

DATE: November 19, 2002

TO: Laura Bub, WT/2

FROM: Pamela Stubbe, Superior

SUBJECT: Drummond S. D. - Surface Water Classification & Designated Use Review

The Drummond S. D. wastewater treatment facility in Bayfield County includes one primary and two secondary cells (Figure 1). Treated wastewater is discharged from the northeast pond through a dispersal pipe located in a bog wetland east of the lagoons (Figure 2). An unnamed, intermittent tributary to the Long Lake Branch of the White River begins at a weir outlet at the northwestern end of the bog (Figure 3). This tributary stream, which does not consistently exhibit defined bed and bank, continues for approximately 350 m, and then it diffuses just before a wetland that surrounds Weso Lake (Figures 4 and 5). The lack of stream connectivity and substrate habitat limits potential fish and aquatic macroinvertebrate communities in the intermittent stream.

Historically the course of the intermittent stream continued under an abandoned railroad grade, but beaver activity has impounded the watercourse (Figures 6 and 7). Historical data include low dissolved oxygen levels, which are characteristic of wetland drainage streams and limiting for potential fish communities. (05/16/91 L. Prens Site Review)

On 4 November 2002 Water Resources Management Specialist Bill Jaeger, Wastewater Engineer Chuck Olson, Watershed Specialist Susan Watson, and I evaluated the site. There was no visible discharge from the dispersal pipe into the bog wetland (Figure 8). Flow from the weir into the tributary channel was negligible. The stream was less than 0.1 m deep and full of allochthonous material (Figure 9). The substrate consisted of silt and decaying organic material. We sampled for fish and aquatic macroinvertebrates immediately downstream of the weir and found nothing. Approximately 200 m downstream of the weir we found a few aquatic macroinvertebrates, including one physid snail and one caddisfly larvae, in an isolated area (<1 m²) that contained gravel and rock substrate.

RECOMMENDATION

The bog and intermittent tributary stream, which receive treated wastewater from the Drummond S. D. facility, shall be classified as "wetland" (NR 104.02(1)(c)) and "noncontinuous stream" (NR 104.02(1)(e)), respectively, and shall be placed in the "marginal surface water/limited aquatic life/very tolerant aquatic life" (NR 104.02(3)(b)) category. The reasons for this recommendation are as follows:

1. *Physical conditions related to the natural features of the water body, such as the lack of proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of a Diverse Fish and Aquatic Life community.*
2. *Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of a Diverse Fish and Aquatic Life community.*
3. *Naturally occurring pollutant concentrations prevent the attainment of a Diverse Fish and Aquatic Life Community.*

Drummond Sanitary District Wastewater Treatment Plant

Figure 1
WI-0031615-5

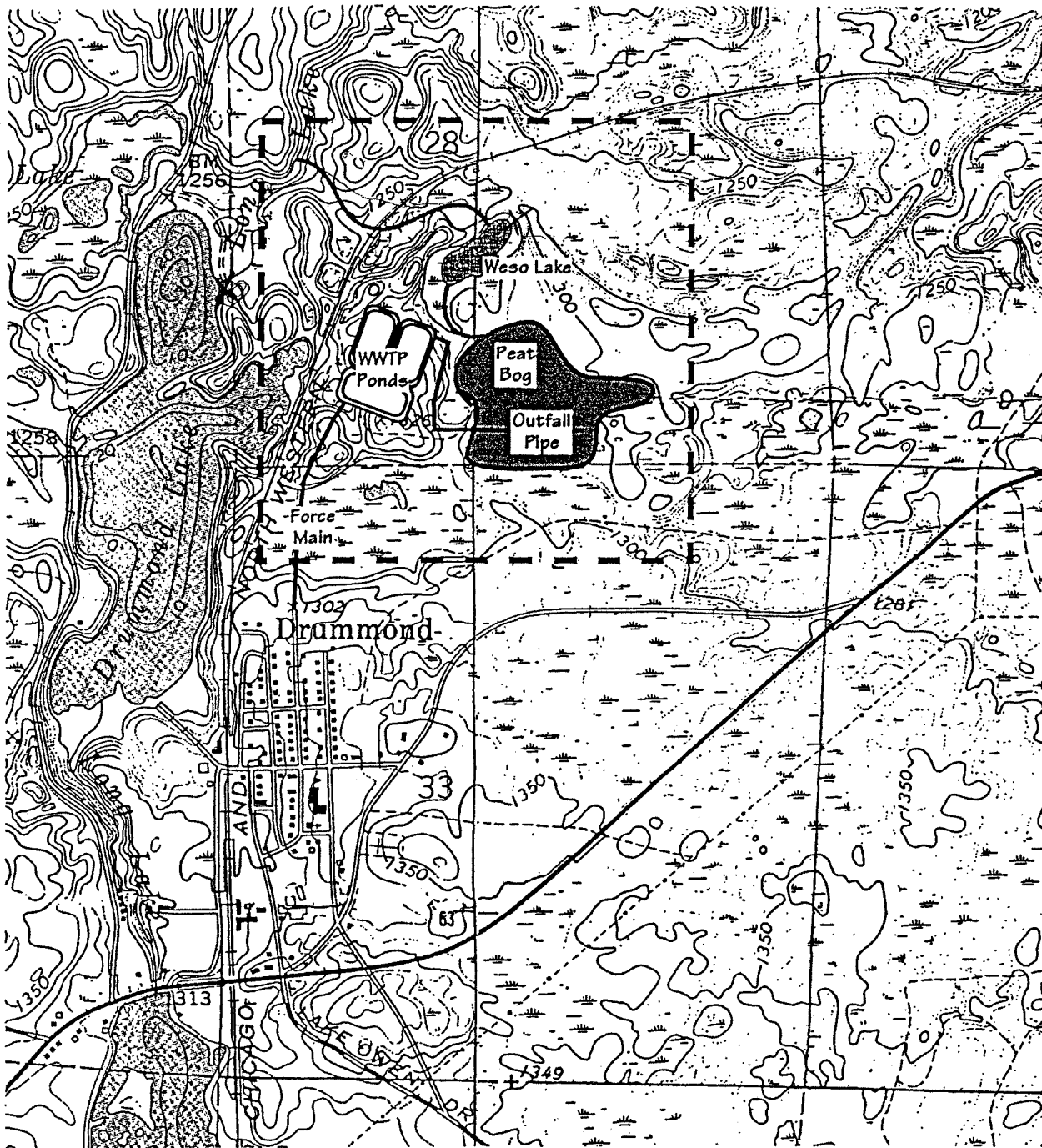




Figure 2. Drummond WWTF outfall pipe into bog.



Figure 3. Drummond WWTF weir outlet into noncontinuous tributary stream to the Long Lake Branch of the White River.



Figure 4. Noncontinuous stream that receives Drummond WWTF effluent and bog discharge. Facing upstream at the end of the tributary segment where the channel loses defined bed and bank.



Figure 5. Noncontinuous stream that receives Drummond WWTF effluent and bog discharge. Facing downstream at the end of the tributary segment where the channel diffuses.



Figure 6. Historical beaver activity has prevented watercourse from continuing under the railroad grade.



Figure 7. Culvert through which tributary stream to the Long Lake Branch of the White River historically traveled.



Figure 8. Drummond WWTF dispersal pipe in bog wetland – no visible discharge.



Figure 9. Noncontinuous stream receiving Drummond WWTF and bog discharge.

TO: FILES

FROM: Larry Prenn

DATE: May 16, 1991

SUBJECT: DRUMMOND WWTP SITE REVIEW

Description:

The WWTP at Drummond operates on a fill and draw basis; it consists of one primary and two secondary cells. After treatment the final effluent is piped from the northeast corner of the northeast pond and fed into a dispersal pipe located in a bog wetland east of the treatment lagoons.

Emerging from this bog wetland at a weir outlet and flowing north is an unnamed tributary to the Long Lake Branch of the White River. Along its course this intermittent tributary flows into another wetland surrounding a 4.4 acre unnamed lake, passes under the abandoned CNW railroad grade, and is joined by a clearwater feeder of equal size.

Water Chemistry:

On May 16, 1991, no discharge was occurring from the WWTP to the bog. Water chemistry samples were collected at the weir outlet of the bog (D-D1), and just below the abandoned railroad grade (D-D2). Lowered dissolved oxygen levels, not atypical of bog drainage, were recorded. Levels were 2.6 (mg/l) and 4.5 (mg/l) respectively. Results showed there to be high levels of phosphorus at both sties. A substantial increase in the BOD₅ level was measured at D-D2, and a noticeable septic odor was present in the water at this site. No slimes, or excessive periphyton growths were present.

Physical and Biological Assessment:

Upstream from the railroad grade extensive beaver activity was in evidence, especially in the area surrounding the unnamed lake. From the abundance of brush, and the number of trees standing dead in the water, it was apparent the lake level had risen two to three feet. An equally large number of trees had been felled into and along the shoreline of the lake.

The stream reach at D-D2, just below the railroad grade, was evaluated with the use of a habitat rating form. For the most part, watershed characteristics rated excellent. Instream habitat, due to a lack of depth and siltation of the streambed, generally rated fair to poor. A composite total of 168 points classified habitat availability as fair.

Except for the presence of a minnow, aquatic organisms were noted as lacking.

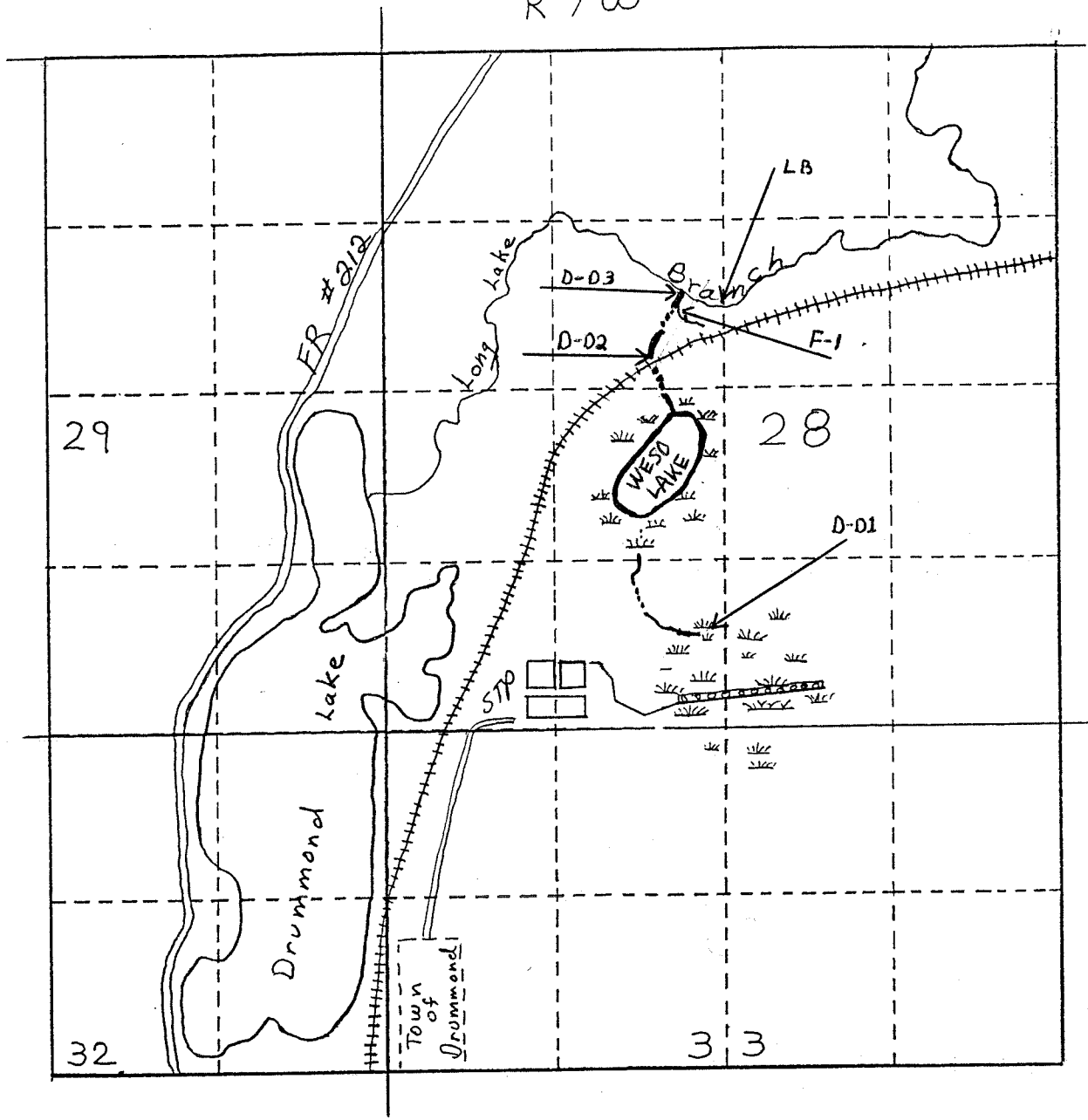
Midway between D-D2 and the confluence with the Long Lake Branch, a clearwater feeder (F-1) joins the Drummond Tributary from the east. This feeder, viewed later in the year on October 31, 1991, appears to be spring fed. Temperature and dissolved oxygen in the feeder were measured at 3.5° C and 10.8 (mg/l). In comparison, temperature and oxygen measurements in the Drummond Feeder at D-D2 were 5.0° C and 3.9 (mg/l). The site at D-D2 still had its characteristic septic odor.

Below the junction of the spring feeder with the Drummond Tributary (D-D3), stream substrate was composed basically of clean sand. There were little or no siltation problems. In this stretch *Tipula* dipteran were present, as were numerous amphipods.

Downstream of their confluence (LB), there was no visible evidence of the Drummond Tributary adversely impacting the Long Lake Branch. Abundant arthropods including stonefly nymphs (*Perlidae*), and fixed cases of intolerant caddis larvae (*Glossomatidae*) were seen throughout the mixing zone. Also in abundance were dipterans (*Chironomidae*, *Tipulidae*), amphipods, and Megaloptera (*Sialis*).

R 7 W

T 45 N



Stream Drummond Reach Location Just below RR Grade Reach Score/Rating 169 / Fair
 County Bayfield Date 5/16/91 Evaluator LP + FK Classification _____
 Trib

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion	No evidence of significant erosion. Stable forest or grass land. Little potential for future erosion. <u>8</u>	Some erosion evident. No significant "raw" areas. Good land mgmt. practices in area. Low potential for significant erosion. 10	Moderate erosion evident. Erosion from heavy storm events obvious. Some "raw" areas. Potential for significant erosion. 14	Heavy erosion evident. Probable erosion from any run off. 16
Watershed Nonpoint Source	No evidence of significant sources. Little potential for future problem. <u>8</u>	Some potential sources (roads, urban area, farm fields). 10	Moderate sources (small wetlands, tile fields, urban area, intense agriculture). 14	Obvious sources (major wetland drainage, high use urban or industrial area, feed lots, impoundment). 16
Bank Erosion, Failure	No evidence of significant erosion or bank failure. Little potential for future problem. <u>4</u>	Infrequent, small areas, mostly healed over. Some potential in extreme floods. 8	Moderate frequency and size. Some "raw" spots. Erosion potential during high flow. 16	Many eroded areas. "Raw" areas frequent along straight sections and bends. 20
Bank Vegetative Protection	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. <u>6</u>	70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. 9	50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding. 15	<50% density. Many raw areas. Thin grass, few if any trees and shrubs. 18
Lower Bank Channel Capacity <i>W=2' D=0.1'</i>	Ample for present peak flow plus some increase. Peak flow contained. W/D ratio <7. <u>8</u>	Adequate. Overbank flows rare. W/D ratio 8-15. 10	Barely contains present peaks. Occasional overbank flow. W/D ratio 15-25. 14	Inadequate, overbank flow common. W/D ratio >25. 16
Lower Bank Deposition <i>Silt present</i>	Little or no enlargement of channel or point bars. 6	Some new increase in bar formation, mostly from coarse gravel. <u>9</u>	Moderate deposition of new gravel and coarse sand on old and some new bars. 15	Heavy deposits of fine material, increased bar development. 18
Bottom Scouring and Deposition	Less than 5% of the bottom affected by scouring and deposition. 4	5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. <u>8</u>	30-50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. 16	More than 50% of the bottom changing nearly year long. Pools almost absent due to deposition. 20
Bottom Substrate/ Available Cover	Greater than 50% rubble, gravel or other stable habitat. 2	30-50% rubble, gravel or other stable habitat. Adequate habitat. 7	10-30% rubble, gravel or other stable habitat. Habitat availability less than desirable. 17	Less than 10% rubble gravel or other stable habitat. Lack of habitat is obvious. <u>22</u>
Avg. Depth Riffles and Runs	Cold >1' 0 Warm >1.5' 0	6" to 1' 6 10" to 1.5' 6	3" to 6" 18 6" to 10" 18	<3" <i>Not over 3"</i> 24 <6" 24
Avg. Depth of Pools	Cold >4' 0 Warm >5' 0	3' to 4' 6 4' to 5' 6	2' to 3' 18 3' to 4' 18	<2' <i>Not over 6"</i> 24 <3' 24
Flow, at Rep. Low Flow	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 6 2-5 cfs 6	.5-1 cfs 18 1-2 cfs 18	<.5 cfs 24 <1 cfs 24
Pool/Riffle, Run/Bend Ratio (distance between riffles + stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. <u>16</u>	>25. Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. 20
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or un-pastured corridor. <u>8</u>	High natural beauty. Trees, historic site. Some development may be visible. 10	Common setting, not offensive. Developed but uncluttered area. 14	Stream does not enhance aesthetics. Condition of stream is offensive. 16

Column Totals: 42 17 16 94

Column Scores E 42 + G 17 + F 16 + P 94 = 169 = Score

<70 = Excellent, 71-129 = Good, 130-200 = Fair, >200 = Poor

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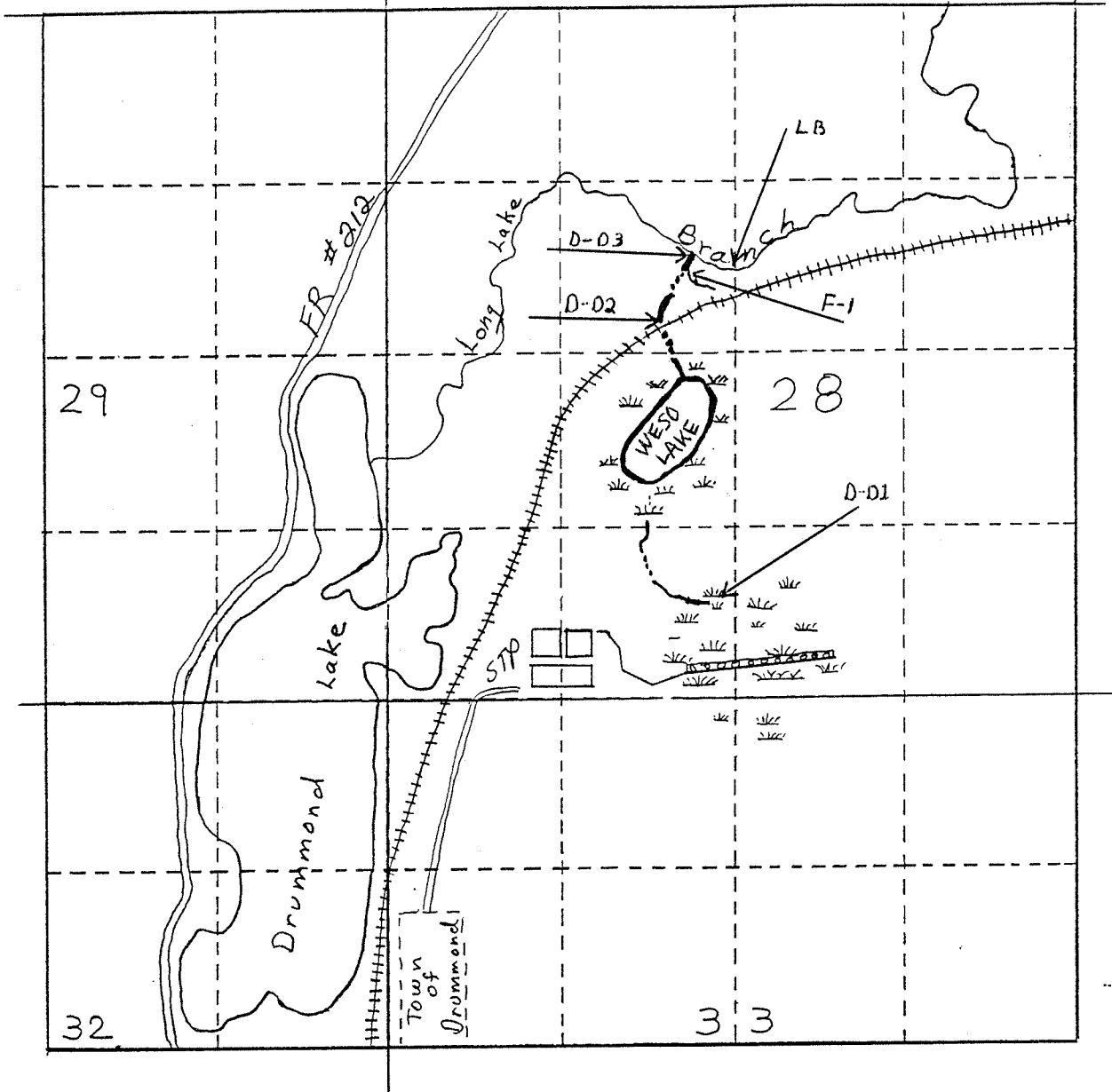
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Column Scores

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