

Station - 2016 staff
gase

Wisconsin DNR - Lake Level Monitoring
2019 Staff Gauge Survey Data Sheet install

Lake Information
Lake Name HORSESHOE LAKE County POCK

Data Collectors
Primary Data Collector _____ Email _____ Phone No. _____
Additional Data Collector(s) _____

Reference Mark and Staff Gauge Information

Reference Mark #1 (RM1) Reference Mark Type: _____
Latitude: 45°26'53.175" Longitude: 92°08'33.399" Mean Sea Level Yes No Elevation: 1217.15 Photograph
Location Description: Highest Point of 2nd Natural Rock Step leading uphill Easterly from Dock Area

Reference Mark #2 (RM2) Reference Mark Type: _____
Latitude: 45°26'53.165" Longitude: 92°08'33.686" Mean Sea Level Yes No Elevation: 1217.62 Photograph
Location Description: NW Corner of 1st concrete step above concrete landing leading South from Dock Area to Easterly end of Cabin.

Reference Mark #3 (RM3) Reference Mark Type: _____
Latitude: 45°26'53.079" Longitude: 92°08'33.094" Mean Sea Level Yes No Elevation: 1217.20 Photograph
Location Description: Highest Point of a 3'x2' Boulder on Point @ NE Corner of Yard

Staff Gauge
Latitude: 45°26'53.057" Longitude: 92°08'33.614" Mean Sea Level Yes No Elevation: 1212.21 Photograph
Location Description: Staff Gauge is located on South Side of bench area of Dock on the shore side of the Lounge Area @ end of Dock

Date: 08/19/19 Time: 8:00 AM/PM Check one: Install Midseason Removal

Survey Stage 1 - Instrument at first height

	Reference Mark 1	Fore sight (FS1)	Calculated Elevation (CE1)
Given Elevation (GE _{RM1})	<u>1217.15</u>		
Back sight 1 (BS1)	<u>+ 3.88</u>		
Height of Instrument (HI1)	<u>1221.03</u>	<u>8.82</u>	<u>1212.21</u>
	HI1 - Staff Gauge	<u>3.40</u>	<u>1217.63</u>
	HI1 - Ref Mark 2	<u>3.88</u>	<u>1217.20</u>

Survey Equations:
HI1 = GE_{RM1} + BS1
CE1 = HI1 - FS1

Survey Stage 2 - Reset instrument at different height

	Staff Gauge	Fore sight (FS2)	Calculated Elevation (CE2)
Calculated Elevation1	<u>1212.21</u> ←		
Back sight 2 (BS2)	<u>+ 8.54</u>		
Height of Instrument (HI2)	<u>1220.75</u>	<u>3.60</u>	<u>1217.15</u>
	HI2 - Ref Mark 1	<u>3.12</u>	<u>1217.63</u>
	HI2 - Ref Mark 2	<u>3.55</u>	<u>1217.20</u>

Survey Equations:
HI2 = CE_{SG1} + BS2
CE2 = HI2 - FS2

Quality Assurance Checks

Reference Mark 1:	BS1 <u>3.88</u>	FS1 <u>8.82</u>	
GE = CE2	BS2 <u>+8.54</u>	FS2 <u>+3.60</u>	
	<u>12.42</u>	<u>12.42</u>	

QA Equations:
BS1 + BS2 = FS1_{SG} + FS2_{RM1}
GE_{RM1} = CE2_{RM1}

*Accept Survey Stage 1 if QA checks within 0.01 ft. Use calculated elevations 1 for the rest of the season unless the gauge moves.

Lake Level Reading: 2.02 ft

WATER - 6.53 - 1214.22 - ELEV

