Report 74-7

GROUNDWATER BASIC DATA OF THE EDMONTON AREA (NORTHWEST SEGMENT), ALBERTA

R. Bibby
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GROUNDWATER BASIC DATA OF THE EDMONTON AREA
(NORTHWEST SEGMENT), ALBERTA

Abstract
As part of a hydrogeological reconnaissance mapping program of the northwest segment of the Edmonton map area (NTS 83H), the basic data from the Central Data File at Alberta Research was abstracted and organized for use and storage on a digital computer. This report contains listings of this data made directly from the computer and arranged in three files: water level data, chemistry data, aquifer test data.

INTRODUCTION
This report contains the basic data pertaining to groundwater in the northwest segment of the Edmonton map area (NTS 83H). The area includes most or all of townships 52 to 58 and ranges 22 to 28, west of the fourth meridian (Figs. 1 and 2).

The basic data contained in this report was taken from the Central Data File at Alberta Research. This file contains over 100,000 items of information on wells in Alberta. The information is obtained primarily from two sources, water well drillers and health authorities. Water well drillers are required to submit a report on every well that they drill to Alberta Environment. Copies of these reports are entered into the Central Data File. The reports contain some or all of the following information relevant to groundwater: well location, well completion, litholog, aquifer test details and water level depth. The information obtained from health authorities consists of chemical analyses of groundwater samples. The well location, depth and water level are given along with the chemical analysis.
FIGURE 1. Location of the northwest segment of the Edmonton map area in Alberta.
FIGURE 2. Northwest segment of the Edmonton map area
The basic data was originally abstracted from the Central Data File for the purpose of hydrogeological reconnaissance mapping of this part of the Edmonton area. It comprises data entered into the file up to mid-1973. The data formed the basis for the interpretation of the hydrogeology which has been published elsewhere (Bibby, 1974; Bibby, in preparation). The basic data was organized into three separate files, one consisting of water level data, one of chemistry data and one of aquifer test data. Thus, it is possible that one well may appear in all three files. When the data was abstracted from the Central Data File it was computer coded for storage and use on the digital computer. The listings of basic data in this report are made directly from the computer. The headings under which the data are listed are described at the beginning of the listing of each file.

Acknowledgments

The author would like to thank W. Neilson who wrote the computer programs which were used to verify and list the basic data in this report.
FILE 1

WATER LEVEL DATA
FILE 1. WATER LEVEL DATA

This file consists of the well index number, well location, well completion, land surface elevation, water level depth and bedrock elevation. If a particular item of information is unknown, a blank space is left in the listing. The data are listed under the following headings:

INDEX NO

This is a unique number, within the area, for the well. The same number is written on the well record in the Central Data File for purposes of identification and cross-reference.

TP, R, SEC, LSD

The township, range, section and legal subdivision, respectively, in which the well is located. This location is as reported by the driller or health authority with the exception that when a location was given as a quarter section, it was changed to an LSD. This means that in general the locations should not be considered to be more accurate than a quarter section.

LAND ELEV FEET

Land surface elevation above mean sea level. These elevations are read from a 1:50,000 scale map with a contour interval of 25 feet. Most of the area has fairly flat terrain so that elevations are reasonably accurate. In areas of steep terrain there is a possibility of large error.

WELL DEPTH FEET

Depth of the completed well in feet below the ground surface as reported by the driller or health authority.

OPEN TOP FEET

Depth of the top of the open interval in feet below the ground surface as reported by the driller.
OPEN BASE FEET

Depth to the bottom of the open interval in feet below the ground surface as reported by the driller.

WATER LEVEL FEET

Depth to the static water level in feet below the ground surface as reported by the driller or health authority.

BEDROCK ELEV FEET

Elevation of the bedrock surface in feet above mean sea level. These values are read from a map and then adjusted according to the litholog and water chemistry, if known, and the land surface elevation. They should only be used to determine if a well is completed in the drift or bedrock.
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FILE 2
WATER CHEMISTRY DATA
FILE 2. WATER CHEMISTRY DATA

This file consists of well index number, well location, well completion, land surface elevation, water level depth, bedrock elevation and water chemistry.

If a particular item of information is unknown, a blank space is left in the listing. All information on the chemical analysis, except pH, is rounded off to the nearest whole number. For example, "0" means 0.0 to 0.5.

The headings under which the data are listed are exactly the same as for the Water Level Data in File 1, with the addition of the following:

TDS PPM
Total dissolved solids in parts per million

HDNS PPM
Hardness in parts per million as calcium carbonate

SO4 PPM
Sulphate in parts per million

CL PPM
Chloride in parts per million

ALK PPM
Alkalinity in parts per million as calcium carbonate

NO3 PPM
Nitrates in parts per million

FE PPM
Iron in parts per million. This is the value of iron in solution: it is not total iron.

F PPM
Fluoride in parts per million

CA PPM
Calcium in parts per million

MG PPM
Magnesium in parts per million

CO3 PPM
Carbonate in parts per million

HCO3 PPM
Bicarbonate in parts per million

NA PPM
Sodium in parts per million

K PPM
Potassium in parts per million

LAB PH
pH as measured in the laboratory.
| X    | Y    | Z    | A    | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    | M    | N    | O    | P    | Q    | R    | S    | T    | U    | V    | W    | X    | Y    | Z    |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
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| LAND | WELL | DTH | WATER | SHORDR | STOR | DLM | SCA | CI | MK | DT | LM | PRR | DVR | PER | PRR | PER | PER | PER | PER | PER |
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FILE 3

AQUIFER TEST DATA
FILE 3. AQUIFER TEST DATA

This file consists of well index number, well location, well completion, land surface elevation, water level depth, bedrock elevation, aquifer test details, aquifer lithology and driller's name.

If a particular item of information is unknown, a blank space is left in the listing.

The headings under which the data are listed are exactly the same as for the Water Level Data in File 1, with the addition of the following:

SAFE YIELD IGPM

Computed 20-year safe yield in imperial gallons per minute (igpm). In general, when a driller reports an aquifer test, he gives the test duration, the water levels at the beginning and end of the test and the test rate. This information is substituted into the following formula to obtain 20-year safe yield:

\[ Q_{20} = \frac{T \cdot A}{2110} \]

where,

- \( Q_{20} \) = 20-year safe yield (igpm)
- \( T \) = apparent transmissivity (imperial gals per day per ft)
- \( A \) = available drawdown (ft)
- \( Q \) = pumping or bailing test rate (igpm)
- \( \Delta s \) = drawdown during test (ft)
- \( t \) = duration of test (mins)

Most of the values of safe yield given in this report are computed by this means. Occasionally the safe yield is calculated by graphical means from data from a properly conducted test. The method of analysis used is indicated under the heading Test Type.
APPARENT T IGPD/FT
Apparent transmissivity in imperial gallons per day per foot. In most cases it is calculated by the formula given above, but occasionally from a properly conducted test. The method of analysis used is indicated under the heading Test Type.

DATE M YR
Month and Year in which the test was conducted.

PUMPING RATE IGP M
Production rate at which the test was conducted (in imperial gallons per minute). The values are rounded off to the nearest integer.

DURATION HRS
Length of the test in hours, rounded off to the nearest hour.

DD FEET
Drawdown, in feet, observed at the end of the test.

AD FEET
Available drawdown in feet. This is the difference between the static water level and the top of the aquifer.

TEST TYPE
Type of Test. The following abbreviations are used.
B - bail test, the formulae given above were used.
P - pump test, the formulae given above were used.
U - not known if bail or pump test, the formulae given above were used.
JP - pump test, Jacob graphical method was used.
JB - bail test, Jacob graphical method was used.
TP - pump test, Theis graphical method was used.
AQUIFER LITHOLOGY

Lithology of the aquifer as reported by the driller. The following abbreviations are used:

SA - Sand       SI - Silt       GR - Gravel       CO - Coal
SS - Sandstone  UN - Unknown    SH - Shale        CL - Clay

DRILLER'S NAME

Driller's name, truncated if it has more than ten characters.
REFERENCES CITED
