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Savannah River Site
1991 Road Erosion Inventory

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Table of Contents

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This paper explains the rationale and results of a 1991 road erosion inventory conducted by members of the USDA Forest Service – Savannah River (FS-SR) and USDA Natural Resources Conservation Service (NRCS). The inventory provided information for the Department of Energy - Savannah River (DOE) to justify the need for developing an erosion and sediment control program with appropriate funding, personnel, and equipment. Federally managed since the early 1950's, the SRS is located on 198,344 acres (80,301 hectares) in the South Carolina counties of Aiken, Barnwell, and Allendale. Located along the eastern border of the Savannah River, the SRS is located within the Upper and Lower Coastal Plains of South Carolina.

During normal operations U.S. Forest Service personnel observed soil erosion and sedimentation problems in connection with roads and facilities. Poorly vegetated road ditches, or other areas of land disturbances are among the most common erosion and sedimentation concerns. With increasing steepness and length of slope, erosion and sediment rates substantially increase. Large impervious areas of asphalt, concrete, rooftops, and compacted soils often associated with facilities and parking lots generate tremendous runoff velocities and volumes. While the accelerated runoff effects are not necessarily apparent around the facilities, a visual inspection of the receiving channels and bordering steep slopes might reveal runoff impacts like gullies and other erosion concerns.

Before and during the FS-SR program to stabilize borrow pits and other disturbed areas on a smaller scale, management realized the need to increase the program. Beginning in the late 1980's, NRCS participated on erosion control projects and DOE funded a full-time Resource Conservationist employee in 1990 on the SRS. Personnel also observed sediment blowing across roads, which provided a safety concern.

Upon the 1991 arrival of the first staff officer for the newly created Soil, Water, & Air (SWA) section, the FS-SR program increased, and had professional and technical assistance from the NRCS. The two units planned to conduct an erosion assessment with a desired result of increasing the soil stabilization program. Divided into road erosion and facility erosion, the assessment started in May 1991 and ended in August 1991. This paper only describes the erosion assessment related to roads or other isolated areas within view from the road. A facility erosion assessment conducted the same year is not discussed. The inventory results were presented to DOE for program development beginning with fiscal year 1992.

Primary, secondary, and forest roads (also called native surface roads) are the three common SRS road types. Small sections of roads are linked to various monitoring wells, or other industrial use. Many, if not most SRS employees, travel solely on paved primary roads to and from their homes to their industrial workplace. There are fairly straight secondary roads several miles long, which allow for fairly rapid transition to certain parts of the interior. While many secondary roads were found bare of vegetation during the inventory, many have since been graveled. With a cover of native soils, native surface

roads are of various lengths. Those roads allow access to a specific stand or a set of stands used for various resource activities like forestry, wildlife, or research.

Though the total length of roads remained unknown at the beginning of the inventory, an estimate of 2,900 kilometers was given by management. A 2003 review of a 2000 roads electronic coverage in the geographic information systems reveals about 2,200 kilometers of roads on the SRS, or about 76% of the earlier estimate.

Methodology

Besides soil erosion, hardpan and sediment observations were noted along with a remarks section for general observations.

Two persons riding in government vehicles inventoried all roads, whether paved, gravel, or native surfaced. The persons noted the distance and width of road erosion. For borrow pits or other broad area the observers made on-site estimates, which they verified later with available aerial photography, if available. Field measurement methods varied. Longer distances of 500 feet or more were determined by vehicle odometer readings, while the observers estimated the shorter distances. Observers calibrated their visual ability to estimate distances by weekly comparisons of a length and width field estimate followed by a tape measure comparison.

Based on soils coverage characteristics (see Table 1), the survey identified four erosion types. On two observations, surveyors noted water ponding on the road from a flooded wetland, which were not identifiable under any erosion type. Noted erosion types assisted the development of treatments needs (see Table 2). Vegetative cover improvement would require the least intensive treatment, followed in intensity treatment levels by sheet erosion, rill erosion, and gully erosion.

Table 1. Erosion Type and Cover Characteristics

Type Number	**Erosion Type**	**Cover Characteristics**
1	Gully	Bare soils; slope failure; scouring of soils exceeding twelve inches in width or depth.
2	Rill	Similar characteristics to a gully, but six to twelve inches in width or depth.
3	Sheet	Bare or very poorly vegetated soils.
4	Vegetative Cover Improvement	Sparse to moderately vegetated soils.

With a form, personnel immediately recorded observations (see Table 3). Normally estimated in feet, the length and width estimated were later calculated into acres in the office. Like mentioned previously, borrow pits or other observed areas of concern were initially field estimated before aerial photographs calculations in the office.

Table 2. Treatment by Erosion Type

	Recommended Treatments				
Erosion Type	**Lime**	**Fertilizer**	**Seed**	**Land Shaping**	**Cover Type**
Gully	Yes	Yes	Yes	Bulldozer, or other medium to large equipment.	Heavy duty erosion control blankets; geo-textile; or structures.
Rill	Yes	Yes	Yes	Light shaping with box blade or other manual equipment	Mulch; erosion control blankets.
Sheet	Yes	Yes	Yes	Not normally	Mulching common.
Vegetative Cover Improvement	Yes	Yes	Varies	None	Possible spot mulching.

Individual sheets were used for each timber compartment. Under the Site column, personnel identified the road number and marked the unit on natural resource compartment maps.

Table 3. Example of Top Two Rows of a Recording Form

Compartment Number: 40

Site	**Type**	**Distance**	**Width**	**Hardpan**	**Sediment**	**Remarks**	**Acres**
Road 9	4	400	30	N	N	Only on east side of road.	0.28
Meyers Mill Road	2	500	60	N	Y	Sediment moving toward stream drainage.	0.69

Along with observations noted since 1991, the inventory data was recorded electronically in a watershed improvement needs database that no longer receives computer support. However, a hardcopy remains in the USFS-SR hydrologist's office. In 1994, a GIS layer created by on-screen digitizing using the U.S. Geologic Survey roads coverage for a reference is stored in the author's geographic information workspace. Despite the poor spatial accuracy of the coverage, it is useful and relates well to the roads coverage.

Observations and Conclusions

Throughout the survey, major erosion problems were often observed on native surface roads and rights-of-ways that transverse steep slopes. Frequently mowing also caused erosion concerns. North of Road A (Highway 125) the inventory persons observed more erosion sites and concerns because of the steeper and longer slopes combined with a greater amount of facilities and rights-of-ways.

The conclusion identified in Table 4, Map 1, and Map 2 requires knowledge of the details behind the observations. Individual observations often had more than one type of erosion concern. For example, the person may observe a gully mixed in with rills, or other observations. In Table 4, the list is based on the greatest concern identified at that observation. Gullies are the greatest concern, followed in order by sheet, rill, and

vegetative cover improvement. For example, a one hectare area of sheet erosion and rills might contain a gully. In hectares, the gully area might total only 0.1 hectare with the rest of the site being a combination of other erosion types. Since gully erosion has the most intensive impact and greatest repair costs, the list places all the hectares under the gully category.

Table 4. Inventory Results by Type

		Total	Average	Maximum	Minimum	Standard Deviation	Variance
Type	**Observations**	**(Ha)**	**(Ha)**	**(Ha)**	**(Ha)**	**(Ha)**	**(Ha)**
n/a	2	0.10	0.05	0.08	0.02	0.05	0.00
Gully	130	130	16.19	16.19	0.00	2.10	10.93
Rill	110	48	8.50	8.50	0.00	0.97	2.31
Sheet	106	75	7.28	7.28	0.00	1.22	3.72
VCI[1]	123	49	3.44	3.44	0.00	0.53	0.69
Total	471	302	16.19	16.19	0.00	1.38	4.69

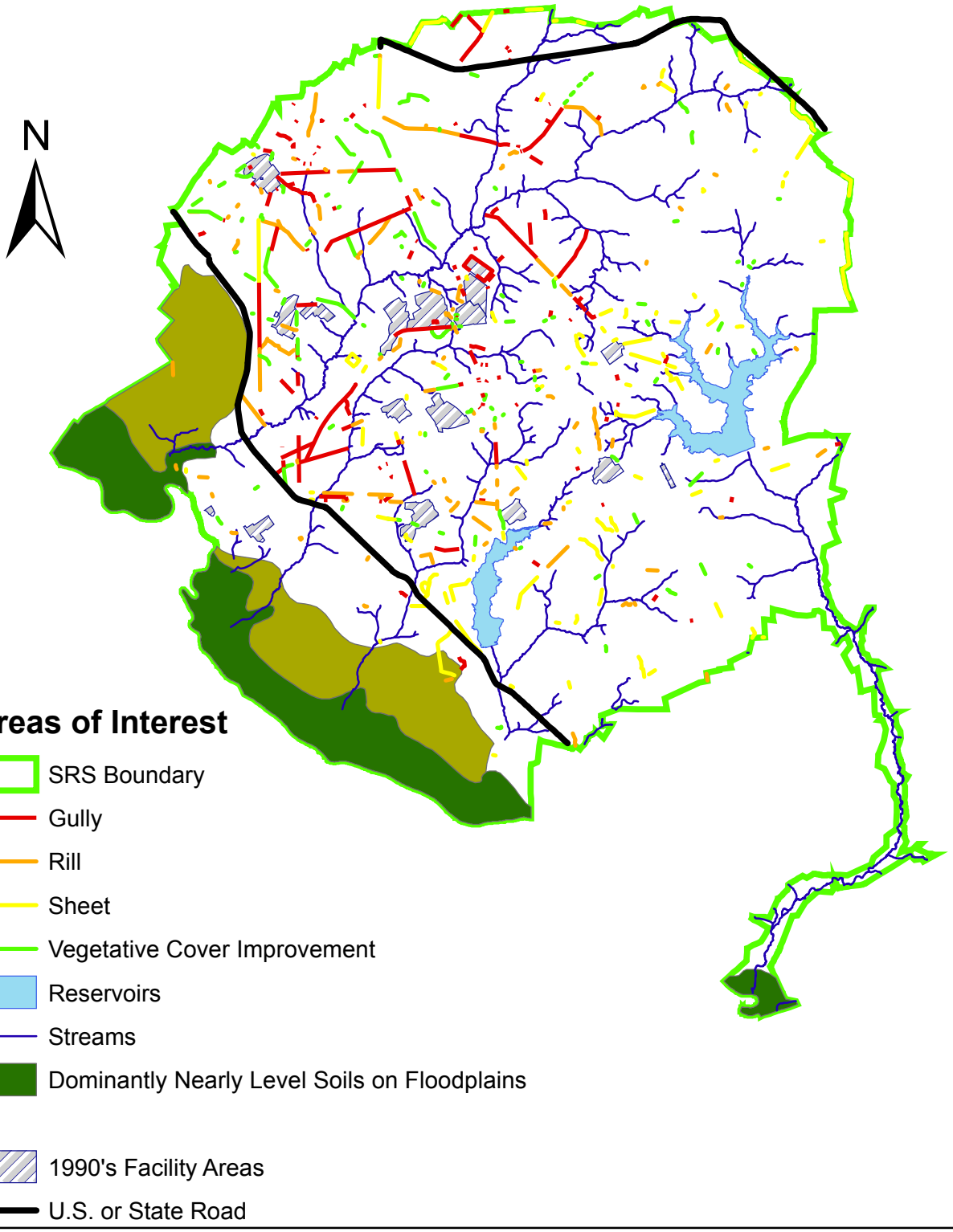
[1]Vegetative Cover Improvement

In brief, the inventory played an important role in producing SRS awareness to the need for establishing an erosion and sediment control program involving a budget; a broad range of labor, technical, contracting, and management skills; and cooperation among the interested contractors and federal agencies. All major roads and rights-of-ways were limed, fertilized, and seeded along with most of the grasses surrounding the facilities. Over the years, contract workers completed most of the erosion and sediment control projects. Forest Service employees, including summer students, also completed many projects.

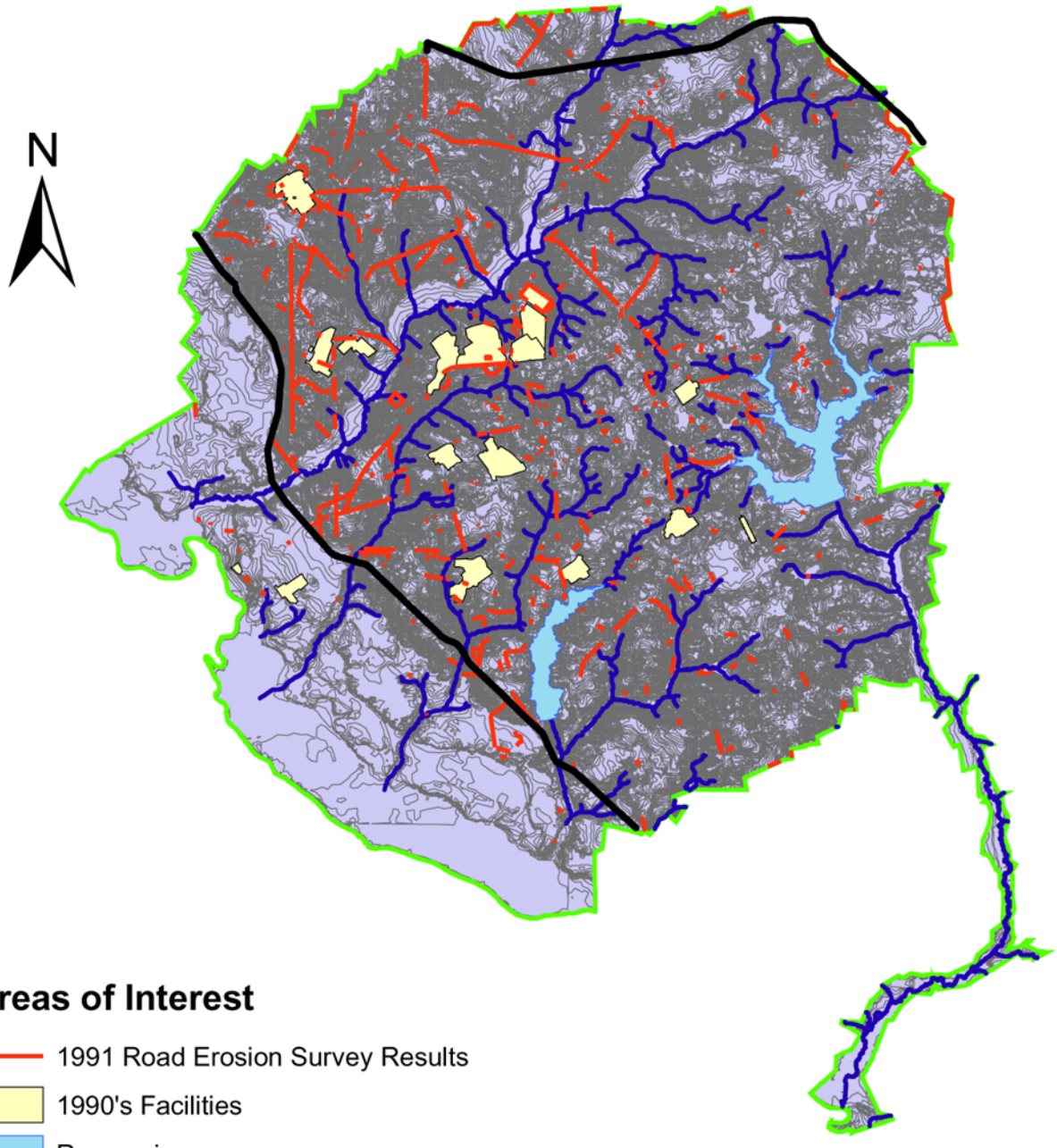
By Cliff Jones, Hydrologist of the USDA Forest Service-Savannah River. June 22, 2007

Map 1

1991 SRS Road Erosion Inventory Results



1991 SRS and Topography



Pages A-1 to A-19 are the raw data for the *1991 SRS Road Erosion and Sediment Inventory*

This section has the following.

GIS Code relates to a Geographic Information Systems identifier. Road Name lists the road or the nearest road. Comp. refers to the natural resources compartment.

Type, length, and width are previously identified in the document. Hardpan relates to soils hardened or cemented by iron oxide, silica, calcium carbonate, or similar substances. Hardpan greatly inhibits the movement of precipitated water through soils. In the case of the SRS, the soils survey indicates that many of the soils have some siliceous content, including Dothan and Fuquay soils. These same two soils have some plinthite.

In the remarks section, ditch work is commonly listed. This remark relates to soil erosion in the roadside drainage ditches. The sand/soil removal remark listed in GIS Code 96 is a term used because we did not have exact knowledge of the reason for the removal of the sand or whatever other soils were removed. The area definitely relates to a large amount of soil removal, possibly a future landfill or a related industrial use. Sediment refers to soils transported by water runoff, wind, or gravity. Piles of soil that appeared to have been moved by equipment are noted.

Acres are calculated with the length and width data.

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
1	Off 5-26	5	1	50	10	0	1	Ditch work	0.0
2	7-22	7	1	500	30	0	1	Ditch work	0.3
3	7-30	7	1	2,640	30	0	1		1.8
4	5-20	5	4	2,640	40	0	1	Ditch work	2.4
5	D-1	5	4	1,584	30	0	1	Ditch work	1.1
6	D-1	7	1	2,112	30	0	1	Ditch work	1.5
7	5-29	5	3	300	150	0	0		1.0
8	D-1	7	2	500	60	0	0	Ditch work	0.7
9	1-A	7	4	1,056	30	0	0		0.7
10	D-1	7	1	375	30	0	0	Ditch work	0.0
11	9-25	9	1	30	20	0	0		0.0
12	1	5	4	1,000	30	0	1		0.7
13	7-26	7	2	300	30	0	0	Ditch work	0.2
14	7-21, 7-26	7	1	6,336	30	0	1	Ditch work	4.4
15	1-A	9	4	1,056	30	0	0		0.7
16	5-33	5	2	500	30	0	1	Ditch work	0.3
17	7-26.1	7	1	2,112	30	0	1	Ditch work	1.5
18	1	5	4	1,056	30	0	1		0.7
19	9-28	9	1	3,168	30	0	0	Ditch work	2.2
20	Near 7-33	7	4	40	30	0	1	Ditch work, ruts in Rd	0.0
21	9-28	9	1	1,200	30	0	1	Ditch work	0.8
22	C-1.1	4	2	3,168	40	0	0		2.9
23	9-28	9	2	250	30	0	1	Ditch work	0.2
24	Off 4-29.3	4	1	5,808	40	0	1		5.3
25	4-27	4	2	2,376	40	0	1	Steep slope on one side	2.2

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
26	Off 4-27	4	4	500	50	0	1	Logging area	0.6
27	SC 125	10	4	1,100	50	0	0		1.3
28	Near 3-24	3	4	800	10	0	0		0.2
29	Rd C	10	4	2,000	40	0	1		1.8
30	C-1.1	4	3	100	50	0	1	Deep-cut banks	0.1
31	4-26	4	4	5,808	40	0	1		5.3
32	C-1.1	10	2	400	30	0	1	Ditch work	0.3
33	Into A-1.1	2	2	225	20	0	0	Needs ditchwork; discing	0.1
34	Into A-4.7a3	6	2	0	0	0	1	1/2 acre	0.5
35	West of 6-33.1a	6	3	100	50	0	0		0.1
36	North 6-33.2	6	2	400	30	0	0		0.3
37	6-33	6	4	500	30	0	0		0.3
38	3	6	2	100	30	0	0		0.1
39	6-42	6	4	40	10	0	0		0.0
40	A-4.7	6	4	300	225	0	1		1.6
41	2	19	2	750	30	0	1	Ditch work	0.5
42	2	19	3	2,000	30	0	1	Ditch work	1.4
43	8-23	8	2	1	30	0	0	Wetland encroaching	0.0
44	8-23	8	4	500	30	0	1	Ruts in Rd; drainage	0.3
45	Above 8-29	8	1	250	40	0	1	Ditch work	0.2
46	Near 8-30	8	1	1,056	40	0	1		1.0
47	7-20	7	2	5,808	40	0	1	Ditch work	5.3
48	8-30	8	1	200	40	0	1	Deep gullies; steep slopes	0.2
49	West of 8-30	8	4	180	40	0	1	Ditch work	0.2
50	East of 8-30	8	1	600	10	0	1	Steep wall	0.1

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
51	South of 8-22	8	1	1,100	40	0	1	Deep gullies; ditch work	1.0
52	D-1	8	2	50	30	0	1	Ditch work	0.0
53	D-1	8	1	500	40	0	1	High wall	0.5
54	8-21	8	2	2,640	40	0	1		2.4
55	1	5	4	2,000	30	1	0	Steep slopes	1.4
56	D	9	1	1,584	50	1	1	Ditch work	1.8
57	9-22	9	2	1,000	50	1	1	Construction activity	1.1
58	9-22	9	1	150	30	0	1	Steep slope	0.1
59	9-22	9	2	100	30	0	0	Rd ruts	0.1
60	9-22	9	2	200	30	0	1	Rd ruts	0.1
61	C-1.1	9	1	528	30	1	1	Deep gullies	0.4
62	C-1.1	9	4	2,640	30	0	1	Ditch work	1.8
63	East of 9-23	9	4	100	50	0	1	Ditch work	0.1
64	Between C-1 and D	9	4	1,000	30	0	1	Ditch work	0.7
65	Rd C-1.1	9	2	2,112	50	1	1	Ditch work	2.4
66	9-31	9	1	2,640	50	0	1	Ditch work	3.0
67	East of D	9	4	300	40	1	0		0.3
68	9-32.1	9	1	100	25	0	1	Deep gully	0.1
69	9-32.1a	9	4	1,584	40	0	1	Ditch work	1.5
70	9-26	9	2	7,392	40	1	1	Ditch work	6.8
71	NE of 9-27	9	2	3,168	40	0	0	Rd ruts	2.9
72	10	2	4	1,000	30	0	0		0.7
73	2	10	2	2,112	40	1	1	Steep slopes	1.9
74	South of 10-24.3	10	4	1,584	30	0	1		1.1
75	C-1	10	1	9,504	40	0	1	Steep slopes, drainage	8.7

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
76	10-24	10	4	500	30	0	1		0.3
77	Across SC 125	10	4	1,584	60	0	0		2.2
78	SC 125	3	4	1,584	30	0	0		1.1
79	11-28	11	2	5,280	40	0	0	Unpassable	4.8
80	C-1	11	1	1,000	40	0	0	Ditch work	0.9
81	C-1	11	2	2,640	40	0	1		2.4
82	Rds 11-23, 11-30	11	4	1,056	40	0	1		1.0
83	Rd 11-23	11	1	2,112	40	0	1	Ditch work	1.9
84	C-2.1	13	1	1,584	40	1	1		1.5
85	C-2.1	13	1	1,320	40	0	1	Ditch work	1.2
86	C-2.1	13	4	2,112	40	0	0		1.9
87	11-32	11	2	2,112	30	0	1		1.5
88	11-22	11	2	1,056	30	0	1		0.7
89	11-31	11	2	3,696	40	0	0		3.4
90	C	13	4	4,224	30	0	1		2.9
91	13-27	13	1	3,168	30	0	1	Ditch work; sandy	2.2
92	C-2.1	13	4	2,640	30	0	0		1.8
93	East of C-2.1	13	4	1,056	30	0	0		0.7
94	Rd 3	14	1	550	80	0	1	Steep slope	1.0
95	Rd 3	14	4	5,280	70	0	0		8.5
96	A-8	14	1	0	0	1	0	Sand/soil removal	10.0
97	14-20	14	1	16,340	35	0	1	Ditch work	13.1
98	14-21	14	2	528	30	0	0	Ruts	0.4
99	A-7	14	1	200	40	0	1	Ditch work	0.2
100	A-8	14	4	4,224	40	0	1		3.9

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
101	Near 14-27.1	14	1	200	35	0	1	Ditch work	0.2
102	F	15	4	3,696	40	0	0		3.4
103	15-29	15	1	100	40	0	1	Ditch work	0.1
104	F-4	15	1	400	40	0	1	Adjacent to pit; perhaps 25	0.4
105	15-30	15	4	1,000	40	0	1	Rd ruts	0.9
106	15-23	15	4	1,000	40	0	1		0.9
107	F-1	15	2	5,280	35	0	1	Ditch work	4.2
108	2-3	15	4	3,696	40	0	0		3.4
109	Into F-1	15	2	1,056	40	0	1		1.0
110	F-1	15	2	4,224	40	0	0		3.9
111	2	9	4	70	40	0	0		0.1
112	C-2	16	1	1,000	50	0	1	Steep slopes; ditch work	1.1
113	2	16	1	1,800	80	0	0	Steep slope; deep gullies	3.3
114	16-28	16	4	800	40	0	1	Rd unpassable	0.7
115	2	8	4	900	75	0	0		1.6
116	F	16	4	5,280	40	0	0		4.8
117	F	16	4	270	75	0	0	Steep slopes	0.5
118	F	16	1	800	70	0	1	Ditch work; ruts	1.3
119	F-3	15	1	10,560	70	0	1	Deep gullies	17.0
120	16-21	16	1	3,168	40	0	0	Ditch work	2.9
121	F-1 (Greene Rd)	17	2	50	50	0	1	Rd ruts	0.1
122	2-1	17	2	13,200	70	0	0	Ditch work	21.2
123	18-21	18	2	1,000	30	0	1	Ditch work	0.7
124	F-2	18	1	250	40	0	0		0.2
125	2-1	18	1	5,280	70	0	1	Ditch work	8.5

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
126	18-35 to F-4	18	4	800	40	0	0		0.7
127	19-22	19	2	1,000	60	0	1		1.4
128	Above 2-1	19	4	1,000	60	0	0		1.4
129	20-24	20	1	70	40	0	0	Ditch work	0.1
130	19-24, 19-26	19	4	7,920	30	0	1		5.5
131	Treadway Bridge Rd	20	4	300	30	0	0		0.2
132	US 278	20	3	350	20	0	1	Dirt piled along Rd	0.2
133	US 278	20	4	1,200	30	0	0	Scattered spots along 278	0.8
134	US 278	21	3	75	10	0	1		0.0
135	Phelps Rd	23	1	400	25	0	1	Includes dirt pile	0.2
136	Phelps Rd	23	1	290	60	0	1	Slopes; ditch work	0.4
137	781.31	23	1	500	50	0	1	Unpassable; ditch work.	0.6
138	781.2	21	1	5,280	50	0	1	Adjacent areas require ditch	6.1
139	21-20	21	1	1,500	30	0	1	One other 10 x 50 Type 2 strip	1.0
140	781.31	21	1	3,168	40	0	1	1.05 acres of other inventory	2.9
141	21-20	21	3	13,200	60	0	1		18.2
142	Above Treadway	22	3	250	60	0	0		0.3
143	US 278	22	3	7,650	30	1	1	Various areas	5.3
144	US 278	22	3	7,650	30	1	1	Various areas	5.3
145	US 278	22	3	7,650	30	1	1	Various areas	5.3
146	US 278	23	3	7,650	30	1	1	Various areas	5.3
147	US 278	25	3	7,650	30	1	1	Various areas	5.3
148	23-20	23	1	200	30	0	1	One gully 10 x 20	0.1
149	781.2	23	3	2,640	50	0	1		3.0
150	23-20	23	3	700	40	0	1	One gully 20 x 40	0.6

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
151	By 23-21	23	3	550	80	0	1	Adjacent to farm field	1.0
152	23-21	23	3	13,200	50	0	1	Type 1 20 x 20	15.2
153	23-22	23	4	5,280	30	0	1	Unpassable Rd, sandy.	3.6
154	Cox Bridge Rd	24	2	6,336	50	0	1		7.3
155	24-22	24	1	500	50	1	1		0.6
156	Eubanks Rd	24	4	2,000	30	0	0		1.4
157	Eubanks Rd	24	4	2,000	30	0	0		1.4
158	Eubanks Rd	24	4	2,000	30	0	0		1.4
159	Eubanks Rd	24	4	2,000	30	0	0		1.4
160	Eubanks Rd	24	4	2,000	30	0	0		1.4
161	24-23&24	24	2	300	30	0	1	Rd ruts	0.2
162	Into Hickson Mill Rd	24	2	150	30	0	1		0.1
163	Hickson Mill Rd	25	3	2,640	30	0	1		1.8
164	25-22	25	3	800	30	0	1		0.6
165	26-20	26	3	5,600	30	0	1		3.9
166	Kennedy Pond Rd	26	2	75	20	0	0	Rd ruts; washout	0.0
167	8-12	27	4	500	30	0	1	Washout	0.3
168	8-12	27	4	400	30	0	1		0.3
169	Kennedy Pond Rd	27	2	50	30	0	1	Washouts	0.0
170	28-24	28	3	200	30	0	1	Ditch work	0.1
171	28-20	28	3	6,280	30	0	1	Much sediment	4.3
172	28-21	28	3	200	30	0	1	Ditch work	0.1
173	28-21	28	3	600	30	0	1	Washouts	0.4
174	8	28	3	4,500	30	0	1		3.1
175	29-20	29	3	2,200	30	0	1		1.5

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
176	29-20	29	4	300	30	0	1	Sandy	0.2
177	29-31	29	3	40	30	0	0	Wetland over Rd	0.0
178	29-22.1b	29	3	50	30	0	1	Sandy	0.0
179	8	29	3	2,740	30	0	1		1.9
180	8	30	3	2,740	30	0	1		1.9
181	30-22.2	30	2	150	30	0	1	Washouts	0.1
182	30-22	30	3	30	30	0	0		0.0
183	Into 31.24.3	30	2	50	10	0	0	Washouts	0.0
184	2-1	33	1	220	35	0	1	Actually 30 x 220 R, 30 x 220 L	0.2
185	32-26	32	1	120	25	0	0	Ruts; undriveable	0.1
186	2-1.1	31	1	7,920	70	0	1	Ditch work	12.7
187	32-24	32	1	1,500	40	0	1	Ditch work	1.4
188	Into Treadway Bridge Rd	32	1	1,000	25	0	1		0.6
189	Treadway Bridge Rd	32	1	1,500	35	0	1	Steep slopes	1.2
190	2-1	31	1	400	25	0	0	Ditch work	0.2
191	33-20	33	1	1,584	40	0	0	Logging activity	1.5
192	33-20	33	2	1,584	40	0	0		1.5
193	33-20	33	2	250	30	0	1		0.2
194	33-20	33	4	400	30	0	1		0.3
195	Ahead Parks Church Rd	35	3	30	20	0	1	Sediment into creek	0.0
196	36-27.1	36	3	100	30	0	1		0.1
197	38-28	38	3	1,320	40	0	0		1.2
198	38-28.1	38	2	25	20	0	1	Washouts	0.0
199	38-24	38	4	35	30	0	1		0.0
200	38-24	38	3	100	40	0	0		0.1

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
201	38-22.1	38	1	20	30	0	1		0.0
202	38-22	38	3	1,584	40	0	1		1.5
203	38-29	38	3	6,336	40	0	1		5.8
204	38-22	38	3	9,504	40	0	1		8.7
205	East of 38-22.4a	38	3	9,504	40	0	1		8.7
206	38-22	38	2	1,584	40	0	1		1.5
207	38-21.1	38	3	5,280	40	0	1		4.8
208	North of 38-27	38	1	250	50	0	0		0.3
209	Robbins Rd	38	3	2,640	40	0	1		2.4
210	38-33.1	38	3	3,168	50	0	0	One 10 x 20 gully	3.6
211	SC 125	38	3	400	10	0	1	Many small areas	0.1
212	SC 125	38	3	400	10	0	1	Many small areas	0.1
213	SC 125	38	3	400	10	0	1	Many small areas	0.1
214	SC 125	38	3	400	10	0	1	Many small areas	0.1
215	Station Rd	38	3	9,504	50	0	0		10.9
216	39-20	39	3	2,112	40	0	1	Sandy	1.9
217	39-20	39	4	100	30	0	0		0.1
218	40-39	40	2	100	30	0	1		0.1
219	40-39	40	3	5,280	30	0	1	Sandy	3.6
220	40-39	40	1	60	10	0	0	Washouts	0.0
221	B-5	40	2	2,640	40	0	1		2.4
222	9	41	3	100	20	0	1		0.0
223	Meyers Mill Rd	40	3	30	10	0	0		0.0
224	41-21	41	3	5,280	40	0	1	New Rd	4.8
225	41-28	41	4	100	10	0	1		0.0

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
226	41-20	41	3	65	15	0	1		0.0
227	West of 41-29	41	4	100	30	1	0		0.1
228	Trestle Rd	41	3	500	40	0	1		0.5
229	41-22	41	3	75	20	0	1		0.0
230	42-28	42	2	100	30	0	0		0.1
231	A-13.1	42	2	50	20	0	0		0.0
232	42-25	42	1	600	30	0	1	Deep gully	0.4
233	SC 125	43	4	125	30	0	0	Steep slopes	0.1
234	SC 125	43	4	500	40	1	1	Steep slope	0.5
235	Near Comp. 42/39 Border	39	1	600	30	0	0		0.4
236	SC 125	43	4	100	30	0	0		0.1
237	B	43	4	300	30	0	1		0.2
238	38-34.3	45	2	100	50	0	0		0.1
239	East of 45-34	45	4	2,112	30	0	1	Washouts	1.5
240	45-24	45	3	1,028	30	0	0		0.7
241	46-23	46	2	200	30	0	1		0.1
242	47-25	47	2	50	30	0	1		0.0
243	East of 47-25	47	2	50	30	0	1		0.0
244	A-11	47	3	50	40	0	0		0.0
245	A-9	47	3	1,056	40	0	1		1.0
246	3	48	1	1,584	40	0	1		1.5
247	Burma Rd	48	1	6,336	70	0	1		10.2
248	A-6	48	4	800	40	0	1		0.7
249	West of 48-27	48	1	0	0	0	1	New construction pit	40.0
250	A-7	48	1	2,112	65	0	1		3.2

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
251	A-7	48	1	1,584	40	0	0		1.5
252	A-6	48	1	1,584	30	0	1		1.1
253	C	49	4	200	60	0	1		0.3
254	C	49	2	350	60	0	1		0.5
255	4	49	2	450	30	0	0	Steep slopes	0.3
256	4	49	2	2,200	30	0	1		1.5
257	4	49	4	60	25	0	0		0.0
258	49-21	49	2	20	30	0	1		0.0
259	West of 49-21	49	1	8,045	40	1	0	Near a 15-acre bare area	7.4
260	49-31	49	4	0	0	0	0	2 acres near large area	2.0
261	E	49	1	2,112	30	0	1		1.5
262	4	50	3	650	20	0	1		0.3
263	50-36	50	1	500	30	0	1	Gulley	0.3
264	50-37.2	50	1	1,800	40	0	1	Washouts	1.7
265	4	50	2	800	10	0	0	Sediment flowing into creek	0.2
266	50-34	50	2	35	30	0	1		0.0
267	South of 50-31	50	2	90	30	0	1	Wetland flows over Rd	0.1
268	50-35	50	1	50	50	0	1	Sediment deposits into	0.1
269	50-29	50	4	100	20	0	1		0.0
270	North of 50-26	50	1	230	10	0	1	Washouts	0.1
271	50-26	50	4	450	20	0	0		0.2
272	Intersects with 50-28.1	50	2	100	10	0	1	Four more acres eroding	0.0
273	50-39	50	2	1,584	20	0	1		0.7
274	50-39	50	2	150	40	0	1		0.1
275	50-39	50	4	20	10	0	1		0.0

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
276	50-39	50	4	500	40	0	1		0.5
277	50-23	50	3	50	20	0	0		0.0
278	50-23	50	4	50	30	0	0		0.0
279	Southeast of F	50	1	200	50	0	1		0.2
280	Z-Area Perimeter	51	1	3,300	40	0	1		3.0
281	51-33.3	51	1	700	12	0	1		0.2
282	51-34.2	51	1	5,280	40	0	1		4.8
283	Into 51-39	51	1	140	30	0	1		0.1
284	Monroe Owens Rd	51	2	1,000	50	0	0		1.1
285	Across 51-38	51	4	60	30	0	1		0.0
286	51-35	51	1	5,280	50	0	0		6.1
287	Beaufort Rd	52	4	120	30	0	0		0.1
288	East of 51-36	51	4	400	40	0	0		0.4
289	F	50	4	800	30	0	0		0.6
290	51-26	51	1	1,600	50	0	1	Stream crossing	1.8
291	51-33	51	1	1,200	60	0	1	Spoil pile; Rd side gullies	1.7
292	Monroe Owens Rd	51	1	12,144	60	0	1		16.7
293	Beaufort Rd	51	1	1,584	70	0	0		2.5
294	Runs into Monroe Owens	51	4	528	30	0	0		0.4
295	Runs into Rd E	52	1	150	30	0	0	Deep gullies	0.1
296	Runs into Monroe Owens	52	3	100	30	0	0		0.1
297	Monroe Owens Rd	52	2	220	70	0	1		0.4
298	Monroe Owens Rd	52	1	5,280	70	0	0		8.5
299	52-30.1	52	1	350	70	0	1	Ditch work	0.6
300	52-33	52	1	2,640	70	0	1		4.2

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
301	Woodward Rd	53	0	50	40	0	0	Wetland across Rd	0.0
302	8-8	53	0	300	30	0	0	Wetland across Rd	0.2
303	Woodward Rd	53	2	80	40	0	0		0.1
304	Monroe Owens Rd	53	1	300	70	0	1		0.5
305	Pleasant Hill Rd	54	4	200	40	0	1		0.2
306	Pleasant Hill Rd	54	4	100	40	0	1		0.1
307	8	54	4	100	40	0	0		0.1
308	Craig Rd	54	4	1,584	30	0	1		1.1
309	Craig Rd	54	4	600	30	0	0		0.4
310	8	54	4	300	40	0	1		0.3
311	56-29.1	56	2	125	25	0	1		0.1
312	8	57	2	500	60	0	0		0.7
313	8	57	4	550	30	0	1		0.4
314	57-21.1	57	3	500	30	0	1	Sandy	0.3
315	5-21	57	4	50	30	0	1		0.0
316	57-20	57	4	800	30	0	1	Ruts; washouts	0.6
317	G	58	3	2,500	60	0	0		3.4
318	G	58	3	650	30	0	1	Steep slope	0.4
319	58-22	58	3	600	30	0	1		0.4
320	58-22	58	3	50	30	0	0		0.0
321	58-20.2	58	3	200	30	0	1		0.1
322	Runs into 58-33	58	3	30	10	0	0		0.0
323	South of 58-20	58	4	1,000	30	0	1	Washouts	0.7
324	58-26	58	1	1,600	30	0	1	Mostly bare soils; one 15 x 50 gully	1.1
325	East of 58-26	58	3	50	30	0	1		0.0

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
326	58-26	58	3	5,280	30	0	1	Sandy	3.6
327	58-30	58	3	50	30	0	1	Washouts	0.0
328	Monroe Owens Rd	58	3	500	30	0	0		0.3
329	53-20	53	3	400	30	0	0		0.3
330	53-20	53	4	200	30	0	1	Sandy; wetland over Rd	0.1
331	58-35	58	3	350	30	0	1		0.2
332	Beaufort Rd	60	2	250	50	0	0		0.3
333	Off of 77-20.3a	77	3	7,920	40	0	1	Washouts	7.3
334	61-23.1(1b)	61	3	2,112	30	0	1		1.5
335	61-23	61	4	1,056	30	0	1		0.7
336	63-36	63	3	35	10	0	0		0.0
337	By 63-36	63	1	528	40	0	1	Mostly type 3 and 4; one 10 x	0.5
338	61-37.2a	61	3	50	30	0	1		0.0
339	South of 61-23	61	1	100	40	0	1		0.1
340	63-36	63	2	400	50	0	1		0.5
341	61-37.4	61	3	3,168	30	0	1	Very sandy	2.2
342	B	62	4	2,640	30	0	0	Construction work at dam	1.8
343	North of 62-31	62	3	150	100	1	0		0.3
344	62-29	62	3	35	10	0	0		0.0
345	63-31.6	63	2	6,336	5	0	1		0.7
346	63-31	63	1	550	30	0	0	Mostly sheet erosion; one 20 x	0.4
347	63-34.1	63	2	50	20	0	1		0.0
348	7	63	2	500	50	0	0		0.6
349	F	63	3	70	30	0	0		0.0
350	58-31	58	3	50	25	0	0		0.0

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
351	E	64	3	30	30	0	0		0.0
352	6	64	3	1,150	20	0	0		0.5
353	6	64	4	200	20	0	0		0.1
354	6	64	3	800	30	0	0		0.6
355	F and 6	64	3	0	0	0	0		0.1
356	F-6	64	2	1,000	30	0	0		0.7
357	65-20	65	2	550	30	0	0		0.4
358	E	65	4	1,000	40	0	0		0.9
359	Old House Rd	65	1	1,056	40	0	1		1.0
360	E-1	65	1	4,224	40	0	1		3.9
361	65-34	65	1	3,696	40	0	1		3.4
362	6	66	4	1,200	100	0	0	Four 100 x 300 strips	2.8
363	F	66	4	450	10	0	0		0.1
364	Old House Rd	65	4	40	10	0	0	New culvert over stream	0.0
365	Old House Rd	65	1	130	50	0	0		0.1
366	C	66	4	208	208	0	0	Actually 1 acre area	1.0
367	6	66	4	350	30	0	0	Two 30 x 175 strips	0.2
368	6	66	1	600	40	0	0		0.6
369	C	68	2	150	30	0	0	Two areas	0.1
370	Off Rd 3	66	1	600	40	0	1		0.6
371	66-25	66	1	110	10	0	1		0.0
372	66-25	66	4	2,640	50	0	1		3.0
373	66-25	66	1	10	20	0	0		0.0
374	E-1	66	1	540	30	0	0		0.4
375	C-5	66	1	1,100	60	0	1		1.5

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
376	C-5	66	1	800	15	0	0		0.3
377	F-6	66	1	375	60	0	1		0.5
378	Youman Rd	66	4	650	50	0	1		0.7
379	E-1	66	4	100	20	0	1	Sandy; two areas	0.0
380	E-1	66	1	1,500	60	0	1		2.1
381	E-1	66	1	3,168	60	0	1	Wetland	4.4
382	North of 67-20.5	67	4	2,640	30	0	1		1.8
383	67-20.5	67	2	125	30	0	1		0.1
384	Off 67-40	67	3	500	40	0	0		0.5
385	Burma Rd	67	3	1,000	40	0	1		0.9
386	67-21	67	2	200	30	0	1		0.1
387	C	65	3	2,112	70	0	1		3.4
388	C-5	67	4	2,640	45	0	1		2.7
389	5	67	4	160	12	0	0	Steep slope	0.0
390	C-5	67	2	1,584	40	0	1		1.5
391	99	68	4	50	10	0	0		0.0
392	68-38	68	3	300	30	0	0		0.2
393	Above Rd 3	68	3	500	40	0	0		0.5
394	68-31	68	3	1,000	40	0	0		0.9
395	A-7	68	2	200	30	0	0		0.1
396	68-34	68	3	2,112	70	0	1		3.4
397	C-6	69	2	700	40	0	1	Sediment into creek	0.6
398	Above 69-31.2	69	2	420	40	0	0		0.4
399	Near 69-31.2	69	1	50	20	0	1		0.0
400	Youman Rd	69	2	550	40	0	1	Sandy	0.5

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
401	C	69	3	50	10	0	0	High walls	0.0
402	Williams Rd	69	3	40	40	0	1	Sediment into stream	0.0
403	Youman Rd	69	2	200	40	0	1		0.2
404	7	69	2	225	30	0	0		0.2
405	74-37.1	69	1	210	30	0	1		0.1
406	6	70	2	100	50	1	1		0.1
407	Youman Rd	70	1	1,848	50	0	1		2.1
408	70-26	70	2	100	50	0	1		0.1
409	70-30	70	2	50	30	0	1		0.0
410	70-30	70	4	50	30	0	1		0.0
411	517	70	4	100	50	0	0		0.1
412	Across 73-33	70	2	65	30	1	1		0.0
413	B	71	4	160	20	0	1		0.1
414	B	71	4	400	30	0	0		0.3
415	B	71	4	300	30	0	0		0.2
416	71-30	71	2	3,160	40	0	1	Ditch work	2.9
417	7	71	4	2,112	30	0	0		1.5
418	Youman Rd	71	2	300	60	0	1		0.4
419	In 71-24.3	71	2	100	60	0	1		0.1
420	Across 71-24.3c	71	2	2,640	40	1	1	Ditch work	2.4
421	71-28	71	2	2,640	40	0	1	Ditch work	2.4
422	Turner Rd	72	1	60	50	0	1		0.1
423	By Turner Rd	72	1	0	0	0	1	30 acre area	30.0
424	Into 72-23.7	72	1	850	70	0	1		1.4
425	B	43	3	600	15	1	0	Steep slopes	0.2

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
426	6	72	1	80	800	1	1	Steep slopes	1.5
427	72-24	72	2	160	40	0	1	Ditch work	0.1
428	6-1	72	2	270	20	0	1		0.1
429	6-1	72	1	1,000	70	0	0		1.6
430	6-1	72	1	300	10	0	1		0.1
431	72-20	72	1	3,696	60	0	1	Ditch work	5.1
432	6-4.1	70	1	1,848	40	0	1		1.7
433	6-3	72	2	450	40	0	1		0.4
434	6-3	72	2	2,640	30	1	1	Ditch work	1.8
435	72-29	72	4	250	40	0	1		0.2
436	72-29	72	1	100	40	0	1	Ditch work	0.1
437	6-2	72	1	3,696	40	1	1		3.4
438	6-2	72	2	100	100	0	1	Break in dike	0.2
439	73-20	73	1	900	45	0	1		0.9
440	B	74	2	2,640	20	1	0	High walls	1.2
441	74-32.1a	74	2	200	40	0	0		0.2
442	74-32.1	74	3	100	40	0	1		0.1
443	74-28	74	1	50	10	0	0		0.0
444	F	74	3	50	20	0	0		0.0
445	F	74	4	100	20	0	0		0.0
446	75-30.2	75	2	35	30	0	0		0.0
447	West of 75-39	75	3	100	20	0	0		0.0
448	76-21	76	1	20	10	0	1	Washout	0.0
449	76-21	76	2	200	30	0	1	Washout	0.1
450	77-22	77	2	100	40	0	0		0.1

GIS Code	Road Name	Comp.	Type	Length (ft)	Width (ft)	HP	Sed.	Remarks	Acres
451	77-22	77	1	50	20	0	1	Washed out	0.0
452	Patterson Mill Rd	80	4	15	15	1	0		0.0
453	Round Tree Rd	81	3	20	20	0	0		0.0
454	Round Tree Rd	81	4	1,000	10	0	0		0.2
455	82-26	82	4	1,000	20	0	1		0.5
456	82-23.3a	82	1	210	30	0	1	Heavy sand; washout	0.1
457	82-25	82	2	500	30	0	0		0.3
458	82-25	82	2	100	10	0	0		0.0
459	82-28.4	82	1	80	10	0	1	Washout	0.0
460	83-25	83	3	50	30	0	0		0.0
461	A-18.3	83	3	800	30	0	0		0.6
462	Ellis Rd	84	4	300	30	0	1		0.2
463	C-85 Boundary	85	2	100	30	0	0		0.1
464	85-28	85	4	200	30	0	1		0.1
465	86-25	85	3	3,696	30	0	0		2.5
466	85-28.3	85	3	500	30	0	0		0.3
467	85-20	85	3	200	40	0	1	Wetlands	0.2
468	85-30	85	2	2,640	40	0	1	Washed out spots	2.4
469	8-25	8	4	3,168	30	0	1	Rd ruts; drainage problem	2.2
470	ENE of 8-28 & 8-29	8	1	25	60	0	1	Deep gully	0.0
471	NW of 8-29	8	1	700	40	0	1	Ditch work	0.6