition

Unit No. 249

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM-GP* / *GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, rock bluffs, sidecast*
Method of Excavation	*Blast, rip & blade*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Roll the grade with minimum road*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Soil material, moisture*
Suggestions for Road Waste and Fill Slope Seeding	*Stabilize toe slopes*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Thin soil mantle, moisture*
Suggestions for Cutbank Seeding	*Minimize cut bank*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Harsh site, hot & dry*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance & accelerated erosion, limited regeneration*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rockfall, steepness*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*100% slope; rockfall*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Rockfall, talus slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard flows*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B - D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Rocky, steepness*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Very steep, shallow soils, moisture*

Unit No. 324

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM-ML* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Rockfall, aquifers, sidecast*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 ft.*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Soils, cover, slope*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, cover*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steep; thin soils*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Fair*
Limitations to Regeneration	*Exposure, moisture, competition*
Suggested Tree Planting Species	*Ponderosa pine*
Waterbar Interval	*4 - 8' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe dislodgement and displacement*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Fair*
Limitations for Trails	*Steep and rocky*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Talus & debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain veg. cover*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Moderate - high*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness, rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Steep, shallow soils*

Unit No. 441

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	ML-GP GM-GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Poor
Limit of Bedrock for Roadrock	Breaks down easily; round boulders
Est. of Roadrock Thickness	Thick
Consid. for Road Location & Construction	Rounded materials, buried subsoils, seeps
Method of Excavation	Blast & rip
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Steep Steep
Probability of Cutbank Failure	Moderately stable
Considerations for Cutbank Stability Problems	Maintain ground cover, roll grade, shallow cut
Failure Potential on Waste & Fill	High
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Sandy soils, high elevation, wildlife use
Suggestions for Road Waste and Fill Slope Seeding	Seed and mulch
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Ravel, cold site
Suggestions for Cutbank Seeding	Maintain ground cover, mulch

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Low
Limitations to Regeneration	Sub-alpine, cold
Suggested Tree Planting Species	Fir
Waterbar Interval	10 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Ground disturbance, poor regeneration
Suggested Slash Disposal	Leave fines on site

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Short season, fragile site
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Low
Susceptibility to Muddiness	Moderate
Trail Suitability	Poor
Limitations for Trails	Heavy snow, late season opening
Considerations for Trail Improvements & Protection	Drainage
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Shallow soil, frost, restrict. permeability

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Snow & Debris slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Disperse runoff
Water Yield Class	I - II
Bedrock Hydrologic Characteristics	III
Hydrologic Group	A - D
Sedimentation Yield Potential	Moderate
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Silt, clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Cold, wildlife summer range
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Cold, short season, heavy wildlife use

Unit No. 419

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	ML GM-OH-GC
Suit. as Topsoil Source	Suited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Suited
Suit. Bedrock for Roadrock	Poor
Limit of Bedrock for Roadrock	Breaks down easily; round cobble, stone, boulders
Est. of Roadrock Thickness	Thick
Consid. for Road Location & Construction	Seeps, glacial drift, heavy clay subsoil
Method of Excavation	Blade & rip
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	Moderate
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Steep Steep
Probability of Cutbank Failure	Mod. stable
Considerations for Cutbank Stability Problems	Roll the grade; maintain ground cover
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Good
Limitations to Road Waste and Fill Slope Seeding	Rainfall impact, snow
Suggestions for Road Waste and Fill Slope Seeding	Use chips as mulch
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Slope, ravel
Suggestions for Cutbank Seeding	Leave rough; seed and follow-up

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Moderate
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Fair
Limitations to Regeneration	Cool air, drainage
Suggested Tree Planting Species	Fir, larch
Waterbar Interval	8 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Burning, siltation, road failures
Suggested Slash Disposal	Pile concentrations; leave fines on site

RECREATION

Soil Suitability for Recreational Development	Moderate
Limitations for Recreational Development	Cool, wet, compactability
Treatment to Increase Suitability	Develop water, gravel paths & roads
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	High
Susceptibility to Muddiness	High
Trail Suitability	Well
Limitations for Trails	None
Considerations for Trail Improvements & Protection	Clearing
Suitability for Sewage Filter Field	Moderate
Soil Limitations to Sewage Filter Field	Proximity to streams, restricted permeabil.

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Snow & debris slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Moderate
Subsoil Erosion Potential	Low
Suggestions for Controlling Subsoil Erosion	Retard surface runoff
Water Yield Class	I
Bedrock Hydrologic Characteristics	II - III
Hydrologic Group	A - C
Sedimentation Yield Potential	High
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Silt, clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Cool, wet, slash, canopy closure
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	High
Limitations to Range Seeding	Canopy, short season, wildlife cover

Unit No. 449

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Breaks down readily; rounded stones*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Drainage into water courses, springs*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*Minimize cuts; roll the grade*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Rainfall impact*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after disturbing*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Ravel, frost, wildlife*
Suggestions for Cutbank Seeding	*Roughen, leave steep, protect*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool air, drainage, ground cover*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Siltation, burning, limited regeneration*
Suggested Slash Disposal	*Leave fines, pile concentrations*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Cool, wet, water*
Treatment to Increase Suitability	*Water development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Springs, windthrow*
Considerations for Trail Improvements & Protection	*Crossings, clearing*
Suitability for Sewage Filter Field	*Well*
Soil Limitations to Sewage Filter Field	*Proximity to streams*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Slipouts around wet areas*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain good ground cover*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II - III*
Hydrologic Group	*A - B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cool, windthrow, closed canopy*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Wildlife use, cool site*

Unit No. 472

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GM-OH-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Incompetent material Rounded boulders*
Est. of Roadrock Thickness	*Very thick*
Consid. for Road Location & Construction	*Unstable, very soft & wet*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Roll grade on minimum road - deep subgrade*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Rain impact, expanding clays*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, seed heavy*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Slope, sloughing sealed clays*
Suggestions for Cutbank Seeding	*Roughen, seed heavily*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Cool air, drainage, burning*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Increased instability, water quality*
Suggested Slash Disposal	*Lop and scatter*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Wet, unstable, cool*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Soft wet areas; windthrow*
Considerations for Trail Improvements & Protection	*Drainage, clearing*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Restricted; soil permeability*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Slumps, rotational slipouts*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse flows*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Thermal cover*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Wildlife use; windthrow*

Unit No. 427

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GP-OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mod. competent*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Loose material, clay lenses, subsoil moisture*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Minimum road, roll the grade*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Expanding clay, slope*
Suggestions for Road Waste and Fill Slope Seeding	*Heavily seed, mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, sloughing, steepness*
Suggestions for Cutbank Seeding	*Leave steep, protect ground vegetation*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool air, drainage, high elevation*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement, increased instability*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Slope; cold site, late season only*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Snow pack, windthrow*
Considerations for Trail Improvements & Protection	*Clearing*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Rotational slumps; old landslide deposits*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Limit exposure*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A - B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cold, snow, steep*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Late season, thermal cover*

Unit No. 451

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GW-GP-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mod. competent*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Heavy snow, springs, round colluvium*
Method of Excavation	*Rip & blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimum cuts; roll the grade*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Season, snow impact*
Suggestions for Road Waste and Fill Slope Seeding	*Seed heavily early as possible*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Sloughing, steepness*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*High elevation, slow growth, cold*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance & displacement, burning*
Suggested Slash Disposal	*Leave fines on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Short season, heavy snow, steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Heavy snow, windthrow*
Considerations for Trail Improvements & Protection	*Drainage, clearing*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Limit exposure*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cold, snow, thermal cover*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Wildlife use, short snowfree season*

Unit No. 437

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	ML-GM / GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Fair
Limit of Bedrock for Roadrock	Moderately competent, rounded drift material
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Steep, sidecast, unconsolidated colluvium
Method of Excavation	Rip
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	Steep / Steep
Probability of Cutbank Failure	Moderately stable
Considerations for Cutbank Stability Problems	Minimum exposure
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Droughty
Suggestions for Road Waste and Fill Slope Seeding	Mulch to retain moisture
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Droughty, shallow soils, ravel
Suggestions for Cutbank Seeding	Leave rough

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	High
Potential for Regeneration	Moderate
Limitations to Regeneration	Moisture, exposure
Suggested Tree Planting Species	Fir, larch
Waterbar Interval	5 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Disturbance, use of fire, over exposure
Suggested Slash Disposal	Lop & scatter, hand pile concentrations

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Steep
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	Ravel, windthrow
Considerations for Trail Improvements & Protection	None
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Too steep

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Mantle creep; debris slides
Expected Mass Movement from Man's Activity	Increase
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Retard runoff, disperse flows
Water Yield Class	II
Bedrock Hydrologic Characteristics	II - III
Hydrologic Group	B
Sedimentation Yield Potential	Moderate
Expected Sediment Size ***Surface*** / ***Subsoil***	Silt / Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Steepness, slash windthrow
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Moderate
Limitations to Range Seeding	Big game use, droughty

Unit No. 346

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	ML-GM / GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Fair
Limit of Bedrock for Roadrock	Mod. competent
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Overland flow, run-off, stream channel
Method of Excavation	Blade & rip
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	Moderate
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	Steep / Steep
Probability of Cutbank Failure	Low
Considerations for Cutbank Stability Problems	Need good ground cover
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Cool, overland flow
Suggestions for Road Waste and Fill Slope Seeding	Seed heavily, N-fixers & early
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Steep, shallow soils
Suggestions for Cutbank Seeding	Leave rough

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Low
Limitations to Regeneration	Shallow, cold soils & cold air drainage
Suggested Tree Planting Species	Larch & fir
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	Severe
Type of Damage	Severe soil disturbance & resulting erosion
Suggested Slash Disposal	Leave all slash on site

RECREATION

Soil Suitability for Recreational Development	Fair
Limitations for Recreational Development	Fragile, cool, windthrow
Treatment to Increase Suitability	Water, site development
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Moderate
Susceptibility to Muddiness	Moderate
Trail Suitability	Well
Limitations for Trails	Erosion in trails, windthrow, lodgepole
Considerations for Trail Improvements & Protection	Waterbar, clearing
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Soil too shallow next to meadows

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Toe slope slipouts
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Maintain good ground cover
Water Yield Class	III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	D
Sedimentation Yield Potential	High
Expected Sediment Size ***Surface*** / ***Subsoil***	Silt / Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Forage, shallow cold site
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Poor
Limitations to Range Seeding	Trampling, water quality

Unit No. 463

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mod. competent; some soft interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Springs, culvert placement*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Flat* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Avoid the seeps; keep less than 10 ft.*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Fines, cover*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Soil, cover, frost heave*
Suggestions for Cutbank Seeding	*Leave rough, mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow harsh site, frost heave*
Suggested Tree Planting Species	*Lodgepole, fir*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe site, disturbance & erosion*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Soils, shade, water, access*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Rocks, windthrow*
Considerations for Trail Improvements & Protection	*Clearing*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Shallow soil*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff good ground cover*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Rocky forage, windthrow*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Shallow poor site*

Unit No. 466

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mod. competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Subsoil clay, lateral subsoil moisture*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Keep water off cut face*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Moisture*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Slope, ravel, frost*
Suggestions for Cutbank Seeding	*Leave rough, mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Fair*
Limitations to Regeneration	*Grass, frost heave*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Disturbance, compaction, hot burn*
Suggested Slash Disposal	*Leave fines; some cool burn*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Water*
Treatment to Increase Suitability	*Site development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Windthrow*
Considerations for Trail Improvements & Protection	*Thinned stand*
Suitability for Sewage Filter Field	*Fair*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Mantle creep*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Limited exposure*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Windthrow*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Shallow sites, wildlife cover*

Unit No. 469

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*ML* *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Fractured, soft interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Runoff and overland flow*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Moderate* *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Avoid seeps, maintain, cover, overland flow*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Exposure, shallow soils*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch; nitrogen fixers*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Roughness, frost, ravel*
Suggestions for Cutbank Seeding	*Maintain good ground cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Seed source; shallow site*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*5-10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Severe erosion; over exposure*
Suggested Slash Disposal	*Crush, lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Fair*
Limitations for Recreational Development	*Shallow sites, water, fragile soils*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Windthrows*
Considerations for Trail Improvements & Protection	*Waterbars*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Shallow soils*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** ***Subsoil***	*Silt* *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, windthrow*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Cool site, shallow soils*

Unit No. 473

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*ML-GM* *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Some soft rocks; breaks down*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Overland flow & runoff*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Keep water off the cut face*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Shallow soil, fertility, dry*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early, add nitrogen fixers*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steep, ravel*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow dry site*
Suggested Tree Planting Species	*Larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe erosion and loss of site productivity*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Fair*
Limitations for Trails	*Windthrow*
Considerations for Trail Improvements & Protection	*Waterbars, clearing*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Rotational slipouts*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain ground cover & canopy*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** ***Subsoil***	*Silt* *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, windthrow, scabland*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Shallow dry site*

Unit No. 475

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*ML-GM* *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Moderately competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Sidecast, large floaters*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize cut height*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Moisture, fines*
Suggestions for Road Waste and Fill Slope Seeding	*Seed heavily & mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, frost, slope*
Suggestions for Cutbank Seeding	*Seed soil horizons*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow harsh sites included*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement, burning*
Suggested Slash Disposal	*Leave fines, yard unmerchantable*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, little water, dry scablands*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris slides or slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Minimize exposure*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*III - II*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** ***Subsoil***	*Silt* *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, slash and windthrow*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Heavy wildlife use, moisture*

Unit No. 476

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*ML-SM* *OL-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Tuffs readily break down*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Sidecast on steep slopes, seeps*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*Minimize cuts and road width*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Expanding clays, frost, slope*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, seed after construction*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Ravel, sloughing, thin soil, slope*
Suggestions for Cutbank Seeding	*Roughen, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade, stored moisture*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Dislodgement and displacement, burning*
Suggested Slash Disposal	*Leave fines, hand pile, whole tree yard*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Steep, some rocky bluffs*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Rotational slipouts, debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Use slash to disperse flows*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** ***Subsoil***	*Silt* *Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Wildlife use, limited growth potential*

Unit No. 479

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM* / *GM-GW*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mod. competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Rock bluff; 100% slope in places*
Method of Excavation	*Blast and rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*No soil*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Very thin soil*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Rock outcrops*
Suggested Tree Planting Species	*None*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Marginal to non-commercial*
Suggested Slash Disposal	*None*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rockfall hazard, too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Very steep, rockfall hazard*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep, no soil*

EROSION AND HYDROLOGY

Natural Stability	*Mod. stable*
Nature of Mass Movement	*Rockfall, talus & debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*None*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep rock bluffs*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Very steep and rocky*

Unit No. 348

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GM-CL*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Soft rock, readily breaks down*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Rockfall, slumps, springs, siltation*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Mod. unstable*
Considerations for Cutbank Stability Problems	*Shallow cuts, rip rap*
Failure Potential on Waste & Fill	*Moderate to high*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Slope ravel*
Suggestions for Road Waste and Fill Slope Seeding	*Leave rough; mulch cover*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness, ravel*
Suggestions for Cutbank Seeding	*Keep water off cut face, leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Good*
Limitations to Regeneration	*Cool site*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Fisheries resource damage - siltation*
Suggested Slash Disposal	*Tree length yard*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Narrow, steep, wet*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Very steep, pitches on sideslopes*
Considerations for Trail Improvements & Protection	*Stream crossings, waterbars*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steep sideslopes, water table*

EROSION AND HYDROLOGY

Natural Stability	*Mod. unstable*
Nature of Mass Movement	*Slipouts*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain tree and ground cover*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Brush, steep sideslopes*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Slope, wildlife use, lowered water quality*

Unit No. 442

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GM-CL-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Fractured - MV round - granites*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Steep sidecast, unconsolidated slopes*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*Roll grade, minimum cut*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Slope, rain impact, ravel*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after construction, mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness, ravel*
Suggestions for Cutbank Seeding	*Roughen, keep water off cut face*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool site, snow, short season*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*6-8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance displacement*
Suggested Slash Disposal	*Yard unmerchantable; lop tops, scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep, cold site*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Dense timber, heavy snow*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Snow, talus or debris slides; soil creep*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*None*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A - B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Good cover, very steep, short season*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Thermal cover, cool site, short season*

Unit No. 486

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *CL-GC-GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Soft sedimentary, mod. competent meta-volcanics*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Ground water, soft materials, sidecast*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*Avoid wet areas; minimum exposure*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Slope*
Suggestions for Road Waste and Fill Slope Seeding	*Seed when moist; then mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness, sloughing*
Suggestions for Cutbank Seeding	*Leave rough, protect cutface*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool, amount of sunlight, disturbance*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Gouging, instability, sediment production*
Suggested Slash Disposal	*Yard unmerchantable or whole tree*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Very steep pitches, windthrow*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Mantle creep; rotational slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Limit exposure, good ground cover*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness, brush*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Wildlife cover, slope, windthrow*

Unit No. 487

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *GM-CL*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Some soft rocks; mod. competent*
Est. of Roadrock Thickness	*Thin, thick in places*
Consid. for Road Location & Construction	*Avoid seeps & gullies*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*Avoid wet areas; keep less than 10 ft.*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Fines, cover ravel, erosion*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early, mulch cover*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness*
Suggestions for Cutbank Seeding	*Maintain good ground cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade, seed*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Over harvest, slow regeneration, site erosion*
Suggested Slash Disposal	*Leave on site; lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep, windthrow, trail erosion*
Considerations for Trail Improvements & Protection	*Clearing, drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain cover; retard runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Overstory, windthrow*

Unit No. 489

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML-CL* / *CL-GC-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Highly fractured, mod. competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, end haul, rockfall hazard*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*No soil*
Suggestions for Road Waste and Fill Slope Seeding	*Leave as is*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*No soil, very steep*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Moisture, shade*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*12 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Excessive harvest on marginal to non CFL site*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep, rockfall hazard*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Very steep, rocky, falling hazard*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Very steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Rockfall, talus & debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Limit exposure*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Very steep & rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Very rocky, steep*

Unit No. 496

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *GM-OH-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mod. competent to soft*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Clay subsoils, groundwater, siltation*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Revegetate; keep water off cut face*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Expanding clays*
Suggestions for Road Waste and Fill Slope Seeding	*Seed heavy, mulch*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Roughness*
Suggestions for Cutbank Seeding	*Leave rough, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Cool air drainage*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Siltation, increase instability*
Suggested Slash Disposal	*Yard unmerchantable, whole tree yard*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Fragile, wet spots adjacent to streams*
Treatment to Increase Suitability	*Site plan development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Windthrow, brush*
Considerations for Trail Improvements & Protection	*Clearing & thining*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Rotational slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Minimize exposure*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cool; dense timber*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Water quality, cool site*

Unit No. 519

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML-R* / *GM-R*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Moderately competent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Unsuited*
Method of Excavation	*Blast, rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Vertical slope*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Vertical*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Cold, high elev. Short season*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*Non-CFL, not rated*
Type of Damage	*Displacement, expsure*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep high elevation*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Rockfall, vertical cliffs*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N/A*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Snow & debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Minimize exposure*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II - III*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Rocky, near vertical*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Very steep rock land*

Unit No. 568

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*SM-ML* / *SW-CL*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Breaks down readily, stones*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Ravel, end hall, loose material*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Minimize cuts, keep water off cut face*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Droughty*
Suggestions for Road Waste and Fill Slope Seeding	*Plant forbs, fertilize, mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel*
Suggestions for Cutbank Seeding	*Shallow cuts*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade, moisture*
Suggested Tree Planting Species	*Larch, pine*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Disturbance, over-cut, burn slash*
Suggested Slash Disposal	*Leave fines, lop and scatter, hand pile*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Water, fragile soils*
Treatment to Increase Suitability	*Spring development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain surface cover & infiltration*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*III - II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Windthrow, slash, maintaining cover*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Canopy closure, wildlife use, droughty*

Unit No. 576

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-SM* / *SP-SM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Steepness, mod. hard and soft*
Est. of Roadrock Thickness	*Very thin*
Consid. for Road Location & Construction	*Very steep, sidecast, rockfall hazard*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Cuts less than 10 ft. Keep water off the face*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Moisture, surface cover*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize, chip, use legumes*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*High surface ravel*
Suggestions for Cutbank Seeding	*Maintain native stands*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade, pinegrass, thick needle fall*
Suggested Tree Planting Species	*Pine, Douglas fir*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe gully erosion and rockfall*
Suggested Slash Disposal	*Leave fines, lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Too steep, rock hazard*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Steep pitches*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris slide*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Surface cover versus little disturbance*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*B - A*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Sand, silt* / *Sand, silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, rock outcrops*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Big game use*

Unit No. 584

ENGINEERING

Unified Class.	***Surface*** *ML-SM* ***Subsoil*** *SW-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Soft, incompetent, breaks down easily*
Est. of Roadrock Thickness	*Thin - thick*
Consid. for Road Location & Construction	*Ravel, lateral flow, soft materials*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio	***Soil*** *Steep* ***Bedrock*** *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Keep less than 20 ft.*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Soil fertility, ravel*
Suggestions for Road Waste and Fill Slope Seeding	*Use N-fixers & mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Slough & ravel*
Suggestions for Cutbank Seeding	*Leave rough, repeat seedings*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Brush, cool air drainage*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe runoff & erosion, slipouts*
Suggested Slash Disposal	*Leave on site, disperse*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Fair*
Limitations for Trails	*Rock, steepness, windthrow*
Considerations for Trail Improvements & Protection	*Maintenance*
Suitability for Sewage Filter Field	*Low*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slipouts along faulted ridges*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain veg. cover, retard surface flows*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II - III*
Hydrologic Group	*A - B*
Sedimentation Yield Potential	*Mod - High*
Expected Sediment Size	***Surface*** *Silt* ***Subsoil*** *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Windthrow, steepness*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Some dense cover, windthrow*

Unit No. 593

ENGINEERING

Unified Class.	***Surface*** *GP-R* ***Subsoil*** *R*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Breaks down under traffic*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Extremely steep, rock bluffs*
Method of Excavation	*Blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio	***Soil*** *Steep* ***Bedrock*** *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Too steep*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Too steep*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Shallow site, slope, aspect*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*Non-CFL, not rated*
Type of Damage	*Displacement*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep & rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Very steep, rock bluffs*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N/A*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Debris & talus slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*None*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size	***Surface*** *Silt* ***Subsoil*** *— —*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Rock walls, forage*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Rock, extremely steep*

Unit No. 596

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GP-SM* / *GP-SP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mixed weathered materials, large boulders, breaks down*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Steep, sidecast hazard*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Cuts less than 10 ft., surface vegetation*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Soil moisture; shade cover*
Suggestions for Road Waste and Fill Slope Seeding	*Legumes, cover with chipped slash*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel & Slough; shallow soils*
Suggestions for Cutbank Seeding	*Fertilize, protect surface*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Exposure v. shallow soils*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*5-15' as needed*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Accelerated surface erosion*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep and rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Rockfall, steepness*
Considerations for Trail Improvements & Protection	*Waterbar*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N/A*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris & talus slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Surface cover and protection*
Water Yield Class	*III - II*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Sand* / *Sand, silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness, light use, rock outcrops*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Steepness, shallow-mod. deep soils*

Unit No. 657

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*SP-SM* / *SM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mod. competent rounded stones*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep end hall*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Cuts less than 10 ft. high ravel hazard*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Cover, moisture*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize, provide chips*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Surface ravel*
Suggestions for Cutbank Seeding	*Enhance native stand*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Needles, crown closure, pinegrass*
Suggested Tree Planting Species	*Pine, Douglas fir*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Surface soil displacement, overexposure, burning*
Suggested Slash Disposal	*Lop and scatter*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Steepness, water*
Treatment to Increase Suitability	*Spring development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep, rocky*
Considerations for Trail Improvements & Protection	*Outsloped*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Surface protection*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Sands* / *Sand, silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness, limited use, access*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Heavy big game use*

Unit No. 659

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	GP-SM GP-SP
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Fair
Limit of Bedrock for Roadrock	Large boulders, breaks down easily
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Sidecast hazard, deep loose colluvium
Method of Excavation	Rip
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Steep Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Roll grade and minimize cutbanks
Failure Potential on Waste & Fill	High
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Moisture, fertility
Suggestions for Road Waste and Fill Slope Seeding	Use brush, forbs, fertilize and mulch
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Ravel and slough
Suggestions for Cutbank Seeding	Protect surface, use deep root grasses

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Low
Limitations to Regeneration	Thick needles, grass, droughty
Suggested Tree Planting Species	Pine
Waterbar Interval	10 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Disturbance, gouging, site exposure
Suggested Slash Disposal	Lop & scatter, hand pile - tree yard

RECREATION

Soil Suitability for Recreational Development	Low
Limitations for Recreational Development	Steepness, easily displaced
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Moderate
Susceptibility to Muddiness	Low
Trail Suitability	Moderate
Limitations for Trails	Steepness, rocky in places
Considerations for Trail Improvements & Protection	Surface drainage
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Steep

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Rockfall, talus and debris slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Very stable
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Retard runoff, minimize exposure
Water Yield Class	II - III
Bedrock Hydrologic Characteristics	III
Hydrologic Group	B - C
Sedimentation Yield Potential	High
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Steep, rocky
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Moderate
Limitations to Range Seeding	Steep, shallow soils, heavy big game use

Unit No. 366

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	ML OL-GC
Suit. as Topsoil Source	Unsuited because of position
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited - position
Suit. Bedrock for Roadrock	Fair
Limit of Bedrock for Roadrock	Soft, incompetent rock flows
Est. of Roadrock Thickness	Thick
Consid. for Road Location & Construction	Heavy subsoils; many creek crossings
Method of Excavation	Blade & rip
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Steep Steep
Probability of Cutbank Failure	Unstable
Considerations for Cutbank Stability Problems	Keep less than 5 ft., seed early, maintain ground cover
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Good
Limitations to Road Waste and Fill Slope Seeding	Fertility, clay content
Suggestions for Road Waste and Fill Slope Seeding	Fertilize, mulch, seed early
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Steepness, slough ravel
Suggestions for Cutbank Seeding	Maintain on established ground cover

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	High
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Good
Limitations to Regeneration	Brush, canopy opening
Suggested Tree Planting Species	Larch, fir
Waterbar Interval	5 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Stream, siltation; stream channel erosion
Suggested Slash Disposal	Tree length yard

RECREATION

Soil Suitability for Recreational Development	Moderate
Limitations for Recreational Development	Too narrow
Treatment to Increase Suitability	Develop several small units
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	Low
Susceptibility to Muddiness	High
Trail Suitability	Well
Limitations for Trails	Brush, wet, large windthrow
Considerations for Trail Improvements & Protection	Waterbars
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Heavy subsoils too close to streams

EROSION AND HYDROLOGY

Natural Stability	Moderately stable
Nature of Mass Movement	Landslide, rotational slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Moderate
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Retard runoff, enhance ground cover
Water Yield Class	I
Bedrock Hydrologic Characteristics	II
Hydrologic Group	B
Sedimentation Yield Potential	High
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Silt, clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Forest canopy, forage
Susceptibility to Soil Compaction	High
Susceptibility to Soil Displacement	Moderate
Potential for Range Improvements through Seeding	Good
Limitations to Range Seeding	Seasonal use, siltation hazard

Unit No. 662

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *OL-OH-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Incompetent, clay matrix easily breaks down*
Est. of Roadrock Thickness	*Very thick*
Consid. for Road Location & Construction	*Soft unstable, subsoil moisture, organic clays*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Minimize cuts, well drained, roll grade*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Expanding clay, raindrop impact*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch seed at construction*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Slope, seeds, expanding clays*
Suggestions for Cutbank Seeding	*Roughen, seed at construction*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cold air drainage*
Suggested Tree Planting Species	*Larch*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Increase instability, deep disturbance on wet soil*
Suggested Slash Disposal	*Leave some fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Soft wet areas, cold site*
Treatment to Increase Suitability	*Drainage, stand management*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Windthrow, brush, Wet areas*
Considerations for Trail Improvements & Protection	*Drainage, gravel*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Water table, restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Mantle creep, rotational slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard runoff, maintain litter, duff layer*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Wet, cold*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Cool air drainage, big game cover*

Unit No. 669

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GC-CH*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Incompetent rock wears poorly under traffic*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Seeps, heavy subsoils*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Protect ground cover keep cuts less than 7'*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Fertility, clay subsoils*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, seed early*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Frost heave, ravel, Heavy soils*
Suggestions for Cutbank Seeding	*Leave rough, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Fair*
Limitations to Regeneration	*Shade & competition*
Suggested Tree Planting Species	*Pine, fir, larch*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Compaction, disturbance*
Suggested Slash Disposal	*Lop & scatter, some broadcast burn*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Water development*
Treatment to Increase Suitability	*Water sites*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Discontinuous, heavy subsoils*

EROSION AND HYDROLOGY

Natural Stability	*Mod. stable*
Nature of Mass Movement	*Slumps & slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard runoff; maintain good ground cover*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Compaction*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Well*
Limitations to Range Seeding	*Overstory, slash*

Unit No. 674

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *ML-OL-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Soft, incompetent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Irregular relief*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Avoid wet areas*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Slope, exposure*
Suggestions for Road Waste and Fill Slope Seeding	*Seed when loose & moist*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Slope roughness*
Suggestions for Cutbank Seeding	*Protect surface cover, roughen*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shade*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe disturbance, and displacement*
Suggested Slash Disposal	*Scatter fines, hand pile concentrations*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Water, scabland*
Treatment to Increase Suitability	*Site development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Slash, rocky scabland*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Deep seated landslide*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*I - III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A - C*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Clay, silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Scabland, springs*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Some shallow sites, dry in places*

Unit No. 675

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GC-CH*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Breaks down & weathers very easily*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Plastic clays, deep overburden*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Mod. stable*
Considerations for Cutbank Stability Problems	*Shallow cuts & protect surface cover*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Ravel, dry and expanding clay*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Ravel, exposure, slope*
Suggestions for Cutbank Seeding	*Leave rough & mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*High*
Limitations to Regeneration	*Shade, disturbance & compaction*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Compaction, severe disturbance*
Suggested Slash Disposal	*Scatter & hand pile concentrations*

RECREATION

Soil Suitability for Recreational Development	*Moderate*
Limitations for Recreational Development	*Water*
Treatment to Increase Suitability	*Water development*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*None*
Considerations for Trail Improvements & Protection	*Brush removal; gravel paths*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Mantle creep, rotational slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*None*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*High*
Limitations to Range Seeding	*Heavy big game use, slash*

Unit No. 697

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*ML-OL* *OL-OH-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Very soft, breaks down in one season*
Est. of Roadrock Thickness	*Very thick*
Consid. for Road Location & Construction	*Soft spots, deep plastic clay*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Intercept subsoil moisture*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Exposure, expanding clays*
Suggestions for Road Waste and Fill Slope Seeding	*Seed & mulch after disturbance*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness, expanding clays, sloughing*
Suggestions for Cutbank Seeding	*Roughen, blown on mulch or straw*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Grasses, compaction, exposure*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Compaction*
Suggested Slash Disposal	*Yard unmerchantable, lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Water, heavy livestock use*
Treatment to Increase Suitability	*Water development; rotational use*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Seeps & muddy spots*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Regional landmass movement*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Avoid runoff concentration*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B - D*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** ***Subsoil***	*Silt, clay* *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*None*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Wildlife use, slash, wet soft areas*

Unit No. 367

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*ML-GM* *OL-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Tuffaceous rock incompetent*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Steep, narrow creeks, sidecast*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Mod. stable to unstable*
Considerations for Cutbank Stability Problems	*End haul, minimum width, bridging, keep less than 5 ft.*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Slope, ravel, clays*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, fertilize*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Steepness, slough, ravel*
Suggestions for Cutbank Seeding	*Maintain ground cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Good*
Limitations to Regeneration	*Brush, disturbance, overstory, sunlight*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe watershed damage & wildlife habitat*
Suggested Slash Disposal	*Tree length yard*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Narrow, brush, too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Fair*
Limitations for Trails	*Displacement slough, heavy snow*
Considerations for Trail Improvements & Protection	*Yearly clearing*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Streams, steepness*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Slumps, massive movement*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain 80% ground cover*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface*** ***Subsoil***	*Silt* *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slope, water quality*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Cool site, sedimentation, limited use*

Unit No. 672

ENGINEERING

Unified Class. *Surface*	*ML*
Subsoil	*OL-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Breaks; soft, clay matrix*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Clay subsoils, ground water intercept, steep*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil*	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize cuts, roll grades*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Clays, slope*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, seed when moist*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Sloughing, slope*
Suggestions for Cutbank Seeding	*Roughen, mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*High*
Limitations to Regeneration	*Brush, over exposure, frost*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*12 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Increased instability*
Suggested Slash Disposal	*Yard unmerchantable, whole tree yard*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Steep, brush*
Considerations for Trail Improvements & Protection	*Clearing*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Massive landslide; rotational slipouts*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain good ground cover*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment *Surface*	*Silt*
Subsoil	*Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slope, brush*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Slope, heavy wildlife use*

Unit No. 678

ENGINEERING

Unified Class. *Surface*	*ML-GM*
Subsoil	*GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Incompetent rocks, soft rocks*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Sidecast, seep & springs, very steep*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate to high*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil*	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep cutbank less than 5 ft. End haul*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Steepness, amt. of soil*
Suggestions for Road Waste and Fill Slope Seeding	*Cover mulch, fertilize*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness, ravel, aspect & exposure*
Suggestions for Cutbank Seeding	*Seed early, leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Fair*
Limitations to Regeneration	*Shade & cover disturbance*
Suggested Tree Planting Species	*Pine, fir, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Gull washout, type conversions*
Suggested Slash Disposal	*Lop & scatter, windrow handpile*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Fair*
Limitations for Trails	*Steep, rockfall*
Considerations for Trail Improvements & Protection	*Yearly maintenance*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain surface cover, aerial log*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*I - II*
Hydrologic Group	*A - B*
Sedimentation Yield Potential	*High*
Expected Sediment *Surface*	*Silt*
Subsoil	*Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steepness*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Steep topography*

Unit No. 748

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GM-CL-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Readily breaks down*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Slumps, ground water, plastic silt & clays*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimum cuts, avoid seeps*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Steep, fertility, some expanding clay*
Suggestions for Road Waste and Fill Slope Seeding	*Seed when moist, mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness*
Suggestions for Cutbank Seeding	*Leave rough, native surface cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool, limited fertility*
Suggested Tree Planting Species	*Larch, fir*
Waterbar Interval	*10 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Increased instability, burning, siltation*
Suggested Slash Disposal	*Yard unmerchantable, whole tree yard*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steepness*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Dense lodgepole, steep, windthrow*
Considerations for Trail Improvements & Protection	*Thining, clearing*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Rotational slipouts, mantle creep*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Limit exposure, retard runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, cool site*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Cool, canopy closure, wildlife use*

Unit No. 677

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*SM-GM* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Clay matrix, breaks down very readily*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Plastic silt & clay, soft rock, sidecast*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize cut, roll the grade*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Dry, expanding clays, rocky*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after disturbance, mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness, exposure, swelling clay*
Suggestions for Cutbank Seeding	*Deeply roughen, seed heavy*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Droughty, frost, low moisture storage*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement, disturbance, poor regeneration, burning*
Suggested Slash Disposal	*Leave on site, hand pile concentrations*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Hot, dry, rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep, dry, rocky*
Considerations for Trail Improvements & Protection	*Outsloped*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steepness*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Regional mass movement*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Minimize exposure*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt, clay* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Moisture, droughty site*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Harsh site*

Unit No. 684

ENGINEERING

Unified Class. ***Surface***	SM-GM
Subsoil	SM-GC
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Incompetent pyroclastics & tuffaceous material*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Steep, end haul*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil***	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize cuts and exposure*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Exposure, lack fines, plastic silt and clay*
Suggestions for Road Waste and Fill Slope Seeding	*Use slash as mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Slope, ravel, frost, limited soil mantle*
Suggestions for Cutbank Seeding	*Mulch if necessary*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Frost, shade, moisture retention*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance & displacement, burning*
Suggested Slash Disposal	*Leave on site where possible*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, dry*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Steepness*
Considerations for Trail Improvements & Protection	*Outslope*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steep, shallow*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Debris, slides, rockfall*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard runoff*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, water, limited cover*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Dry, southern exposure, wildlife use*

Unit No. 689

ENGINEERING

Unified Class. ***Surface***	SM
Subsoil	SM-GM
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Good basalts but incompetent tuffs*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, rockfall, end haul*
Method of Excavation	*Blast, rip*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil***	*Steep*
Bedrock	*Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Avoid talus slopes*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Slope, no fines*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Thin soil mantle*
Suggestions for Cutbank Seeding	*Maintain ground surface cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Moisture retention, exposure*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Cover disturbance & displacement*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep, rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Rockfall, very steep*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steepness*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Rockfall, talus & debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Minimize exposure*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*I - II - III*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Very steep, rocky, talus*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Rock outcrops, very steep*

Unit No. 693

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	ML-GC GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Poor
Limit of Bedrock for Roadrock	Soft rock, breaks down easily
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Soft subsoils, deep plastic material
Method of Excavation	Blade & rip
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Moderate Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Roll the grade
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Amount of soil & cover
Suggestions for Road Waste and Fill Slope Seeding	Seed early
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Slope
Suggestions for Cutbank Seeding	Leave rough

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Moderate
Limitations to Regeneration	Frost heave, shallow soil areas
Suggested Tree Planting Species	Pine, larch
Waterbar Interval	8 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Compaction, disturbance, over exposure
Suggested Slash Disposal	Lop & scatter

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Rocky, cover
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Moderate
Susceptibility to Muddiness	High
Trail Suitability	Poor
Limitations for Trails	Cobbly surface, compaction
Considerations for Trail Improvements & Protection	Waterbars
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Shallow, restricted permeability

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	None
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Low
Subsoil Erosion Potential	Low
Suggestions for Controlling Subsoil Erosion	Retard runoff & disperse
Water Yield Class	II
Bedrock Hydrologic Characteristics	II
Hydrologic Group	C
Sedimentation Yield Potential	High
Expected Sediment Size ***Surface*** ***Subsoil***	Silt clay Clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Scabland, rough surface
Susceptibility to Soil Compaction	High
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Early big game use, shallow soils

Unit No. 373

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	GM-GC-ML GM-GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Poor
Limit of Bedrock for Roadrock	Soft breccia and pyroclastics
Est. of Roadrock Thickness	Thick
Consid. for Road Location & Construction	High expanding clay subsoil
Method of Excavation	Blade and rip
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope Ratio ***Soil*** ***Bedrock***	Moderate Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Cuts less than 5 ft.
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Expanding clays
Suggestions for Road Waste and Fill Slope Seeding	Seed when moist, mulch
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Dense subsoil
Suggestions for Cutbank Seeding	Roughen

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	High
Potential for Regeneration	Low
Limitations to Regeneration	Sod cover & harsh site complex
Suggested Tree Planting Species	Pine
Waterbar Interval	8 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Compaction, sedimentation
Suggested Slash Disposal	Scatter

RECREATION

Soil Suitability for Recreational Development	Low
Limitations for Recreational Development	Scabland and meadow types
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Low
Susceptibility to Muddiness	High
Trail Suitability	Well
Limitations for Trails	Wetness and slick
Considerations for Trail Improvements & Protection	Well drained
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Slow permeability

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	N/A
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Low to high
Subsoil Erosion Potential	Low
Suggestions for Controlling Subsoil Erosion	Maintain cover
Water Yield Class	I - III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	C
Sedimentation Yield Potential	High
Expected Sediment Size ***Surface*** ***Subsoil***	Silt Clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	None
Susceptibility to Soil Compaction	High
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Moderate
Limitations to Range Seeding	Meadow and scabland types

Unit No. 730

ENGINEERING

Unified Class. ***Surface***	*OL-GC*
Subsoil	*GC-OL*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Fairly soft rock, easily breaks down*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Heavy subsoils, wet at times*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil***	*Flat*
Bedrock	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 ft. cuts*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Clays sealing over or drying*
Suggestions for Road Waste and Fill Slope Seeding	*Seed after construction*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Thin soil mantle, moisture*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Compaction, grass, cold site*
Suggested Tree Planting Species	*Fir, spruce*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance, compaction, sedimentation*
Suggested Slash Disposal	*Hand pile*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Shade, gen. lack of trees*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*High*
Trail Suitability	*Good*
Limitations for Trails	*Soft sticky mud*
Considerations for Trail Improvements & Protection	*Keep grassed, drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Restricted soil depth and permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Maintain ground cover, disperse water*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*D*
Sedimentation Yield Potential	*High*
Expected Sediment Size ***Surface***	*Silt clay*
Subsoil	*Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*None*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Rocky units, overuse*

Unit No. 738

ENGINEERING

Unified Class. ***Surface***	*GM-ML*
Subsoil	*GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Mixed volcanic flow and tuffaceous rock*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Concentrating runoff*
Method of Excavation	*Blade & rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio ***Soil***	*Flat*
Bedrock	*Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Roll the grade*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Exposure, limited soils*
Suggestions for Road Waste and Fill Slope Seeding	*Seed early, cover with mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Frost heave, shallow soils*
Suggestions for Cutbank Seeding	*Leave rough, fertilize*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow, exposed site, frost*
Suggested Tree Planting Species	*Ponderosa Pine*
Waterbar Interval	*4-6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Exposure, frost, sheet & rill erosion*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Water*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Well*
Limitations for Trails	*Rocky ground*
Considerations for Trail Improvements & Protection	*Waterbars, windthrow*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Shallow soils*

EROSION AND HYDROLOGY

Natural Stability	*Very stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard & disperse runoff*
Water Yield Class	*III - II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Low*
Expected Sediment Size ***Surface***	*Silt*
Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Lodgepole thickets, shallow rocky soil*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Poor site, need long rotation*

Unit No. 743

ENGINEERING

Unified Class. ***Surface***	ML-GM
Subsoil	GM-GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Suited
Suit. Bedrock for Roadrock	Poor
Limit of Bedrock for Roadrock	Soft rock, discontinuous materials
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Plastic subsoils
Method of Excavation	Rip and blade
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope ***Soil***	Steep
Ratio ***Bedrock***	Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Minimize cutbank, avoid seeps
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Timely seeding, shallow soils
Suggestions for Road Waste and Fill Slope Seeding	Mulch
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Slope, ravel, dryness & exposure
Suggestions for Cutbank Seeding	Roughen, maintain ground cover

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Low
Limitations to Regeneration	Shallow soils, limited moisture storage
Suggested Tree Planting Species	Pine
Waterbar Interval	6 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Compaction, disburbance
Suggested Slash Disposal	Leave fines on site

RECREATION

Soil Suitability for Recreational Development	Low
Limitations for Recreational Development	Water, scabland
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	High
Susceptibility to Muddiness	Low
Trail Suitability	Well
Limitations for Trails	Rocky, harsh site
Considerations for Trail Improvements & Protection	None
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Limited soil depth & permeability

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Regional faults
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Minimize exposure
Water Yield Class	III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	C
Sedimentation Yield Potential	Moderate
Expected ***Surface*** Sediment ***Subsoil*** Size	Silt Silt, clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Poor site
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Marginal site

Unit No. 746

ENGINEERING

Unified Class. ***Surface***	ML-SM
Subsoil	GM-CH-GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Poor
Limit of Bedrock for Roadrock	Incompetent
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Seeps, plastic silt, silt and clay subsoils
Method of Excavation	Rip and blade
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	Low
Est. Cutslope ***Soil***	Moderate
Ratio ***Bedrock***	Steep
Probability of Cutbank Failure	Stable
Considerations for Cutbank Stability Problems	Minimize exposure, avoid seeps
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Moisture
Suggestions for Road Waste and Fill Slope Seeding	Mulch
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Plastic subsoils, Moisture content
Suggestions for Cutbank Seeding	Leave rough

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Moderate
Limitations to Regeneration	Slash disposal, cool site, disturbances
Suggested Tree Planting Species	Larch, fir
Waterbar Interval	8 ft. vertical
Harvest Potential Impact on Soil Resource	Moderate
Type of Damage	Compaction, regeneration damage, slash disposal
Suggested Slash Disposal	Yard unmerchantable, leave fines

RECREATION

Soil Suitability for Recreational Development	Low
Limitations for Recreational Development	Water, fragile site
Treatment to Increase Suitability	Site development
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	High
Susceptibility to Muddiness	Moderate
Trail Suitability	Well
Limitations for Trails	Deadfall, lodgepole thickets
Considerations for Trail Improvements & Protection	Thining
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Shallow soil, restricted permeability

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Regional faults & landslides
Expected Mass Movement from Man's Activity	Unchanged
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Use slash to retard runoff
Water Yield Class	I - II
Bedrock Hydrologic Characteristics	II
Hydrologic Group	B - C
Sedimentation Yield Potential	Moderate
Expected ***Surface*** Sediment ***Subsoil*** Size	Silt Silt, clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Slash, forage potential
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Moderate
Limitations to Range Seeding	Somewhat shallow and droughty

Unit No. 767

ENGINEERING

Unified Class. Surface	ML
Unified Class. Subsoil	OL-OH-GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Unsuited
Limit of Bedrock for Roadrock	Incompetent
Est. of Roadrock Thickness	Thick
Consid. for Road Location & Construction	Unstable areas; deep consolidated colluvium
Method of Excavation	Blade & rip
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio Soil	Steep
Est. Cutslope Ratio Bedrock	Steep
Probability of Cutbank Failure	Unstable
Considerations for Cutbank Stability Problems	Minimum road
Failure Potential on Waste & Fill	High
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Slope, plastic clays
Suggestions for Road Waste and Fill Slope Seeding	Seed & mulch early
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Steepness, sloughing
Suggestions for Cutbank Seeding	Maintain ground cover, roughen

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	High
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	High
Limitations to Regeneration	Brush, microclimate
Suggested Tree Planting Species	Larch, fir
Waterbar Interval	6 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Increased instability, burning, ground disturbance
Suggested Slash Disposal	Yard unmerchantable

RECREATION

Soil Suitability for Recreational Development	Low
Limitations for Recreational Development	Instability, wet, brushy
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Low
Susceptibility to Muddiness	High
Trail Suitability	Fair
Limitations for Trails	Steep, brush, unstable areas, wet
Considerations for Trail Improvements & Protection	Drainage, thining
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Slope

EROSION AND HYDROLOGY

Natural Stability	Moderately stable
Nature of Mass Movement	Rotational landslides slumps
Expected Mass Movement from Man's Activity	Greatly increased
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Limit exposure, utilize slash
Water Yield Class	I
Bedrock Hydrologic Characteristics	II
Hydrologic Group	B
Sedimentation Yield Potential	High
Expected Sediment Size Surface	Silt
Expected Sediment Size Subsoil	Silt clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Slope, brush
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Moderate
Limitations to Range Seeding	Steep, cool, moist, site, big game cover

Unit No. 877

ENGINEERING

Unified Class. Surface	SM-GM
Unified Class. Subsoil	GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Poor
Limit of Bedrock for Roadrock	Soft pyroclastics, moderately hard volcanics
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Rockfall, end haul, drainage off site
Method of Excavation	Blast, rip, blade
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio Soil	Steep
Est. Cutslope Ratio Bedrock	Steep
Probability of Cutbank Failure	Moderately stable
Considerations for Cutbank Stability Problems	Minimize exposure
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	No fines
Suggestions for Road Waste and Fill Slope Seeding	None
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Steep, thin soil, mantle, ravel
Suggestions for Cutbank Seeding	Seed when moist

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Low
Limitations to Regeneration	Exposure, poor moisture regime
Suggested Tree Planting Species	Pine
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Gouging, ground displacement, poor regeneration
Suggested Slash Disposal	Scatter & leave on site

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Steep, rocky, limited shade
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Low
Limitations for Trails	Rock areas, steep
Considerations for Trail Improvements & Protection	None
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Too steep

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Rockfall, talus and debris slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	Low
Suggestions for Controlling Subsoil Erosion	None
Water Yield Class	III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	C - D
Sedimentation Yield Potential	Low
Expected Sediment Size Surface	Silt
Expected Sediment Size Subsoil	Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Steep, rocky, limited forage
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Shallow, harsh, rocky, big game use

Unit No. 895

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*SM-GM* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Incompetent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Rockfall, off site drainage, end haul*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Minimize cut exposure*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*No fines*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, thin soil, mantle, slope*
Suggestions for Cutbank Seeding	*Protect the ground cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Poor moisture regime*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Gouging, displacement, no regeneration*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Low*
Limitations for Trails	*Rocky areas, very steep*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Rockfall, rotational movement*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*None*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, rocky, limited forage*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Big game use, steep, harsh site*

Unit No. 818

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *GM-CL-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Weathers easily*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Heavy snows, some soft clays inclusions*
Method of Excavation	*Rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Keep the cuts shallow*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Soil fines, cool site*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Frost, cool site*
Suggestions for Cutbank Seeding	*Roughen, mulch if necessary*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Cool site, fertility*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Burning, severe ground disturbance*
Suggested Slash Disposal	*Leave all fines, scatter, crush or chip*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Small timber, fragile site, water*
Treatment to Increase Suitability	*Thin the stand, gravel road, spring dev.*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Thick stands, windthrow*
Considerations for Trail Improvements & Protection	*Thining*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*None*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cool site, dense stand*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Well*
Limitations to Range Seeding	*Thick stand, big game cover*

Unit No. 382

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML* / *CL-GM*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Breaks down and weathers rapidly*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Subsoil water, clay*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Low*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Flat* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Less than 5 ft.*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Good*
Limitations to Road Waste and Fill Slope Seeding	*Expanding clays*
Suggestions for Road Waste and Fill Slope Seeding	*Hay mulch, fertilize*
Suitability of Cutbank Seeding	*Good*
Limit of Cutbank Seeding	*Cool site, subsoil water*
Suggestions for Cutbank Seeding	*Leave rough, hay mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Cold, wet, frost pocket*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Stream degradation, sedimentation*
Suggested Slash Disposal	*Lop and scatter, some fines*

RECREATION

Soil Suitability for Recreational Development	*Poor*
Limitations for Recreational Development	*Cold, wet*
Treatment to Increase Suitability	*Extensive development*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Lodgepole thickets*
Considerations for Trail Improvements & Protection	*Thinned stand*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Slow permeabilities, high water table*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*N/A*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Low*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*I*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cold*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Cool, canopy closure*

Unit No. 848

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Soft sedimentary rock-clay matrix*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*End haul, very steep, rockfall, snow*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize cutbank exposure*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Shallow soil, slope*
Suggestions for Road Waste and Fill Slope Seeding	*Use chips or slash, if necessary*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Thin soil mantle, slope, ravel*
Suggestions for Cutbank Seeding	*Roughen, seed when moist*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Micro-climate, moisture regime*
Suggested Tree Planting Species	*Pine, fir*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Gouging and displacement*
Suggested Slash Disposal	*Lop and scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Rockfall, steepness*
Considerations for Trail Improvements & Protection	*Drainage protection*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Rockfall, debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Retard & disperse runoff*
Water Yield Class	*I - III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slope, rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Big game use, moisture regime, access*

Unit No. 891

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM-R* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Incompetent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Rockfall, end hall, 100% slopes*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*No roads, minimize cuts*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Slope, limited soil*
Suggestions for Road Waste and Fill Slope Seeding	*Seed toe slopes*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steep, ravel, slough*
Suggestions for Cutbank Seeding	*Protect surface cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Short season, micro-climate*
Suggested Tree Planting Species	*Fir, larch*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Gouging and soil displacement*
Suggested Slash Disposal	*Lop & scatter, whole tree yard*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rockfall, too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Very steep, rock bluffs*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Too steep*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Talus slides, rockfall*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Maintain good infiltration*
Water Yield Class	*I - III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B - D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep and rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Steep, rock bluffs*

Unit No. 869

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GM-GC*
Suit. as Topsoil Source	*Suited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Clay matrix rock breaks down readily*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Plastic clay subsoils water, deep subsoils*
Method of Excavation	*Rip and blade*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Roll the grade, minimize cuts*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Expanding clay, slope wash*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Sloughing, expanding clay*
Suggestions for Cutbank Seeding	*Roughen and mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Compaction, frost*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*8 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Deep gouging, exposed subsoil*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Water development, compaction*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*High*
Trail Suitability	*Well*
Limitations for Trails	*Some soft areas*
Considerations for Trail Improvements & Protection	*Gravel drainage*
Suitability for Sewage Filter Field	*Moderate*
Soil Limitations to Sewage Filter Field	*Restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Slipouts along old fault scarps*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Divert runoff*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A - C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Dense canopy to slash*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Moderate*
Limitations to Range Seeding	*Slash, canopy cover, some droughtyness*

Unit No. 872

ENGINEERING

Unified Class. Surface / Subsoil	ML-CL / CL-CH
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Suited
Suit. Bedrock for Roadrock	Unsuited
Limit of Bedrock for Roadrock	Soft, incompetent
Est. of Roadrock Thickness	Very thick
Consid. for Road Location & Construction	Soft, clay subsoils, seeps
Method of Excavation	Blade
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	Moderate
Est. Cutslope Ratio Soil / Bedrock	Flat / Steep
Probability of Cutbank Failure	Unstable
Considerations for Cutbank Stability Problems	Elevated roadbed, rolling grade
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	Moderate
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Expanding clays, fertility
Suggestions for Road Waste and Fill Slope Seeding	Mulch cover, seed, N-fixers
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Ravel, frost, cool site
Suggestions for Cutbank Seeding	Leave rough, seed early, use N-fixers

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Moderate
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Moderate
Limitations to Regeneration	Cold soils & air drainage
Suggested Tree Planting Species	Fir, larch
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Loss of ground cover, frost, sedimentation
Suggested Slash Disposal	Leave on site

RECREATION

Soil Suitability for Recreational Development	Poor
Limitations for Recreational Development	Too cool and wet
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Low
Susceptibility to Muddiness	High
Trail Suitability	Well
Limitations for Trails	Windthrow, mud
Considerations for Trail Improvements & Protection	Waterbars, thining
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Very slow permeability

EROSION AND HYDROLOGY

Natural Stability	Moderately stable
Nature of Mass Movement	Toe slope slipouts
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	High
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Retard runoff; maintain good groundcover
Water Yield Class	I
Bedrock Hydrologic Characteristics	II
Hydrologic Group	D
Sedimentation Yield Potential	High
Expected Sediment Size Surface / Subsoil	Silt / Clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Cool, wet, forage
Susceptibility to Soil Compaction	High
Susceptibility to Soil Displacement	Low
Potential for Range Improvements through Seeding	Fair
Limitations to Range Seeding	Wet, windthrow

Unit No. 853

ENGINEERING

Unified Class. Surface / Subsoil	ML / GM-CL-GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Unsuited
Limit of Bedrock for Roadrock	Incompetent, breaks down to clay
Est. of Roadrock Thickness	Thick
Consid. for Road Location & Construction	Overland flow, dis-sections, heavy subsoils
Method of Excavation	Blade and rip
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	Moderate
Est. Cutslope Ratio Soil / Bedrock	Moderate / Steep
Probability of Cutbank Failure	Moderately stable
Considerations for Cutbank Stability Problems	Construct less than 10 ft., roll grades
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Fair
Limitations to Road Waste and Fill Slope Seeding	Fertility, amt. of soil and rock
Suggestions for Road Waste and Fill Slope Seeding	Use N-fixers, mulch cover
Suitability of Cutbank Seeding	Fair
Limit of Cutbank Seeding	Smoothness, soil depth
Suggestions for Cutbank Seeding	Add N-fixers, leave rough

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Moderate
Limitations to Regeneration	Frost heave, surface exposure
Suggested Tree Planting Species	Fir, larch
Waterbar Interval	6 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Severe exposure and gully erosion
Suggested Slash Disposal	20-30% harvest, leave slash on site

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Water, uneven topography
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	High
Susceptibility to Muddiness	Moderate
Trail Suitability	Well
Limitations for Trails	Dense thickets, windthrow
Considerations for Trail Improvements & Protection	Thinning, waterbars
Suitability for Sewage Filter Field	Poor
Soil Limitations to Sewage Filter Field	Shallow soils

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Mass movement Slipouts
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	High
Subsoil Erosion Potential	Low
Suggestions for Controlling Subsoil Erosion	Retard runoff
Water Yield Class	II
Bedrock Hydrologic Characteristics	II
Hydrologic Group	B
Sedimentation Yield Potential	High
Expected Sediment Size Surface / Subsoil	Silt / Silt, clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Relief rocks, position
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	Moderate
Potential for Range Improvements through Seeding	Moderate
Limitations to Range Seeding	Poor position, windthrow, wildlife

Unit No. 867

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*ML* / *CH-CL-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Soft, incompetent sandstones*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Unstable fill potential; soft base*
Method of Excavation	*Blade and rip*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Moderate* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Minimize cut and fill*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Weathering, frost, amount of soil*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch if necessary*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Frost, ravel, slough*
Suggestions for Cutbank Seeding	*Roughen, seed when moist*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Frost heave, fertility*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*Moderate*
Type of Damage	*Disturbance, burning, exposure*
Suggested Slash Disposal	*Leave all fines*

RECREATION

Soil Suitability for Recreational Development	*Low*
Limitations for Recreational Development	*Wildlife cover, lodgepole, wet subsoils*
Treatment to Increase Suitability	*Gravel, drainage*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Wildlife area, thick lodgepole, windthrow*
Considerations for Trail Improvements & Protection	*Stand management drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Shallow soils, restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Small slipouts along local faults*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Moderate*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff, maintain infiltration*
Water Yield Class	*I - II*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B - C*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Dense stand, windthrow*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*Low*
Potential for Range Improvements through Seeding	*Well*
Limitations to Range Seeding	*Wildlife, lodgepole, regen., by meadows*

Unit No. 894

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	*GM-ML* / *GM-ML*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Some good andesite but many soft tuffs*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Some hard rock, soft spots, lateral flows*
Method of Excavation	*Mostly rip but some blasting*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*Moderate*
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	*Steep* / *Steep*
Probability of Cutbank Failure	*Stable*
Considerations for Cutbank Stability Problems	*Roll the grades, minimize exposure*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Fair*
Limitations to Road Waste and Fill Slope Seeding	*Shallow soils, exposed site*
Suggestions for Road Waste and Fill Slope Seeding	*Fertilize, cover with chips or slash*
Suitability of Cutbank Seeding	*Fair*
Limit of Cutbank Seeding	*Shallow soil, exposure - heat, frost*
Suggestions for Cutbank Seeding	*Maintain vegetative soil cover*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow site, frost Heave*
Suggested Tree Planting Species	*Ponderosa pine, larch*
Waterbar Interval	*5 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Severe runoff and site deterioration*
Suggested Slash Disposal	*Leave fines; lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Shallow soils; water*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Well*
Limitations for Trails	*Dense stands windthrow*
Considerations for Trail Improvements & Protection	*Stand management*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Limited soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Slipouts along fault planes*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Retard surface runoff and concentrations*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** / ***Subsoil***	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Dense stands*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*Moderate*
Potential for Range Improvements through Seeding	*Fair*
Limitations to Range Seeding	*Cold site, shallow soils*

Unit No. 900

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GP-R*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Mixed deposits, mostly incompetent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, rockfall*
Method of Excavation	*Blast*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Very unstable*
Considerations for Cutbank Stability Problems	*Screen, catch walls & roads*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*No soil*
Suggestions for Road Waste and Fill Slope Seeding	*N/A*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*No soil, too steep*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Non-CFL*
Limitations to Regeneration	*Mostly rock*
Suggested Tree Planting Species	*N/A*
Waterbar Interval	*N/A*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Type conversion displacement*
Suggested Slash Disposal	*None*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rockfall, too steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Unsuited*
Limitations for Trails	*Steep, very rocky*
Considerations for Trail Improvements & Protection	*Costly construction*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Rock*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Talus & debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain veg. cover*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Very steep, rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Unsuited*
Limitations to Range Seeding	*Rocky*

Unit No. 911

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GM-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Poor*
Limit of Bedrock for Roadrock	*Some soft interflows*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Very steep, sidecast, unstable talus, rockfall*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Very unstable*
Considerations for Cutbank Stability Problems	*Lateral flows, esp. in timbered stand, surface runoff*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Steepness, lack of fines*
Suggestions for Road Waste and Fill Slope Seeding	*End haul*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Steepness, exposure Lack of fines in places*
Suggestions for Cutbank Seeding	*Keep banks shallow, seed early*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*High*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low to moderate*
Limitations to Regeneration	*Shade & exposure*
Suggested Tree Planting Species	*Fir, larch, pine*
Waterbar Interval	*5' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*High runoff, rapid erosion in waterways*
Suggested Slash Disposal	*Lop & scatter parallel with slope*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Steep, rocky*
Considerations for Trail Improvements & Protection	*N/A*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope, rock*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Talus or debris slide; rotational landslides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain cover, retard runoff*
Water Yield Class	*III - II*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Low - moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, limited use*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Steep, access water*

Unit No. 912

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*ML-GM* *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Some breccia & scoria*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Steep, long debris slopes, rockfall*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*Moderate*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Maintain surface veg., limit cutbank size*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Steep, exposed, of fines*
Suggestions for Road Waste and Fill Slope Seeding	*End haul*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Shallow soil, surface ravel*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Shallow soils, exposure, moisture*
Suggested Tree Planting Species	*Pine, fir*
Waterbar Interval	*5 ft.*
Harvest Potential Impact on Soil Resource	*Severe*
Type of Damage	*Surface runoff, rill & gully erosion, road would be very visible*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep, rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Steep, rocky*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N/A*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Talus slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Retard & slow surface water*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size ***Surface*** ***Subsoil***	*Silt* *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, steepness*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Shallow, exposed site*

Unit No. 914

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*R, GM* *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Suited*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Very thin*
Consid. for Road Location & Construction	*Steep, rockfall, hard rock, lateral water*
Method of Excavation	*Blasting*
Cutbank & Ditch Erosion Potential	*Low*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Keep less than 5 ft.*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Lack of soil & W.H.C.*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Shallow, dry soils*
Suggestions for Cutbank Seeding	*None*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Erosion, site exposure*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4-6' vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Loss of wildlife cover & accelerated erosion*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Rocky, steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Rockfall, very steep*
Considerations for Trail Improvements & Protection	*None*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N/A*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Debris & talus slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*High*
Subsoil Erosion Potential	*Low*
Suggestions for Controlling Subsoil Erosion	*Limit exposure, disperse flows*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B*
Sedimentation Yield Potential	*Low*
Expected Sediment Size ***Surface*** ***Subsoil***	*Silt* *— —*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, too steep; rock bluff*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Very steep, limited production*

Unit No. 915

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*SP-GM* *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, rockfall, sidecast hazards, loose*
Method of Excavation	*Blade, rip and blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Very shallow cut*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Steepness, dry site, no fines*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Loose material, dry ravel*
Suggestions for Cutbank Seeding	*None, shallow cuts*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Shallow, grassland*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance, displacement*
Suggested Slash Disposal	*Scatter, leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Dry, very steep*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Steep, dry, rock ravel*
Considerations for Trail Improvements & Protection	*Outsloped*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N. A*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Talus & debris slide*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Non-activity*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*B - D*
Sedimentation Yield Potential	*Low*
Expected Sediment ***Surface*** ***Subsoil***	*Silt* *Silt, gravels*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Very steep*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Poor*
Limitations to Range Seeding	*Very dry, harsh site, wildlife use*

Unit No. 918

ENGINEERING

Unified Class. ***Surface*** ***Subsoil***	*GM* *GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Soft pyroclastics interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*End haul, very steep*
Method of Excavation	*Rip and blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio ***Soil*** ***Bedrock***	*Steep* *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Catch roads min. width*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*No fines*
Suggestions for Road Waste and Fill Slope Seeding	*N/A*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Slope, shallow*
Suggestions for Cutbank Seeding	*Roughen*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Shallow, harsh site*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Exposure, displacement*
Suggested Slash Disposal	*Leave fines*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep, rocky, exposed*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Steep, very rocky*
Considerations for Trail Improvements & Protection	*Out sloped*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N/A*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Rockfall, mantle creep, talus slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Disperse flow, maintain cover*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*Low*
Expected Sediment ***Surface*** ***Subsoil***	*Silt* *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, limited cover, water*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Dry, exposed site, steep*

Unit No. 919

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-R* / *GM*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*None*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, rockfall*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Catch roads, mesh*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*No fines*
Suggestions for Road Waste and Fill Slope Seeding	*Seed toe slopes*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Soil depth*
Suggestions for Cutbank Seeding	*Roughen*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Poor*
Limitations to Regeneration	*Frost, moisture*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement, disturbance*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Very steep, rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Very steep, high elev., heavy snow*
Considerations for Trail Improvements & Protection	*Outsloped*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N/A*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Talus & debris slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Limit exposure*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, very rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Wildlife use, steep rocky*

Unit No. 920

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM* / *GM-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Suited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Good*
Limit of Bedrock for Roadrock	*Pyroclastic interflows*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, highly dissected*
Method of Excavation	*Rip & blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Catch roads, mesh, bin wall*
Failure Potential on Waste & Fill	*Low*
Erosion Potential on Road Waste and Fills	*Low*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*No fines*
Suggestions for Road Waste and Fill Slope Seeding	*None*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Soil depth*
Suggestions for Cutbank Seeding	*Leave rough*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Grassland, harsh site*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement exposure*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep, rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Low*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Rockfall, slides*
Considerations for Trail Improvements & Protection	*Maintenance, outsloped*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N/A*

EROSION AND HYDROLOGY

Natural Stability	*Unstable*
Nature of Mass Movement	*Debris & talus slides*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Limit exposure*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Very steep, sparse cover*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Steep, access*

Unit No. 922

ENGINEERING

Unified Class. ***Surface***	GM-ML
Subsoil	GM
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Competent rock
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Rockfall, steep, end hall
Method of Excavation	Blast & rip
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil***	Steep
Bedrock	Steep
Probability of Cutbank Failure	Moderately stable
Considerations for Cutbank Stability Problems	Mesh, bin walls
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	No fines
Suggestions for Road Waste and Fill Slope Seeding	Seed toe slopes
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Soil depth, slope
Suggestions for Cutbank Seeding	Roughen

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Low
Limitations to Regeneration	Exposure
Suggested Tree Planting Species	Fir
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Displacement, surface erosion
Suggested Slash Disposal	Leave on site

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Too steep, rocky
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Low
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Poor
Limitations for Trails	Steep, rockfall
Considerations for Trail Improvements & Protection	Outsloped
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	N/A

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Talus & debris slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Minimize disturbance
Water Yield Class	III - II
Bedrock Hydrologic Characteristics	I
Hydrologic Group	B
Sedimentation Yield Potential	Low
Expected Sediment Size ***Surface***	Silt
Subsoil	Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Forage, too steep
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Poor
Limitations to Range Seeding	Shallow, steep

Unit No. 924

ENGINEERING

Unified Class. ***Surface***	GM
Subsoil	GM-GP
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Good
Limit of Bedrock for Roadrock	Soft pyroclastic interflows
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	End hall, very steep & rocky
Method of Excavation	Blade, rip
Cutbank & Ditch Erosion Potential	Moderate
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil***	Steep
Bedrock	Steep
Probability of Cutbank Failure	Moderately stable
Considerations for Cutbank Stability Problems	Catch roads, bin walls
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	No fines
Suggestions for Road Waste and Fill Slope Seeding	None
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Slope, ravel exposure
Suggestions for Cutbank Seeding	Leave rough

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	High
Potential for Regeneration	Low
Limitations to Regeneration	Shallow soil, grassland
Suggested Tree Planting Species	Pine
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Dislodgement, displacement
Suggested Slash Disposal	Lop & scatter

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Steep, rocky
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Low
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Poor
Limitations for Trails	Very steep, rocky
Considerations for Trail Improvements & Protection	Outslope
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	N/A

EROSION AND HYDROLOGY

Natural Stability	Moderately stable
Nature of Mass Movement	Mantle creep, slides
Expected Mass Movement from Man's Activity	Greatly increased
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Disperse flow
Water Yield Class	III
Bedrock Hydrologic Characteristics	I
Hydrologic Group	C - D
Sedimentation Yield Potential	Low
Expected Sediment Size ***Surface***	Silt
Subsoil	Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Steep, rocky
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Wildlife use, shallow soil, exposure

Unit No. 991

ENGINEERING

Unified Class. *Surface* / *Subsoil*	
Suit. as Topsoil Source	*SW-ML* / *GM*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Good* / *None*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Overland flow, runoff*
Method of Excavation	*Blast & rip*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Flat* / *Steep*
Probability of Cutbank Failure	*Low*
Considerations for Cutbank Stability Problems	*None*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Frost, soil, fines*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Shallow soil, frost heave*
Suggestions for Cutbank Seeding	*Seed when moist*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Non-forest*
Suggested Tree Planting Species	*None*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance*
Suggested Slash Disposal	*Scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Severely eroded, no trees*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Good*
Limitations for Trails	*Severe erosion & runoff potentials*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Stable*
Nature of Mass Movement	*Surface ravel*
Expected Mass Movement from Man's Activity	*Unchanged*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Disperse flows*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*I*
Hydrologic Group	*D*
Sedimentation Yield Potential	*Low*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage*
Susceptibility to Soil Compaction	*Moderate*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Severely disturbed, frost*

Unit No. 925

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM-GC* / *GP-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Suited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Incompetent, clay & silt matrix*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*End hall, deep soft subsoil, seeps*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Minimize exposure, roll the grade*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Exposure, expanding clays*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch, fertilize*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Expanding clays, frost, ravel, slough*
Suggestions for Cutbank Seeding	*Roughen, fertilize, mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Compaction, sod*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Type conversion*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, no water nor trees*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*High*
Trail Suitability	*Moderate*
Limitations for Trails	*Dry, rocky, rockfall*
Considerations for Trail Improvements & Protection	*Runoff control*
Suitability for Sewage Filter Field	*Poor*
Soil Limitations to Sewage Filter Field	*Steep, restricted permeability*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Failures along faults, rotational collapses*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain cover*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Clay* / *Clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Forage, water, steep*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Wildlife use*

Unit No. 927

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GM-GC*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Soft incompetent, breaks down readily*
Est. of Roadrock Thickness	*Thick*
Consid. for Road Location & Construction	*Very steep, end haul, soft material*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Drainage*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Slope, expanding clays*
Suggestions for Road Waste and Fill Slope Seeding	*Seed when cons., mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Sealing clays, slope*
Suggestions for Cutbank Seeding	*Roughen*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Moderate*
Limitations to Regeneration	*Shallow fringe units*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Disturbance and displacement*
Suggested Slash Disposal	*Yard out*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Extremely steep, rock outcrops*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Extremely steep, rockfall*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Steep*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Mantle creep, rotational collapse*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*Moderate*
Suggestions for Controlling Subsoil Erosion	*Disperse flows*
Water Yield Class	*I - III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*A - D*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Steep, rock outcrops*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Rocky, wildlife use*

Unit No. 928

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM* / *GM-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Unsuited*
Limit of Bedrock for Roadrock	*Incompetent*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, rockfall, end haul*
Method of Excavation	*Blade*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Minimum road width and cut*
Failure Potential on Waste & Fill	*High*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Soil material, exposure*
Suggestions for Road Waste and Fill Slope Seeding	*Seed soil when moist*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Soil depth*
Suggestions for Cutbank Seeding	*Drought species*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*Moderate*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Exposure, moisture, rock outcrops*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*12 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Site conversion, disturbance & displacement*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep, rocky*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*High*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Low*
Limitations for Trails	*Rocky & extremely steep*
Considerations for Trail Improvements & Protection	*Yearly rock removal*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*N/A*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Debris & talus slides, collapse along faults*
Expected Mass Movement from Man's Activity	*Greatly increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Maintain veg. cover*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*II*
Hydrologic Group	*C*
Sedimentation Yield Potential	*High*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt, clay*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Slope, water, aspect*
Susceptibility to Soil Compaction	*High*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Early wildlife use, water, slope*

Unit No. 997

ENGINEERING

Unified Class. Surface	GM
Unified Class. Subsoil	GC
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Suited
Suit. Bedrock for Roadrock	Unsuited
Limit of Bedrock for Roadrock	Incompetent
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Very steep, end haul, soft material
Method of Excavation	Rip
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio Soil	Moderate
Est. Cutslope Ratio Bedrock	Steep
Probability of Cutbank Failure	Unstable
Considerations for Cutbank Stability Problems	Maintain surface veg.
Failure Potential on Waste & Fill	High
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Harsh, exposed site, fines
Suggestions for Road Waste and Fill Slope Seeding	mulch, if necessary
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Soil depth, slope
Suggestions for Cutbank Seeding	Leave rough, drought species

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Low
Limitations to Regeneration	Harsh, non-forest
Suggested Tree Planting Species	None
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Accelerated erosion, disturbance
Suggested Slash Disposal	N/A

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Hot, dry, steep, rocky
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	Moderate
Susceptibility to Muddiness	Low
Trail Suitability	Poor
Limitations for Trails	Very steep & rocky
Considerations for Trail Improvements & Protection	Yearly cleanup
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	N/A

EROSION AND HYDROLOGY

Natural Stability	Moderately stable
Nature of Mass Movement	Mantle creep, collapse along faults
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	Disperse flow
Water Yield Class	III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	D
Sedimentation Yield Potential	High
Expected Sediment Size Surface	Silt
Expected Sediment Size Subsoil	Silt, clay

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Steep, rocky, dry
Susceptibility to Soil Compaction	Moderate
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Steep, compaction, wildlife use

Unit No. 935

ENGINEERING

Unified Class. Surface	ML-GM
Unified Class. Subsoil	GP
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Fair
Limit of Bedrock for Roadrock	Hard - breaks down to sands
Est. of Roadrock Thickness	Thick
Consid. for Road Location & Construction	High elevation, very steep
Method of Excavation	Blast
Cutbank & Ditch Erosion Potential	High
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio Soil	Steep
Est. Cutslope Ratio Bedrock	Steep
Probability of Cutbank Failure	Unstable
Considerations for Cutbank Stability Problems	Matting, bin walls
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	High
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	Frost, lack of fines, season
Suggestions for Road Waste and Fill Slope Seeding	Seed at construction, mulch
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Ravel, exposure, limited soil
Suggestions for Cutbank Seeding	Leave rough

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Low
Potential for Regeneration	Low
Limitations to Regeneration	High elev., frost, season
Suggested Tree Planting Species	Alpine
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Displacement & accelerated erosion
Suggested Slash Disposal	None

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	High elevation
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	High
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Poor
Limitations for Trails	Very steep, rocky, high elevation
Considerations for Trail Improvements & Protection	None
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	No soil

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Mantle creep, debris and talus slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	High
Suggestions for Controlling Subsoil Erosion	
Water Yield Class	II - III
Bedrock Hydrologic Characteristics	III
Hydrologic Group	C - D
Sedimentation Yield Potential	Low
Expected Sediment Size Surface	Silt
Expected Sediment Size Subsoil	Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Short season, high elevation, access
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Big game summer use, short season

Unit No. 958

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*ML-GM* / *GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Hard massive boulders, weathers to sand*
Est. of Roadrock Thickness	
Consid. for Road Location & Construction	*Very steep, end haul*
Method of Excavation	*Blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Moderate* / *Steep*
Probability of Cutbank Failure	*Unstable*
Considerations for Cutbank Stability Problems	*Snow pack, roll the grade*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*High*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Frost, short season, slope*
Suggestions for Road Waste and Fill Slope Seeding	*Mulch*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Slope, rock outcrop*
Suggestions for Cutbank Seeding	*Leave rough, mulch*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Moisture, marginal unit*
Suggested Tree Planting Species	*Fir*
Waterbar Interval	*6 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Dislodgement, displacement*
Suggested Slash Disposal	*Leave on site*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Too steep, access*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Moderate*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep, access, snow pack*
Considerations for Trail Improvements & Protection	*Drainage*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Mantle creep, talus & debris slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*II - III*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Very steep & rocky*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Heavy wildlife use, rock outcrops*

Unit No. 960

ENGINEERING

Unified Class. *Surface* / *Subsoil*	*GM* / *GM-GP*
Suit. as Topsoil Source	*Unsuited*
Sand or Gravel Source	*Unsuited*
Suit. as Clay Source	*Unsuited*
Suit. Bedrock for Roadrock	*Fair*
Limit of Bedrock for Roadrock	*Breaks down to sand*
Est. of Roadrock Thickness	*Thin*
Consid. for Road Location & Construction	*Very steep, end haul, rockfall*
Method of Excavation	*Blast*
Cutbank & Ditch Erosion Potential	*High*
Susceptibility to Cutbank Sloughing & Raveling	*High*
Est. Cutslope Ratio *Soil* / *Bedrock*	*Steep* / *Steep*
Probability of Cutbank Failure	*Moderately stable*
Considerations for Cutbank Stability Problems	*Matting*
Failure Potential on Waste & Fill	*Moderate*
Erosion Potential on Road Waste and Fills	*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding	*Poor*
Limitations to Road Waste and Fill Slope Seeding	*Ravel, slope*
Suggestions for Road Waste and Fill Slope Seeding	*Seed heavily, forbs*
Suitability of Cutbank Seeding	*Poor*
Limit of Cutbank Seeding	*Ravel, slope*
Suggestions for Cutbank Seeding	*Matting*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Low*
Susceptibility to Pinegrass Revegetation	*High*
Potential for Regeneration	*Low*
Limitations to Regeneration	*Moisture*
Suggested Tree Planting Species	*Pine*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Dislodgement, displacement, site conversion*
Suggested Slash Disposal	*Lop & scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, access, short season*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*Moderate*
Susceptibility to Dust	*Moderate*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Poor*
Limitations for Trails	*Rocky, steep*
Considerations for Trail Improvements & Protection	*Disperse runoff*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope, soil depth*

EROSION AND HYDROLOGY

Natural Stability	*Moderately stable*
Nature of Mass Movement	*Debris & talus slides*
Expected Mass Movement from Man's Activity	*Increased*
Surface Soil Erosion Potential	*Very severe*
Subsoil Erosion Potential	*High*
Suggestions for Controlling Subsoil Erosion	*Disperse runoff*
Water Yield Class	*III*
Bedrock Hydrologic Characteristics	*III*
Hydrologic Group	*C - D*
Sedimentation Yield Potential	*Moderate*
Expected Sediment Size *Surface* / *Subsoil*	*Silt* / *Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Water, steep access*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Wildlife use, moisture regime*

Unit No. 947

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	GM / GM-GP
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Fair
Limit of Bedrock for Roadrock	Moderately competent
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Very steep, end hall, 100% slope
Method of Excavation	Blast
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	Steep / Steep
Probability of Cutbank Failure	Moderately stable
Considerations for Cutbank Stability Problems	Minimize roads
Failure Potential on Waste & Fill	Low
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	No soil
Suggestions for Road Waste and Fill Slope Seeding	None
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Thin soil
Suggestions for Cutbank Seeding	Maintain good ground cover

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	High
Potential for Regeneration	Low
Limitations to Regeneration	Sod, moisture regime
Suggested Tree Planting Species	Fir, pine
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Site conversion, dislodgement, displacement
Suggested Slash Disposal	Leave on site

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Steep, dry, rocky
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	Low
Susceptibility to Muddiness	Low
Trail Suitability	Moderate
Limitations for Trails	100% slope in places Large windthrow
Considerations for Trail Improvements & Protection	Disperse runoff
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Slope

EROSION AND HYDROLOGY

Natural Stability	Stable
Nature of Mass Movement	Mantle creep, talus slides
Expected Mass Movement from Man's Activity	Increased
Surface Soil Erosion Potential	Very severe
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Maintain infiltration, ground cover
Water Yield Class	II - III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	C - D
Sedimentation Yield Potential	Low
Expected Sediment Size ***Surface*** / ***Subsoil***	Silt / Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Rock, steep
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Rock, moisture, regime, wildlife use

Unit No. 948

ENGINEERING

Unified Class. ***Surface*** / ***Subsoil***	ML-GM / GP
Suit. as Topsoil Source	Unsuited
Sand or Gravel Source	Unsuited
Suit. as Clay Source	Unsuited
Suit. Bedrock for Roadrock	Fair
Limit of Bedrock for Roadrock	Moderately competent
Est. of Roadrock Thickness	Thin
Consid. for Road Location & Construction	Very steep, 100% sideslope, end hall
Method of Excavation	Blast
Cutbank & Ditch Erosion Potential	Low
Susceptibility to Cutbank Sloughing & Raveling	High
Est. Cutslope Ratio ***Soil*** / ***Bedrock***	Steep / Steep
Probability of Cutbank Failure	Unstable
Considerations for Cutbank Stability Problems	None
Failure Potential on Waste & Fill	Moderate
Erosion Potential on Road Waste and Fills	Low
Suitability of Road Waste & Fill Slopes to Seeding	Poor
Limitations to Road Waste and Fill Slope Seeding	No soil
Suggestions for Road Waste and Fill Slope Seeding	None
Suitability of Cutbank Seeding	Poor
Limit of Cutbank Seeding	Steep, ravel
Suggestions for Cutbank Seeding	Minimize exposure

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	Low
Susceptibility to Pinegrass Revegetation	Moderate
Potential for Regeneration	Moderate
Limitations to Regeneration	Seed source
Suggested Tree Planting Species	None
Waterbar Interval	4 ft. vertical
Harvest Potential Impact on Soil Resource	High
Type of Damage	Dislodgement and displacement, burning
Suggested Slash Disposal	Leave fines on site

RECREATION

Soil Suitability for Recreational Development	Unsuited
Limitations for Recreational Development	Too steep
Treatment to Increase Suitability	None
Soil and Site Damage Susceptibility	Moderate
Susceptibility to Dust	Moderate
Susceptibility to Muddiness	Low
Trail Suitability	Fair
Limitations for Trails	Slope, rock outcrops
Considerations for Trail Improvements & Protection	Disperse runoff
Suitability for Sewage Filter Field	Unsuited
Soil Limitations to Sewage Filter Field	Slope

EROSION AND HYDROLOGY

Natural Stability	Moderately stable
Nature of Mass Movement	Soil mantle creep, rotational slipouts
Expected Mass Movement from Man's Activity	Greatly increased
Surface Soil Erosion Potential	Severe
Subsoil Erosion Potential	Moderate
Suggestions for Controlling Subsoil Erosion	Minimum disturbance
Water Yield Class	II - III
Bedrock Hydrologic Characteristics	II
Hydrologic Group	B - C - D
Sedimentation Yield Potential	Moderate
Expected Sediment Size ***Surface*** / ***Subsoil***	Silt / Silt

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	Slope, rock outcrops
Susceptibility to Soil Compaction	Low
Susceptibility to Soil Displacement	High
Potential for Range Improvements through Seeding	Low
Limitations to Range Seeding	Wildlife use, water, limited soil

Unit No. 951

ENGINEERING

Unified Class.	***Surface***	*ML-SW*
	Subsoil	*SW-GM*
Suit. as Topsoil Source		*Unsuited*
Sand or Gravel Source		*Unsuited*
Suit. as Clay Source		*Unsuited*
Suit. Bedrock for Roadrock		*Fair*
Limit of Bedrock for Roadrock		*Moderately competent*
Est. of Roadrock Thickness		*Thick*
Consid. for Road Location & Construction		*Snow, very steep, rockfall, end haul*
Method of Excavation		*Blast*
Cutbank & Ditch Erosion Potential		*Low*
Susceptibility to Cutbank Sloughing & Raveling		*High*
Est. Cutslope Ratio	***Soil***	*Steep*
	Bedrock	*Steep*
Probability of Cutbank Failure		*Unstable*
Considerations for Cutbank Stability Problems		*Minimize cuts*
Failure Potential on Waste & Fill		*Moderate*
Erosion Potential on Road Waste and Fills		*Moderate*
Suitability of Road Waste & Fill Slopes to Seeding		*Poor*
Limitations to Road Waste and Fill Slope Seeding		*No fines*
Suggestions for Road Waste and Fill Slope Seeding		*None*
Suitability of Cutbank Seeding		*Poor*
Limit of Cutbank Seeding		*Ravel, slough, shallow soil*
Suggestions for Cutbank Seeding		*Minimize exposure*

TIMBER MANAGEMENT

Susceptible to Brush Revegetation	*Moderate*
Susceptibility to Pinegrass Revegetation	*Low*
Potential for Regeneration	*Low*
Limitations to Regeneration	*High elev., cold soils, marginal, seed source*
Suggested Tree Planting Species	*None*
Waterbar Interval	*4 ft. vertical*
Harvest Potential Impact on Soil Resource	*High*
Type of Damage	*Displacement, accelerated erosion*
Suggested Slash Disposal	*Lop, scatter*

RECREATION

Soil Suitability for Recreational Development	*Unsuited*
Limitations for Recreational Development	*Steep, fragile*
Treatment to Increase Suitability	*None*
Soil and Site Damage Susceptibility	*High*
Susceptibility to Dust	*Low*
Susceptibility to Muddiness	*Low*
Trail Suitability	*Moderate*
Limitations for Trails	*Steep, high elev., heavy snow*
Considerations for Trail Improvements & Protection	*Disperse snow; runoff*
Suitability for Sewage Filter Field	*Unsuited*
Soil Limitations to Sewage Filter Field	*Slope*

EROSION AND HYDROLOGY

Natural Stability		*Stable*
Nature of Mass Movement		*Soil creep, talus-rotational slides*
Expected Mass Movement from Man's Activity		*Greatly increased*
Surface Soil Erosion Potential		*Very severe*
Subsoil Erosion Potential		*High*
Suggestions for Controlling Subsoil Erosion		*No disturbance*
Water Yield Class		*II - III*
Bedrock Hydrologic Characteristics		*II*
Hydrologic Group		*C - D*
Sedimentation Yield Potential		*Low*
Expected Sediment Size	***Surface***	*Silt*
	Subsoil	*Silt*

RANGE AND WILDLIFE

Limitations for Domestic Livestock and Wildlife Use	*Cold site, high elevation*
Susceptibility to Soil Compaction	*Low*
Susceptibility to Soil Displacement	*High*
Potential for Range Improvements through Seeding	*Low*
Limitations to Range Seeding	*Wildlife use, short season, growth limit*

Appendix

Engineering

Interpretations for engineering include characteristics for roads, foundations, bedrock, and some miscellaneous interpretations. The table, "General Engineering Interpretations", gives engineering interpretations which will be useful to engineers and other resource managers. These interpretations are explained and defined in this section. Generally, the following interpretations and ratings are based on the entire land-type unit including soil, bedrock and landform. Some interpretations are based only on the soil material or bedrock material. These are stated in the description for each interpretation. The interpretations pertaining to roads are based on standard Forest Service regulations and construction methods presently used.

Unified Classification

Each soil is classified to the unified classification system. Most soils will be classified into one class. Those soils with significant layers of different soil materials will have a classification for each layer designated. The classification was estimated.

Suitability for Use as Topsoil Source

This rating evaluates each soil as to its suitability for use as topsoil. It does not specify any particular use of the topsoil. Ratings are based on soil characteristics.

Suited—Soil texture ranges from sandy loam to clay loam; gravel content is less than 35 percent and soil layer is at least three feet thick.

Unsuited—This rating indicates the soils do not satisfy the requirements specified under "Suited". However, soils rated "Unsuited" may still satisfy a particular requirement. See the "Table of Soil Characteristics" for soil texture, thickness and gravel content.

Suitability of Soil as Sand and/or Gravel Source

This interpretation indicates the suitability of each soil as a possible source of sand and/or gravel. It does not indicate the kind of quality of sand or gravel, or refer to any specific use of the sand and/or gravel.

Suited—This rating indicates that sand and/or gravel is present and the following conditions are satisfied: There is a layer present which is composed of 80 percent, by volume, of sand and/or gravel. This layer is at least four feet thick.

Unsuited—This rating indicates that sand and/or gravel is generally not present in amounts which satisfy the requirements under "Suited". However, soils rated "Unsuited" may still satisfy a particular requirement. See the "Table of Soil Characteristics" for soil depth and gravel content.

Suitability of Soil as a Possible Clay Source

This rating indicates the suitability of each soil as a possible source of clay. It does not indicate the kind or quality of clay or refer to any specific use of clay.

Suited—This rating indicates that the soil is a possible source of clay. Soils with this rating have the following: Texture ranges from clay loam to clay. Gravel content is less than 35 percent. This layer is at least two feet thick.

Unsuited—Soils with this rating generally are not possible sources for clay.

Suitability of Bedrock for Road Rock

This interpretation indicates the *general* stability of rock when used as road rock for base course or wearing surface. These ratings are based on rock hardness, density, and susceptibility to weathering and breakdown. Soils are not related when depth to bedrock is greater than 12 feet. (*Cautionary note:* This information is for broad planning purposes only. Specific onsite characterization data are required to accurately determine rock suitability.)

Unsuited—Rock is soft and breaks down rapidly under logging traffic.

Poor—Rock is only moderately hard and breaks down easily under logging traffic, usually in one or two years' time.

Fair—Rock is hard and dense but tends to break down under logging traffic after about two to four years' use.

Good—Rock is hard, dense and resists breakdown under logging traffic.

Limitations of Bedrock for Road Rock

This indicates the major limitation of the bedrock for road rock use.

Estimate of Road Rock Thickness

This interpretation refers to estimated amount of road rock (base course and wearing surface) generally needed on heavy-vehicle, all-weather use roads constructed on each soil. Factors involved in making this interpretation include field observations, texture and plasticity of soil, depth of bedrock, drainage, and kind of subgrade the road generally will have—common material or bedrock. Ratings are based on *uncompacted fills* and on the use of high quality rock. (*Cautionary note:* This information is for broad planning purposes only. Specific onsite characterization data are required to accurately determine thickness needs.)

Very thin—Generally less than six inches

Thin—Approximately six to 12 inches

Thick—Approximately 12 to 24 inches

Very thick—Generally over 24 inches

Considerations for Road Location and Construction

This indicates the major considerations for road location and construction through each soil. The rating evaluates the impact of road construction on other resources and/or road construction problems likely to be encountered.

Method of Excavation

This interpretation refers to excavation methods most commonly used and required for each soil. This includes soil, bedrock and cemented and/or compacted layers in the soil. Methods are blading, ripping, and/or blasting. (*Cautionary note:* These appraisals are subject to change as machinery capabilities change.)

Cutbank and Ditch Erosion Potential

This interpretation indicates the *potential for subsoil erosion by running water of each soil.* Subsoil refers to the B horizon of soils with distinct profiles. It underlies the topsoil of volcanic ash layer and overlies bedrock or residual and colluvial materials. It includes erosion which takes place along road ditches and on cutslopes. Rating is of soil material only and does not apply when cutbank or ditch is in bedrock. Factors considered in making ratings are field observations, texture and structure of subsoil materials, permeability, compaction, and climate.

Low—Factors indicate that little or no subsoil erosion is likely to occur.

Moderate—Factors indicate that the subsoils have moderate erosion potential.

High—Factors indicate that the subsoils are likely to erode severely.

Susceptibility to Cutbank Sloughing and Raveling

This rating evaluates each unit for its susceptibility to sloughing or raveling after excavation. Ratings are based on cutbanks at least ten feet high. Factors include field observations, soil and bedrock characteristics, backslope ratio, frost action, climate and potential for revegetation.

Low—Sloughing and/or raveling is a minor problem requiring occasional road maintenance.

Moderate—Sloughing and/or raveling causes some damage. Annual road maintenance is usually adequate.

High—Sloughing and raveling occur at a rate that often plugs culverts and fills inside ditches. Frequent road maintenance with heavy equipment such as front-end loader is required.

Estimated Cutslope Ratio

This interpretation estimates the cutslope ratio which generally will result in the most stable cutbank condition. Ratings made are for cutbanks at least ten feet high and pertain both to soil and bedrock material. Ratings are based on soil and bedrock factors and on observations. (*Cautionary note:* This information is for broad planning purposes only. Specific onsite characterization data is needed to determine the proper ratio.)

Steep— Cutbank ratio from vertical to ¼:1

Moderate—Cutbank ratio from about 1:1 to 1 ½:1

Flat—Cutbank ratio flatter than 1 ½:1

Probability of Cutbank Failures

This interpretation indicates the probability of failures in cutbanks following road construction or excavation for buildings. Failures are considered to be at least ten cubic yards of material in volume. Ratings are based on cutbanks of at least ten feet in height and refer to more than a 50-percent chance for failures. This interpretation is for standard single lane roads with turnouts meeting Forest Service construction specifications.

I. **Very stable**— practically no probability of chance of cutbank failures

II. **Stable**—probability of no more than two failures per mile of road cutbank

III. **Moderately stable**—probability of two to four failures per mile of road cutbank

IV. **Unstable**—probability of four to six failures per mile of road cutbank

V. **Very unstable**—probability of more than six failures per mile of road cutbank

Considerations for Cutbank Stability Problems

This rating gives suggestions, when applicable, to increase stability of cutbanks or reduce damage from raveling and sloughing.

Failure Potential on Road Waste and Fills

This interpretation rates the soil units as to the susceptibility of failure occurring on fill and sidecast waste material and related damage to resources. Failures are defined as a loss or partial loss of road fill or sidecast material on the fill slope. Considered are initial and subsequent failures caused by construction, erosion and additional sidecast during maintenance. Failures result in damage to various resources. Stream sedimentation levels are increased, resulting in an adverse effect on both water quality and fisheries. Timber growth potential is affected as fill slope areas no longer contribute to production. Occasionally the failures do damage to the road itself. The ratings are based on current road construction practices and procedures and on type of soil materials, natural drainage of the site, landform, slope of the fill, and field observation.

Low—Failure on road waste and fills is sufficiently low to result in only minor damage to resource values.

Moderate—Failures on road waste and fills occur with sufficient frequency to cause moderate damage to resource values.

High—Failures on road waste and fills occur at a rate and magnitude sufficient to cause major damage to resource values.

Erosion Potential on Road Waste and Fills

This interpretation rates the soil units as to the susceptibility of erosion occurring on fill and sidecast waste material and related damage to resources. Erosion is defined as the loss of surface soil from fill or sidecast.

Erosion of sidecast and fills contributes sedimentation to streams. Timber growth potential is affected as fill slope areas no longer contribute to production. The ratings are based on current road construction practices and procedures and on type of soil materials, natural drainage of the site, landform, slope of the fill, and field observation.

Low—Erosion on road waste and fills is sufficiently low to result in only minor damage to resource values.

Moderate—Erosion on road waste and fills occurs with sufficient magnitude to cause moderate damage to resource values.

High—Erosion on road waste and fills occurs at a magnitude sufficient to cause major damage to resource values.

Suitability of Road Waste and Fill Slopes to Seeding

This interpretation indicates the probable success of fill slope seeding. Factors considered in making ratings are soil characteristics, elevation, slope, climate, snowpack, and frost hazard. Ratings are based on current methods and practices of seeding, grass species, fertilizer application and time of seeding.

Poor—Probability of success is low. Seeding generally is not successful and requires three or more reseedings and/or special treatments.

Fair—Success is likely on about 50 percent of area treated. Requires one or two followup treatments. Seeding usually becomes well established within two years. Follow-up seeding may be necessary.

Good—Probability of high success. Seeding usually becomes well established within two years. Little follow-up seeding is necessary.

Limitations to Road Waste and Fill Slope Seeding

This indicates the major limitations to success of fill slope seeding.

Considerations for Road Waste and Fill Slope Seeding

This indicates special treatment to be given, when applicable, to increase the chance of success of fill slope seeding. A statement indicates the necessary requirements other than normal fill slope seeding practices carried on by the Forest.

Suitability of Cutbanks to Seeding

This interpretation indicates the probable success of cutbank seeding. Factors considered in making ratings are soil characteristics, elevation, slope, climate, snowpack, and frost hazard. Ratings are based on current methods and practices of seeding, grass species, fertilizer application and time of seeding.

Poor—Probability of success is low. Seeding generally is not successful and requires more reseedings and/or special treatments.

Fair—Success if likely on about 50 percent of area treated. Requires one or two followup treatments. Seeding is usually spotty; some areas become easily established, while others fail completely.

Good—Probability of high success. Seeding usually becomes well established within two years. Little follow-up seeding necessary.

Limitations to Cutbank Seeding

This indicates the major limitations to success of cutbank seeding.

Considerations for Cutbank Seeding

This indicates special treatment to be given, when applicable, to increase the chance of success of cutbank seeding.

Timber Management

Interpretations for Timber Management are of two types. One type includes some interpretations that directly affect timber management such as "Potential for Regeneration". The other type indicates the effect on the soil resource from timber harvest activities.

Timber management interpretations are intended to be a general guide to the forester; giving basic information on the soil, the management possibilities and limitations imposed by the soil unit. The home of the roots is the soil, and thus the growth of the tree and the production of the forest are directly related to the quantity, quality and location of the soil.

Susceptibility to Brush Revegetation

This indicates the susceptibility of mapping units to revegetate naturally by brush following timber harvest. These ratings are based on soil characteristics, field observation, slope, aspect, climate and elevation.

Low—Indicates brush revegetation is insignificant.

Moderate— Indicates that some brush revegetation will occur.

High—Indicates brush revegetation is very dense.

Natural Susceptibility to Pinegrass Revegetation

This interpretation indicates the susceptibility of each mapping unit to revegetate to pinegrass following timber harvest operations. These ratings are based on soil characteristics, drainage, elevation, climate, topography position and field observations.

Low—Factors do not encourage pinegrass establishment and growth. Little or no pinegrass revegetation occurs.

Moderate—Factors are moderately favorable for pinegrass establishment and growth. Pinegrass revegetation is moderate.

High—Factors are highly favorable for pinegrass establishment and growth. Pinegrass revegetation occurs rapidly.

Potential for Regeneration

This interpretation indicates the potential for each landtype unit to regenerate at a minimum level of stocking as set by the Forest Service. Factors included in this interpretation are soil characteristics, climate, aspect, elevation, frost potential, brush competition, and tree species. Includes planted stock and natural regeneration.

Low—This rating indicates the potential for regeneration is low. Probability of success is very limited. Major regeneration problems can be expected and reseeding or replanting may be required throughout the area. Several years may elapse before an adequate stocking level is achieved.

Moderate—This rating indicates that some problems will be encountered in attaining a satisfactory stocking level. Usually regeneration is spotty and some replanting will be necessary.

High—This rating indicates that regeneration has a high probability of success. Few problems should be encountered in attaining good stocking levels.

Limitations to Regeneration

This indicates the major soil limitations to regeneration of planted stock and naturals.

Considerations for Tree Planting Species

This column lists the tree species that the soil, climate, and topographic factors indicate may be best suited for planting.

Potential Impacts on the Soil Resource from Timber Harvest Methods

This interpretation indicates the susceptibility of soil and water resources to incur damage from various timber harvest methods. The evaluation of expected impact includes soil and water resource damages from timber removal, spur roads, landings and other activities that may be associated with the harvest method being evaluated. The evaluations are based on a full operating season. Damage is caused to soils by creating soil disturbance which may destroy soil structure, cause compaction and increase erosion. This may affect other resources through loss of production, lower water quality and yield, and loss of fisheries. Field observations indicate the most important factors to consider in making these ratings are wetness of soil, soil texture and structure, percentage of coarse fragments, slope, drainage, climate, and field observations.

Low—This rating indicates that the impacts to the soil and water resources are minor. Little or no soil damage is expected.

Moderate—This rating indicates that the impacts to the soil and water resources are moderate. Soil and water resources are expected to incur moderate damage.

High—This rating indicates that the impacts to the soil and water resources are major. Excessive damage to soil and water resources is likely to occur.

Type of Damage Expected by Timber Harvest Operations

This indicates the type of soil and water resource damage expected on each soil from harvest operations.

Considerations for Slash Disposal

Forest residues enhance soil physical and chemical properties as well as improve aeration, drainage and moisture retention. Desirable microbial activity, including rapid decomposition of residues and gradual release of nutrients for tree growth can be enhanced by proper treatment. Factors considered are soil type and depth, humus layer, ground cover and plant community types.

Waterbar Interval

This is an estimate, from field observations, of the vertical drop in feet between waterbars and skid trails or road. Factors considered are soil characteristics, climate, slope length and gradient, hydrologic characteristics of the soil and bedrock material.

Recreation

Interpretations for recreation pertain primarily to recreation development. They are based on soil and bedrock properties, drainage, landform and vegetation. Factors such as aesthetics and accessibility are not considered when making these ratings. The following interpretations are some most generally needed for planning base camp recreation developments.

Landtype Suitability for Recreation Area Development

This rating is based on soil and bedrock characteristics and topographic features of each unit as related to recreation development such as campground and picnic sites. Factors important to this interpretation are soil depth, texture, structure, permeability, drainage, topography, and susceptibility to flooding.

Unsuited—This rating indicates that soils and/or topography are of a nature which would prohibit recreation development without extensive modification.

Low—These soil units have major limitations to recreation development but limited development is feasible.

Moderate—This rating indicates that the soil unit is generally suitable for recreation development but has minor limitations.

High—These soils are particularly well suited for recreation development. Generally, they have no limitations.

Landtype Limitations for Recreation Development

This indicates the major soil limitations to recreation development.

Treatment to Increase Suitability

This indicates, when applicable, the treatment necessary to increase the suitability for recreation development.

Soil and Site Damage Susceptibility

This interpretation applies to recreational areas after development. Each soil that is suitable or can be made suitable for campground development is rated for its susceptibility to damage of soil and/or site by normal recreation use. Site includes vegetation as well as soil conditions. Factors used in determining

ratings include erosion potential, soil compactibility, and vegetative growth potential.

Low—These soils resist compaction and have low erosion potential. The native vegetation is hardy and not readily destroyed. These soils will withstand and hold up well under continual use.

Moderate—These soils are not readily compacted or eroded and vegetative types are somewhat hardy. In general, these soils and site can sustain continual use but require some rehabilitation.

High—These soils are fragile and easily damaged and have vegetation that is not hardy, easily damaged and generally herbaceous. Under normal use, the vegetation will very likely be destroyed, the soil compacted and/or eroded to such a degree that periodic nonuse and major rehabilitation will be required.

Susceptibility to Dustiness

This interpretation pertains only to the soils suitable for recreation development, and applies primarily to unsurfaced roads within recreation areas.

Low—Factors indicate dust will not be a problem.

Moderate—Under normal conditions dust will not be a problem but under heavy use and droughty conditions, dust very likely will be a problem.

High—Factors indicate dust will be a problem. Dust abatement measures are necessary under normal conditions and use.

Susceptibility to Muddiness

This interpretation pertains only to the soils suitable, or those that can be made suitable, for recreation development. This interpretation rates each soil as to its susceptibility to becoming muddy. The rating is limited to the surface soil under normal conditions. Factors include soil characteristics, climate and drainage.

Low—Muddiness is not likely to be a problem. Factors indicate soils are not susceptible to muddiness.

Moderate—Soils become muddy at times for short periods, occasionally causing problems. Road rock is usually necessary.

High—Soils are very likely to become muddy and stay muddy for long periods. Road rock is necessary. Campground closure may be necessary during wet periods.

Trail Suitability

This interpretation indicates the suitability of each soil for trails. Factors include soil and bedrock characteristics, drainage, climate, and slope.

Poor—These soils have properties which severely limit their use for trails. Extensive treatment measures are required.

Moderate—These soils have some limitations for trail development. Certain treatment measures may be required.

Well—These soils have no limitations for trail development.

Limitations for Trails

This indicates the limitations for trails.

Considerations for Trail Improvements and Protection

This indicates some treatment measures to be considered in improving suitability and protecting trails.

Suitability for Sewage Filter Field

This interpretation evaluates the soil as to its suitability as a sewage filter field. Ratings are based on soil depth, texture, permeability, drainage and slope. Only those soils suitable for recreation development are rated. Onsite investigation is recommended before design or installation of filter system.

Poor—These soils have properties which make them poorly suited as sewage filter fields. Sewage filter disposal in these soils would be ineffective and create major problems.

Moderate—These soils have properties which limit their use as sewage filter fields. They require a large filter area for adequate drainage which limits the capacity of the campground.

Well—These soils are well suited to sewage filter use and offer only minor limitations, if any.

Soil Limitation to Sewage Filter Field Use

This indicates the major limitations to sewage filter field use.

Erosion and Hydrology

Erosion and some hydrologic interpretations include erosion and water management interpretations. Interpretations for erosion include the two major kinds of erosion—surface and mass movement. Surface erosion pertains only to surface soil loss by runoff and overland flow. Mass movement pertains to all types of soil and bedrock movement which occurs below the soil surface such as landships, slumps, slides, rockfall and land flow.

Natural Stability

This rating is based on the relative stability of the mapping units as they occur in the natural state. It includes any movement or loss other than surface erosion. Types of movement are slumps, slides, and all kinds of deep-seated failures. This rating applies throughout Region 6.

I. **Very stable** — No evidence of failure

II. **Stable**—Occasional failures are observed

III. **Moderately stable** — Several failures are observed

IV. **Unstable**—Many failures are observed

V. **Very unstable** — Entire area shows evidence of recent and past failures

Nature of Mass Movement

This is an estimation of the kind and/or size of mass movement observed.

Expected Mass Movement as a Result of Man's Activities

This rating indicates the expected mass movement resulting from man's activities as compared to stability under natural conditions. Ratings are based on soil and bedrock characteristics, slopes, revegetation potential, and effects of timber removal, road construction and fire.

Unchanged—The expected mass movement is relatively unchanged from that of the natural state.

Increased — The expected mass movement is greater than that of the natural state.

Greatly increased—The expected mass movement is much greater than that of the natural state.

Surface Soil Erosion Potential

This rating is based on expected losses of surface soil *when all vegetative cover, including litter, is removed.* Evaluations of climate, slope gradient and length, soil characteristics, hydrologic characteristics of the soil and bedrock materials of each landtype unit are considered in making ratings.

Slight—Little loss of soil materials is expected. Some minor sheet and rill erosion may occur.

Moderate—Some loss of surface soil materials can be expected. Rill erosion and some small gullies or sheet erosion may be occurring. Sheet erosion can be determined by some soil pedestals and observable accumulation of soil materials along the upslope edge of rocks and debris. At this level of erosion, there is a possible fertility loss.

Severe—Considerable loss of surface soil materials can be expected. Rill erosion, numerous small gullies *or* evidence that considerable loss from sheet erosion may occur. Sheet erosion is indicated by frequent occurrence of soil pedestals and considerable accumulation of soil materials along the upslope edge of rocks and debris. This is accompanied by a probable fertility loss.

ratings include erosion potential, soil compactibility, and vegetative growth potential.

Low—These soils resist compaction and have low erosion potential. The native vegetation is hardy and not readily destroyed. These soils will withstand and hold up well under continual use.

Moderate—These soils are not readily compacted or eroded and vegetative types are somewhat hardy. In general, these soils and site can sustain continual use but require some rehabilitation.

High—These soils are fragile and easily damaged and have vegetation that is not hardy, easily damaged and generally herbaceous. Under normal use, the vegetation will very likely be destroyed, the soil compacted and/or eroded to such a degree that periodic nonuse and major rehabilitation will be required.

Susceptibility to Dustiness

This interpretation pertains only to the soils suitable for recreation development, and applies primarily to unsurfaced roads within recreation areas.

Low—Factors indicate dust will not be a problem.

Moderate—Under normal conditions dust will not be a problem but under heavy use and droughty conditions, dust very likely will be a problem.

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Susceptibility to Muddiness

This interpretation pertains only to the soils suitable, or those that can be made suitable, for recreation development. This interpretation rates each soil as to its susceptibility to becoming muddy. The rating is limited to the surface soil under normal conditions. Factors include soil characteristics, climate and drainage.

Low—Muddiness is not likely to be a problem. Factors indicate soils are not susceptible to muddiness.

Moderate—Soils become muddy at times for short periods, occasionally causing problems. Road rock is usually necessary.

High—Soils are very likely to become muddy and stay muddy for long periods. Road rock is necessary. Campground closure may be necessary during wet periods.

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Poor—These soils have properties which make them poorly suited as sewage filter fields. Sewage filter disposal in these soils would be ineffective and create major problems.

Moderate—These soils have properties which limit their use as sewage filter fields. They require a large filter area for adequate drainage which limits the capacity of the campground.

Well—These soils are well suited to sewage filter use and offer only minor limitations, if any.

Soil Limitation to Sewage Filter Field Use

This indicates the major limitations to sewage filter field use.

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Unchanged—The expected mass movement is relatively unchanged from that of the natural state.

Increased — The expected mass movement is greater than that of the natural state.

Greatly increased—The expected mass movement is much greater than that of the natural state.

Surface Soil Erosion Potential

This rating is based on expected losses of surface soil *when all vegetative cover, including litter, is removed.* Evaluations of climate, slope gradient and length, soil characteristics, hydrologic characteristics of the soil and bedrock materials of each landtype unit are considered in making ratings.

Slight—Little loss of soil materials is expected. Some minor sheet and rill erosion may occur.

Moderate—Some loss of surface soil materials can be expected. Rill erosion and some small gullies or sheet erosion may be occurring. Sheet erosion can be determined by some soil pedestals and observable accumulation of soil materials along the upslope edge of rocks and debris. At this level of erosion, there is a possible fertility loss.

Severe—Considerable loss of surface soil materials can be expected. Rill erosion, numerous small gullies *or* evidence that considerable loss from sheet erosion may occur. Sheet erosion is indicated by frequent occurrence of soil pedestals and considerable accumulation of soil materials along the upslope edge of rocks and debris. This is accompanied by a probable fertility loss.

Very severe—Large loss of surface soil material can be expected in the form of many large gullies and/or numerous small gullies *or* large loss from sheet erosion. Sheet erosion loss is exhibited by numerous examples of soil pedestals and extensive accumulation of soil materials along the upslope edge of rocks and debris. This is accompanied by a fertility loss.

Subsoil Erosion Potential

This interpretation indicates the potential for subsoil erosion by water for each unit. It includes erosion which takes place after the surface soil has been removed (at least to 1-foot depth) such as in skid trails and firebreaks. Factors considered in making ratings are texture and structure of subsoil materials, slope, permeability, compaction, climate, and landform.

Low—Factors are such that little or no erosion may occur. Very little evidence of erosion.

Moderate—Considerable erosion occuring such as rills and small gullies. Factors indicate considerable erosion is likely to occur.

High—Factors indicate severe erosion may occur.

Considerations for Controlling Subsoil Erosion

In this column, considerations are given, when applicable, for controlling erosion.

Water Yield Class

This interpretation is an indication of the rate and amount of water yield expected from each soil. It is based on factors such as soil characteristics, infiltration rates, permeability, slope, climate, vegetation, and drainage patterns.

Class I—These soils have a high water detention storage capacity and a low rate of runoff. Little water is yielded to peak flows until detention storage capacity is exceeded or unless the soils are initially saturated or frozen. They are important in sustaining high base flow due to a relatively large volume of water held in detention storage.

Class II—These soils have a moderate water detention storage capacity and a moderate rate of runoff. Water contributes to both peak flows and base flow.

Class III—These soils have a low water detention storage capacity and a high rate of runoff. The storage capacity is low and easily exceeded with most of the water contributing to peak flow. Little water is yielded to sustain base flow.

Bedrock Hydrologic Characteristics

This interpretation indicates the relative capacity of bedrock to store and transmit water. The rating is based on bedrock kind, texture, type and extent of fracturing, frequency of jointing, bedding characteristics, and degree of weathering.

Class I—This indicates that the bedrock has a relatively high capacity to store water. The water transmission rate is low unless the storage capacity is exceeded. Rocks in this class include sandstones because of their texture, fracture, and bedding characteristics, and basalts where water occurs in large tubes and other cavities or in the interflow zone between successive lava flows.

Class II—This indicates that the bedrock has a moderate capacity to store water. The rate of water transmission is moderate. Rocks in this class are generally hard to moderately hard, moderately fine textured, and moderately to highly fractured siltstone, mudstone, pyroclastics, argillite and schist.

Class III—This indicates that the bedrock has a relatively low capacity to store water. The rate of water transmission is rapid. Rocks generally in this class are fractured coarse crystalline (i.e. granite, gabbro and gneiss) and other hard-fractured rocks such as conglomerate.

Class IV—This indicates that the bedrock has both low-storage capacity and low rate of water transmission. Rocks in this class are generally highly weathered, fine-textured, and lack open fracture channels.

Hydrologic Group

This interpretation is a grouping of soils into four classes, indicating the general infiltration and permeability of the soil and bedrock materials. This method of ratings has been developed by the Soil Conservation Service. The four groups are the standard SCS groupings and definitions.

Group A—Soils having high infiltration rates even when thoroughly wetted, consisting chiefly of deep, well to excessively drained sands and/or gravel. These soils have a high rate of water transmission and would result in a low runoff potential.

Group B—Soils having moderate infiltration rates when thoroughly wetted, consisting chiefly of moderately deep to deep, moderately well to well drained soils, with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

Group C—Soils having slow infiltration rates when thoroughly wetted, consisting chiefly of (1) soils with a layer that impedes the downward movement of water, or (2) soils with moderately fine to fine texture and a slow infiltration rate. These soils have a slow rate of water transmission.

Group D—Soils having very slow infiltration rates when thoroughly wetted, consisting chiefly of (1) clay soils with high swelling potential, (2) soils with a high permanent water table, (3) soils with claypan or clay layer at or near the surface, and (4) shallow soils over nearly impervious materials. These soils have a very slow rate of water transmission and high runoff potential.

Sedimentation Yield Potential

This interpretation indicates the potential for water sedimentation and pollution from silt and clay particles carried in suspension following timber harvest, road construction, or other activities. Factors considered in making ratings are *soil texture, structure and depth, drainage patterns, landform and climate.*

Low—Sedimentation levels of silt and clay particles are not expected to be significant following management activities. Soils are generally moderately coarse-textured.

Moderate—Sedimentation levels of silt and clay particles may be significantly increased following management activities with moderate loss of water quality and damage to fisheries. Soils are generally medium-textured.

High—Sedimentation levels of silt and clay particles are expected to be high following management activities. Streams become turbid and there is considerable loss of water quality and damage to fisheries. Soils are generally fine to moderately fine-textured.

Expected Sediment Size

This interpretation indicates the expected sediment size reaching the streams resulting from erosion of each unit. This interpretation is a statement of the two dominate separates expected (gravel, sand, silt or clay) from each soil unit. The ratings indicate the separates expected from the surface soils, and from the subsoils.

Range and Wildlife Management Interpretations

Range and Wildlife Management interpretations are presented to enable better rangeland management through utilization of soil information. These interpretations are oriented toward use by domestic livestock, deer and elk.

Limitations for Domestic Livestock and Wildlife Use

This interpretation indicates the *major topographic and site limitations* existing on the mapping unit that would hinder use by domestic livestock and wildlife. Forage or the potential for establishing good forage is not considered in this interpretation.

Susceptibility to Soil Compaction

This interpretation indicates the soil's inherent ability to resist compaction by hoofed animals. Factors important to this interpretation are: soil texture, structure, bulk density, pore size and distribution, and rate of infiltration.

Low—Factors indicate that the soil will resist compaction.

Moderate—Factors indicate that the soil has tendencies to become compacted under livestock and wildlife use. Time of grazing on these soil units is important.

High—Factors indicate that soil compaction will be severe unless livestock use is withheld until the soils have dried adequately.

Susceptibility to Soil Displacement

This interpretation indicates the general susceptibility of the soil unit to be displaced by livestock grazing. Soil displacement is the downslope movement of soil. Animal trampling causes loosening of soil particles which are moved downslope by gravity, wind and water. Displacement ratings are based on such facts as texture, slope, and field observations.

Low—Factors indicate that displacement is insignificant. Slopes usually are less than 35 percent.

Moderate—Factors indicate that moderate soil displacement will occur.

High—Factors indicate that displacement is severe and slopes usually exceed 50 percent.

Potential for Range Improvement Through Seeding

This interpretation indicates the potential for each mapping unit to be improved through seeding. Factors used to determine the potential for range improvement through seeding are climate, topography, natural vegetation and the soil characteristics that relate to water-holding capacity and fertility.

Low—This rating indicates the potential for a successful grass seeding is low. Probability of success is very limited.

Moderate—This rating indicates that some problems will be encountered in attaining a satisfactory grass cover.

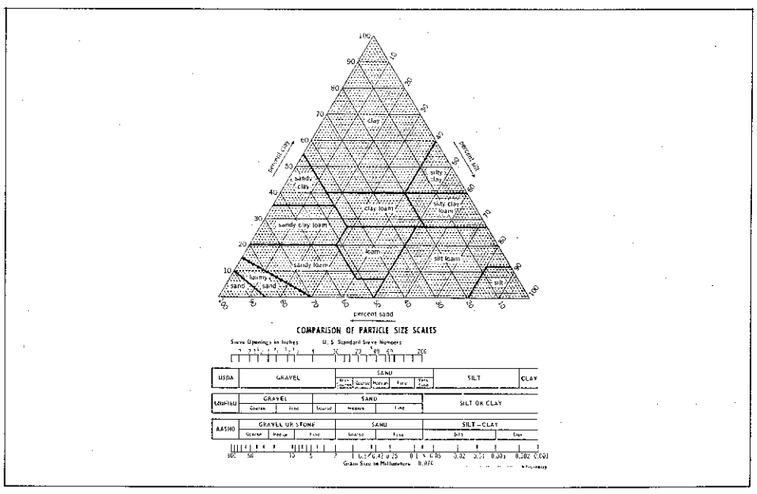
High—This rating indicates that necessary conditions for a successful grass cover establishment exist.

Limitations to Range Seeding

This interpretation indicates the major limitations to successful range improvement through seeding. Limitations are based on field observations, topography, climate, and soil characteristics.

Definitions and Abbreviations for Soil Descriptions

TEXTURE



SOIL TEXTURAL CLASSES

The following textural abbreviations and modifiers will be used:

st	—	stones and stony
cob	—	cobbles and cobbly
g	—	gravel and gravelly
vcos	—	very coarse sand
cos	—	coarse sand
s	—	sand
fs	—	fine sand
vfs	—	very fine sand
lcos	—	loamy coarse sand
ls	—	loamy sand
lfs	—	loamy fine sand
cosl	—	coarse sandy loam
sl	—	sandy loam
fsl	—	fine sandy loam
vfsl	—	very fine sandy loam
l	—	loam
si	—	silt
sil	—	silt loam
scl	—	sandy clay loam
cl	—	clay loam
sicl	—	silty clay loam
sc	—	sandy clay
sic	—	silty clay
c	—	clay

Structure

Structure is described by grade or distinctness, size, and type. Terms are used to describe natural aggregates in the soil called peds in contrast to clods caused by disturbance, fragments by rupture of peds, and concretions by local concentrations of compounds that irreversibly cement the soil grains together.

Grade

- m - massive, no aggregation.
- sg - single grain, no aggregation.
- 1 - weak, peds barely observable in place, and when disturbed, few entire peds are observed, much of the material being unaggregated.
- 2 - moderate, peds easily observable but not distinct in place, and when disturbed, many entire peds are observed and little unaggregated material.
- 3 - strong, peds are distinctly visible in place, and when disturbed, nearly the entire mass consists of entire peds.

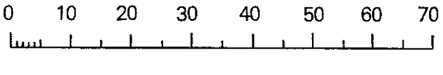
Size

Size differs with kind of structure as follows:

Size Class	Diameter of granules	Thickness of plates	Diameter of blocks	Diameter of prisms
vf-very fine or *very thin	< 1mm.	< 1mm.	< 5mm.	<10mm.
f - fine or *thin	1-2mm.	1-2mm.	5-10mm.	10-20mm.
m - medium	2-5mm.	2-5mm.	10-20mm.	20-50mm.
c - coarse or *thick	5-10mm.	5-10mm.	20-50mm.	50-100mm.
vc - very coarse or very thick	>10mm.	>10mm.	>50mm.	>100mm.

*use for platy structure only.

Scale—mm.



Type

There are 6 types of structure each with its own distinctive shape and arrangement.

gr - granular, approximately spherical with no accommodation of faces to surrounding peds.

pl - platy, with vertical dimension small with regard to horizontal dimensions; faces accommodate with those of adjacent peds.

pr - prismatic, without rounded caps, vertical faces well defined and with angular vertices, vertical length relatively long with respect to horizontal dimensions; faces accommodate with those of adjacent peds.

cpr - columnar, with rounded caps, otherwise similar to the prismatic.

abk - angular blocky, blocklike with all 3 dimensions of the same order of magnitude, faces flattened, most vertices sharply angular; faces accommodate with those of adjacent peds.

sbk - subangular blocky, similar to angular blocky but both rounded and flattened faces occur with many rounded vertices.

Consistence

Consistence is a measure of the property of a soil to adhere or cohere or to resist deformation or rupture. This property varies with moisture content and is measured when dry, when wet, and about midway between, when moist.

Dry Consistence

lo - loose

so - soft, easily crushes to powder or single grain.

sh - slightly hard, easily broken between thumb and forefinger.

h - hard, can be broken in the hands without difficulty but difficult to break between thumb and forefinger.

vh - very hard, can be broken in hands with difficulty.

eh - extremely hard, cannot be broken in hands.

Moist Consistence

lo - loose

vfr - very friable, crushes under gentle pressure.

fr - friable, crushes easily under gentle to moderate pressure between thumb and forefinger.

fi - firm, crushes under moderate pressure between thumb and forefinger but resistance is distinctly noticeable.

vfi - very firm, crushes under strong pressure, barely crushable between thumb and forefinger.

efi - extremely firm, crushes under very strong pressure, cannot be crushed between thumb and forefinger.

Wet Consistence

Stickiness is measured by pressing the wet soil between the thumb and forefinger and noting its adherence.

so - nonsticky; practically no adherence when pressure released.

ss - slightly sticky; after pressure, soil adheres to both thumb and finger but comes off one rather cleanly. Does not appreciably stretch.

s - sticky; after pressure, soil adheres to both thumb and finger and tends to stretch somewhat before pulling apart from either digit.

vs - very sticky; after pressure, soil adheres strongly to both digits and is markedly stretched when they are separated.

Plasticity is measured by rolling the wet soil between the thumb and finger and observing whether or not a wire or thin rod can be formed.

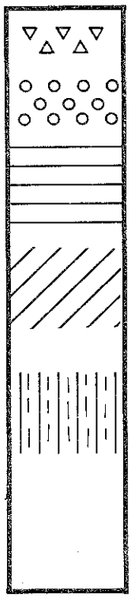
po - nonplastic; no wire is formable.

ps - slightly plastic; wire forms, but soil mass easily deformed.

p - plastic; wire forms, moderate pressure required to deform soil mass.

vp - very plastic; wire forms, much pressure required to deform soil mass.

TEXTURAL SYMBOLS



gravel cobble stone

sands

loam silt loam

clay

permeable clay

Represents 5 ft. profile

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UMATILLA NATIONAL FOREST

OREGON AND WASHINGTON
WILLAMETTE MERIDIAN

1959

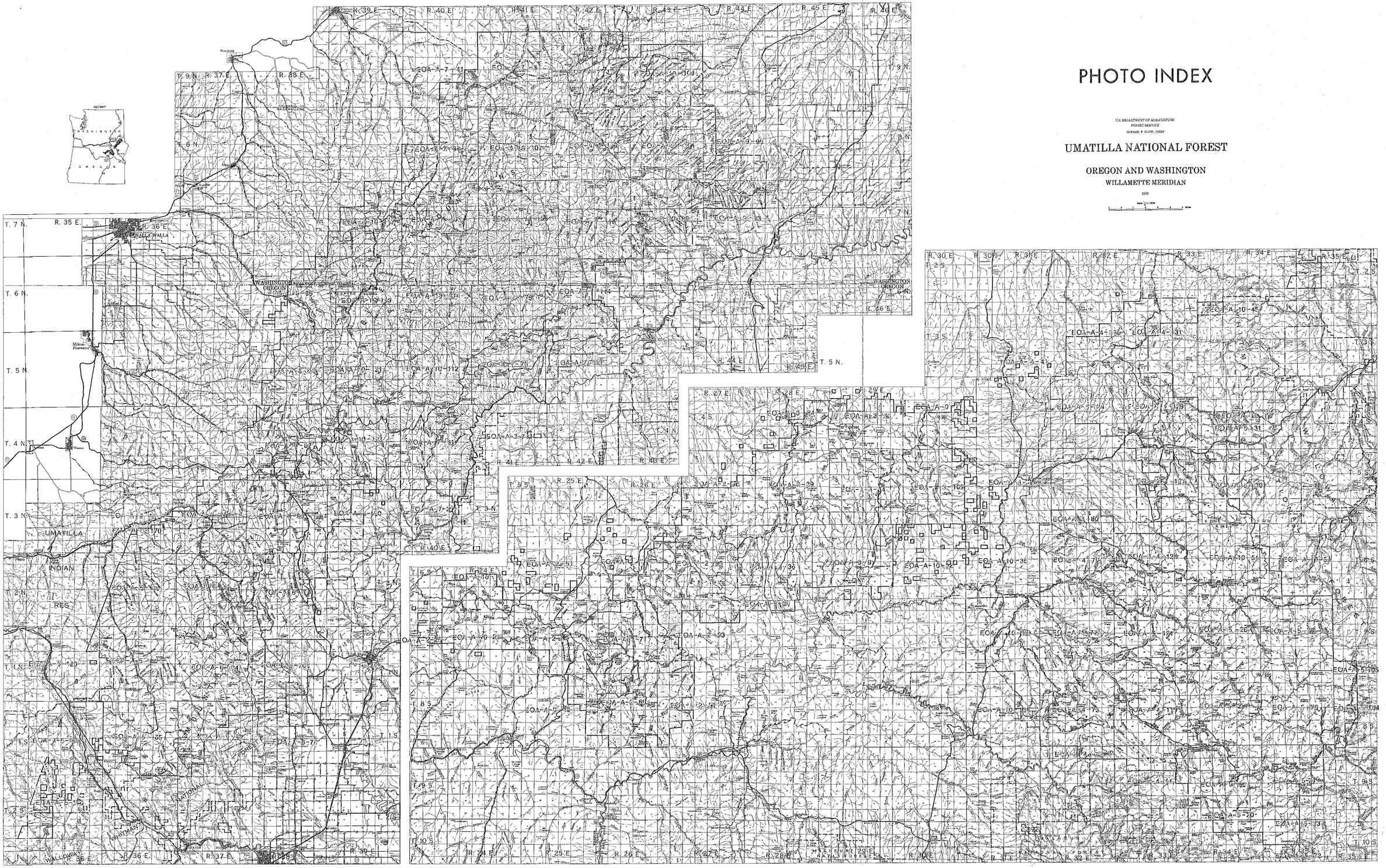


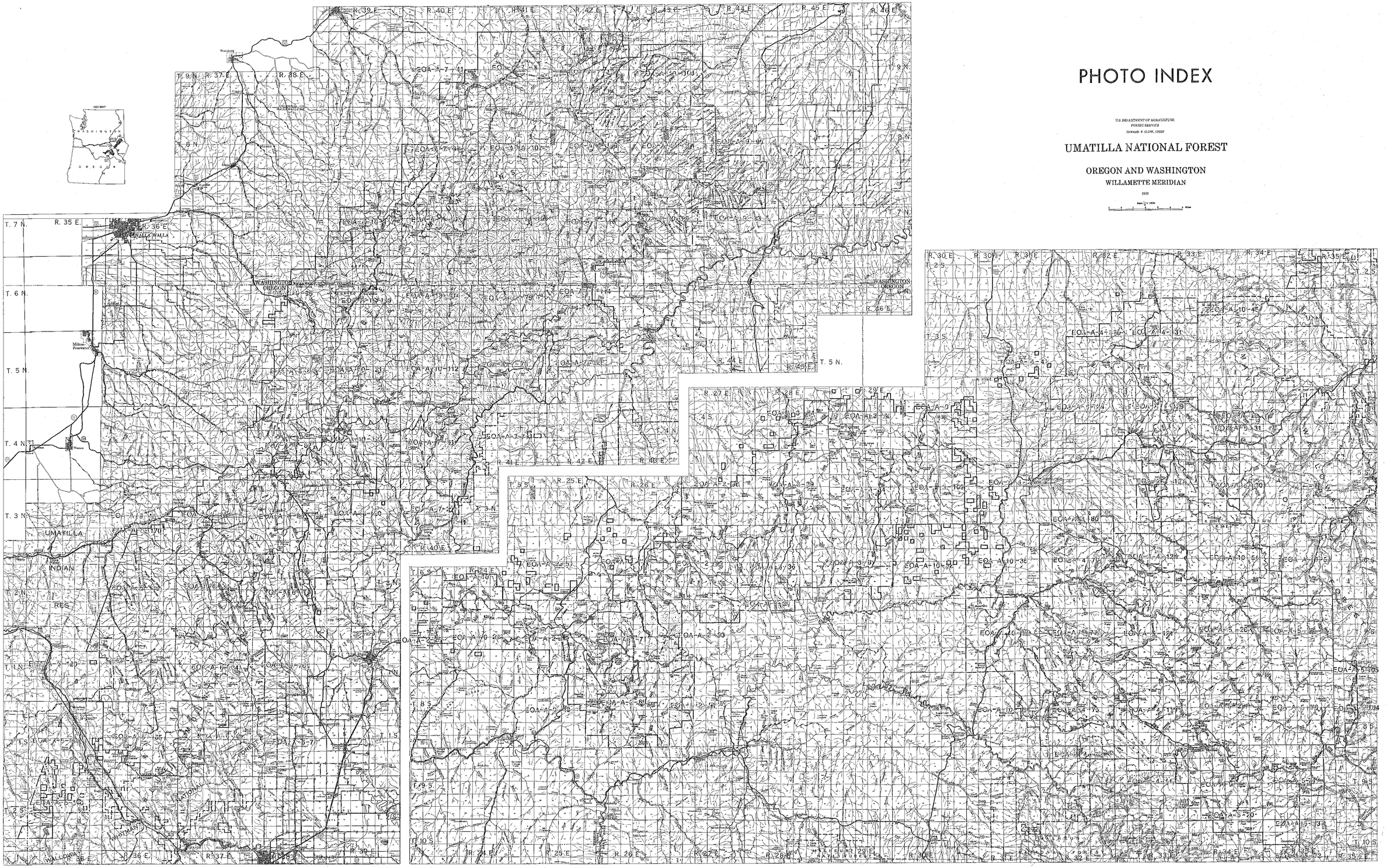
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MEAN ANNUAL PRECIPITATION
in inches

Data Compiled in 1976 by Curtis Johnson, Hydrologist

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1969



GENERALIZED TECTONIC MAP

EAST OF THE 121st MERIDIAN

Reference Source: PRELIMINARY GEOLOGIC AND TECTONIC MAPS OF OREGON
Compiled by George W. Walker 1973

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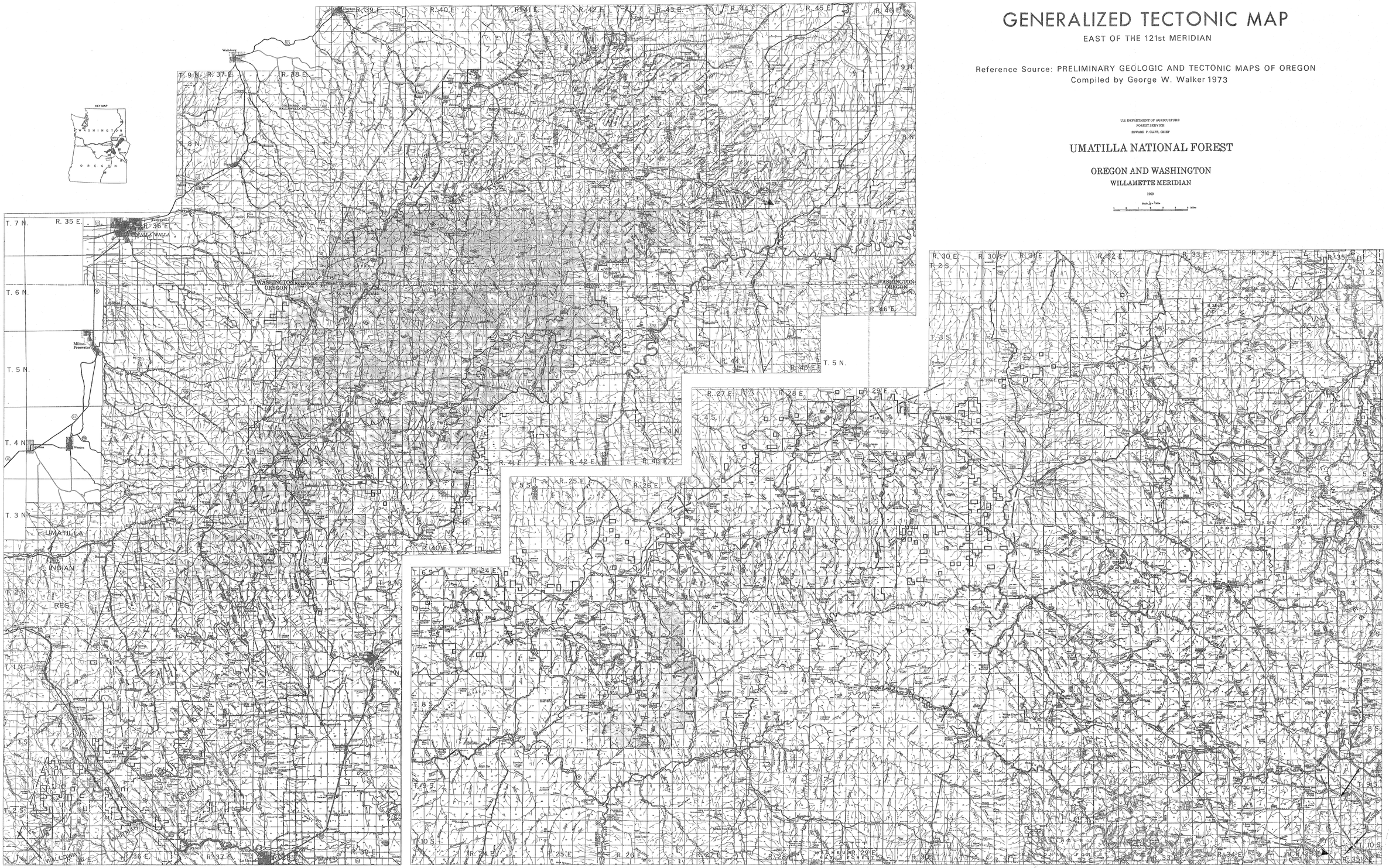
UMATILLA NATIONAL FOREST

OREGON AND WASHINGTON
WILLAMETTE MERIDIAN

1969

Scale 1/2 0 1 Mile

KEY MAP



GENERALIZED GEOLOGY

Reference Source: GENERALIZED GEOLOGY MAP
compiled by George W. Walker, Oregon Department of Geology and Mineral Industries

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UMATILLA NATIONAL FOREST

OREGON AND WASHINGTON
WILLAMETTE MERIDIAN

1969

Scale 1"=1 Mile

KEY MAP

WASHINGTON
OREGON

BASALT ANDESITE

BASALT ANDESITE LACUSTRINE PYROCLASTIC

PYROCLASTIC META-SEDIMENTARY

BASALT ANDESITE META-VOLCANIC

BASALT ANDESITE META-VOLCANIC PYROCLASTIC META-SEDIMENTARY

GRANITE GRANODIORITE

PYROCLASTIC META-SEDIMENTARY

META-SEDIMENTARY PYROCLASTIC META-VOLCANIC META-SEDIMENTARY SERPENTINE META-VOLCANIC

LANDSLIDE DEBRIS

WALLA WALLA

UMATILLA INDIAN RES.

WASHINGTON OREGON