



REQUISITION FOR TECHNICAL SERVICES

Project OHW Survey for East and West Four legged lakes		Lake No. 15-0027P & 15-0028P	
City Lenard		County Clearwater	
Sec. 9, 10, & 17		Twp. 148N	Rng. 36W
		Quad No.	

Statement of Problem/Situation (Provide detailed information)

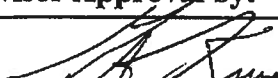
The County Engineer is looking at lowering the culvert as much as 2 feet under the Township Road at the west side of West Four Legged Lake. He claims the culvert was illegally raised 2 feet about 15 years ago and it is impacting their County Road. He has also has had complaints from some property owners that the lake should be lower. A legal ditch (Judicial Ditch #5) runs through the middle of West Four Legged Lake all the way to the outlet of East Four Legged Lake. The ditch is under the authority of the Red Lake Watershed District. I feel an OHW determination will help to assess the potential impacts of the proposed action and help me determine if the County Engineer, through the Watershed District, has the legal right to lower the culvert since it is part of the legal ditch system.

Services Requested (Attach map as necessary)

OHW Survey of both lakes since a lowering of West Four Legged Lake would also lower East Four Legged Lake.

Landowner(s):

Permission obtained for access: ☐ Yes ☒ No

Requested By: Dan Thul	Date 9/1/2010	Phone No. 218-308-2627
Manager/Supervisor Approval by:		Date
Assigned By: 		Date 9/13/2010

Minnesota DNR Waters Field Survey Report

Project: East and West Four Legged Lakes			Lake No. 15-27 and 15-28
City: near Leonard		County: Clearwater	Req. No. 2011-18
Sec. 3,9,10,15,16,17	Twp. 148	Rng. 36	Watershed

SURVEY DATE: 9/29 and 9/30/2010
SURVEY CREW: Scherek, Schaffer, Cameron

LAKE SIZE

Meandered Area 1182	Acres	Non-meandered (East is listed as dry.)
Planimetered Area 945	Acres	Unknown

East=455 acres, West=490 acres (planimetered) East=539 acres, West=643 acres (meandered)

DATUM ADJUSTMENT

Assumed 1912 1929 x 1988 Source: MN/DOT B.M. "LEGGED 1996"
 (-1.13' to obtain NGVD-1929)

CONTROL BENCHMARK

Location: SE ¼ - Sec. 8, T 148, R 36
 Elevation: 1439.99
 Description: disk on top of an aluminum alloy rod, at Hwy 223 milepoint 7.05, 54' N-NW of Hwy. 223 and 20' E-NE of a field entrance road

SURVEY WORK COMPLETED

x levels	topography	cross sections	profiles	x OHW
x establish benchmarks	x outlet elevations	x other: photographs		

WATER LEVELS

Highest Recorded:	Water Surface: East=1430.10, West (NE of C.R. 2)= 1429.86, West (SW of C.R. 2)=1428.84
Lowest Recorded:	OHW Elev: See next page
Range:	Highest Known:

OUTLET

General Description: See next page
 Runout Elevation and Description: See next page

BENCHMARKS SET

Location: on the SW side of the north portion of the East lake (NW-SW-SW, Sec. 10-148-36)
 Elevation: 1435.29
 Description: a 3/8"x 8" spike at a slight angle 0.8' above the ground in the east side of a 1.1' oak, closest tree to the lake at the SE corner of the mowed yard area at address #25256 C.R. 23, also 20' SW of an electrical box

Location: on the NE side of the SW portion of the West lake (NE-SE-NW-NW, Sec. 16-148-36)
 Elevation: 1431.96
 Description: a 60d spike 1.1' above ground in the W-SW side of a power pole with a guy wire, 88' east of C.R. 2 and approximately 150' S-SE of the culvert between the SW and NE portions of the West lake

Prepared By: John M. Scherek	<i>JMS</i>	Title: Eng. Spec. Senior	Date: 10/8/10
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We also set three additional benchmarks as follows:

At C.R. 23 between East Four Legged Lake and West Four Legged Lake – a PK nail set flush on the NE edge of the blacktop surface of C.R. 23, 52' NW of the centerline of 253rd Ave. to the south and adjacent to the outlet culvert under C.R. 23; elevation = 1437.24.

At C.R. 2 between the NE and SW portions of West Four Legged Lake – a PK nail set flush on the east edge of the blacktop surface of C.R. 2, adjacent to the connecting culvert between the two portions of the lake; elevation = 1432.54.

At the township road downstream of the SW portion of West Four Legged Lake – a horizontal 3/8"x 8" spike 0.7' above ground in the NE side of a 1.3' oak (next to a 0.9' oak), 32' east of the centerline of the township road and 125' south of a 36" CMP under the road at the outlet crossing; elevation = 1438.46.

East Four Legged Lake consists of two portions on the north and south sides of C.R. 23 and an old railroad grade which bisect it. They are connected by a large concrete culvert (no exact size determined), that passes under both the railroad grade and C.R. 23. We could only locate the north end of the culvert and the top north end of the culvert is at elevation 1429.04 and the north flowline is at elevation 1427.1. The water level is the same on both sides of the road, so the culvert apparently acts as an equalizer. The East lake outlets via a 2.5' or 3.0' CMP under the old railroad grade and a RCP (no size determined) under C.R. 23, SW to the West lake. Following are the elevations we found at that area:

Water level East Four Legged Lake = head water at old railroad grade	1430.10
Note: The upstream end of the railroad culvert is blocked by a beaver dam.	
Water level between the old railroad grade and C.R. 23	1429.88
Top downstream end of CMP thru railroad grade	1429.25
Downstream flowline of CMP	1427.1
Top upstream end of RCP under C.R. 23	1428.36
Upstream flowline of RCP	1426.6
Top downstream end of RCP	1428.64
Downstream flowline	1427.4
Tailwater at C.R. 23 (no visible flow thru culvert)	1429.88
Water level of the NE portion of West Four Legged Lake	1429.88
Note: No sizes could be determined on the culverts, since they are both under water.	

West Four Legged Lake is also separated into two portions by C.R. 2 which bisects it. Following are the elevations we found at the connecting culvert:

Water level of the NE portion of West Four Legged Lake	1429.88
Top of the east (broken) end of the 24" RCP under C.R. 2	1427.49
Flowline at east end of culvert	1426.3
Top of C.R. 2 over culvert	1431.8
Top west end of 24" RCP	1427.33
West invert of culvert	1425.09
Water level of the SW portion of West Four Legged Lake	1428.84

Note: There is no visible flow into the upstream end of the culvert, but there is heavy flow out of the downstream end. As per the water level difference, I suspect that the culvert is substantially plugged on the inside.

At the outlet on the west side of the SW portion of West Four Legged Lake, there is a beaver dam approximately 500' upstream of the township road. Following are the elevations we found at the beaver dam and the downstream road crossing:

Headwater at beaver dam = water level of SW portion of West Four Legged Lake	1428.84
Top of beaver dam (present runout of the SW portion of the lake)	1428.7
Tailwater at beaver dam	1427.45

Headwater at township road	1427.39
Top upstream end of 36" CMP thru road (on 1 st corrugation back)	1430.00
Upstream flowline	1426.8
Centerline of road over culvert	1434.7
Top of bent downstream end of culvert	1429.19
Bent downstream invert of culvert	1426.12
Channel bottom at downstream end of culvert	1424.8
Tailwater at township road (steady flow thru culvert)	1425.26
Channel bottom 30' downstream of culvert	1424.2

Note: Four photos were taken at this location, one looking at the upstream end of the culvert, two looking at the downstream end and one looking at the channel upstream of the township road.

We also found the following elevations on the NW side of the north portion of East Four Legged Lake where it is bisected by 450th Street:

Water level on south side of road	1430.10
Top south end of a deformed (?) 30" CMP	1430.25
South flowline	1427.7
Centerline of road over culvert	1431.8
Top north end of culvert	1430.11
North invert of culvert	1427.67
Water level on north side of road (no visible flow)	1430.09

Good OHWL tree evidence on East Four Legged Lake was very limited. During our investigation we documented seven trees (jack pine and ash), all on the north portion of the lake. The OHW level of 1430.2 is based on the average reduced elevation of those seven trees. No stainlines or washlines were observed. The water level of the lake is shown at 1428 (NGVD-1929) on the 1972 USGS quadrangle.

On West Four Legged Lake we documented 39 trees, 21 on the SW portion and 18 on the NE portion (white pine, jack pine, elm, ash, aspen, cottonwood, spruce and willow). The 18 trees on the NE portion, indicate an OHW level of 1430.0 and the 19 best trees on the SW portion indicate an OHW level of 1429.3. No stainlines or washlines were observed on either portion. The water level of the SW portion is shown at 1427 (NGVD-1929) on the 1969 USGS quadrangle. No water level is shown for the NE portion.

The different OHW levels for the NE and SW portions of West Four Legged Lake, indicates that their water levels have fluctuated separately and that conditions at the C.R. 2 culvert have provided the effective runout for the NE portion.

c.c. Dan Thul, Greg Kruse, Joe Cameron, Doug Schaffer