# CHAPTER V

## LIST OF PREPARERS

This Environmental Assessment was prepared under contract by Bob Reese of KJ&B Enterprises. Information contained in the document was obtained from the following sources:

High Plains Marina, LLC
Wyoming State Department of Game and Fish
Bridger-Teton National Forest GIS Database
University of Wyoming Natural Diversity Data Base
Chambers Design-Build
Wyoming Wildlife Consultants
Frank Bain, Consulting Geologist

### U.S. Forest Service Interdisciplinary Review Team

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| Susan Marsh | Recreation Officer |
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| Jamie Schoen | Archeologist |
| Cindy Stein | Natural Resource Manager/Recreation |
| Darin Martens | Landscape Architect |
| Wes Smith | Hydrologist |

# APPENDIX A

# GROUNDWATER REPORT

# HYDROLOGIC INVESTIGATION FOR THE PROPOSED EXPANSION OF THE LAKESIDE LODGE RESORT AND MARINA

## INTRODUCTION

Lakeside lodge is located on the southwestern shore of Freemont Lake, approximately 2.5 air miles northeast of Pinedale, Wyoming. Lakeside Lodge currently consists of a marina, restaurant, a 20-unit campground, 9 cabins, and a bathhouse. The existing leach field for the six new cabins is located approximately 600 feet south of the lakeshore and southwest of the cabins. This leach field is along side Forest Service Road 749, on the south side of a low ridge that separates the highway from the lake. The existing leach fields for the restaurant, the campground sites, and the bathhouse are located near those facilities, however if the proposed expansion is approved, all leach fields will be located adjacent to Forest Road 749 and approximately 650 feet south of the lakeshore.

Fremont Lake is the drinking water source for the City of Pinedale. Pinedale has an exemption from the EPA to use the lake water without filtration, but a chlorinating facility is present at the intake point. A groundwater study had been requested to determine where the leachate from the leach field at Lakeside Lodge will migrate to and to insure that it does not impact the water quality of Fremont Lake.

## GEOLOGY / GEOGRAPHY

Fremont Lake is the largest of many hundreds of lakes that are found on the flanks of the Wind River Range. Fremont Lake is a large, very clear, and deep lake. The maximum depth is 608 feet, and it ranks as the seventh deepest lake in the conterminous United States. The total drainage area supplying Fremont Lake is approximately 94 square miles. Fremont Lake has a surface area of 7.9 square miles. Pine Creek, located at the northeast end of Fremont Lake, is the only influent stream other than a few minor rivulets.

Fremont Lake lies in a valley of the Wind River Range that was scoured by glacial ice into rocks consisting of granites, gneisses, and pegmatite dikes. Two major glacial advances, the Bull Lake and the Pinedale, shaped the topography in the vicinity of the lake. The downstream end of the valley was plugged by a series of terminal moraines ranging in age from about 60,000 to 9,000 years ago. Pine Creek is the outlet stream for Fremont Lake and is located in glacial till at the southwestern corner of the lake.

## SCOPE OF PROJECT

A list of all water wells located between Pinedale and the south shore of Fremont Lake was obtained from the Wyoming State Engineers Office. No surface elevation data was

available for the well locations, so fieldwork was required to obtain the data, in order that the static water depth could be calculated. A total of 42 wells were selected for the project. Only wells with a depth greater than 100 feet were used. Drill logs, when available, were reviewed for each well to try and determine the depth to bedrock. Numerous other shallow water wells not registered with the state engineers office exist within the study area, but were not used in preparing this report. A summation of the data, including well location, depth, static water level, and elevation is presented in Table I.

## RESULTS

The selected water wells were plotted on the Fremont Lake South USGS topographic map. The map has been enlarged to a 1:1000 scale. Much of the land immediately south of Fremont Lake is owned by the federal government and has not been developed, thus no water well data is available. Good quality data is available from the numerous wells located on private land southwest of the lake.

The static water elevation at several points on the south shore of Fremont Lake including the Lakeside Lodge area is 7,350'. The lowest static water elevation was found in the extreme northwestern corner within the town of Pinedale. That point had an elevation of 7,145'. The high and low points are 11,000 feet apart, thus the hydrologic gradient between the two points would be 1 vertical foot for every 54 feet laterally. The hydrologic gradient is illustrated by the blue line in Cross Section A-A', Figure III. Well data points were contoured on 50-foot intervals. The resulting contour map, Figure II, showed the hydrologic gradient dipping or flowing to the southwest away from Fremont Lake and basically following the course of Pine Creek. Several small anomalies or hydrostatic highs (well points) are shown on the contour map. These high points are located near Pine Creek and probably result from the influence of a shallow aquifer under Pine Creek.

Depth to bedrock in the study area is a little uncertain. Drillers logs were reviewed for many of the deeper wells, but lithologic descriptions of the rock were for the most part vague and non descript. Most of the wells logs referred to glacial till as sand and gravel and the underlying bedrock, which is most likely Wasatch Formation, as gray shale. On this basis, the depth to bedrock was approximated in as many wells as possible, and plotted on the hydrologic gradient cross section as the brown line. No data exists for the depth to bedrock under Fremont Lake. The geomorphology of the bedrock under the study area would probably have been low rolling hills, dipping gently to the west, before being covered by glacial till.

## CONCLUSIONS / RECOMMENDATIONS

Hydrologic analysis of water wells located southwest of Fremont Lake shows that the hydrologic gradient is 1:54 in a southwesterly direction away from the lake. Other

factors, including the hydrologic pressure exerted by Freemont Lake and impervious clay bedrock (Wasatch Formation?) beneath the glacial till would prevent the leachate from flowing north into Fremont Lake and degrading the quality of the lake water. The monitoring wells proposed by Wester-Wetstein in a memo dated May 8, 2002 is an excellent idea, however, it is recommended that the distance of each monitoring well from the leach field be increased to 300 feet and to a depth to be determined by when the clay layer beneath the glacial till is reached.

Report prepared by:

Frank Bain, Consulting Geologist / Hydrologist
WY PG 3249
March 27, 2003

**FIGURE 1 - WATER WELL DATA SUMMARY**

| PERMIT NUMBER | WELL NAME | LOCATION | QUARTER/QUARTER | ELEVATION | WELL DEPTH | STATIC H2O DEPTH | STATIC H2O ELEVATION |
|---|---|---|---|---|---|---|---|
| P114469W | Spring Lake No. 1 | T34N,R109W,SEC 22 | SE/SW | 7390 | 195' | 25' | 7365 |
| P112108W | Clayta No. 1 | | SE/SE | 7410 | 205' | 100' | 7310 |
| P114470W | Spring Lake No. 2 | | SE/SE | 7415 | 155' | 40' | 7375 |
| P085485W | Carollo No. 1 | T34N,R109W,SEC 23 | SE/NW | 7425 | 320' | 75' | 7350 |
| P129008W | Lynn No. 1 | T34N,R109W,SEC 24 | SW/NE | 7520 | 320' | 152' | 7368 |
| P094607W | Wallace No. 1 | " | NW/SE | 7530 | 340' | 165' | 7365 |
| P027786W | Varley No. 1 | T34N,R109W,SEC 26 | NE/NE | 7470 | 205' | | |
| P061999W | Benson No. 1 | " | NE/NE | 7470 | 408' | 162' | 7308 |
| P010296P | Reach No. 1 | " | SW/SW | 7400 | 120' | 60' | 7340 |
| P027323P | Low No. 1 | " | SW/SW | 7425 | 174' | 60' | 7365 |
| P010140W | Tatman No. 1 | T34N,R109W,SEC 27 | NE/NE | 7410 | 155' | 30' | 7380 |
| P024395W | Straley No. 1 | " | NE/NE | 7410 | 200' | 106' | 7304 |
| P088492W | McCullough No. 1 | " | NE/NE | 7410 | 220' | 140' | 7270 |
| P089483W | Hagerman No. 1 | " | NE/NE | 7390 | 220' | 120' | 7270 |
| P098339W | Seneshale No. 1 | " | NE/NE | 7445 | 201' | 54' | 7391 |
| P094328W | UMW-14 | " | SW/NE | 7290 | 28' | 24' | 7266 |
| P030492W | Wise No. 1 | " | SE/NW | 7370 | 68' | 28' | 7342 |
| P005696P | Bernice No. 1 | " | NW/SE | 7350 | 141' | 100' | 7250 |
| P125477W | Goodrich No.1 | " | SW/SE | 7365 | 160' | 92' | 7273 |
| P135742W | Rosencranse No. 1 | " | SW/SE | 7350 | 265' | 100' | 7250 |
| P027437W | Parry No. 1 | " | SE/SE | 7375 | 200' | 143' | 7232 |
| P028227W | Petrie No. 1 | " | SE/SE | 7375 | 180' | 80' | 7295 |
| P068833W | Spence No. 1 | " | SE/SE | 7375 | 180' | 102' | 7273 |
| P113871W | Whitaker No. 1 | T34N,R109W,SEC 33 | NW/NE | 7210 | 120' | 14' | 7196 |
| P133734W | Crandall No. 1 | " | NW/NE | 7275 | 325' | 84' | 7191 |
| P038571W | Wilson No. 1 | " | NE/NE | 7270 | 252' | 97' | 7173 |
| P074094W | Bentley No. 1 | " | NE/NE | 7280 | 175' | 85' | 7195 |
| P082332W | Latta No. 1 | " | NE/NE | 7240 | 260' | 95' | 7145 |
| P091795W | Blagg No. 7 | T34N,R109W,SEC 34 | NW/NE | 7360 | 200' | 110' | 7250 |
| P099177W | McGuire No.1 | " | NW/NE | 7355 | 240' | 125' | 7230 |
| P116987W | Swanson No.1 | " | NW/NE | 7320 | 265' | 92' | 7228 |
| P087461W | J.D.A. No. 1 | " | SW/NE | 7320 | 160' | 55' | 7265 |
| P105014W | Belveal No. 1 | " | SW/NE | 7320 | 165' | 75' | 7245 |
| P050289W | Our Place No. 1 | " | SE/NE | 7310 | 204' | 60' | 7250 |
| P056481W | Wyatt No. 1 | " | SE/NE | 7320 | 178' | 75' | 7245 |

| PERMIT NUMBER | WELL NAME | LOCATION | QUARTER/QUARTER | ELEVATION | WELL DEPTH | STATIC H2O DEPTH | STATIC H2O ELEVATION |
|---|---|---|---|---|---|---|---|
| P0742444 | Mahoney No. 5 | " | SE/NE | 7310 | 165' | 60' | 7250 |
| P063182W | Oakley No. 1 | " | SW/NW | 7320 | 227' | 89' | 7231 |
| P080594W | Walker No. 1 | " | SW/NW | 7310 | 275' | 100' | 7210 |
| P085781W | Rozier No. 1 | " | SW/NW | 7310 | 232' | 112' | 7198 |
| P030386W | Gallatin No. 1 | " | SE/NW | 7325 | 206' | 185' | 7140 |
| P042801W | Toth No. 1 | " | SE/NW | 7320 | 230' | 110' | 7210 |
| P067726W | Bell No. 1 | " | SE/NW | 7325 | 205' | 96' | 7229 |

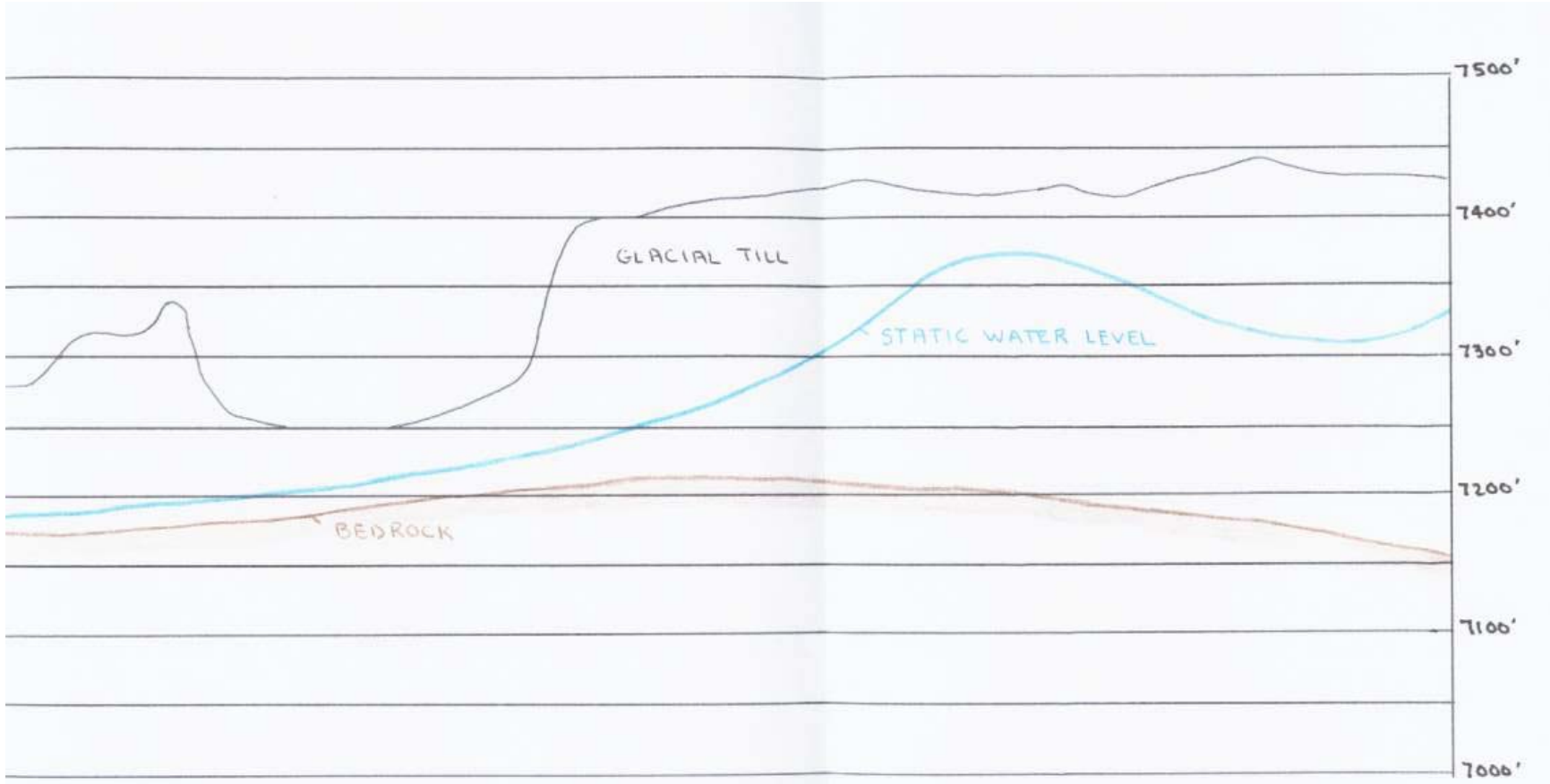



FIGURE III. WEST TO EAST CROSS SECTION OF HYDROLOGIC GRADIENT BETWEEN PINEDALE AND FREMONT LAKE, WYOMING.
Horizontal and Vertical scale - 1"=1,000'

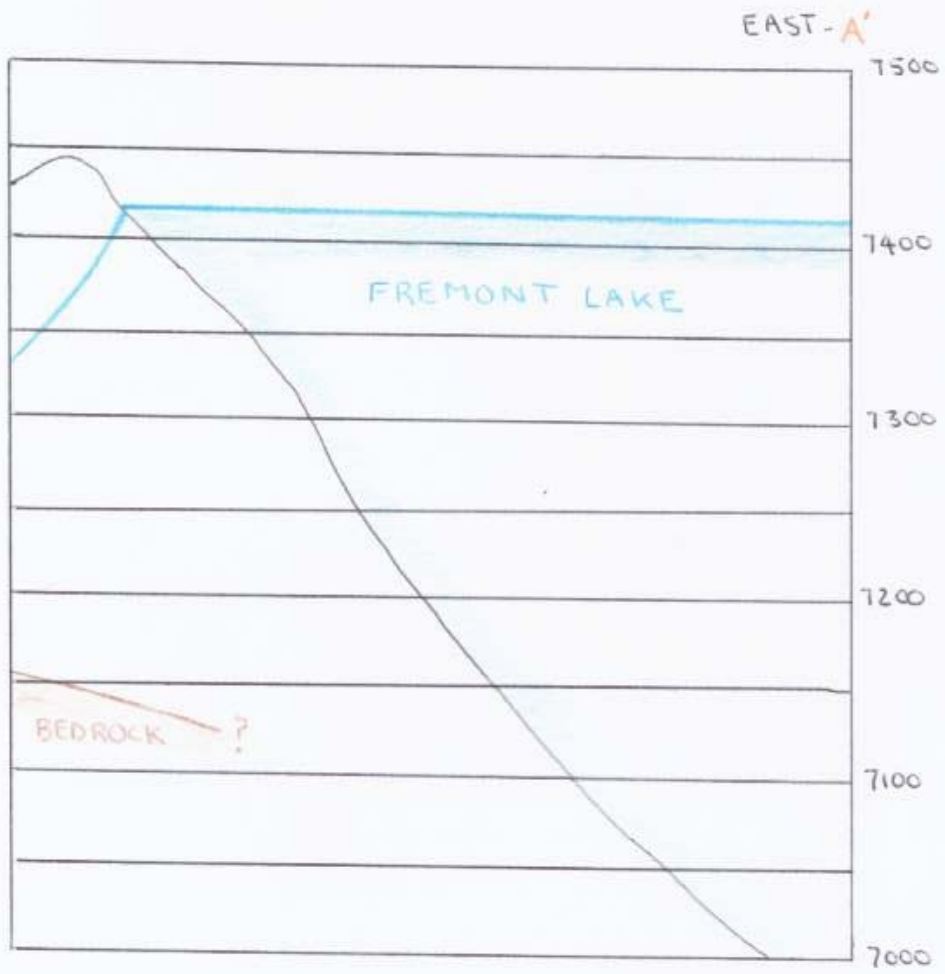
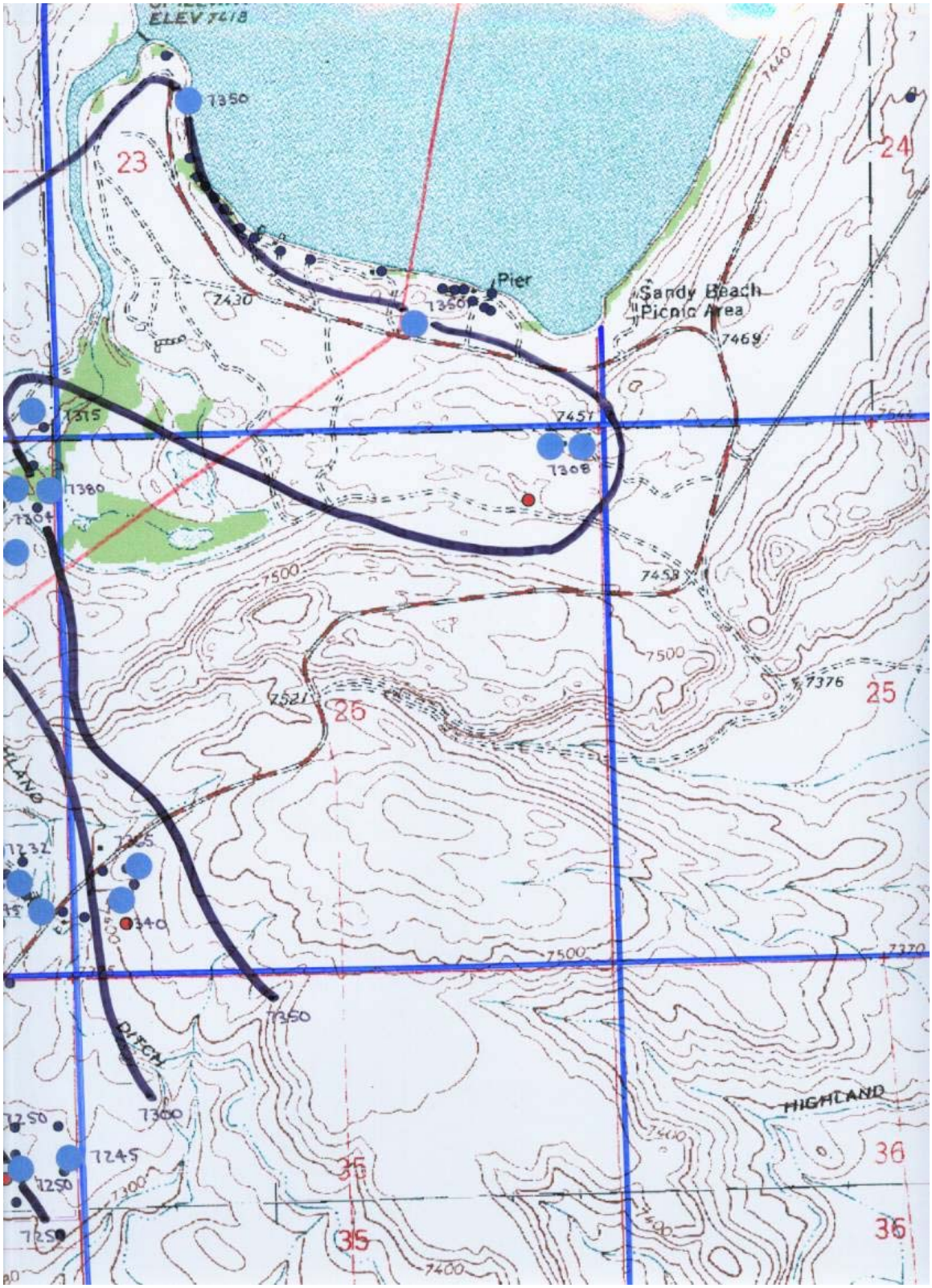



FIGURE III. WEST TO EAST CROSS SECTION OF HYDROLOGIC GRADIENT BETWEEN PINEDALE AND FREMONT LAKE, WYOMING.
Horizontal and Vertical scale - 1"=1,000'


FREMONT
Willow Island
Pine
LAKE
ROAD
WILLOW
LEE
DITCH
Pinedale
Plainview
21
22
27
28
33
34
7400
7350
7300
7250
7200
7390
7348
7270
7342
7393
7310
7210
7240
7230
7273
7250
7185
7145
7141
7173
7207
7196
7198
7229
7210
7245
7269


ELEV 7418
7350
23
24
Pier
Sandy Beach
Picnic Area
7430
7360
7469
7440
7315
7451
7308
7380
7364
7500
7458
7521
26
7376
25
7232
7340
7500
7370
7350
DITCH
7300
HIGHLAND
7250
7245
7400
35
36

# APPENDIX B

# WATER SAMPLE LOCATION MAP

# APPENDIX C

# PETS POLICY

LAKESIDE LODGE Resort & Marina
P.O. Box 1819 Pinedale, Wyoming 82941 307-367-2221
lakesidelodge@wyoming.com www.lakesidelodge.com

**To our guests at Lakeside Lodge**

Fremont Lake is the Town of Pinedale's source of drinking water. The lake is considered to be one of the cleanest lakes in the country and because of the natural purity of the water the Town does not filter the drinking water. The Environmental Protection Agency, the Forest Service and the Town of Pinedale have an agreement to protect the watershed area surrounding the lake.

The EPA considers animals, especially dogs to be potentially dangerous to maintaining the purity of the lake. The EPA has suggested the following list of rules for dogs at the south shore of Fremont Lake

## PLEASE

1. All dogs must be on a leash within 200 feet of the shore.
2. No dogs are allowed to swim at the south shore.
3. All dog waste within 200 feet of the shore must be picked up and disposed of properly.

Lakeside Lodge considers it an honor and a privilege to be able to provide services for our guests. We appreciate your participation and cooperation in helping us manage our watershed and protect the purity of the water at Fremont Lake.

Thank you for choosing Lakeside Lodge for your stay in the Pinedale area and we look forward to your return visit.

# APPENDIX D

# MULE DEER MIGRATION ROUTES