STATE OF OREGON

CHRIS L. WHEELER
STATE ENGINEER

GROUND-WATER LEVELS

1965

BY

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OREGON GROUND-WATER LEVELS

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INTRODUCTION

Ground water, like surface water, is part of nature's never-ending water cycle. A part of the precipitation that falls on the surface of the earth seeps into the ground. This water replenishes soil moisture and the excess continues to seep downward until it encounters a "zone of saturation." This is a zone where all the interstices or void spaces in the rock materials are filled with water. The water in such zones is termed "ground water."

Ground water moves under hydrostatic pressure from the point or area of recharge to the point or area of discharge. It may remain in storage in the ground on this journey from a few hours to many years. Ground water discharge occurs in springs, or by evaporation or transpiration. Ground water discharge constitutes a large part of the summer flow of most of our streams and rivers. Pumping from wells also constitutes a form of ground water discharge.

Under natural conditions, nature tends to keep a balance between ground water discharge and ground water recharge. That is, the amount of annual recharge is balanced each year by an equal amount of ground water discharge. In Oregon, most of the ground water recharge occurs in the winter and spring months. This seasonal

distribution of ground water recharge results in a seasonal fluctuation of the water table. During the recharge period, there is a rise in the water table. This rise produces a thicker saturated zone and a steeper slope or gradient, which is required to move the additional quantity of water. During the summer and autumn months when recharge is generally at a minimum, the water table declines. This results in a reduction in the water table gradient and a corresponding reduction in the amount of ground-water movement. During long periods of above average precipitation, there will generally be an above average position for the water table and during long periods of below average precipitation the position of the water table will decline.

Whenever a well or group of wells go into operation, they upset this natural balance between recharge and discharge. In order for nature to adjust to this situation, there must be either a reduction in the amount of natural ground water discharge or there must be an increase in the amount of recharge. These changes are produced by changes in the gradients on the water table. If pumping exceeds the amount of annual recharge, nature will ultimately force a new balance on the system, as the water table will decline each year until it is no longer physically possible to withdraw more water than the amount of annual recharge.

There are two major factors that control the availability of ground water. These are the availability of water for recharge, and the occurrence of permeable geologic formations to absorb and transmit ground water.

The Cascade Mountains divide the State into two climatic provinces. The area lying west of the Cascade Mountains has a temperate marine climate that is characterized by mild temperatures and abundant

precipitation. The precipitation has a marked seasonal distribution, being very high in the winter and spring months and ranges from about 30 inches in the Willamette Valley to as much as 120 inches in some parts of the Coast Range. Eastern Oregon has a continental type of climate, having more severe temperatures and less precipitation than Western Oregon. Precipitation ranges from less than eight inches in some of the desert basins to more than 40 inches in some of the higher mountainous areas.

In general, Western Oregon has large quantities of water available for ground water recharge, while in many parts of Eastern Oregon the available water supply for ground water recharge is relatively small. In some areas in Eastern Oregon, precipitation is generally insufficient to replace soil moisture deficiencies.

The occurrence of permeable rock formations capable of absorbing and transmitting ground water varies greatly from place to place in the State. The most permeable rock formations occur in the Cascade Mountains. These permeable rock formations are composed chiefly of young volcanic rocks. They lie in a belt that receives relatively large quantities of recharge. The ground water discharge from these rock formations forms the many large springs that occur on both sides of the Cascade Mountains.

Coarse alluvial sediments composed chiefly of volcanic rock types were deposited along the eastern part of the Willamette River Valley by the swift streams flowing off the Cascade Mountains. These coarse-grained sediments form the chief water-bearing zones in the Willamette Valley. Streams eroding the softer sedimentary rocks that compose a large part of the coast range deposited relatively fine-grained

deposits along the western margin of the valley. This difference in character of the alluvial sediments from one side of the Willamette Valley to the other accounts for the difference in the availability of ground water in these two areas. In general, the Coast Range and Klamath Mountains are barren of permeable rock units. Even though these areas receive large amounts of precipitation, only small supplies of ground water can be developed. Along our coastal area, there are many areas underlain by sand dune deposits. These sand dune areas absorb large quantities of water and are capable of furnishing relatively large supplies of ground water. Vigilance will be required in the development of some of these sand dune areas to prevent encroachment of saline water from the Pacific Ocean.

In Eastern Oregon, the central mountains are composed chiefly of relatively impermeable rock formations which are capable of yielding only small supplies of ground water. Intermountain basins such as the Baker, the Wallowa and the Grande Ronde Valleys contain permeable rock formations and moderately large supplies of ground water that have been or could be developed. The area lying north of the central mountains is underlain by the Columbia River Basalt Formation. This formation of of wide areal extent in both Oregon and Washington and is generally capable of yielding moderate to large supplies of ground water. Ground water supplies in the industrial area being developed near Boardman, Oregon will be developed from this formation. Since precipitation along the Columbia Slope area is generally low, vigilance will be required in this area to prevent the overdevelopment of the ground-water supply. The basin and plateau areas of Southeastern Oregon contain permeable rock formations. Where these formations contain water, they are generally capable of furnishing moderate to large supplies of ground water. Precipitation is also low in

this part of the state, and problems of local overdevelopment of the ground-water resources could occur.

The State Engineer has carried on a program for the measurement of ground-water levels for many years in cooperation with the Ground Water Branch of the U. S. Geological Survey. This program was expanded in 1962 and the task of measuring water levels was assumed by the State Engineer. This report presents some representative hydrographs of wells located in many of the larger ground-water basins. These hydrographs show the extent of ground water depletion during periods of withdrawal and the extent of recovery during recharge periods and serve as an early warning system to depict areas where problems of ground-water supply are liable to develop.

Oregon has two areas that have been declared as "Critical Ground Water Areas" by the State Engineer on the basis of declining water levels. These are Cow Valley in Northern Malheur County and The Dalles Area in Wasco County. Both of these areas have been closed to further appropriations except for stock and domestic purposes. Both of the orders have been appealed to our courts to determine the constitutionality of Oregon's Ground Water Act. The Cow Valley case has been tried but no decision has been rendered and The Dalles appeal has not yet come to trial. Water levels in the Cow Valley area appear to have stabilized while new all time low water levels occurred in The Dalles area during the year.

Serious water-level declines are also occurring in the Ordnance area in Morrow and Umatilla Counties where declines of four to five feet per year have been occurring in some of the deeper wells.

GROUND-WATER INVESTIGATIONS AND REPORTS

The ground-water investigation of the Salem Hills area of Marion County was continued and reconnaissance studies of the ground-water resources of Lincoln County and the Hood River Valley were completed. The following ground water reports were published by the State Engineer.

Ground Water Report

No. 5.	Ground Water Levels, by Jack E. Sceva and Robert DeBow
No. 6.	Records of wells, water levels and chemical quality of water in the Baker Valley, Baker County, Oregon, by G. L. Ducret and D. B. Anderson

Ground-water investigations under the State Engineer's cooperative program with the U. S. Geological Survey were continued in the Molalla-Salem Slope area of Marion and Clackamas Counties and the Eola Hills area of Polk and Yamhill Counties. An interpretive report on the ground water resources of the French Prairie-Mission Bottom area of Marion County was prepared and released in manuscript form. During the year, the following cooperative ground water reports were published by the Geological Survey.

Water Supply Paper

1697	Geology and ground water of the Tualatin Valley, Oregon, by D. H. Hart and R. C. Newcomb
1793	Ground water in the East Portland area, Oregon, by G. M. Hogenson and B. L. Foxworthy

OBSERVATION WELL PROGRAM

The observation well program consists of the periodic measurement of the depth to water or artesian pressure in water wells located throughout the State. At the close of the year, the observation well net had been expanded to 809 wells located as follows:

County	Number of Observation Wells
Baker	13
Benton	14
Clackamas	37
Clatsop	2
Columbia	2
Coos	7
Crook	11
Curry	0
Deschutes	5
Douglas	7
Gilliam	4
Grant	6
Harney	50
Hood River	3
Jackson	5
Jefferson	6
Josephine	9
Klamath	59
Lake	111
Lane	23
Lincoln	5
Linn	40
Malheur	52
Marion	85
Morrow	33
Multnomah	24
Polk	13
Sherman	3
Tillamook	18
Umatilla	46
Union	17
Wallowa	0
Wasco	38
Washington	38
Wheeler	1
Yamhill	22

This report contains hydrographs for 192 observation wells. For convenience in using this report, the depicted hydrographs have been grouped together by area.

A reference number assigned to each area is shown on Figure 1 and is listed on the top of each page of hydrographs. A complete list of observation wells is given on page 106. Water level information and measuring point descriptions for the wells in the observation network can be obtained from the State Engineer.

The hydrographs presented in this report have all been drawn with a vertical scale of one division equals one foot. This scale has masked some of the detail that was shown on the hydrographs given in the 1963 report where many different scales were used. This loss of detail is believed to be more than compensated by the uniform scale which allows an easy comparison of one hydrograph with another.

This report has been expanded to include additional hydrographs in the Ordnance area of Morrow and Umatilla Counties, the Pendleton-Pilot Rock area of Umatilla County, the John Day Valley in Grant County, the Southern Malheur and Southern Harney Counties, the Sprague River Valley in Klamath County and the Umpqua River Valley in Douglas County.

ACKNOWLEDGEMENTS

We wish to acknowledge the help and assistance furnished by the Pacific Power and Light Company, the Harvey Aluminum Company, General Foods, Inc., and the Arlington, Dalles City, Milton-Freewater, Pendleton, Tigard and Woodburn Water Departments, and the personnel of the Umatilla Army Depot at Ordnance for measuring ground water levels and making them available for this report. Appreciation is also given to the many well owners of the State who have cooperated in making their wells available for measurement in this program.

WELL NUMBERING SYSTEM

The well numbering system used in this report gives the township, range, section and 40-acre subdivision of the section in which the well is located. The first number is the township, and the second number is the range. In townships lying south of the Willamette Base Line and in ranges lying east of the Willamette Meridian, the letters "S" and "E" are omitted. The number following the hyphen indicates the section and the letter indicates the subdivision of the section as depicted in the following diagram. The number in parentheses following the letter is the serial number of the well.

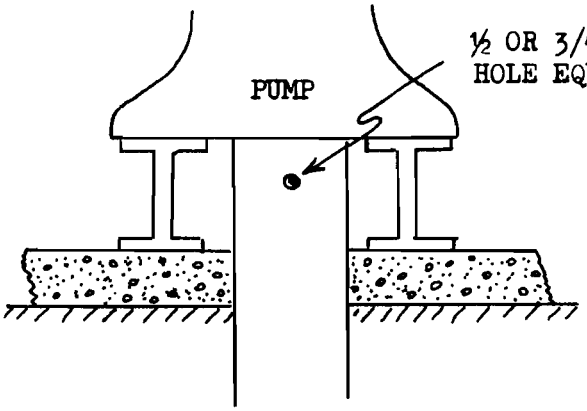
For example, the well numbered 27/17-22R(2) indicates the well is in the SE¼ SE¼, Section 22, Township 27 South, Range 17 East, and is the second well noted in this 40-acre tract.

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

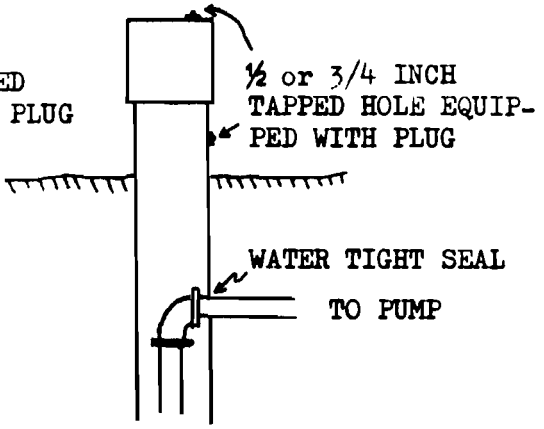
METHODS OF MEASURING WATER LEVELS

The most accurate method of measuring the depth to water is with a weighted steel tape. The lower end of the tape is chalked and a known amount is lowered into the well. The amount of tape that is submerged, which can be easily determined by the water line on the chalk, is subtracted from the amount of tape lowered into the well. In some wells it is impossible to measure water levels with a steel tape because water leaking into the well obliterates the water line on the tape. In such wells a commercial electric tape or air line should be used. The diagrams on Page 10 shows the methods of installing access ports and the installation of an air line.

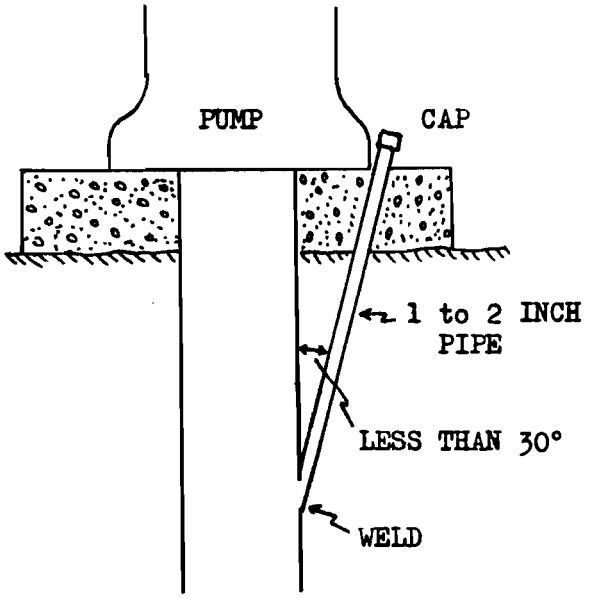
SUGGESTED METHODS OF INSTALLING ACCESS PORTS, PRESSURE GAGES, AND AIR LINES FOR MEASURING WATER LEVELS IN WELLS



ACCESS PORT FOR MEASURING DEVICE



ACCESS PORT FOR MEASURING DEVICE



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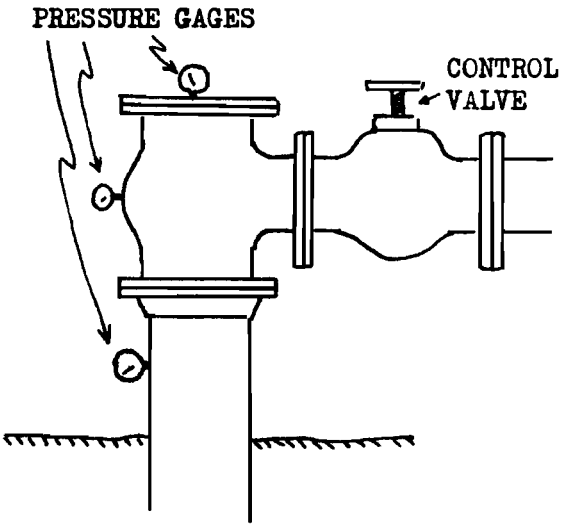
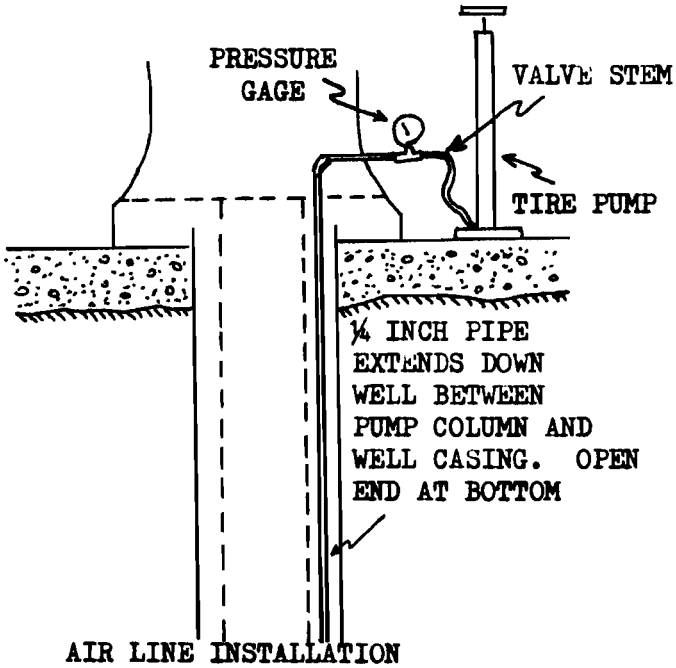


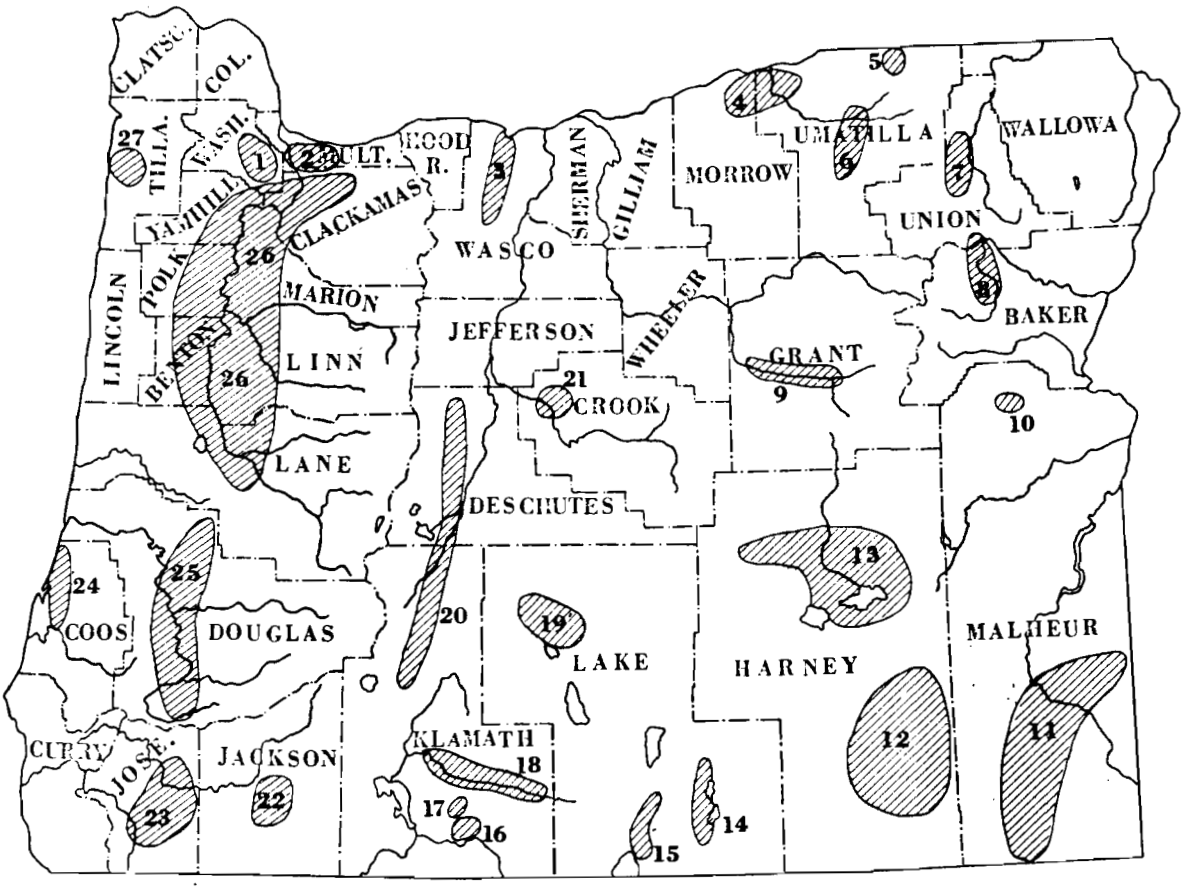
POSSIBLE LOCATION FOR PRESSURE GAGES ON AN ARTESIAN WELL



AIR LINE INSTALLATION

AN AIR LINE INSTALLATION IS RECOMMENDED WHERE THE WATER LEVEL LIES AT A CONSIDERABLE DEPTH BELOW LAND SURFACE. THE AMOUNT OF AIR PRESSURE THAT CAN BE BUILT UP INSIDE THE AIR LINE WILL BE EQUAL TO THE DEPTH OF WATER STANDING ABOVE THE BOTTOM OF THE AIR LINE. THE EXACT DEPTH TO THE BOTTOM OF THE AIR LINE IS REQUIRED TO OBTAIN AN ACCURATE MEASUREMENT OF THE WATER LEVEL IN THE WELL. ONE POUND PER SQUARE INCH PRESSURE EQUALS 2.31 FEET OF WATER.

Figure 1



Ground Water Areas Represented By Hydrographs In This Report

1. Tualatin Valley
2. Portland Metropolitan Area
3. The Dalles Area
4. Columbia Slope Area
5. Milton-Freewater Area
6. Pendleton-Pilot Rock Area
7. Grande Ronde Valley
8. Baker Valley
9. Upper John Day Valley
10. Cow Valley Area
11. Southern Malheur Area
12. Southern Harney Area
13. Harney Basin
14. Warner Valley
15. Goose Lake Basin
16. Yonna Valley
17. Swan Lake Valley
18. Sprague River Valley
19. Fort Rock Area
20. Chemult-Lapine-Sisters Area
21. Prineville Area
22. Medford Area
23. Grants Pass Area
24. Coos Bay Area
25. Umpqua River Valley
26. Willamette Basin
27. Tillamook Area

TUALATIN VALLEY (1)

The Tualatin Valley is a broad basin that has been partially filled with fine-grained lake deposits composed chiefly of silt and clay. The bedrock, which forms the surrounding hills and underlies the lake deposits, is a series of basaltic lava flows known as the Columbia River Basalt. Ground water generally occurs in the broken contact zones between individual lava flows in the basalt formation. The basaltic lava flows are underlain by marine sedimentary rocks that are generally barren of potable water supplies. Weathering of the basalt surface to a clay restricts recharge to the basaltic aquifers like an umbrella spread over each outcrop area.

Water levels in most wells throughout the Tualatin Valley recover each spring to the previous spring high position. Some of the wells developing water from the basalt in the Cooper Mountain area have shown a decline in recent years as indicated by the hydrographs of wells 1/1W-19R(3) and 1/2W-26F(1). Water level declines are also occurring in some of the deep basalt wells in the Tigard and Bull Mountain areas.

OBSERVATION WELLS

1N/2W-35E(1) (E. L. Lewis) is a 23-foot dug well in valley fill deposits ar Orenco. Periodic water level measurements available from 1951 to date.

1N/3W-36R(2) (General Foods, Birdseye Division) is a 171-foot drilled well in valley fill deposits at Hillsboro. Periodic water level measurements available from 1951 to date.

1/1W-19R(3) (E. Miller) is a 320-foot drilled well in basalt located near the Cooper Mountain School.

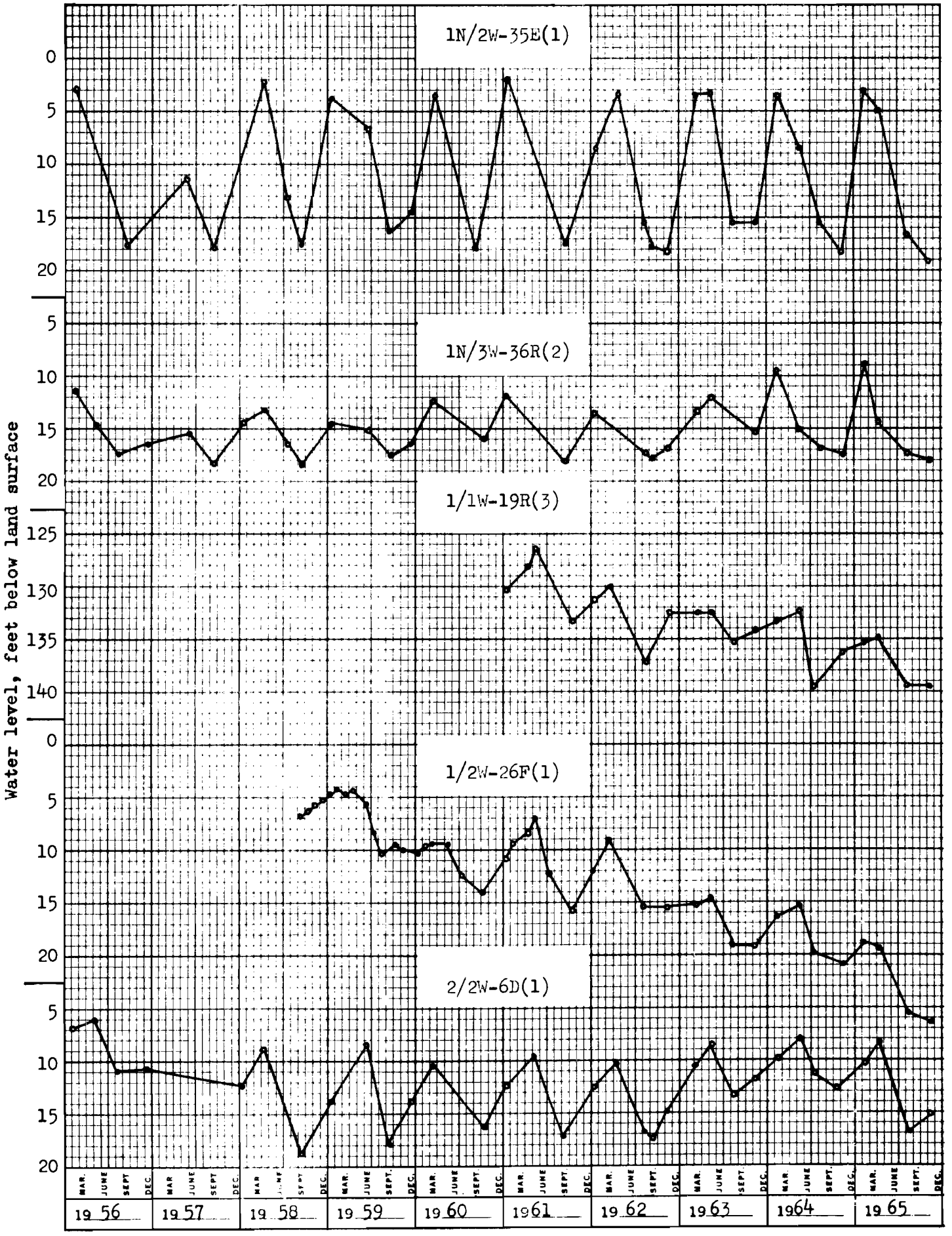
1/2W-26F(1) (K. Schaefer) is a 403-foot drilled well in basalt located at the west end of Cooper Mountain.

2/2W-6D(1) (S. Rotchstrom) is a 486-foot drilled well in basalt located about 6 miles south of Hillsboro. Periodic water level measurements available from 1951 to date.

REFERENCES

Hart, D. H. and Newcomb, R. C., 1965, Geology and ground water of the Tualatin Valley, Oregon: U. S. Geological Survey Water Supply Paper 1697.

TUALATIN VALLEY (1)



Ground water in the alluvial aquifers is generally replenished each year and no problems of declining water levels have developed in these materials. At places in the Valley, the water-table recovers to land surface and additional water, which is available for recharge, is rejected and flows off as surface water.

OBSERVATION WELLS

1/4W-2H(1) (Myron Sheelar) is a 78-foot drilled well in gravel located about two miles west of Forest Grove. Measurements available from 1951 to date.

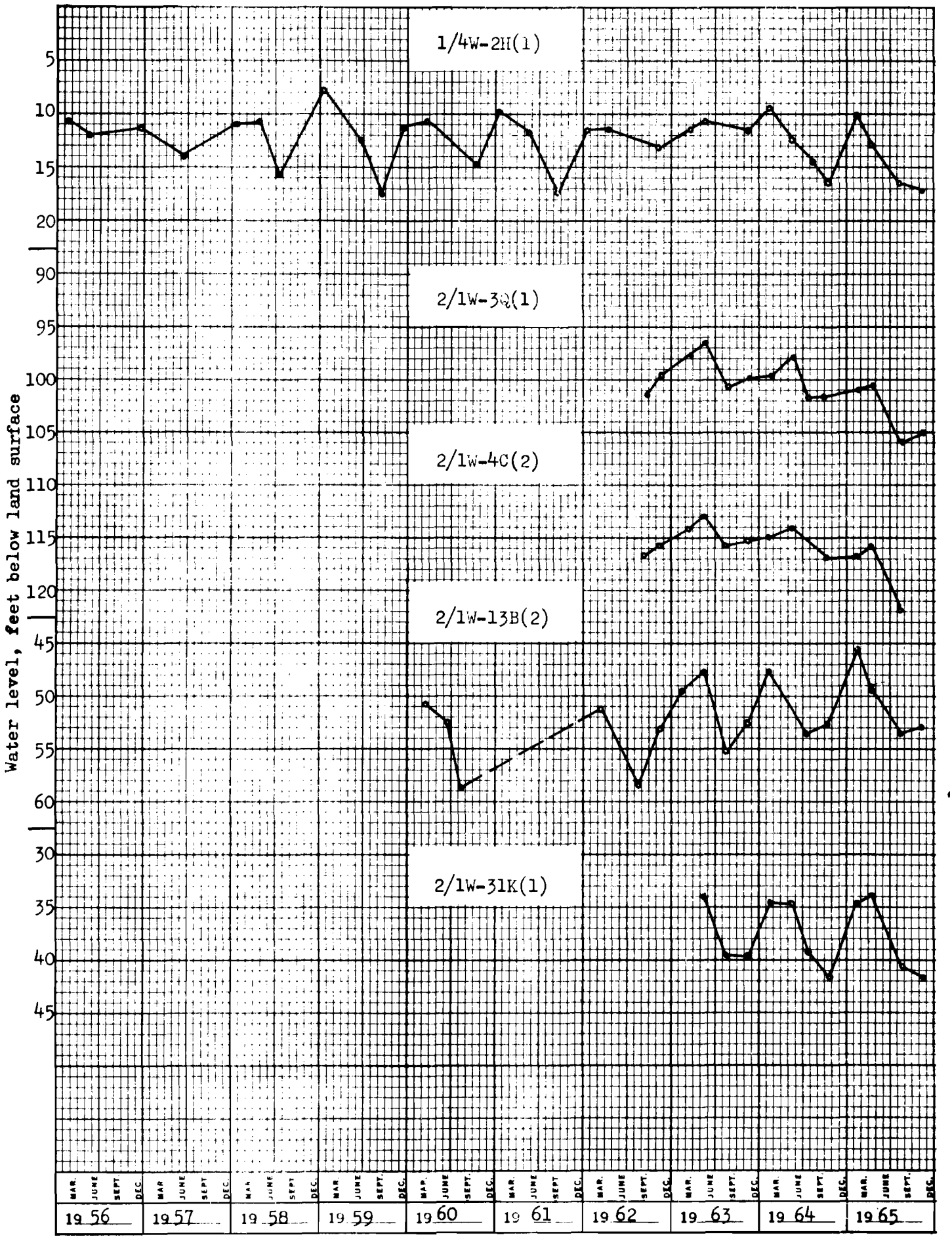
2/1W-3Q(1) (Leonard S. Davis) is a 218-foot drilled well in basalt located about one mile west of Tigard.

2/1W-4C(2) (Harris H. Hanson) is a 600-foot well drilled in basalt located about two miles west of Tigard.

2/1W-13B(2) (Ralph Sittel) is a 162-foot drilled well in sand located about one and one-half miles northeast of Tualatin.

2/1W-31K(1) (Ralph Reynolds) is a 215-foot drilled well in basalt located about one mile southwest of Sherwood.

TUALATIN VALLEY (1)



The westside business district of Portland is one of the most concentrated areas of large ground-water developments in the Portland Metropolitan area. Ground water is used for heating and cooling of many of the large office buildings.

The westside business district is underlain by water-bearing alluvial sand and gravel deposits and the Columbia River basalt formation. The water-bearing gravels are separated from the underlying basalt by a section of silt and clay known as the Sandy River Mudstone. Wells develop water from both the gravels and basalt. Owing to sewer charges, many operators have constructed recharge wells for the disposal of waste water. Some operators pump water from the basalt and dispose of water in the gravels and some operators pump water from the gravels and dispose of water into the basalt. This seasonal transfer of water from one formation to another and difference in water quality and water temperature has created a very complex hydrologic condition.

OBSERVATION WELLS

1/1-3D(3) (Pacific Power & Light Co. - Public Service Bldg.) is a 100-foot drilled well in gravel in the westside business district.

1N/1-33C(2) (Good Samaritan Hospital) is a 400-foot drilled well in basalt in the westside business district.

1/1-10P(1) (J. Donald Kroeker & Associates) is a 486-foot drilled well in basalt in Westside Portland near Ross Island.

1N/1-33L(1) (Fred Meyer, Inc.) is a 195-foot drilled well in gravel in the westside business district.

1N/1-34N(6) (Pittock Block, Inc.) is a 96.6-foot drilled well in gravel in the westside business district.

REFERENCES

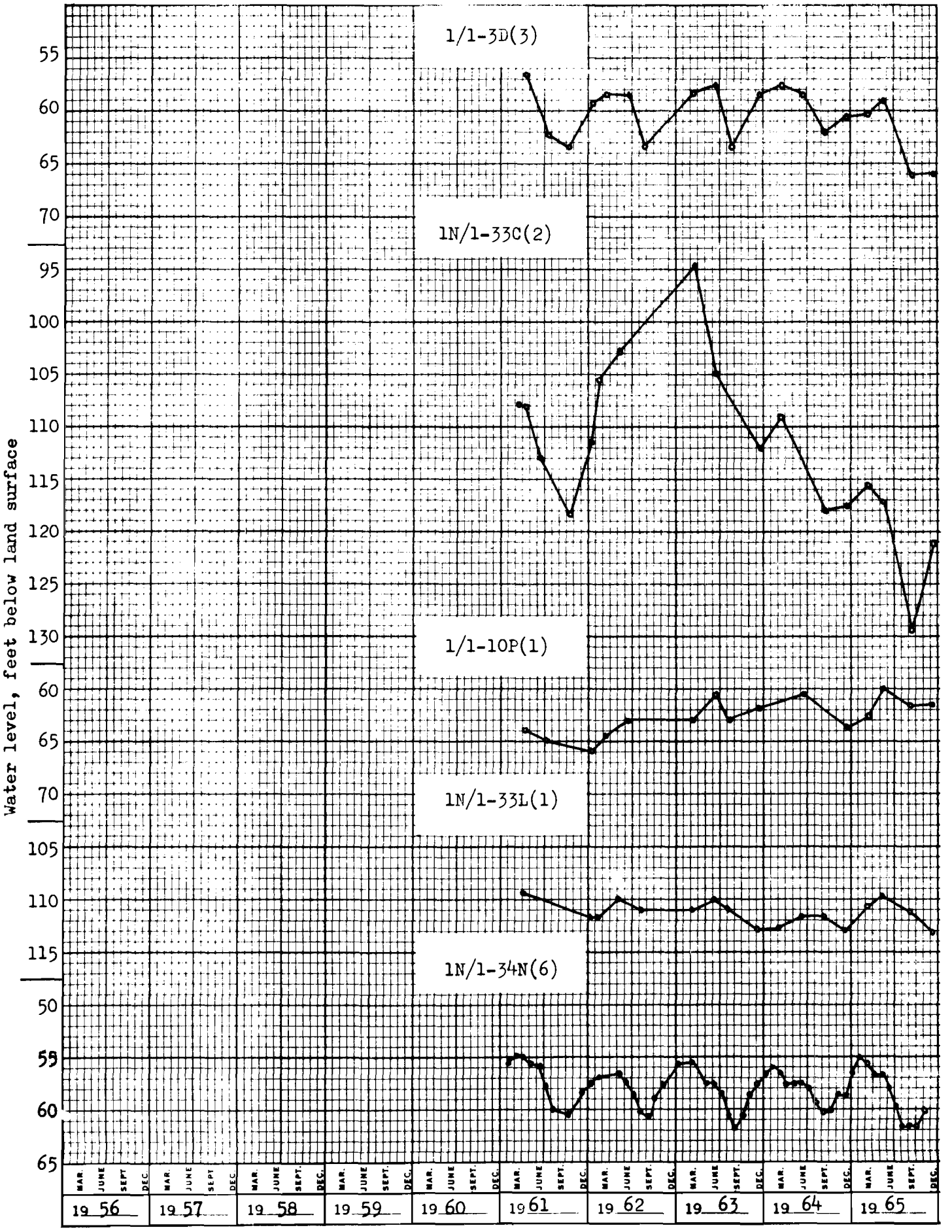
Brown, S. G., 1963, Problems of utilizing ground water in the westside business district of Portland, Oregon: U.S. Geological Survey Water Supply Paper 1619-O.

Foxworthy, B. L., Hogenson, G. M. and Hampton, E. R., 1964, Records of wells and springs, water levels and chemical quality of ground water in the East Portland Area, Oregon: State Engineer Ground Water Report No. 3.

Griffin, W. C., et. al., 1956, Water resources of the Portland, Oregon and Vancouver, Washington area: U.S. Geological Survey Circular 372.

Hogenson, G. M. and Foxworthy, B. L., 1965, Ground water in the East Portland area, Oregon: U.S. Geological Survey Water Supply Paper 1793.

PORTLAND METROPOLITAN AREA (2)

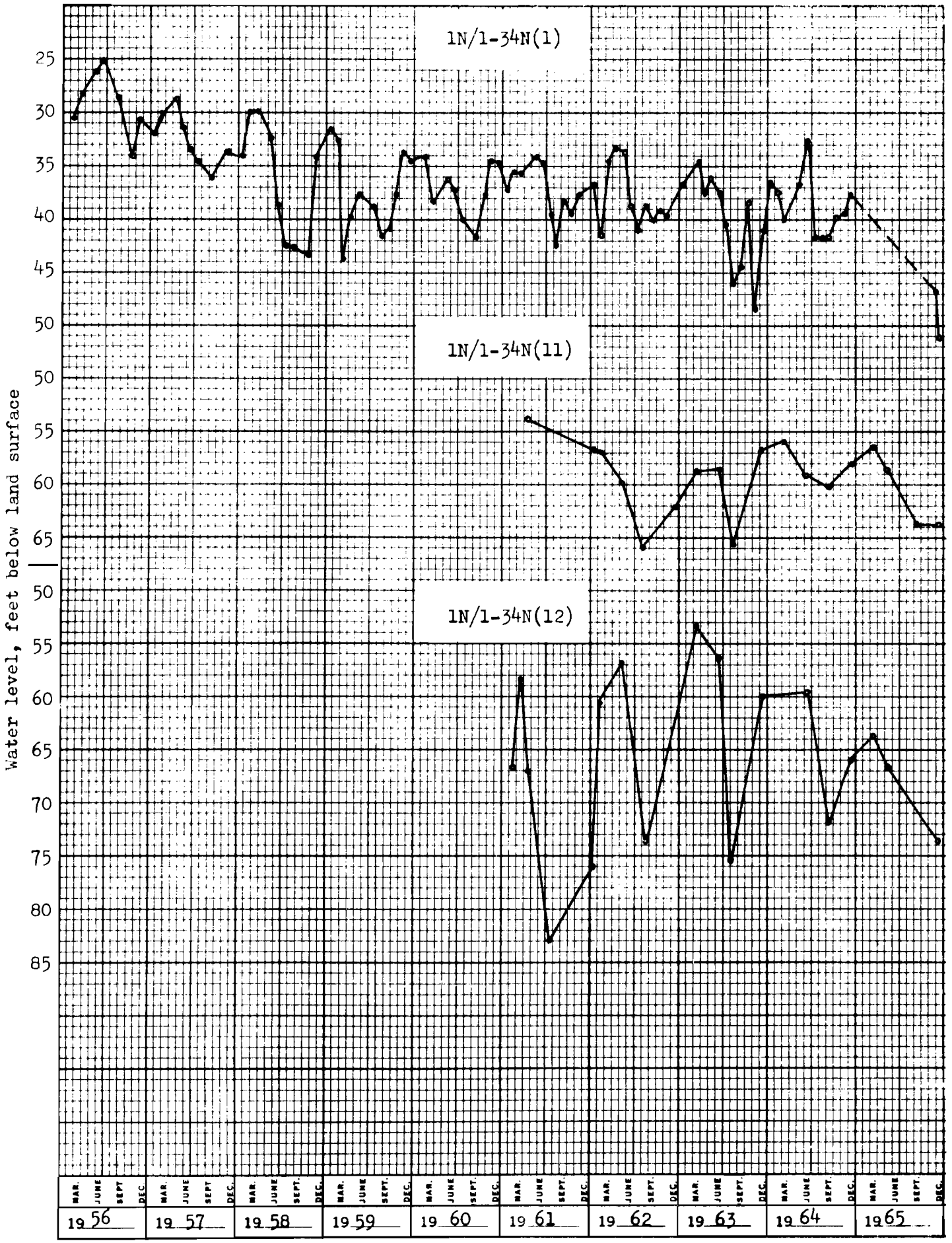


1N/1-34N(1) (Weisfield's Inc.) is a 155-foot drilled well in gravel in the westside business district. Periodic water level measurements available from 1940 to date.

1N/1-34N(11) (Dirks Medical Center) is a 418-foot drilled well in basalt in the westside business district.

1N/1-34N(12) (Federal Reserve Bank) is a 755-foot drilled well in basalt in the westside business district.

PORTLAND METROPOLITAN AREA (2)



No problems of overdevelopment of the ground-water supply are known in the East Portland area. The permeable character of the alluvial deposits provide productive ground-water reservoirs. The extensive development of the East Portland area has created a pollution threat as some of the shallow ground-water supplies in parts of the area can be readily polluted by the surface and near-surface disposal of waste.

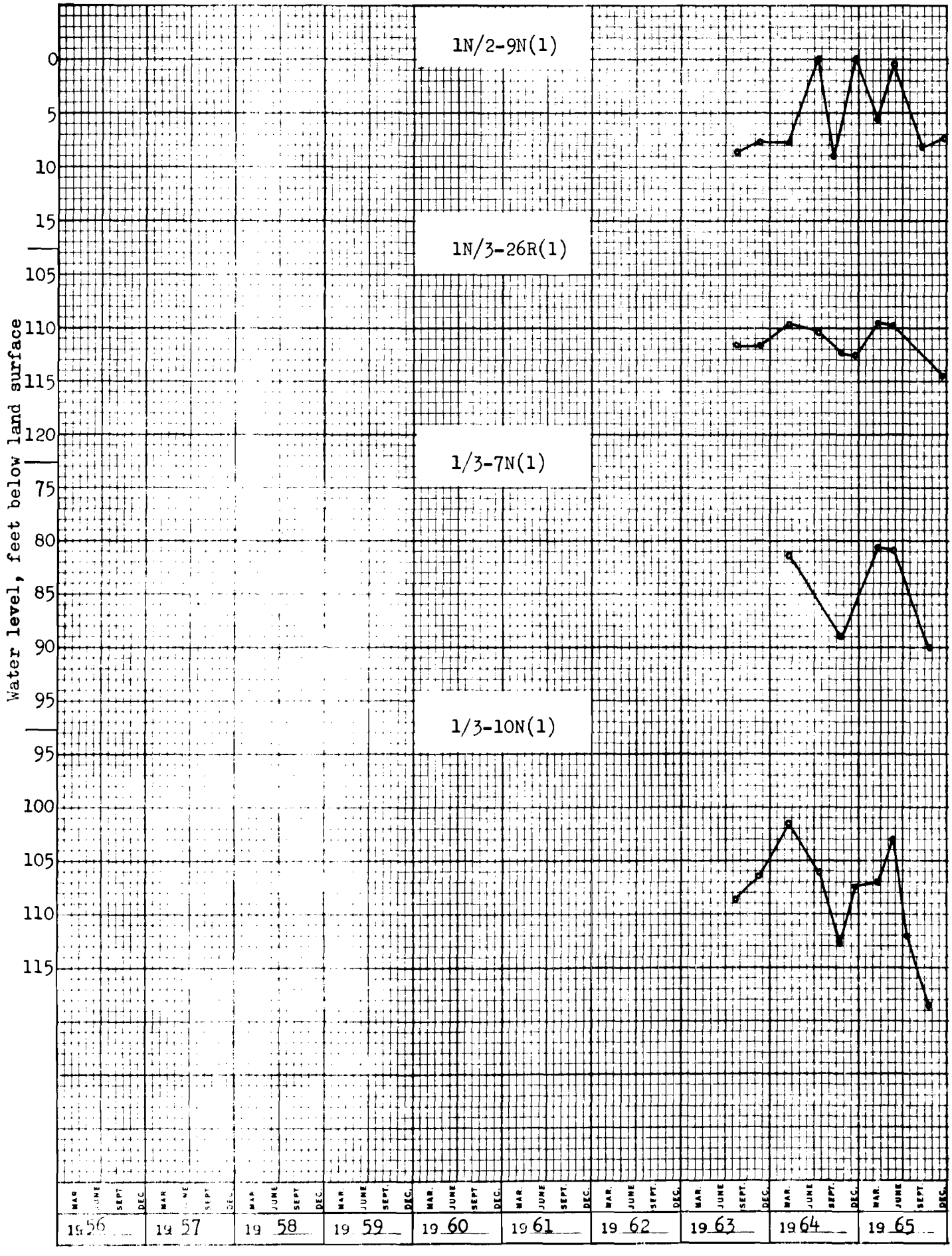
1N/2-9N(1) (Port of Portland) is a 155-foot drilled well in sand and gravel located about one mile north of Parkrose.

1N/3-26R(1) (Kazuo Fujii) is a 478-foot drilled well in gravel located about one mile southwest of Troutdale.

1/3-7N(1) (Meadowland Dairy) is a 261-foot drilled well in sand and gravel located about two miles southwest of Gresham.

1/3-10N(1) (Forest Lawn Memorial Park) is a 715-foot drilled well in gravel located in Gresham.

PORTLAND METROPOLITAN AREA (2)



THE DALLES AREA (3)

The area in and around Dalles City has been declared a "Critical Ground Water Area" because of declining water levels. The ground-water reservoir developed by most of the municipal, industrial and irrigation wells develop ground water from a very permeable zone in the Columbia River Basalt Formation. This zone has been named The Dalles Ground Water Reservoir and is locally known as "The Dalles Pool." The 1965 spring high position of the water level in The Dalles Ground Water Reservoir was at an altitude of about 42 feet, or some 31 feet below the adjacent level of the Bonneville pool in the Columbia River, which was about the same as the 1964 spring high position. A reduction of ground-water withdrawals occurred during 1965 because of the initial operation of The Dalles Irrigation Project. Water levels in The Dalles Ground Water Reservoir continued to decline however, and a new all time low level occurred in September 1965.

OBSERVATION WELLS

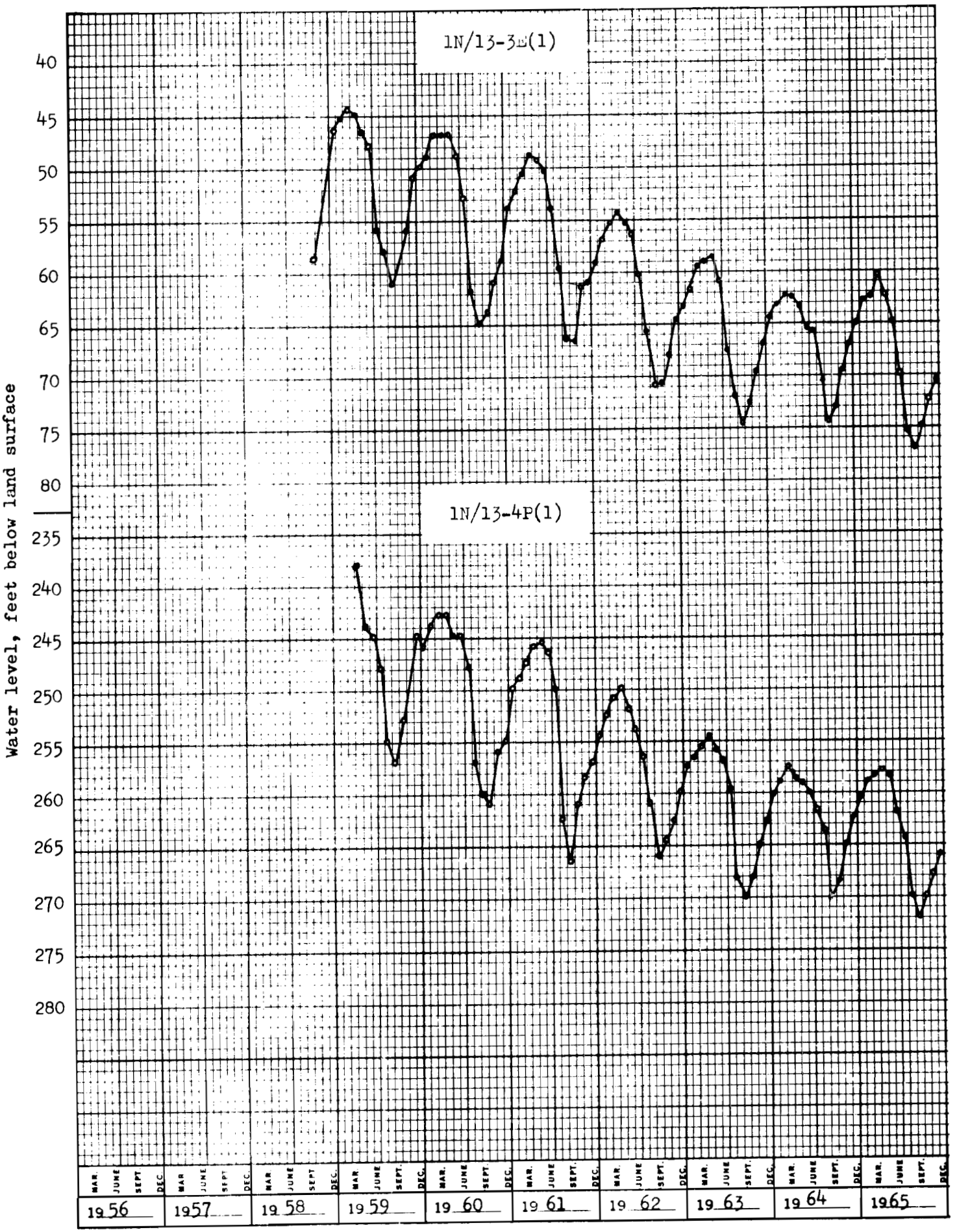
1N/13-3E(1) (Dalles City - City Hall Well) is a 200.5-foot drilled well in The Dalles Ground Water Reservoir. Periodic water level measurements available from 1926-1930; 1951-1952 and 1958 to date.

1N/13-4P(1) (Dalles City - Marx Well) is a 570-foot drilled well in The Dalles Ground Water Reservoir.

REFERENCES

Piper, A. M., 1932, Geology and ground-water resources of The Dalles Region, Oregon: U. S. Geological Survey Water Supply Paper 659-B.

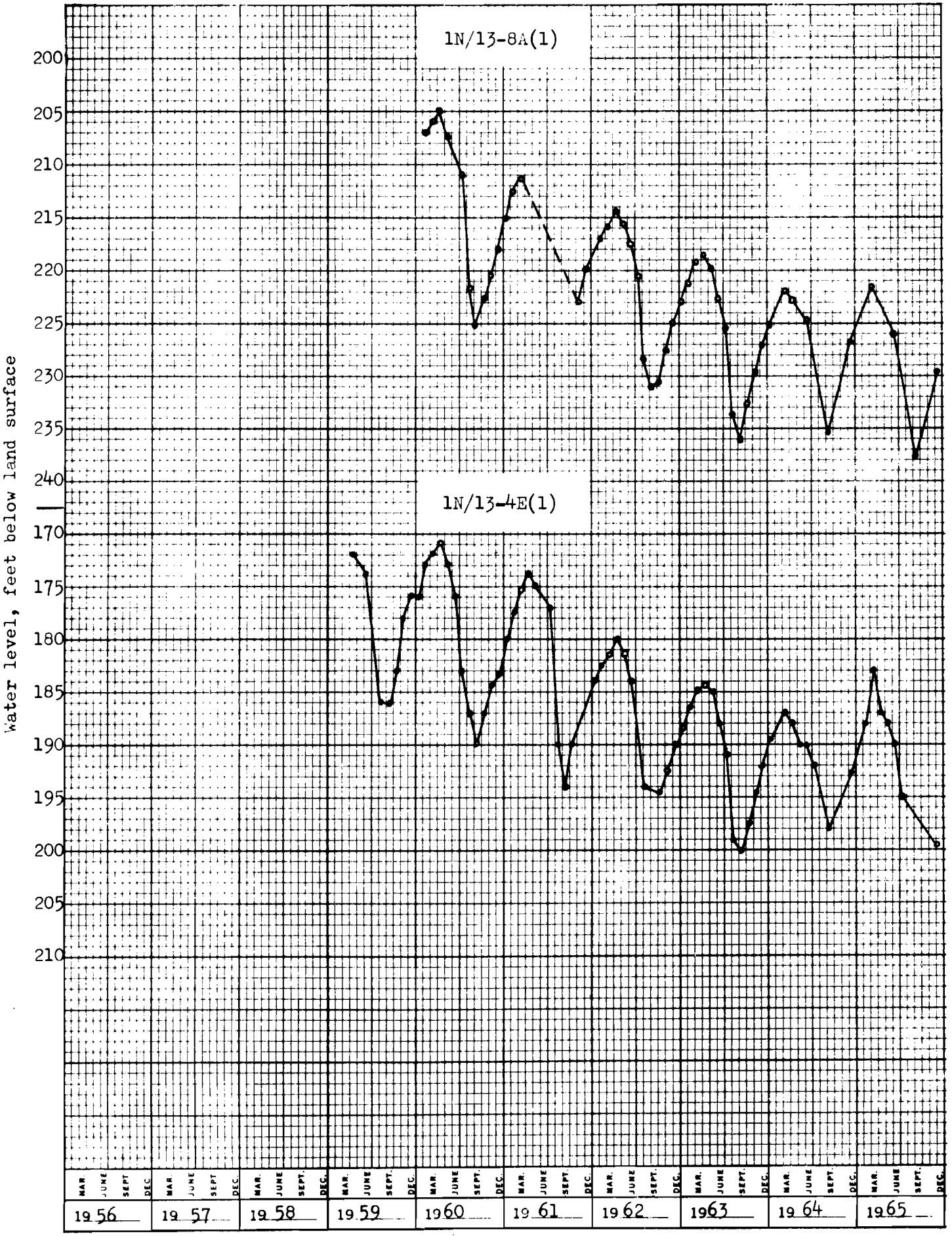
THE DALLES AREA (3)



1N/13-8A(1) (G. S. Williams) is a 341-foot drilled well in The Dalles Ground Water Reservoir.

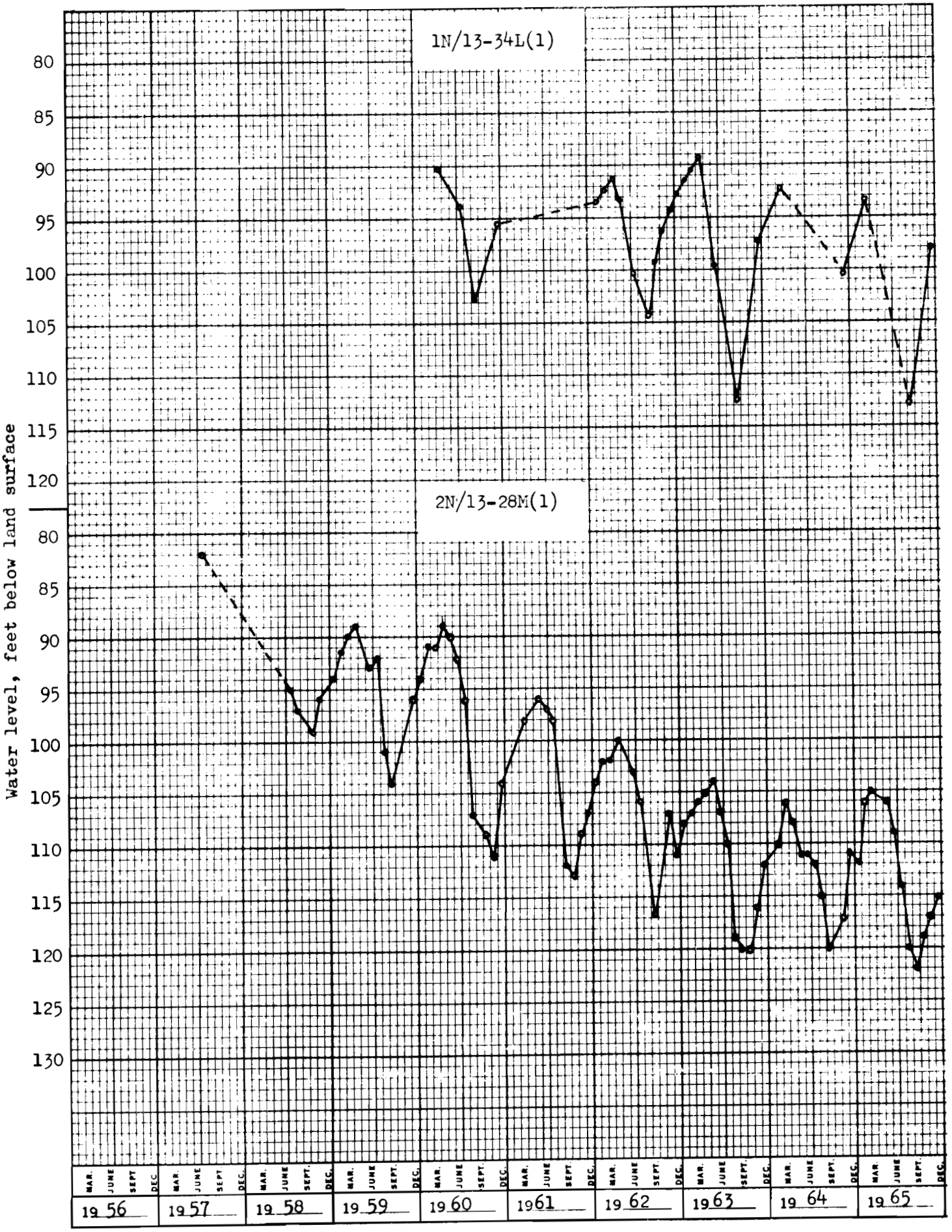
1N/13-4E(1) (Odd Fellows Cemetery) is a 306-foot drilled well in The Dalles Ground Water Reservoir.

THE DALLES AREA (3)



1N/13-34L(1) (William O. Wright & Walter Cruikshank) is a 500-foot drilled well in basalt located in the Fivemile Creek Valley.

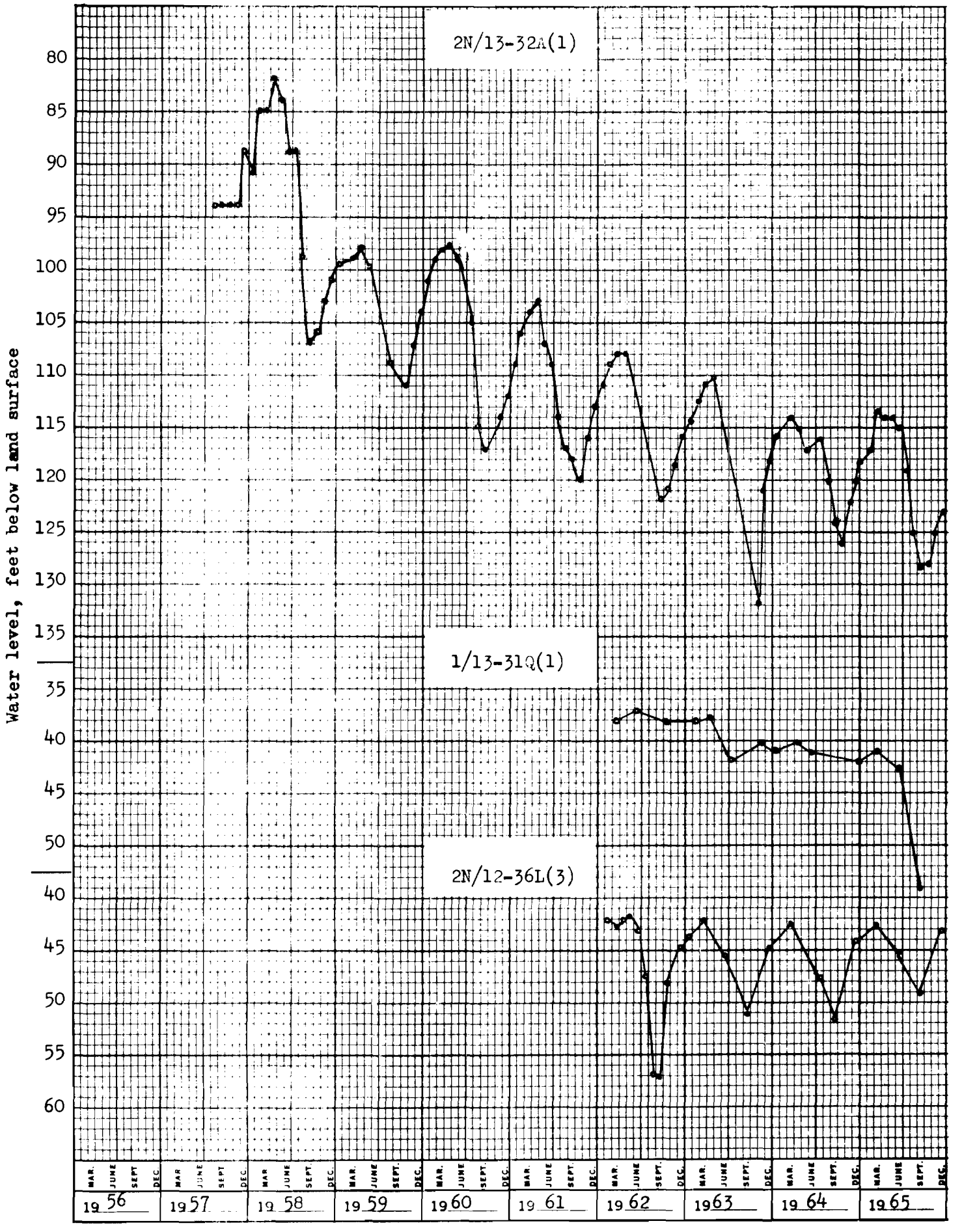
2N/13-28M(1) (Harvey Aluminum Company) is a 314-foot drilled well in The Dalles Ground Water Reservoir.


1N/13-34L(1)
2N/13-28M(1)
Water level, feet below land surface
80
85
90
95
100
105
110
115
120
125
130
MAR. JUNE SEPT. DEC.
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965

2N/13-32A(1) (Chenowith Irrigation Coop.) is a 275-foot drilled well in The Dalles Ground Water Reservoir.

1/13-31Q(1) (L. Hulse, formerly Harvey McAllister) is a 111-foot drilled well in basalt located near Dufur.

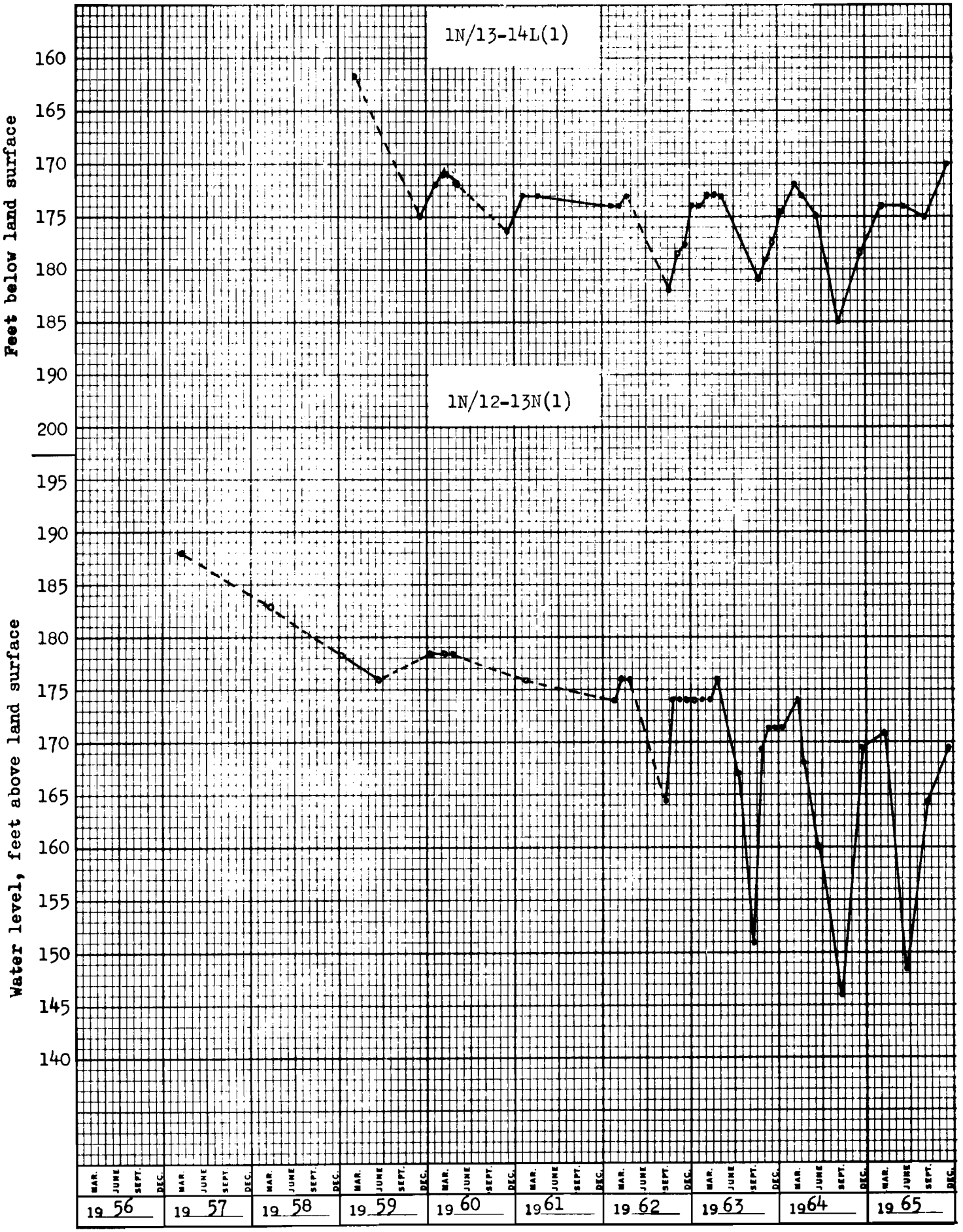
2N/12-36L(3) (W. S. Nelson) is a 320-foot drilled well in sandstone in the Chenowith Valley.


2N/13-32A(1)
1/13-31Q(1)
2N/12-36L(3)
Water level, feet below land surface
80
85
90
95
100
105
110
115
120
125
130
135
35
40
45
50
40
45
50
55
60
MAR.
JUNE
SEPT.
DEC.
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965

1N/13-14L(1) (Joseph Douthit, formerly Dewey Wagenblast) is a 230-foot drilled well in basalt located in the Three Mile Creek Valley.

1N/12-13N(1) (Julius Sandoz) is a 572-foot drilled artesian well in basalt located in the Mill Creek Valley.

THE DALLES AREA (3)



COLUMBIA SLOPE AREA (4)

The Columbia Slope area includes the broad northward sloping area in northwestern Umatilla County and northern Morrow County. A large part of this area is underlain by 100 feet or more of sand and gravel and clay deposits that were laid down during the Ice Age. These deposits rest upon a very thick sequence of basaltic lava flows that have been named the Columbia River Basalt Formation. This formation is a series of individual lava flows layered one upon another. Individual flows may range from a few feet to a hundred feet or more in thickness. The very fluid lava gushed forth from large cracks that opened up in many parts of the Columbia Basin area and spread out as extensive lakes of molten rock. Long periods of time often separated the outpourings of lava. At times, soil zones and forests developed only to be buried by a subsequent lava flow. The total time for the accumulation of the Columbia River Basalt Formation was many millions of years. (Continued on Page 34).

OBSERVATION WELLS

3N/26-4L(1) (Luther Cramer) is a 623-foot drilled well in basalt located about eight miles southwest of Ordnance. Reported as 32R(1) in Ground Water Report No. 4.

4N/27-32J(1) (R. Holzapfel) is a 310-foot drilled well in basalt located about two miles southwest of Ordnance.

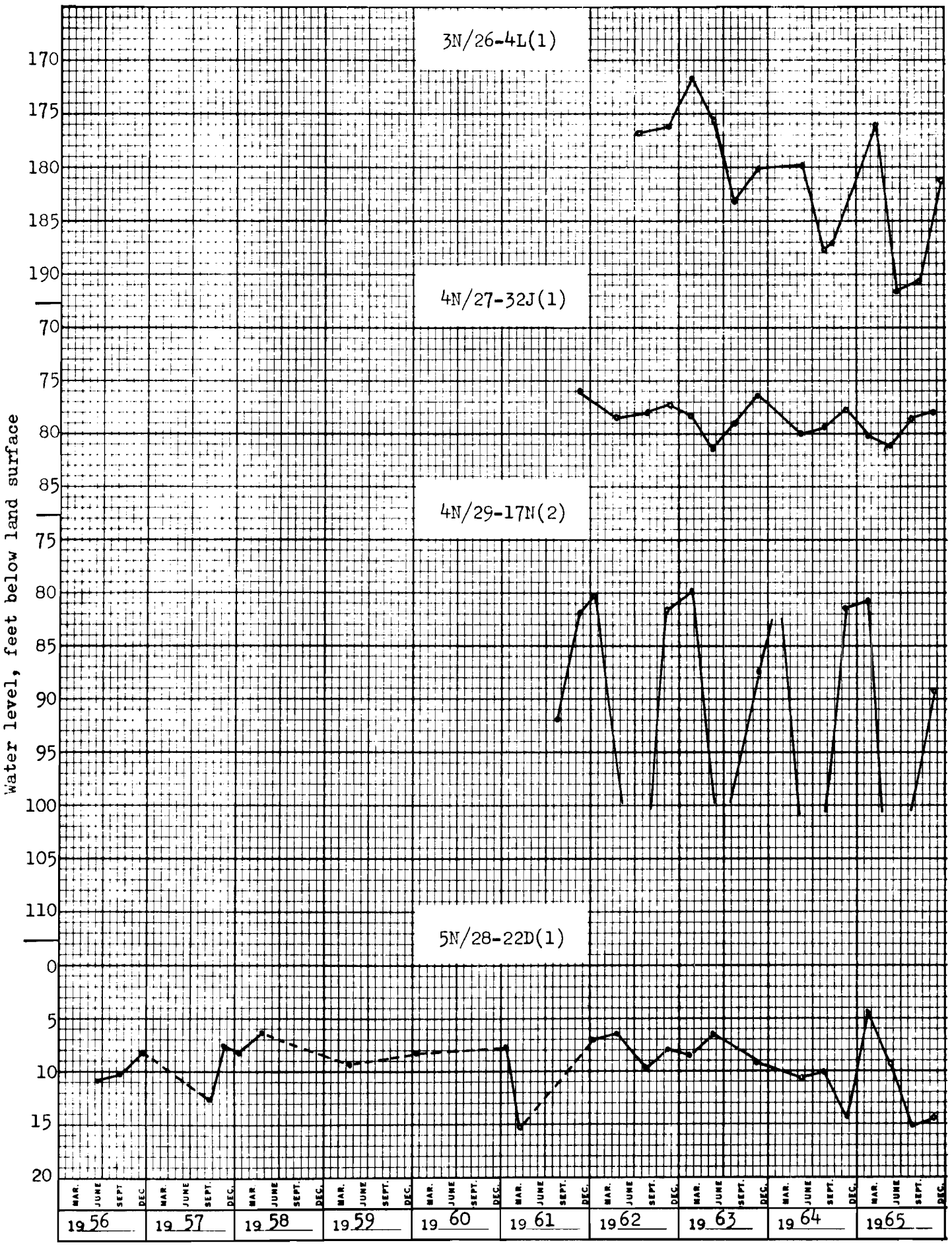
4N/29-17N(2) (Kenneth Casper, formerly Ben Dreyer) is a 207-foot drilled well in white sand located about one mile north of Stanfield.

5N/28-22D(1) (Munson Auto Court) is a 189-foot drilled well in basalt located about three miles south of Umatilla. Periodic water level measurements available from 1953 to date.

REFERENCES

Hogenson, G. M., 1964, Geology and ground water of the Umatilla River Basin, Oregon: U. S. Geological Survey Water Supply Paper 1620.

COLUMBIA SLOPE AREA (4)



COLUMBIA SLOPE AREA (4)

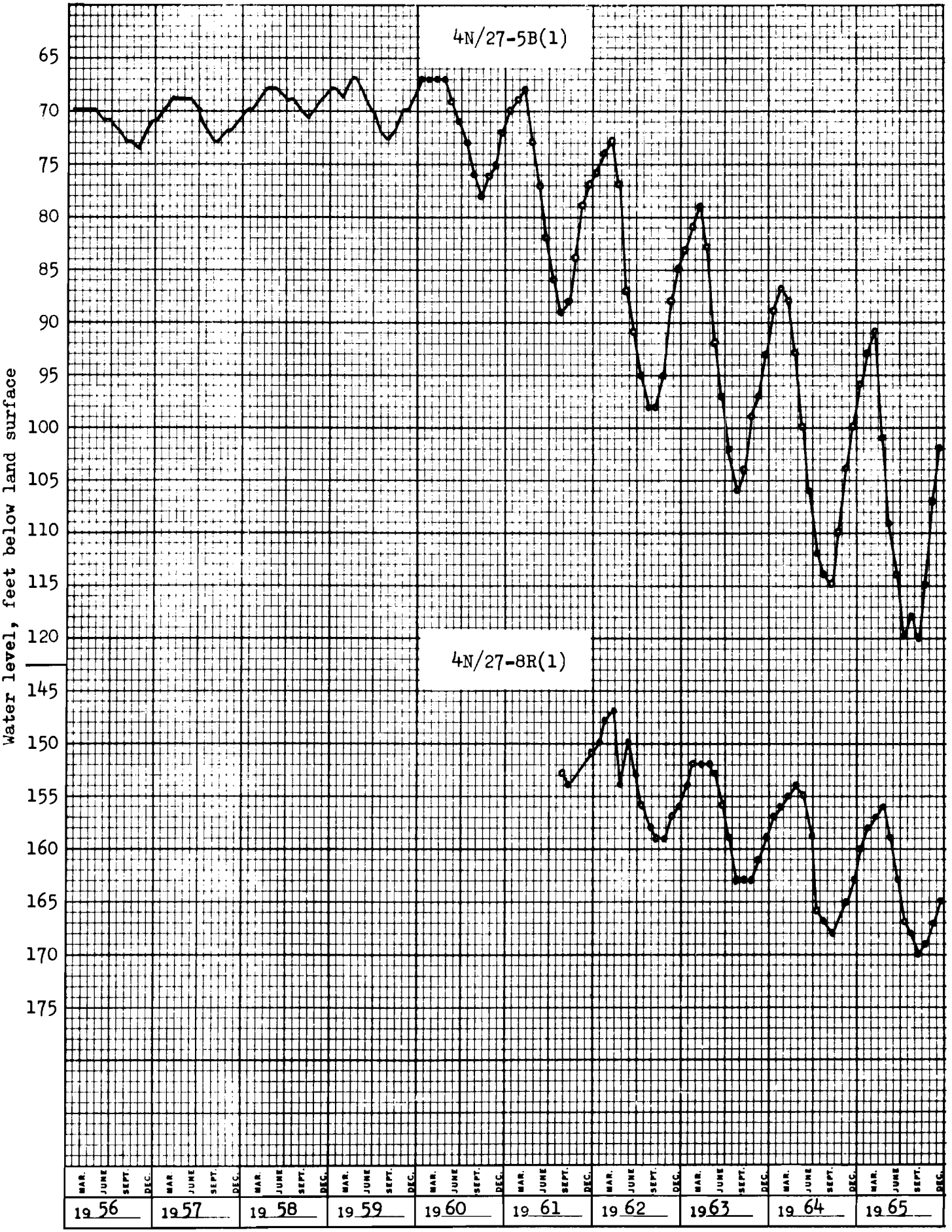
Most of the Columbia River Basalt Formation has low porosity, that is, the per cent of open space for the storage of water is low, probably averaging less than one per cent. Part of this porosity is formed by shrinkage cracks that formed when the lava consolidated, part is formed by the bubble holes that develop near the surface of a lava flow by expanding gases in the zone of reduced pressure, and by rubbly or broken zones in the contact between lava flows. The shrinkage cracks and bubble holes are not generally interconnected to a degree that allows for the easy passage of water. The contact zones between flows are at places very permeable and serve as the chief zones for the development of ground water. Generally several such permeable zones must be penetrated by wells in order to develop an adequate water supply for the larger capacity wells. (Continued on Page 36).

OBSERVATION WELLS

4N/27-5B(1) (Umatilla Army Depot-Well No. 6) is a 710-foot well in basalt at Ordnance.

4N/27-8R(1) (Umatilla Army Depot-Well No. 3) is a 453-foot well in basalt at Ordnance.

COLUMBIA SLOPE AREA (4)



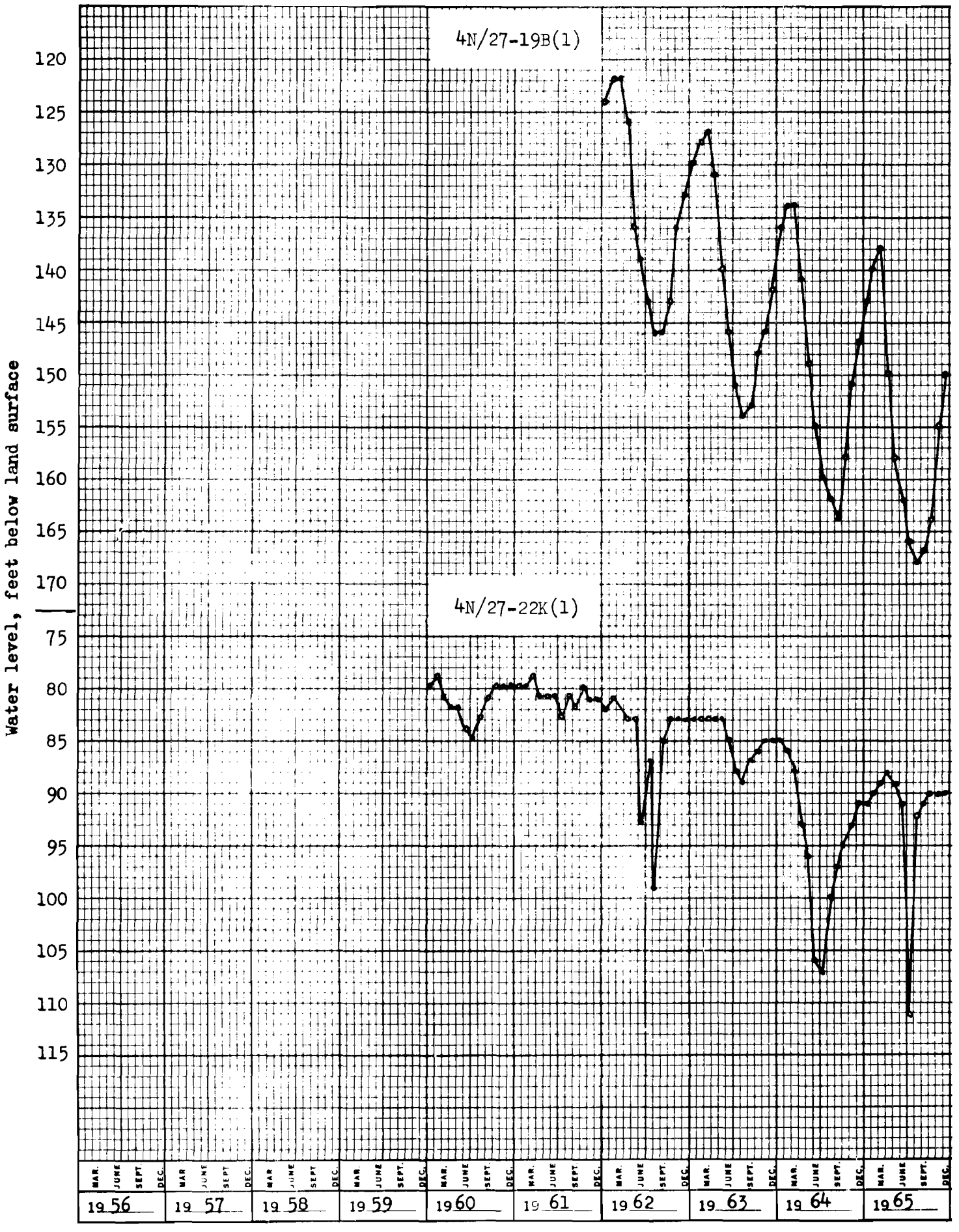
Ground water occurring in the gravels overlying the basalt is recharged chiefly by irrigation water imported into the area. The shallow water-bearing zones in the underlying basalt formation are believed to be hydraulically connected with the overlying gravels and the two constitute one ground water reservoir. No serious problems of water level decline have yet developed in the gravel formation. From the available data, it appears that water levels are higher and more ground water is available in the gravel formation in the months of August and September than in the months of May and June. This is believed due to the recharge of imported irrigation water from the Umatilla River.

The deep water bearing zones in the basalt are hydraulically separated from the shallow water bearing zone and receive very little annual recharge. The meager amount of pumping from these deep zones in the past few years has been sufficient to cause a major decline in water levels and it appears that we are mining the available ground water supply from these deep zones. This occurs whenever annual pumping exceeds the rate of annual recharge.

OBSERVATION WELLS

4N/27-19B(1) (Umatilla Army Depot-Well No. 4) is a 600-foot well in basalt at Ordnance.

4N/27-22K(1) (Umatilla Army Depot-Well No. 2) is a 360-foot well in basalt at Ordnance.


4N/27-19B(1)
4N/27-22K(1)
Water level, feet below land surface
120
125
130
135
140
145
150
155
160
165
170
75
80
85
90
95
100
105
110
115
MAR. JUNE SEPT. DEC.
19 56
19 57
19 58
19 59
19 60
19 61
19 62
19 63
19 64
19 65

MILTON-FREEWATER AREA (5)

Milton-Freewater is located at the head of a large alluvial fan where the Walla Walla River flows out of the Blue Mountains. This fan, which is in large part composed of coarse gravels is recharged by the Walla Walla River and by irrigation diversions. High ground water levels in many of the wells occurs during the irrigation season. The permeable character of the alluvial gravels and the extensive recharge from irrigation creates a pollution threat to all the shallow wells on the alluvial fan.

The alluvial fan is underlain at depth by the Columbia River Basalt Formation. Some of the deep wells in the Milton-Freewater area, which develop ground water from the basalt, have been declining in recent years.

OBSERVATION WELLS

5N/35-1C(1) (William A. Bingman, formerly Cecil Brodie) is a 32.5-foot dug well in gravel located near Milton-Freewater. Periodic water level measurements available from 1933 to date.

5N/35-2C(1) (K. A. Townsend, formerly E. J. McSherry) is a 22-foot dug well in sand and gravel located about one mile west of Milton-Freewater. Periodic water level measurements available from 1933 to date.

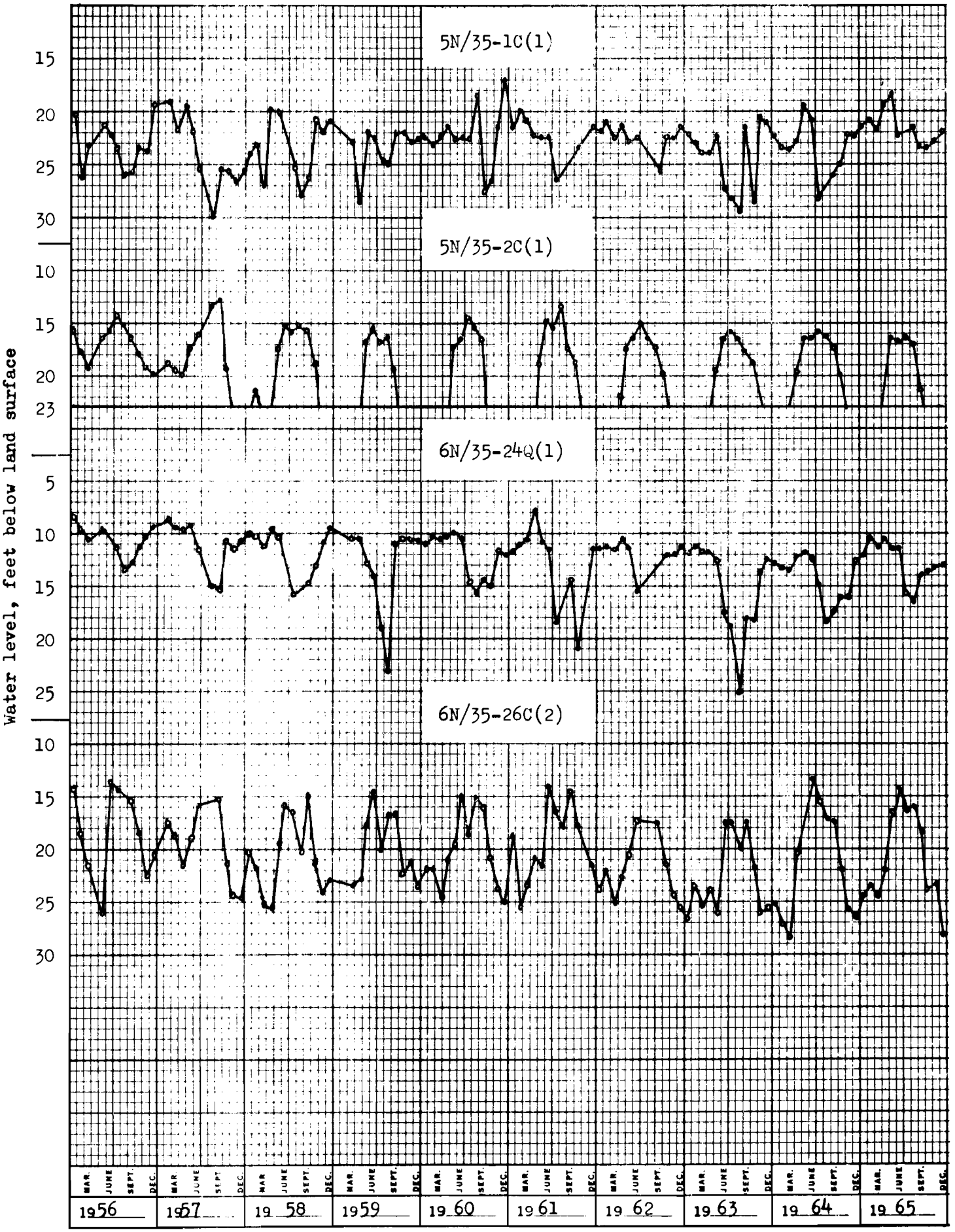
6N/35-24Q(1) (George H. Ransom, formerly E. Miller) is a 165-foot dug and drilled well in gravel located about three miles north of Milton-Freewater. Periodic water level measurements available from 1933 to date.

6N/35-26C(2) (Earl Ransom) is a 110-foot dug and drilled well in gravel located about two miles north of Milton-Freewater. Periodic water level measurements available from 1933 to date.

REFERENCES

Newcomb, R. C., 1951, Preliminary report on the ground-water resources of the Walla Walla Basin, Washington-Oregon: U. S. Geological Survey open-file report.

MILTON-FREEWATER AREA (5)

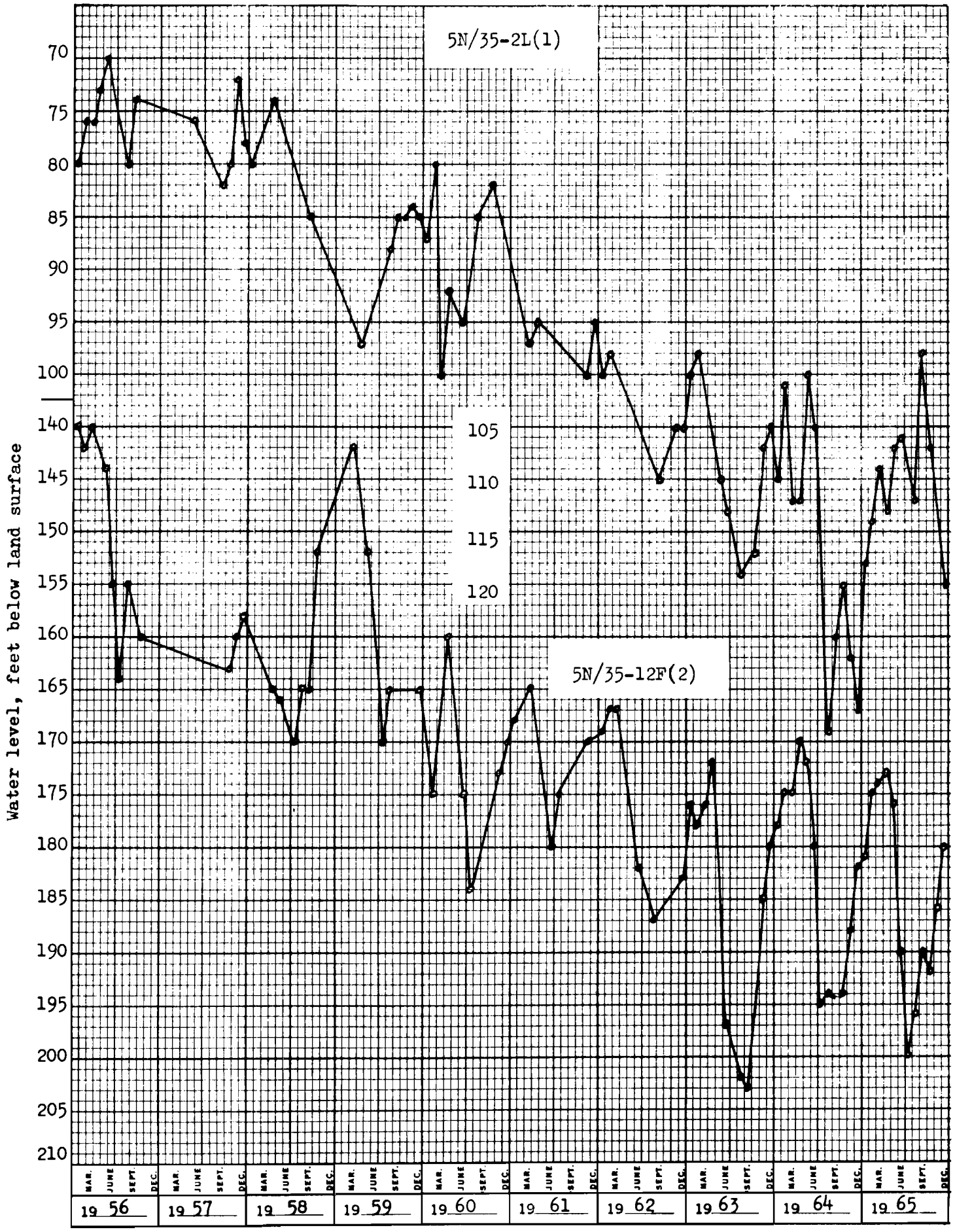


MILTON-FREEWATER AREA (5)

5N/35-2L(1) (City of Milton-Freewater, Well No. 6) is a 952-foot drilled well in the Columbia River Basalt formation. The well is located within the City of Milton-Freewater.

5N/35-12F(2) (City of Milton-Freewater, Well No. 2) is a 902-foot drilled well in the Columbia River Basalt formation. The well is located within the City of Milton-Freewater.

MILTON-FREEWATER (5)



PENDLETON-PILOT ROCK AREA (6)

The Pendleton-Pilot Rock area lies in a structural valley in the Columbia River Basalt Formation. This structural valley has been partially filled with sand and gravel deposits. The deep wells all develop water from the basalt formation. Some water level declines have been reported in the Weston area and some observation wells will be established in this area.

The uncertainty of being able to develop large ground-water supplies in the Columbia River at every location was demonstrated in 1965 by the construction of a 1,500-foot well at Pendleton which had a capacity of only 525 gallons per minute with 361 feet of drawdown.

OBSERVATION WELLS

2N/32-2N(1) (City of Pendleton - Stillman Park Well) is a 700-foot drilled well in the Columbia River Basalt Formation. Well is located in Pendleton.

1/32-17G(1) (City of Pilot Rock - Well No. 1) is a 309-foot drilled well developing confined ground water from the Columbia River Basalt Formation.

1/32-17K(1) (City of Pilot Rock - Well No. 2) is a 486-foot drilled well developing confined ground water from the Columbia River Basalt Formation.

1/32-23J(1) (Hilmer Horn) is a 774-foot drilled well in basalt located about four miles southeast of Pilot Rock.

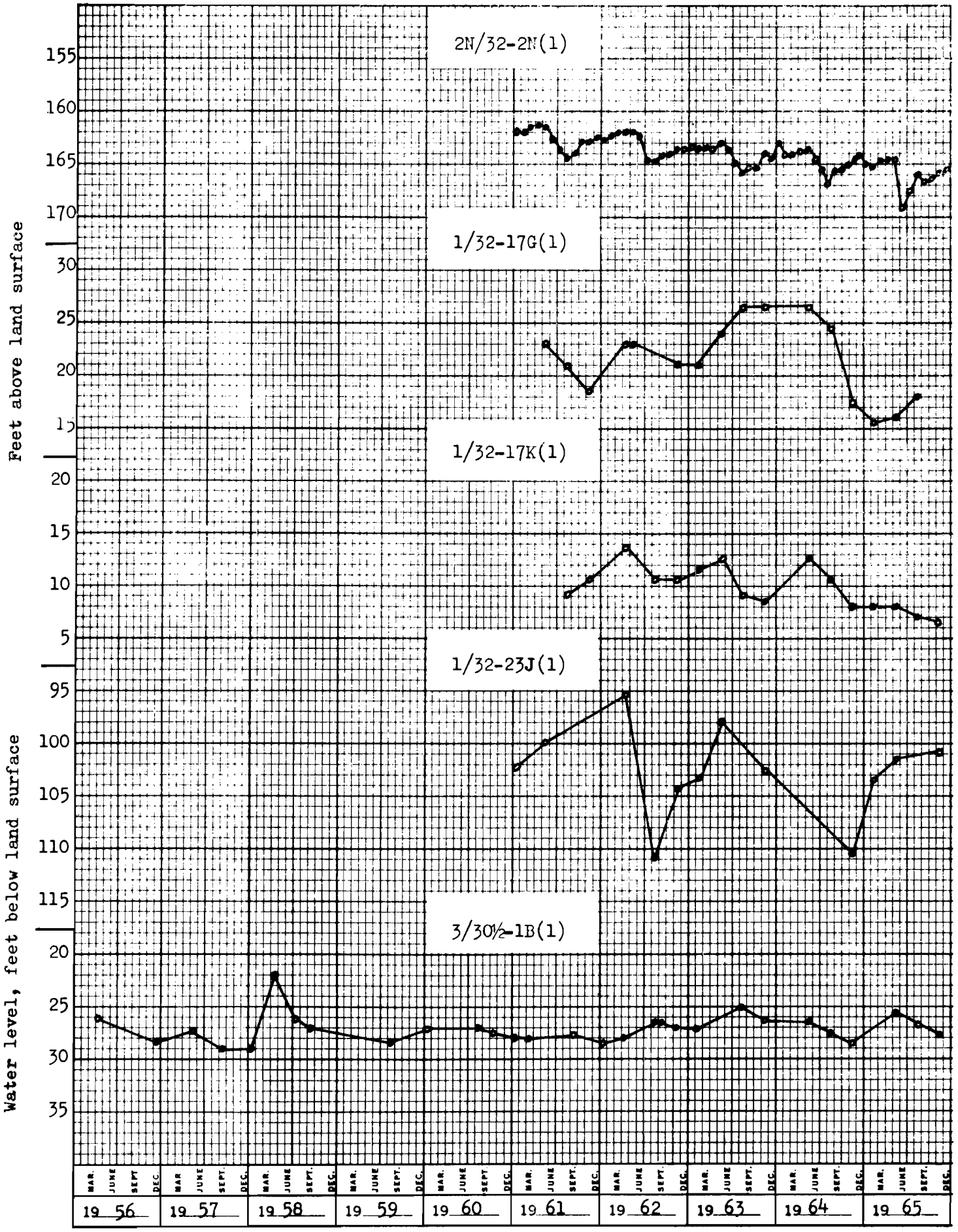
3/30½-1B(1) (Joseph Pedro) is a 99-foot drilled well in basalt located about ten miles southwest of Pilot Rock.

REFERENCES

Brown, Stuart G., 1955, Inquiry into the reported interference between artesian wells near Pilot Rock, Oregon: U. S. Geological Survey open-file report.

Hogenson, G. M., 1964, Geology and ground water of the Umatilla River Basin, Oregon: U. S. Geological Survey Water Supply Paper 1620.

PENDLETON-PILOT ROCK AREA (6)



GRANDE RONDE VALLEY (7)

The Grande Ronde Valley is a broad, deep structural valley that has been partially filled with lake and stream deposited clays, silts, sands and gravels. The coarse-grained sand and gravel deposits are confined chiefly to the alluvial fans that have formed where the larger streams flow into the valley. The deeper materials in the basin fill are chiefly fine-grained silts and clays.

The basin is underlain by the Columbia River Basalt Formation which contains confined ground water. Wells drilled into the basalt generally flow at the surface. Many new irrigation wells have been drilled during the past few years. Some of these develop several thousand gallons per minute from the sand and gravel deposits.

It appears that the permeable alluvial deposits can withstand a large additional development without creating a serious problem of declining water levels. At the present time, large amounts of the precipitation which would be available for ground-water recharge is being rejected because the ground water reservoir in the alluvial deposits are full to overflowing. Additional pumping during the irrigation season would cause a lowering of the water table and create additional storage space for the storage of precipitation.

OBSERVATION WELLS

1N/38-21C(1) (Robert Burr, formerly Schmittel) is a 67-foot drilled well in gravel located about nine miles southwest of Elgin along Willow Creek.

1/38-24R(1) (H. L. Wagner) is a 1,150-foot artesian well in basalt located near Imbler. Periodic water level measurements available from 1950 to date.

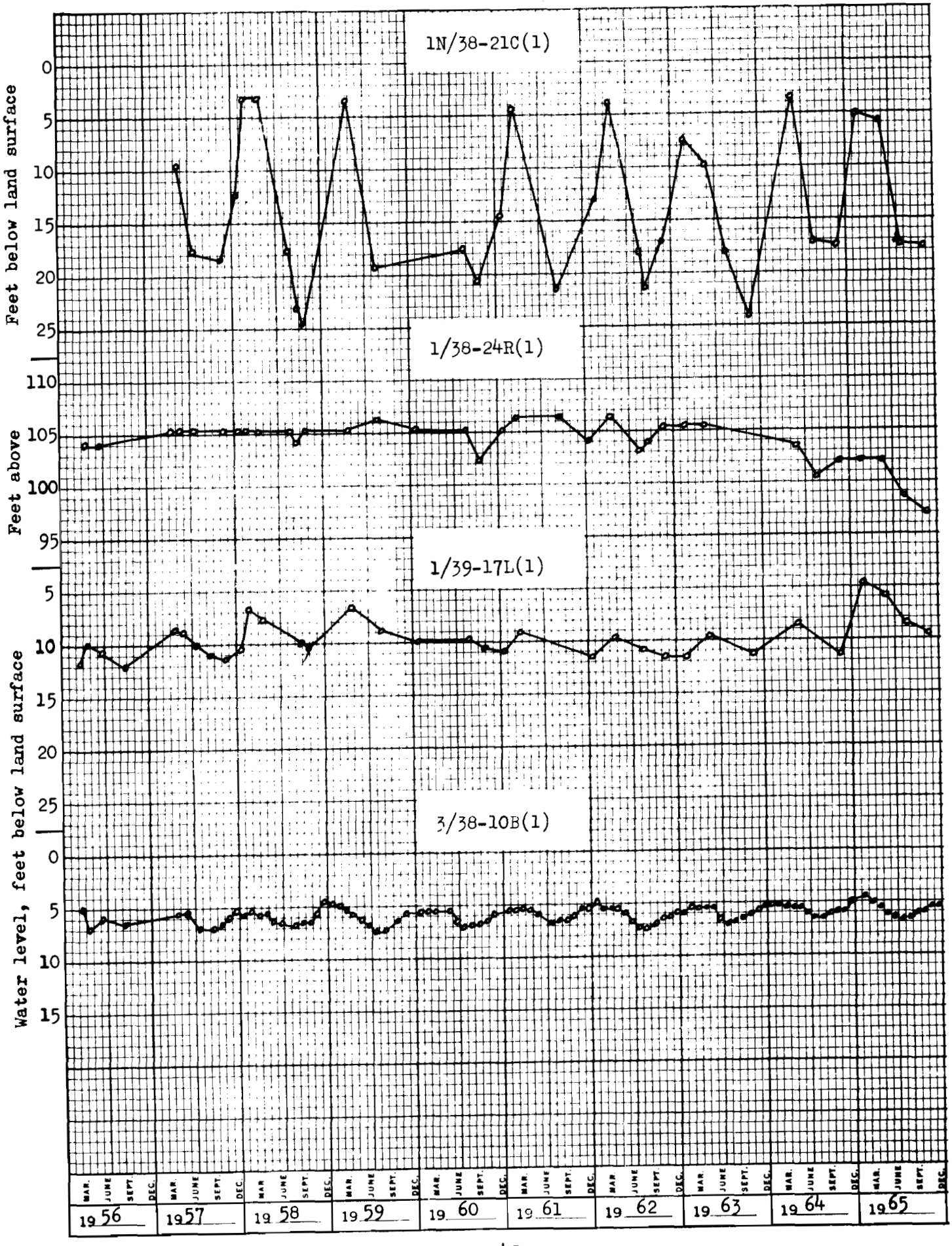
1/39-17L(1) (A. F. Furman) is a 44.6-foot drilled well in sand located near Imbler. Periodic water level measurements available from 1940 to date.

3/38-10B(1) (Union County) is a 11-foot dug well in sand and gravel located near the LaGrande golf course. Periodic water level measurements available from 1936 and 1938 to date.

REFERENCES

Hampton, E. R. and Brown, S. G., 1964, Geology and ground-water resources of the Upper Grande Ronde River Basin, Union County, Oregon: U. S. Geological Survey Water Supply Paper 1597.

GRANDE RONDE VALLEY (7)



GRANDE RONDE VALLEY (7)

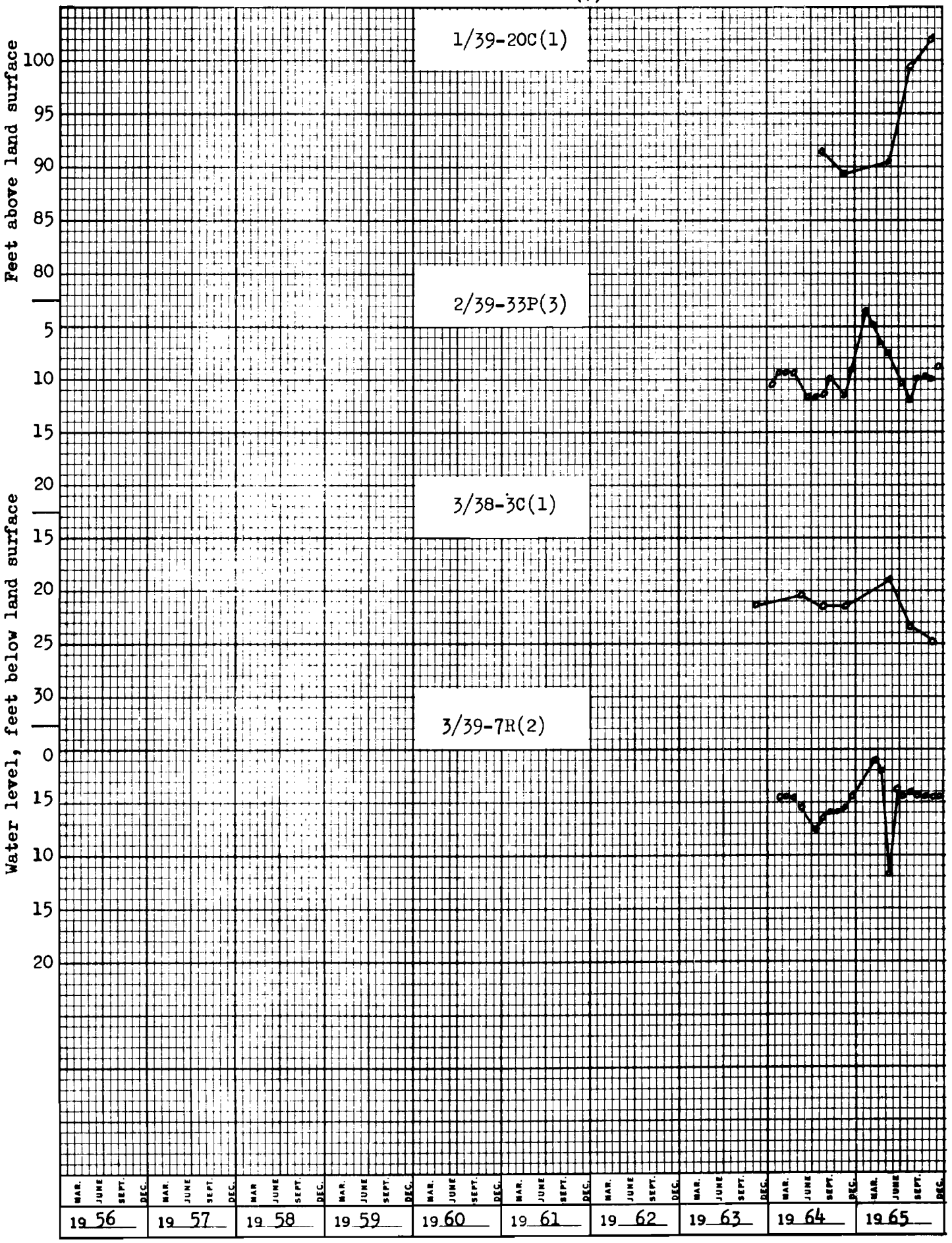
1/39-20C(1) (Clayton Fox) is a 1,468-foot artesian well in basalt located about one mile north of Imbler.

2/39-33P(3) (Wilfred Hamann) is a 430-foot test well located about seven miles east of La Grande.

3/38-3C(1) (Glen Lester) is a 315-foot well in Island City.

3/39-7R(2) (Stanley Weishaar) is a 395-foot test well located about five miles east of La Grande.

GRANDE RONDE VALLEY (7)



BAKER VALLEY (8)

The Baker Valley is a broad structural basin that has been partially filled with lake and stream deposits. The coarser-grained sand and gravel deposits are confined chiefly to the large alluvial fans that have been formed by streams flowing out of the Elkhorn Mountains.

At many places in the Baker Valley the water table is at or near land surface which indicates that the ground-water reservoirs are full. Ground-water developments in parts of the Valley would aid in solving drainage problems. A 650-foot well was drilled near the City of Baker during 1965 that was tested at a yield of 2,000 gallons per minute with 100 feet of drawdown. Part of the ground-water was developed from the alluvial gravels and part from the permeable volcanic rocks that were encountered in the bottom 150 feet of the well.

OBSERVATION WELLS

8/39-22F(1) (Baker County) is a 12-foot dug well in sand and gravel in the Baker Valley. Periodic water level measurements available for 1936 and from 1938 to date.

8/40-19D(1) (Baker County) is a 9-foot dug well in sand and gravel in the Baker Valley. Periodic water level measurements available for 1936 and from 1938 to date.

9/39-2N(1) (Kermit Hansen, formerly Chris Lee) is a 321-foot drilled well in the Baker Valley. Periodic water level measurements available from 1949 to date.

9/40-18Q(1) (Paul Hill) is a 575-foot drilled well in gravel in the Baker Valley.

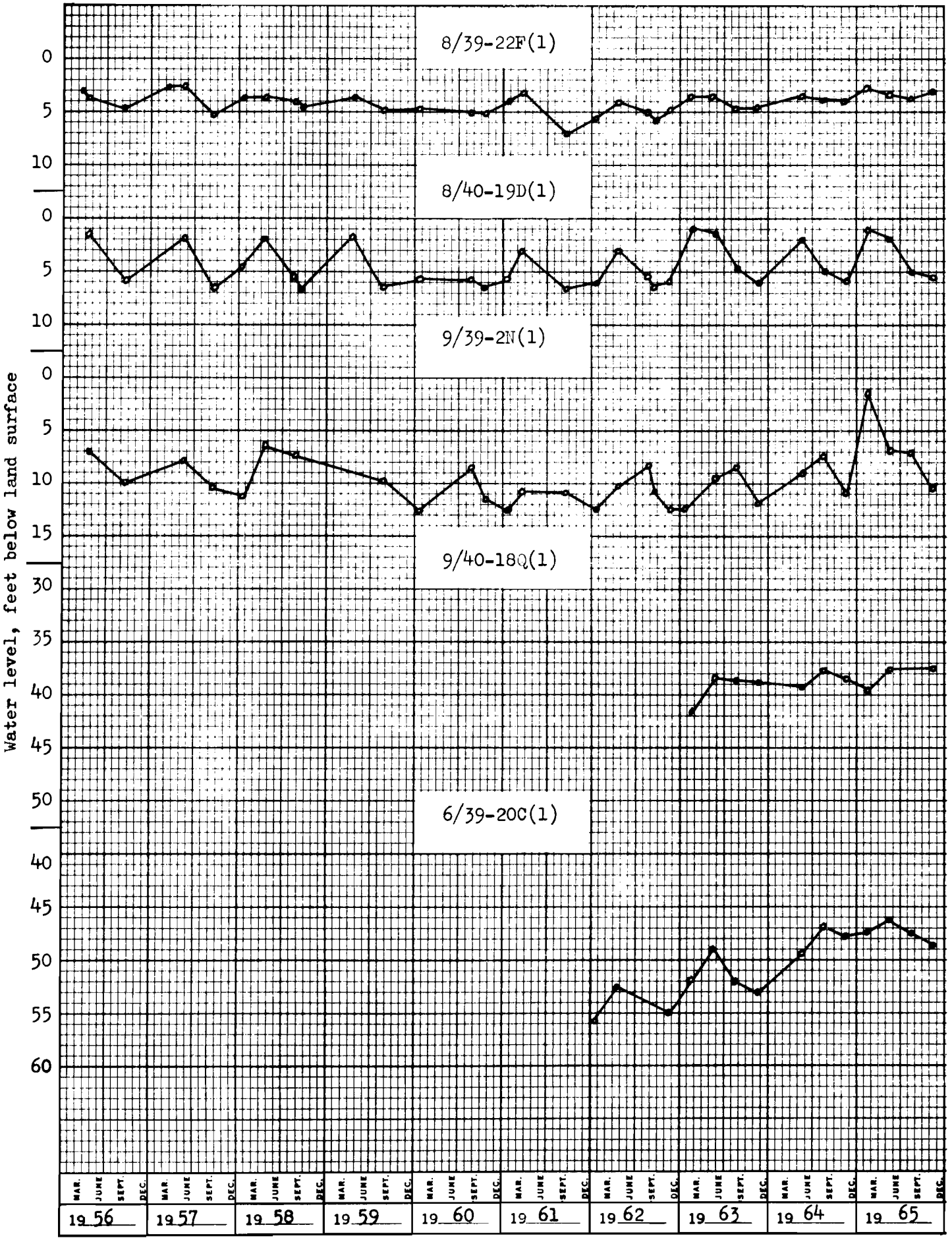
6/39-20C(1) (Ed McCanse) is a 562-foot drilled well in gravel near North Powder.

REFERENCES

Ducret, G. L. Jr., and Anderson, D. B., 1965, Records of wells, water levels and chemical quality of water in Baker Valley, Baker County, Oregon.

Trauger, Frederick D., 1951, Ground water resources of Baker Valley, Baker County, Oregon: U. S. Geological Survey open-file report.

BAKER VALLEY (8)



UPPER JOHN DAY VALLEY (9)

The upper John Day Valley is a long, narrow valley that extends from Dayville to Prairie City. The valley floor is generally less than a mile in width and is bordered by steep valley walls. The flood plain is underlain by coarse alluvial deposits of sand, gravel and boulders. Ground water in these permeable deposits is at most places hydraulically connected with the adjacent river. Ground water developments from the alluvial deposits have been by dug sumps or ponds and shallow drilled wells. The extreme permeability of the alluvial deposits and their shallow occurrence makes the ground water readily subject to pollution problems.

At places, as at John Day, the Columbia River Basalt Formation extends below the alluvial deposits and some deep wells have encountered confined ground water in the lavas. The John Day formation which underlies the alluvial deposits in the Dayville area has very low permeability and is generally capable of yielding only small supplies of ground water.

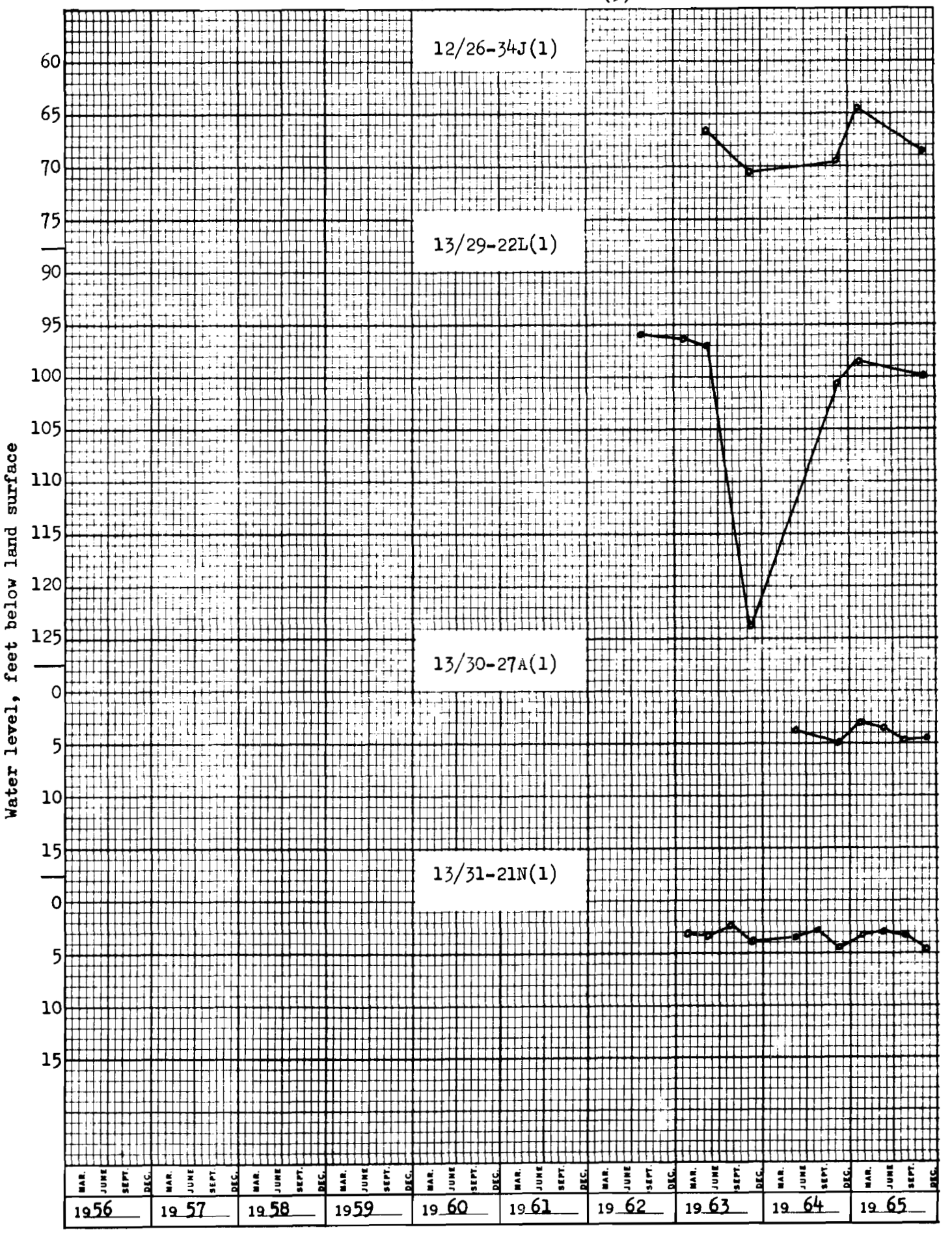
OBSERVATION WELLS

12/26-34J(1) (Dayville Cemetery) is a 465-foot well in sand and gravel located about three miles southwest of Dayville.

13/29-22L(1) (Curtis Martin) is a 215-foot drilled well in gravel located about six miles west of Mt. Vernon.

13/30-27A(1) (State Highway Department - Clyde Holliday Wayside Park) is a 155-foot domestic well in basalt located about one mile east of Mt. Vernon.

13/31-21N(1) (Mt. View Country Club) is a 10-foot dug well in gravel located about one mile west of John Day.


12/26-34J(1)
13/29-22L(1)
13/30-27A(1)
13/31-21N(1)
Water level, feet below land surface
60
65
70
75
90
95
100
105
110
115
120
125
0
5
10
15
0
5
10
15
MAR.
JUNE
SEPT.
DEC.
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965

COW VALLEY AREA (10)

Cow Valley is a small upland basin in Northern Malheur County that was declared a critical ground water area in 1959 on the basis of declining water levels. The valley has been closed to further ground-water developments and existing irrigation wells have been restricted to the duty of water which is three acre feet per acre of irrigated land. Ground water withdrawals for the period 1951-1965 are given below:

GROUND WATER PUMPAGE

Year	Acre Feet	Year	Acre Feet
1951	1826	1959	5588
1952	3451	1960	4722
1953	2564	1961	5495
1954	5494	1962	5110
1955	6058	1963	3520
1956	5611	1964	3553
1957	5980	1965	4344
1958	5080		

OBSERVATION WELLS

15/40-2J(1) (Max Holloway #1) is a 421-foot drilled well in the Cow Valley Ground Water Reservoir. Periodic water level measurements available from 1950 to date.

15/40-2N(1) (Crow #2) is a 310-foot drilled well in the Cow Valley Ground Water Reservoir. Periodic water level measurements available from 1950 to date.

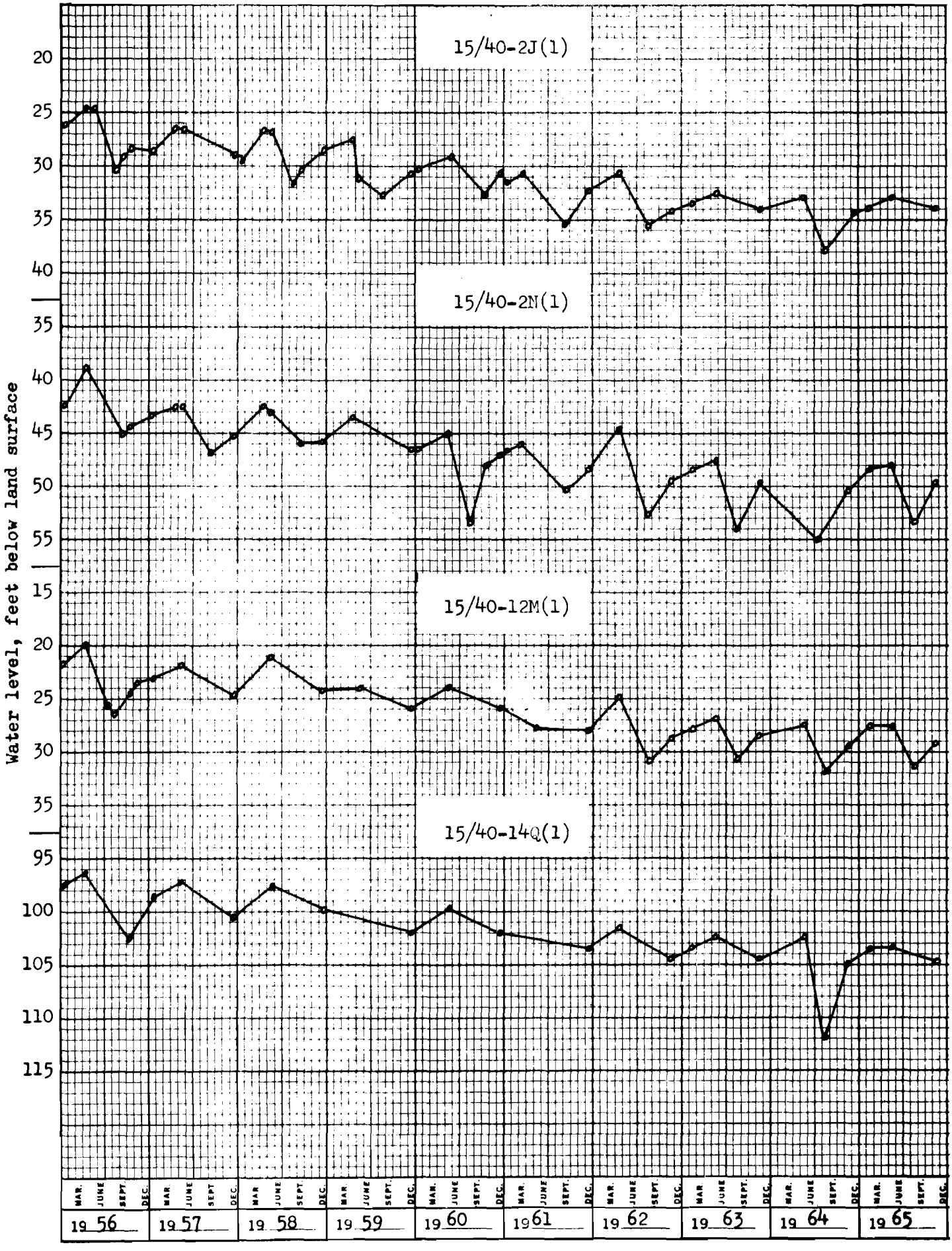
15/40-12M(1) (Davis #3) is a 280-foot drilled well in the Cow Valley Ground Water Reservoir. Periodic water level measurements available from 1955 to date.

15/40-14Q(1) (Crow #8) is a 248-foot drilled well in the Cow Valley Ground Water Reservoir. Periodic water level measurements available from 1954 to date.

REFERENCES

Brown, S. G., and Newcomb, R. C., 1962, Ground-water resources of Cow Valley, Malheur County, Oregon: U. S. Geological Survey Water Supply Paper 1619-M.

COW VALLEY AREA (10)



COW VALLEY AREA (10)

15/40-1C(1) (Altha Anderson) is a 330-foot drilled well in the Cow Valley Ground Water Reservoir. Periodic water level measurements available from 1954 to date.

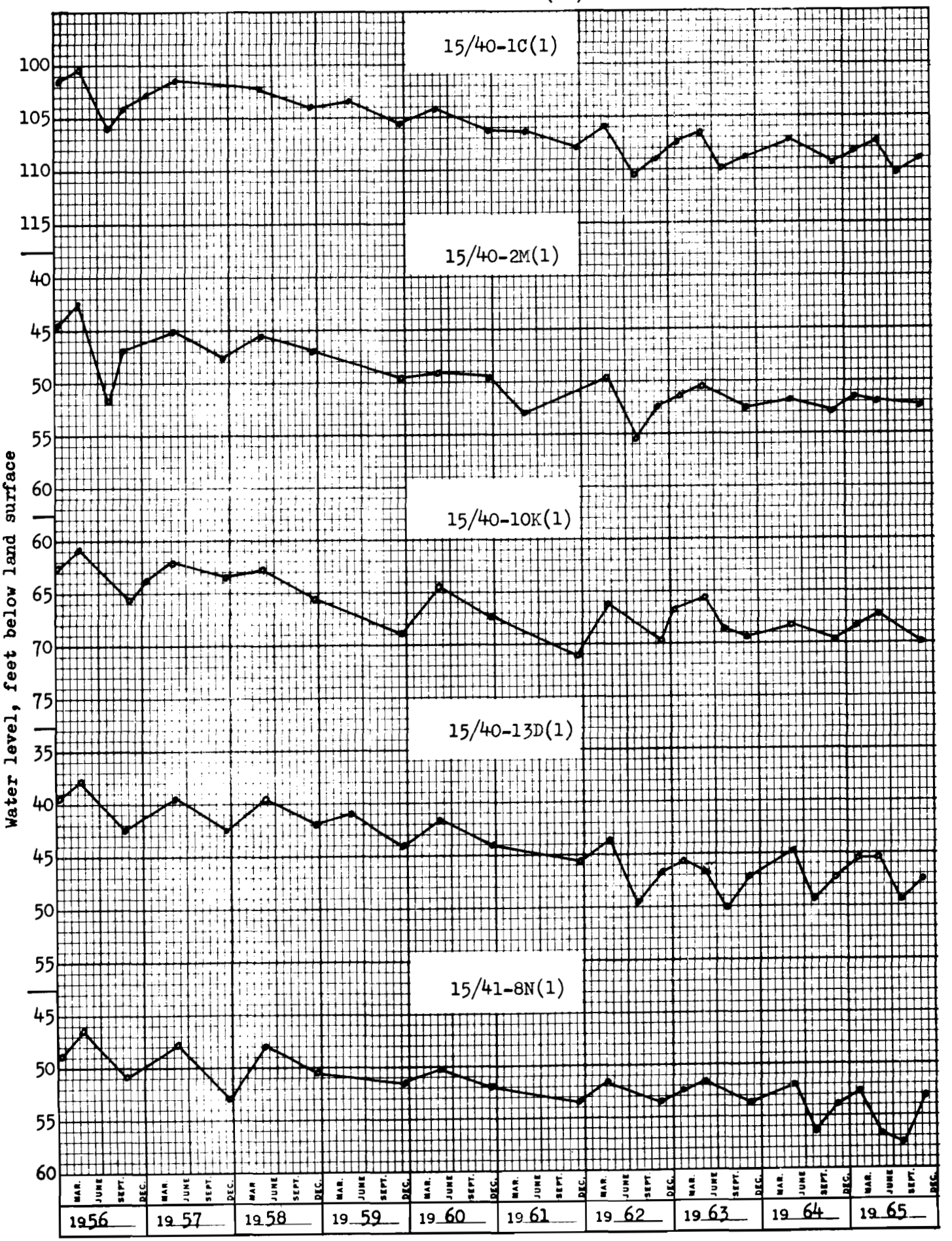
15/40-2M(1) (Max Holloway #2) is a 535-foot drilled well in the Cow Valley Ground Water Reservoir. Periodic water level measurements available from 1954 to date.

15/40-10K(1) (Crow #9) is a 1,000-foot drilled well in the Cow Valley Ground Water Reservoir. Periodic water level measurements available from 1954 to date.

15/40-13D(1) (Davis #1) is a 300-foot drilled well in the Cow Valley Ground Water Reservoir. Periodic water level measurements available from 1955 to date.

15/41-8N(1) (Crow #6) is a 338-foot drilled well in the Cow Valley Ground Water Reservoir. Periodic water level measurements available from 1963 to date.

COW VALLEY AREA (10)



SOUTHERN MALHEUR AREA (11)

The Southern Malheur Area has been broken into many basin and ridge areas by faulting. The faulting has also divided the area into numerous disconnected ground-water reservoirs and areas. A large part of the area is underlain by permeable volcanic rocks, but the low precipitation incident to the area limits the amount of ground-water recharge. Recharge comes chiefly from snowmelt runoff from the ridges and hills during the spring months. To date there has been very little ground-water development in this area, however, the area should be able to sustain many moderate sized ground-water developments without serious problems.

OBSERVATION WELLS

30/46-2H(1) (Jordan Valley Cemetery District) is a 221-foot drilled well in basalt located in Jordan Valley.

30/46-10N(5) (Jaca Bros.) is a 420-foot irrigation well in sand located about two miles southwest of Jordan Valley.

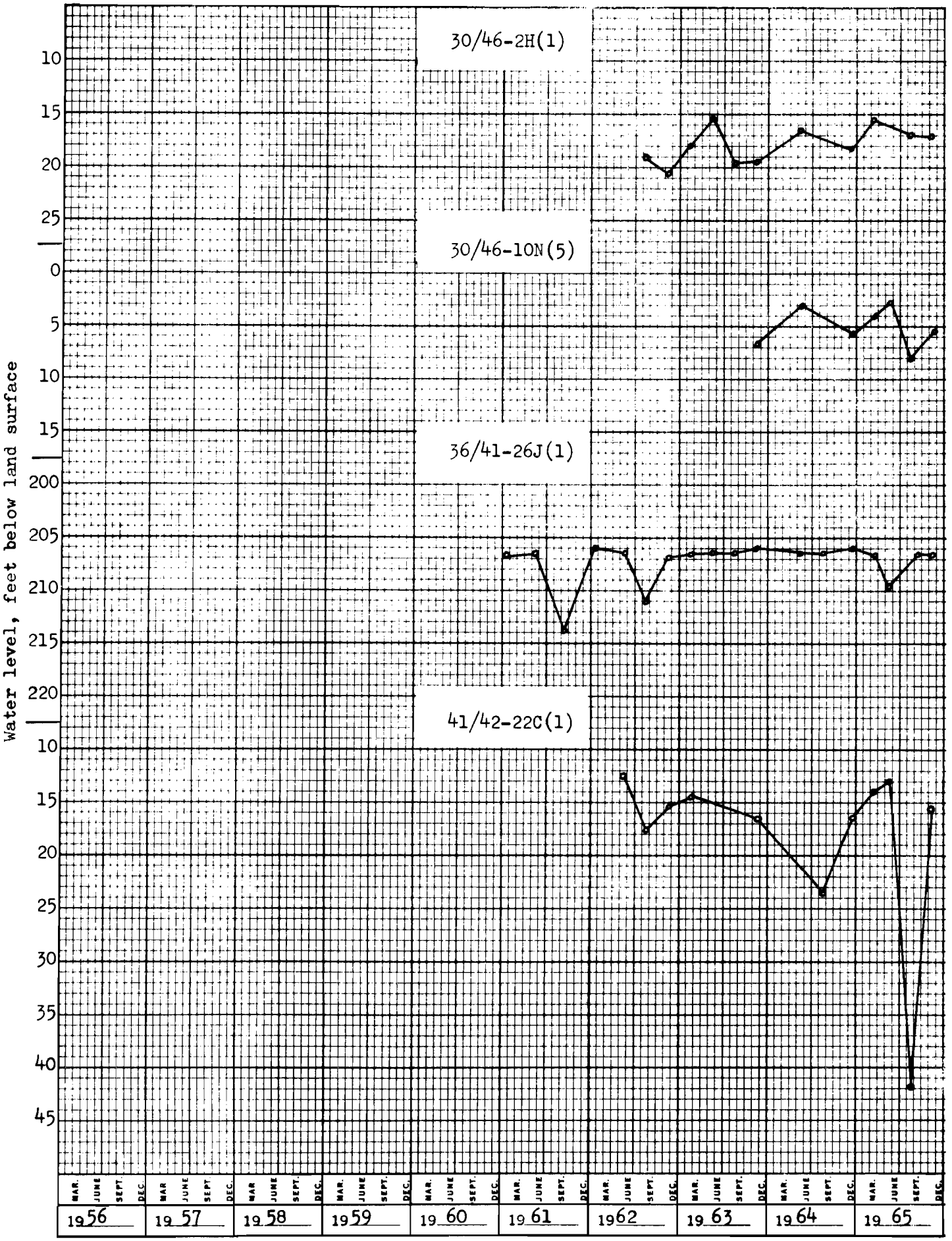
36/41-26J(1) (State Highway Department - Basque Maintenance Station) is a 222-foot drilled well in basalt located about one mile northwest of Basque.

41/42-22C(1) (Lucky 7 Ranch) is a 615-foot drilled well in gravel located about two miles west of McDermitt.

REFERENCES

Newcomb, R. C., 1961, Ground water in the western part of the Cow Creek and Soldier Creek grazing units, Malheur County, Oregon: U. S. Geological Survey Water Supply Paper 1475-E.

SOUTHERN MALHEUR AREA (11)



SOUTHERN HARNEY AREA (12)

The Southern Harney area, like the Southern Malheur area, has been divided by faulting into many basins and ridges. Steens Mountain, the largest and most prominent fault-block mountain in the northwest, is located in this area. This mountain is bordered on the east by the Alvord Valley and on the west by the Donner and Blitzen Valley and the Catlow Valley. The various basins in the area have been partially filled with alluvium derived from the adjacent ridges and hills. Recharge comes chiefly from snowmelt during the spring months. The larger basins as the Alvord Valley, the Donner and Blitzen Valley and the Catlow Valley are believed to contain large supplies of ground water. Recharge to these larger basins is related to the snowfall on the Steens Mountain. The yield of the smaller basins will be controlled by snowfall on the adjacent hills.

OBSERVATION WELLS

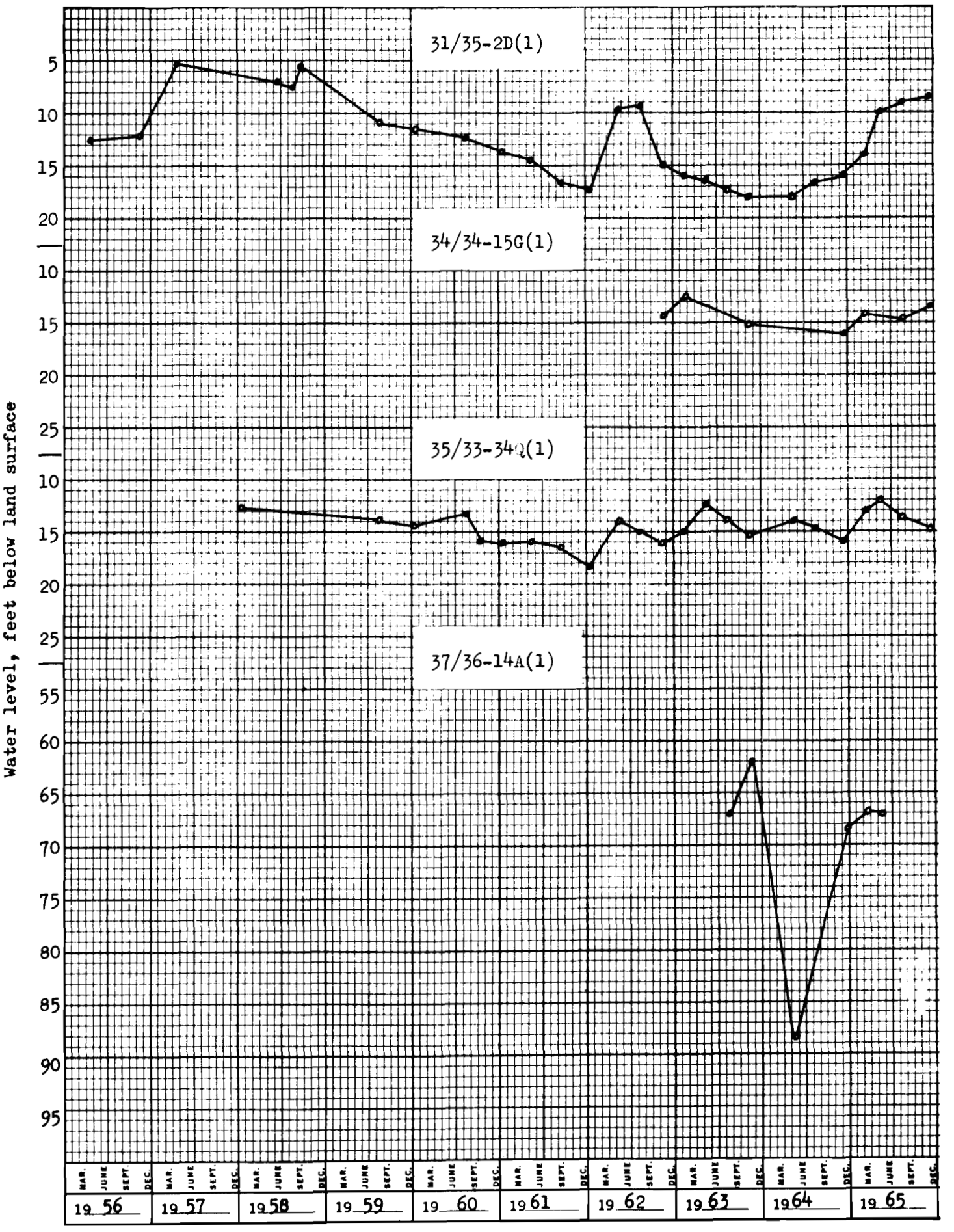
31/35-2D(1) (Fred Pallock) is a 32-foot drilled well near Juniper Lake.

34/34-15G(1) (Alvord Ranch, formerly Rocky Hill Inc.) is a 300-foot irrigation well in lava located about eight miles northeast of Andrews.

35/33-34Q(1) (Andrew Shull) is a 170-foot drilled well in sand and gravel at Andrews.

37/36-14A(1) (Whitehorse Ranch) is a 792-foot drilled well in basalt located about 28 miles northeast of Fields.

SOUTHERN HARNEY AREA (12)



HARNEY BASIN (13)

The Harney Basin is a large closed structural basin that was partially filled with lake and stream deposits and volcanic debris. The water table lies close to land surface beneath the entire basin floor and the underlying ground-water reservoirs are near full capacity. From the available information, it appears that this basin can sustain large ground-water developments without serious problems of declining water levels.

OBSERVATION WELLS

23/27-30B(1) (Green Valley Ranch) is a 268-foot drilled well in gravel (?) located about three miles northwest of Riley.

23/31-16K(1) (T. Allen Jones) is a 300-foot drilled well in gravel located about two miles west of Burns. Periodic water level measurements available from 1930-1932, 1956 and 1960 to date.

24/30-26R(1) (John Campbell) is a 501-foot drilled well in sand and gravel located about nine miles southwest of Burns.

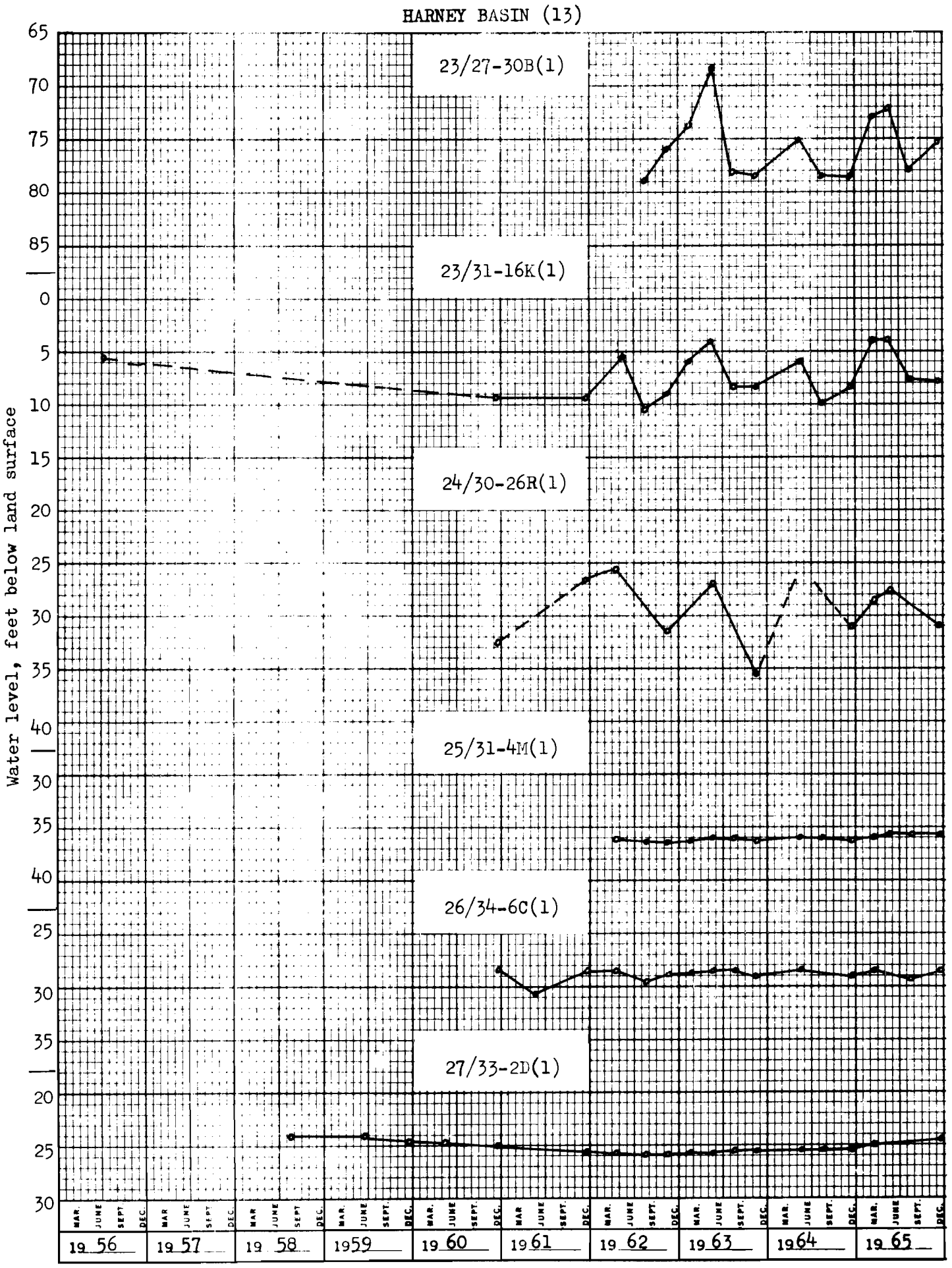
25/31-4M(1) (James Stahl) is a 170-foot drilled well in sand and gravel located about ten miles southeast of Burns.

26/34-6C(1) (John Fecht) is a 260-foot drilled well in sand located about 4½ miles south of Crane.

27/33-2D(1) (R. F. Upton) is a 176-foot drilled well in lava and cinders located about two miles southwest of New Princeton.

REFERENCES

Piper, A. M., et al., 1939, Geology and ground-water resources of the Harney Basin, Oregon: U. S. Geological Survey Water Supply Paper 841.


HARNEY BASIN (13)
23/27-30B(1)
23/31-16K(1)
24/30-26R(1)
25/31-4M(1)
26/34-6C(1)
27/33-2D(1)
Water level, feet below land surface
65
70
75
80
85
0
5
10
15
20
25
30
35
40
30
35
40
25
30
35
20
25
30
MAR.
JUNE
SEPT.
DEC.
19 56
19 57
19 58
1959
19 60
19 61
19 62
19 63
1964
19 65

22/31-34N(1) (L. F. Lazaus) is a 288-foot drilled well in sand, gravel, and basalt located about three miles northeast of Burns. Periodic water level measurements available from 1930-1936 and 1938 to date.

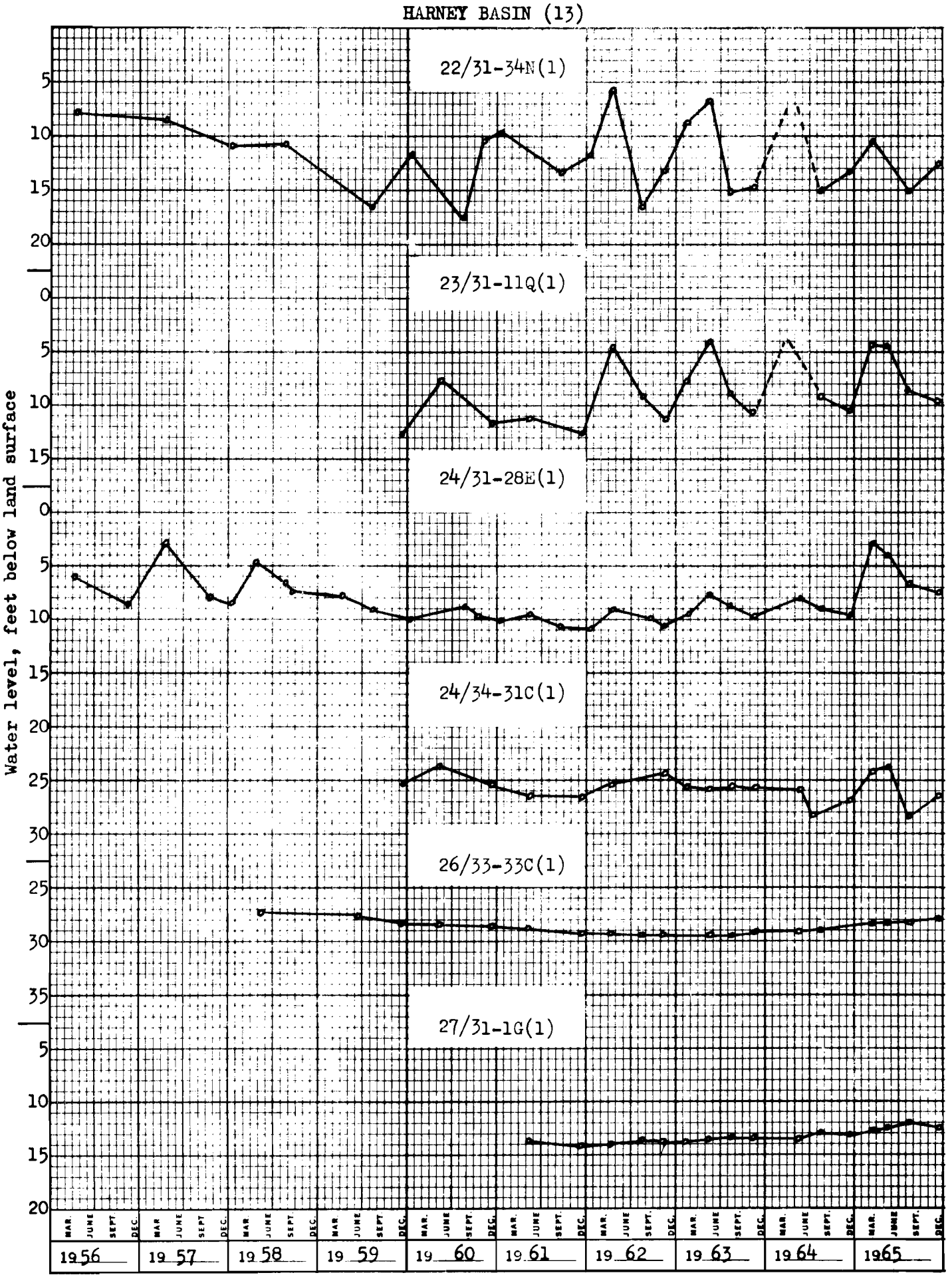
23/31-11Q(1) (E. Sewell) is a 120-foot drilled well in gravel located about four miles east of Burns.

24/31-28E(1) (Harney County) is a 17-foot dug well in gravel located about nine miles southeast of Burns. Periodic water level measurements available from 1936 and 1938 to date.

24/34-31C(1) (John Rossberg) is a 305-foot drilled well in lava and cinders located about two miles north of Crane.

26/33-33C(1) (De B. Forslund, formerly A. B. Hann) is a 300-foot drilled well in cinders located about 3½ miles west of New Princeton.

27/31-1G(1) (John Crow) is a 118-foot drilled well in basalt and cinders located near the south shore of Malheur Lake.


HARNEY BASIN (13)
22/31-34N(1)
23/31-11Q(1)
24/31-28E(1)
24/34-31C(1)
26/33-33C(1)
27/31-1G(1)
Water level, feet below land surface
5
10
15
20
0
5
10
15
0
5
10
15
20
25
30
25
30
35
5
10
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1961
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1963
1964
1965

WARNER VALLEY (14)

Warner Valley is a long narrow structural valley located in southeastern Lake County. In general, the valley is bordered by fault block mountains that have contributed materials for the partial filling of this basin. This valley was the site of the spectacular "hot water" geyser that developed in a deep test well on the Crump Ranch a few years back.

In general, most of the ground-water reservoirs underlying this basin are filled and water levels are at or near land surface. It is believed that large supplies of ground water underlie this valley.

OBSERVATION WELLS

35/24-9J(1) (U.S.B.L.M.) is a 376-foot drilled well in basalt located about eight miles north of Hart Lake. Periodic water level measurements available from 1949 to date.

36/24-27D(2) (Con Lynch) is a 255-foot drilled well located about one mile east of Plush.

36/24-33B(3) (Con Taylor) is a 262-foot drilled well in gravel and lava located about one mile east of Plush.

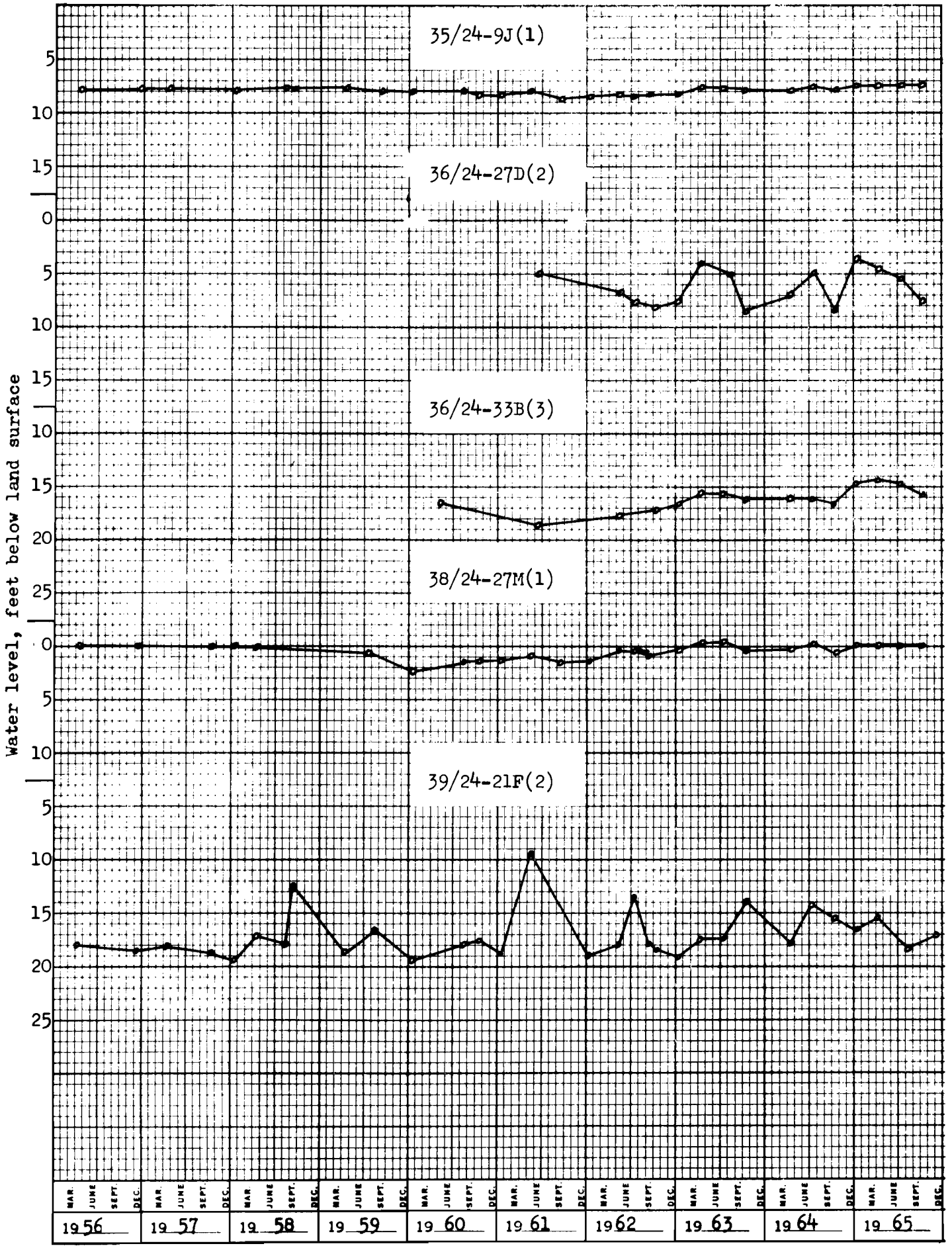
38/24-27M(1) (Charles Crump) is a 81-foot drilled well in gravel located near Crump Lake. Periodic water level measurements available from 1948 to date.

39/24-21F(2) (J. G. Dyke) is a 165-foot drilled well in gravel located in Adel. Periodic water level measurements available from 1948 to date.

REFERENCES

Trauger, Frederick D., 1950, Basic ground-water data in Lake County, Oregon: U. S. Geological Survey open-file report.

WARNER VALLEY (14)



GOOSE LAKE BASIN (15)

The Goose Lake Basin is a large structural basin located in southeastern Lake County. This basin has been partially filled with stream and lake deposits. The stream deposited sands and gravels occur chiefly where alluvial fans have been built into the basin. Some of the alluvial deposits have been buried by fine-grained lake sediments which tend to confine the ground water and cause some wells to flow.

In general, the water table stands close to land surface and a large quantity of ground water is in storage in this basin. Ground-water developments for irrigation are few in number but are expected to increase.

OBSERVATION WELLS

37/20-34R(1) (Robert Weir) is a 808-foot drilled well in gravel located about nine miles north of Lakeview.

39/19-34H(1) (William Hoffman) is a 110-foot drilled well in sand and gravel located about seven miles west of Lakeview.

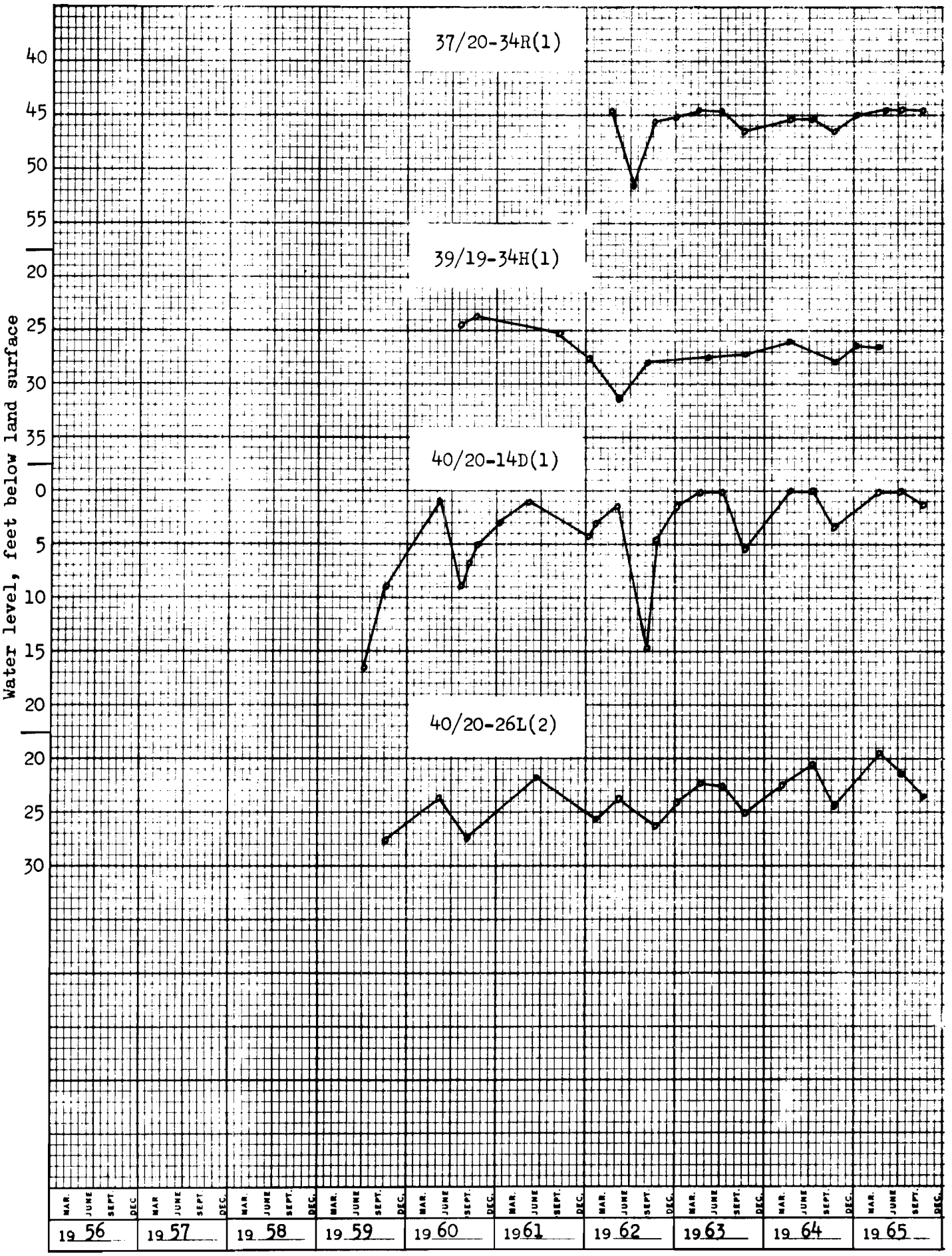
40/20-14D(1) (Snyder & Alexis) is a 305-foot drilled well in sand and gravel located about five miles south of Lakeview.

40/20-26L(2) (Neal Elliott) is a 190-foot drilled well in sand and gravel located about eight miles south of Lakeview.

REFERENCES

Trauger, Frederick D., 1950, Basic ground-water data in Lake County, Oregon: U. S. Geological Survey open-file report.

GOOSE LAKE BASIN (15)



YONNA VALLEY (16)

Yonna Valley is a broad basin in Southern Klamath County that is surrounded by fault block ridges and mountains. The valley is drained by several small streams that are tributary to Lost River.

A large part of the valley floor is underlain by sedimentary strata of siltstone, tuffaceous sandstone, diatomite and volcanic ash. These strata, which have been named the Yonna Formation, have low permeability and are generally capable of yielding only small supplies of ground water. A sequence of volcanic rock which underlies the Yonna Formation generally has high permeability and is generally capable of yielding large supplies of ground water to deep wells. It appears that the ground-water reservoirs in the Yonna Valley can withstand substantial development without serious problems.

OBSERVATION WELLS

38/11-6R(1) (B. Jendrzejewski) is a 194-foot drilled well in broken lava located in Yonna Valley.

38/11½-12N(2) (Frank Challis) is a 150-foot drilled well in porous lava located in Yonna Valley. Periodic water level measurements available from 1949 to date.

38/11½-13N(1) (William Konig) is a 600-foot drilled well in diatomaceous material located in Yonna Valley. Periodic water level measurements available from 1948 to date.

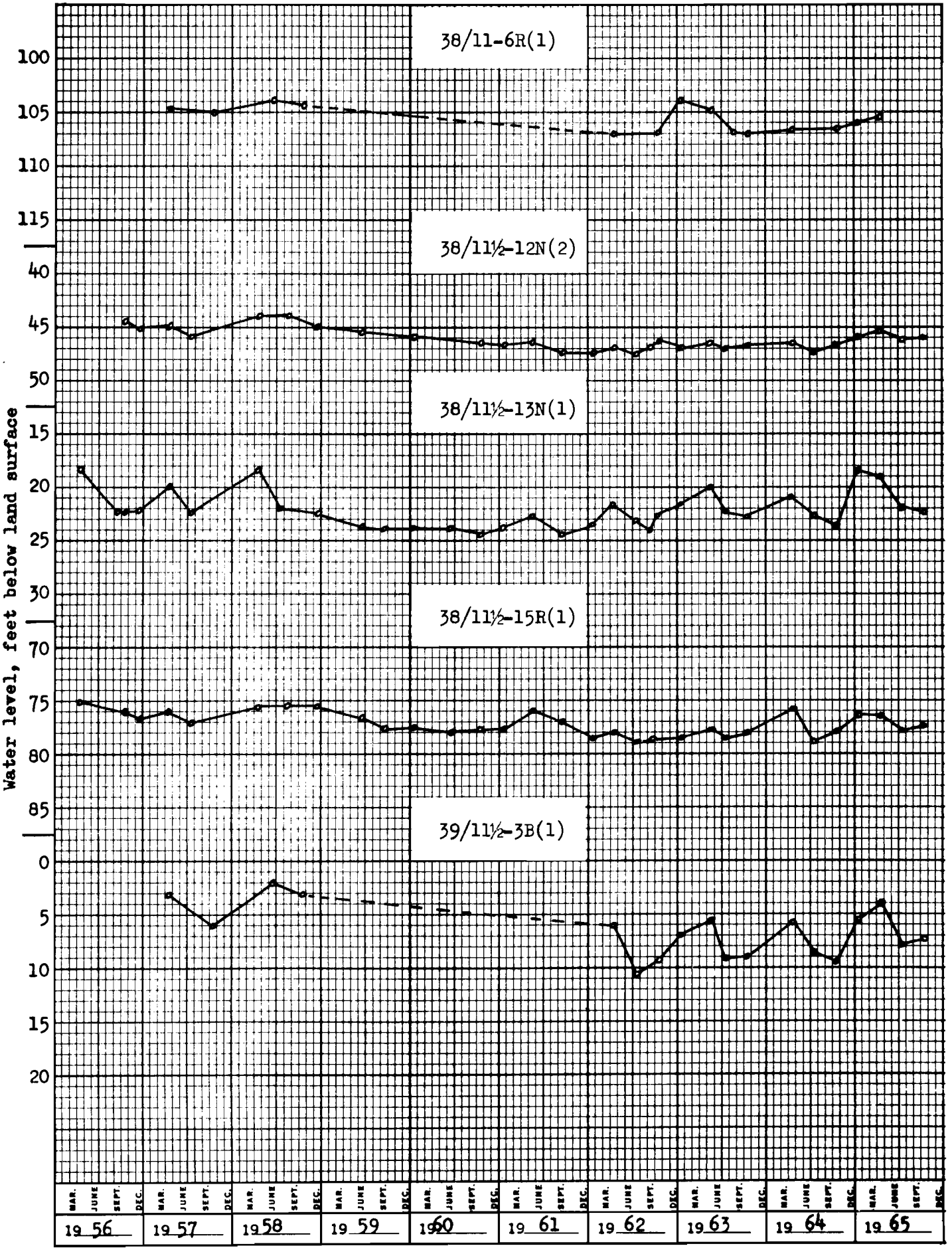
38/11½-15R(1) (Frank R. White, formerly L. M. Hankins) is a 495-foot drilled well in lava and cinders located in Yonna Valley. Periodic water level measurements available from 1948 and 1950 to date.

39/11½-3B(1) (L. J. Horton) is a 102-foot drilled well located about one mile south of Dairy in Yonna Valley.

REFERENCES

Meyers, Joseph D. and Newcomb, R. C., 1952, Geology and ground-water resources of the Swan Lake-Yonna Valleys area, Klamath County, Oregon: U. S. Geological Survey open-file report.

Newcomb, R. C. and Hart, D. H., 1958, Preliminary report on the ground-water resources of the Klamath River Basin, Oregon: U. S. Geological Survey open-file report.


38/11-6R(1)
38/11½-12N(2)
38/11½-13N(1)
38/11½-15R(1)
39/11½-3B(1)
Water level, feet below land surface
100
105
110
115
40
45
50
15
20
25
30
70
75
80
85
0
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10
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MAR.
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SWAN LAKE VALLEY (17)

The Swan Lake Valley is a closed basin lying immediately west of Yonna Valley. The valley, which is surrounded by fault block ridges, has been partially filled with fine-grained lake deposits. These lake beds are believed capable of yielding only small supplies of ground water.

Large ground-water supplies have been obtained from deep wells drilled into the volcanic rocks that surround and underlie the lake beds. A 295-foot well drilled into the volcanic rocks in 1965 was tested at 2,850 gallons per minute with only eight feet of drawdown.

OBSERVATION WELLS

37/10-8N(1) (Edgewood Ranch) is a 281-foot drilled well in lava located in Swan Lake Valley.

37/10-29K(2) (Edgewood Ranch) is a 800-foot drilled well in gravel located in Swan Lake Valley. Periodic water level measurements available from 1949 to date.

38/10-22C(1) (Mike Short) is a 460-foot drilled well in lava located in Swan Lake Valley.

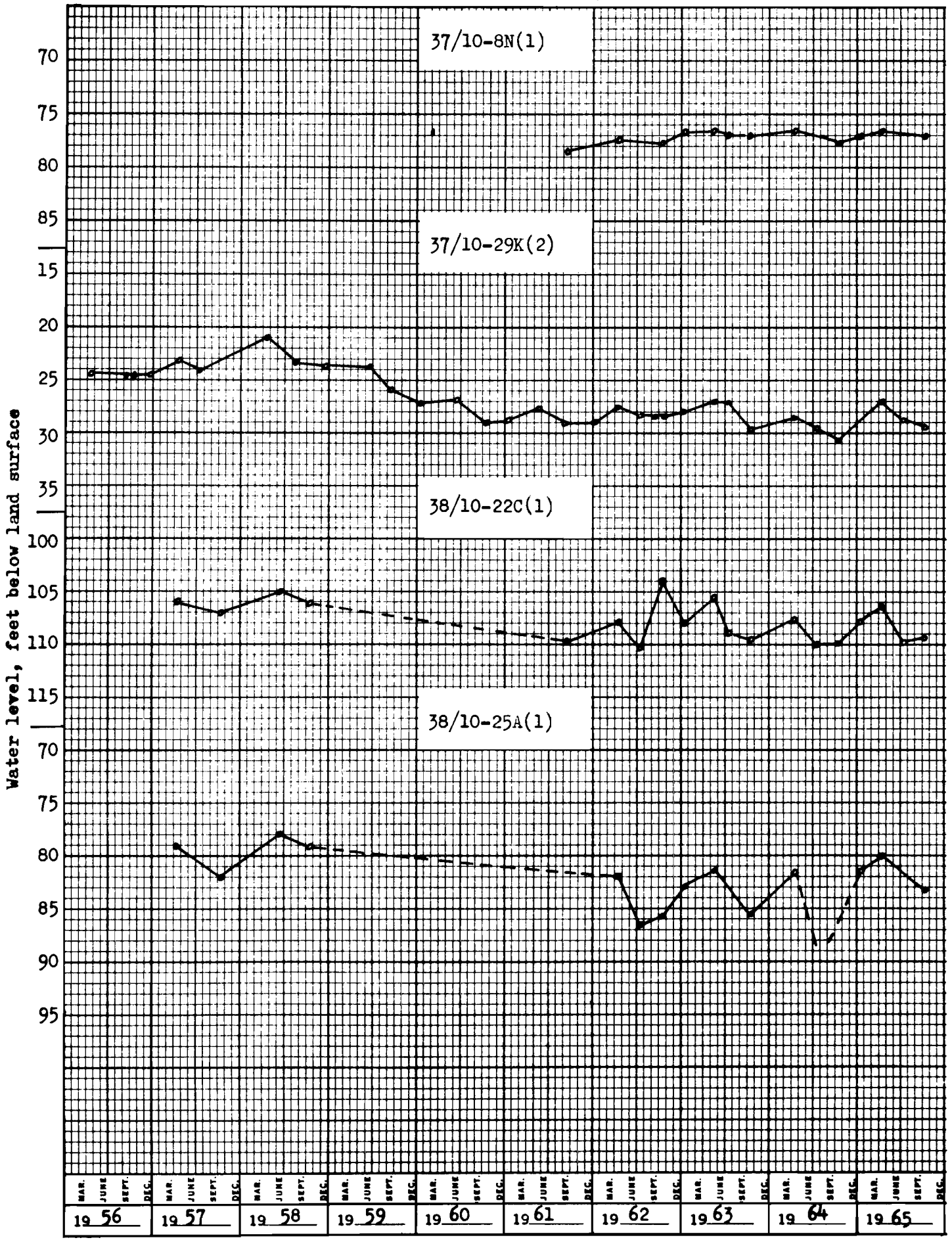
38/10-25A(1) (Garrison Mitchell) is a 524-foot drilled well in lava boulders and cinders located in Swan Lake Valley.

REFERENCES

Meyers, Joseph D. and Newcomb, R. C., 1952, Geology and ground-water resources of the Swan Lake-Yonna Valleys area, Klamath County, Oregon: U. S. Geological Survey open-file report.

Newcomb, R. C. and Hart, D. H., 1958, Preliminary report on the ground-water resources of the Klamath River Basin, Oregon: U. S. Geological Survey open-file report.

SWAN LAKE VALLEY (17)



SPRAGUE RIVER VALLEY (18)

The Sprague River Valley, which extends from the community of Sprague River to Bly, is underlain by some of the most productive ground-water reservoirs in the State. The productive wells in the Bly area develop ground water from porous lava and cinders. One well was tested at 3,500 gallons per minute with no apparent drawdown. In the Beatty area, deep wells drilled into the lavas and cinders underlying the Yonna Formation develop confined ground water. Some of these wells have artesian flows of 1,000 gallons per minute or more and have pumping capacities exceeding 2,000 gallons per minute. Similar artesian conditions extend down the valley to near the community of Sprague River.

OBSERVATION WELLS

35/8-1E(1) (Henry Wolff) is a 101-foot drilled well located about nine miles east of Chiloquin.

35/10-19B(1) (Ted Chrume) is a 360-foot drilled well in sand located about six miles northwest of Sprague River.

36/10-14G(1) (K. R. Newlun) is a 527-foot drilled well in volcanic rock located in Sprague River.

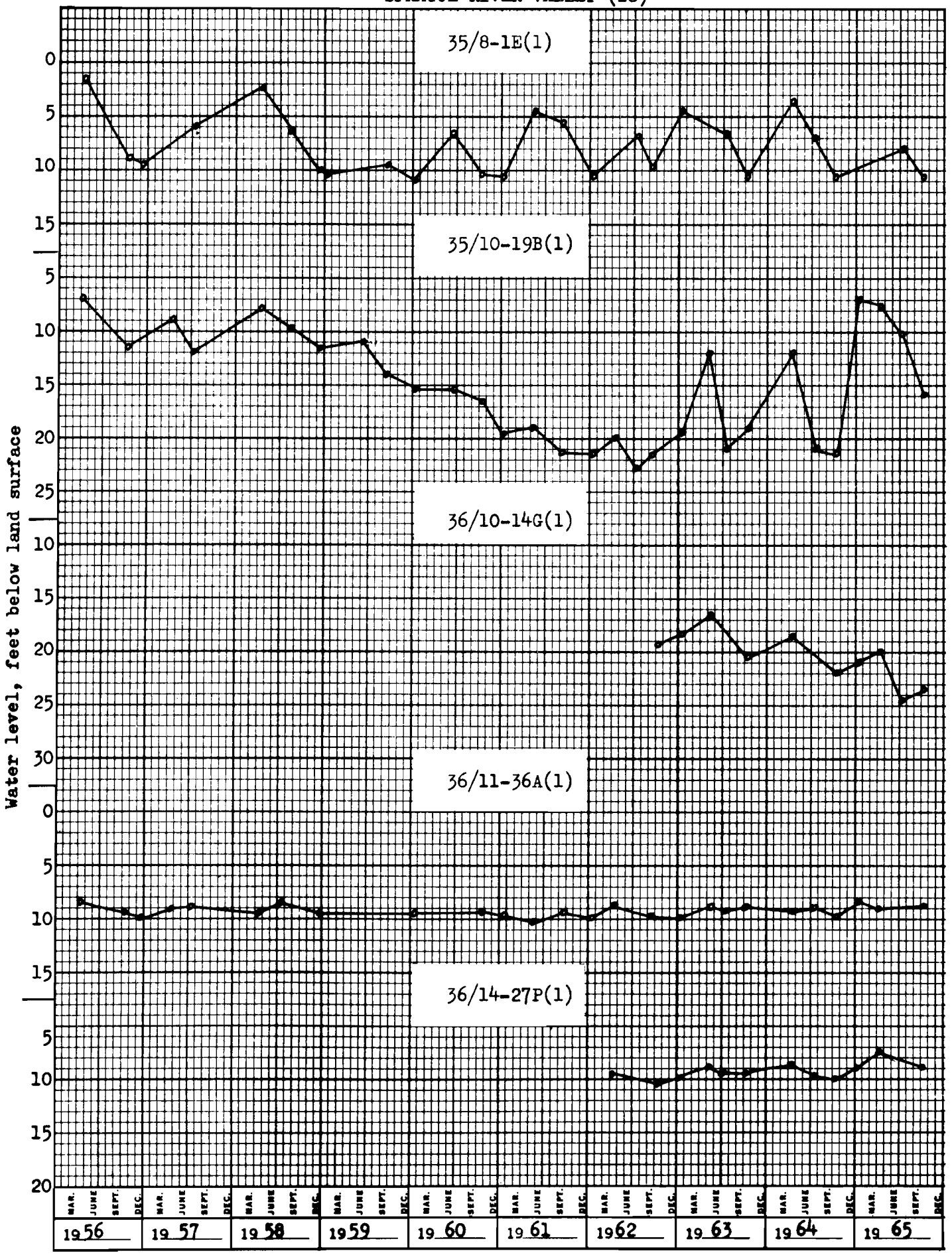
36/11-36A(1) (Frank McBain) is a 223-foot drilled well in volcanic rock located five miles southwest of Beatty.

36/14-27P(1) (Henry Gerber) is a 438-foot drilled well in volcanic rock located about one mile north of Bly.

REFERENCES

Newcomb, R. C., and Hart, D. H., 1958, Preliminary report on the ground-water resources of the Klamath River Basin, Oregon: U. S. Geological Survey open-file report.

SPRAGUE RIVER VALLEY (18)



FORT ROCK AREA (19)

The Fort Rock area is a broad structural basin in Northern Lake County and includes the Christmas Lake area and Fossil Lake area.

Recent subdivision of large tracts of land in this basin has sparked the construction of wells and the development of ground water supplies. Numerous water level measurements throughout the area show a marked similarity in the fluctuations of the water table. In general, the trend of water levels in this area is related to long term changes in the amount of annual precipitation occurring in the surrounding upland areas. New all time high water levels occurred in many wells during 1965. No serious problems of declining water levels have developed in this area.

OBSERVATION WELLS

26/14-5A(1) (V. A. Wagers, formerly D. A. Busch) is a 83.4-foot drilled well located about one mile west of Fort Rock.

26/14-12C(1) (Elmer Kohler) is a 200-foot drilled well in sand located about 2½ miles southeast of Fort Rock.

26/15-31A(3) (Nick Klerk) is a 225-foot drilled well located seven miles southeast of Fort Rock.

26/15-29B(1) (Delbert Wilson) is a 230-foot drilled well in sand located about seven miles southeast of Fort Rock. Measurements discontinued.

27/15-4G(1) (M. Y. Parks) is a 257-foot drilled well in lava and cinders located about nine miles southeast of Fort Rock. Periodic water level measurements available from 1932, 1935-36 and 1938 to date.

27/16-13B(1) (Bob Morehouse) is a 560-foot drilled well located in Christmas Lake Valley.

27/17-22R(2) (Century Ranch) is a 54-foot drilled well located in Christmas Lake Valley. Periodic water level measurements available from 1938, 1940-44 and 1946 to date.

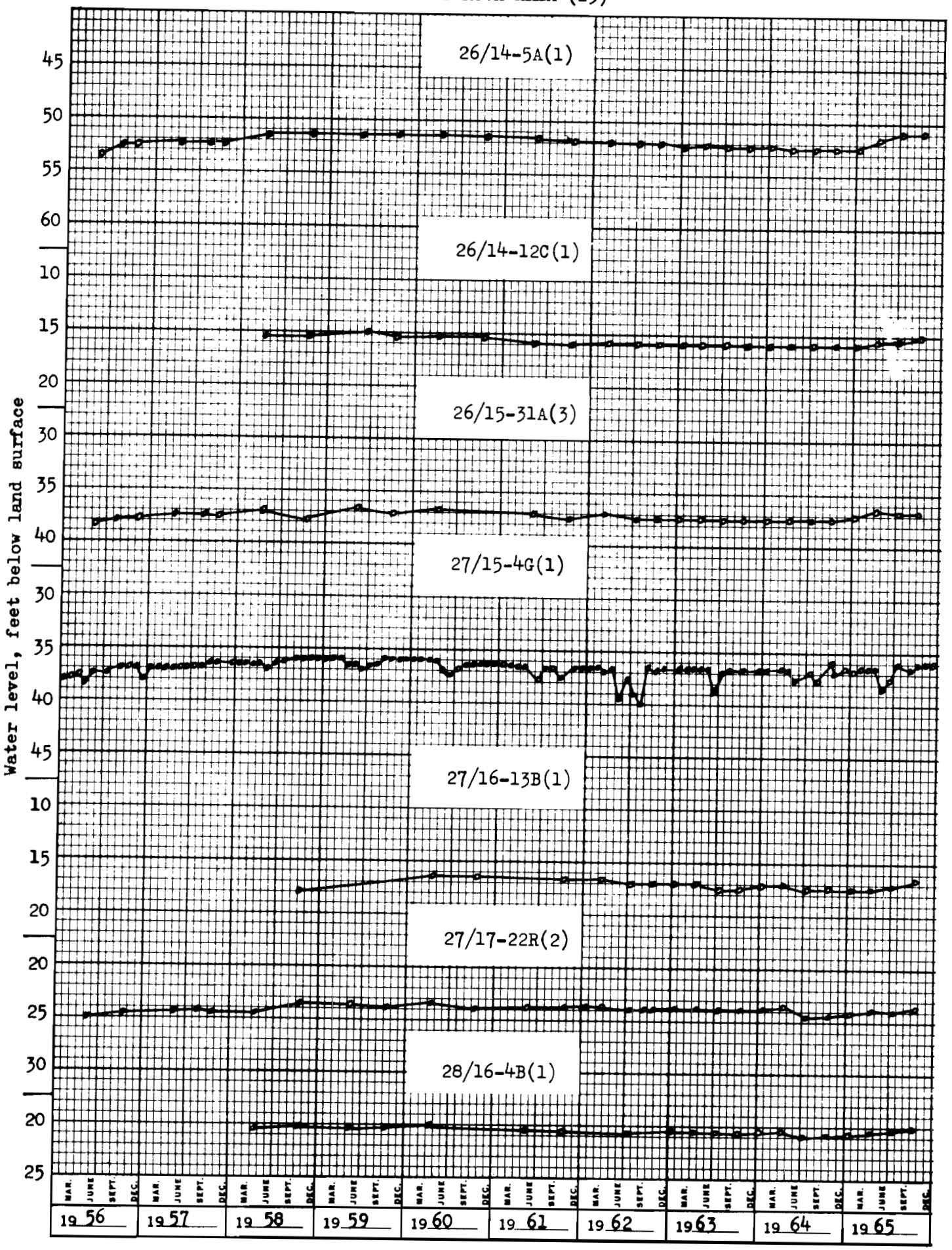
28/16-4B(1) (U.S.B.L.M., formerly L. V. Gray) is a 707-foot drilled well in lava located in Christmas Lake Valley.

REFERENCES

Hampton, E. R., 1962, Geologic factors that control the occurrence and availability of ground water in the Fort Rock Basin, Lake County, Oregon: U.S. Geological Survey Professional Paper 383-B.

Trauger, F. D., 1950, Basic ground water data in Lake County, Oregon: U. S. Geological Survey open-file report.

FORT ROCK AREA (19)



CHEMULT-LAPINE-SISTERS AREA (20)

The eastern slope of the Cascade Mountains contains many ground-water reservoirs. The most permeable of these are generally associated with the younger volcanic rocks and associated cinder deposits. As the demand for additional water in this area increases, and as the availability of surface water supplies becomes so costly or unobtainable, communities, industries, and possibly agriculture will turn to the development of ground water supplies. Large capacity wells can be obtained throughout large parts of the area.

Water levels in many of the wells in this area, which have been declining slowly during the period 1959-64, showed a marked reverse in trend in 1965 and are now rising. These changes are believed due to changes in ground-water recharge which is controlled by climatic conditions.

OBSERVATION WELLS

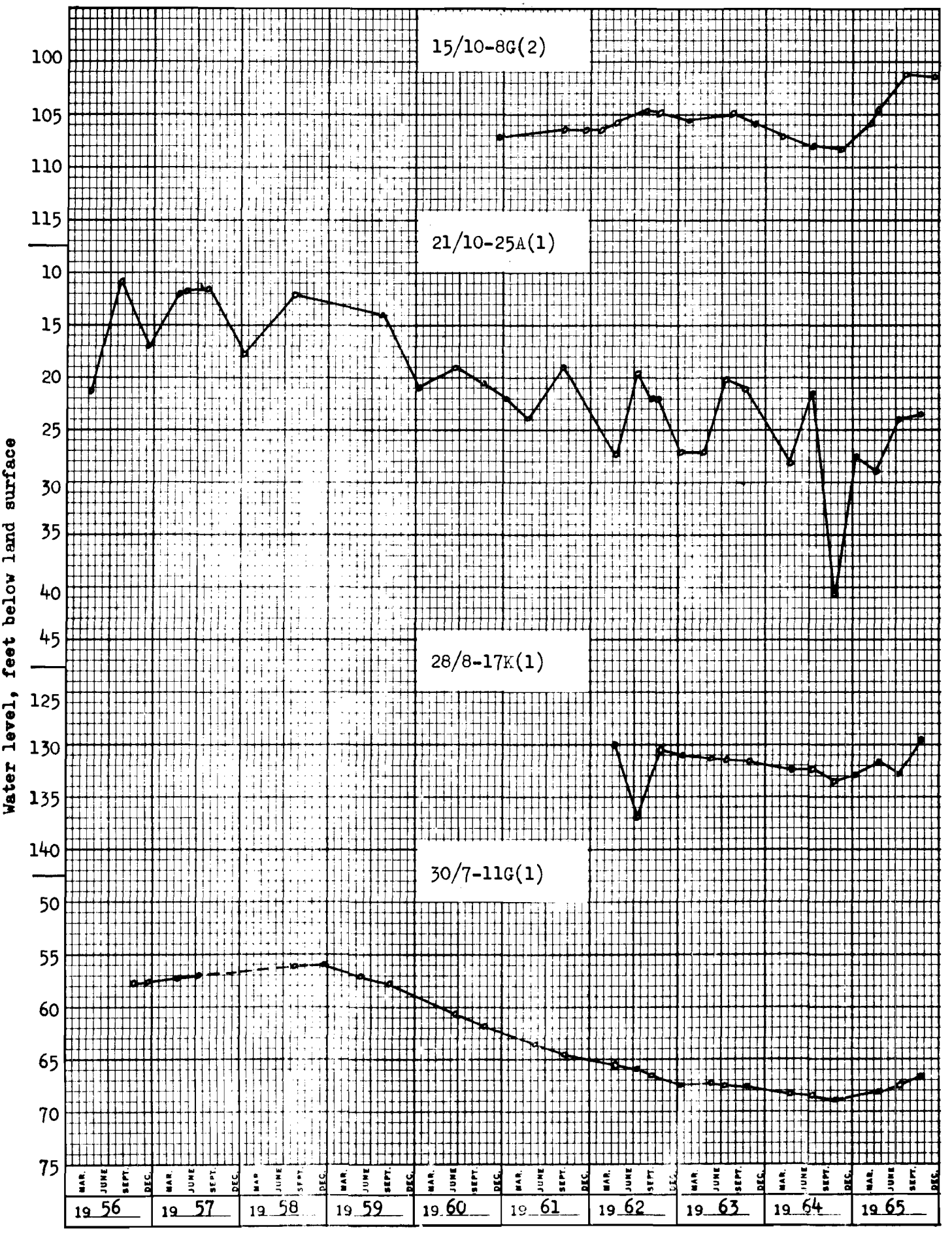
15/10-8G(2) (Ross Hammond) is a 228-foot drilled well in volcanic rock located near Sisters.

21/10-25A(1) (Inez Kellems) is a 100-foot drilled well in sand and gravel located about six miles north of LaPine.

28/8-17K(1) (Winema Lumber Co.) is a 361-foot drilled well in lava located about seven miles south of Chemult.

30/7-11G(1) (Crown Zellerbach Corp.) is a 123-foot drilled well located near Klamath Marsh.

CHEMULT-LAPINE-SISTERS AREA (20)



PRINEVILLE AREA (21)

The Prineville area includes the Ochoco Creek and Crooked River Valleys in and around the City of Prineville. Ground water occurs at shallow depth in the sandy alluvial deposits and from a single sand and gravel stratum that lies at the base of the alluvial deposits. The shallow ground-water reservoir contains unconfined ground water that furnishes supplies generally less than 20 gallons per minute.

The thin sand and gravel stratum lying at the base of the alluvial deposits contains confined ground water that at places has an artesian head of from 70 to 80 feet above land surface. At Prineville, wells have been constructed in this confined ground-water reservoir with yields in excess of 500 gallons per minute.

Recharge to the confined ground-water reservoir is believed to come from leakage in irrigation canals and irrigation in the area north and northwest of Prineville. There has been some decline of water levels in the artesian zone, however, there has been some recovery during the past five years.

OBSERVATION WELLS

14/15-15Q(1) (L. H. McPhetridge, formerly M. D. Colahan) is a 210-foot drilled artesian well in sand and gravel located about four miles northwest of Prineville. Periodic water level measurements available from 1945 to date.

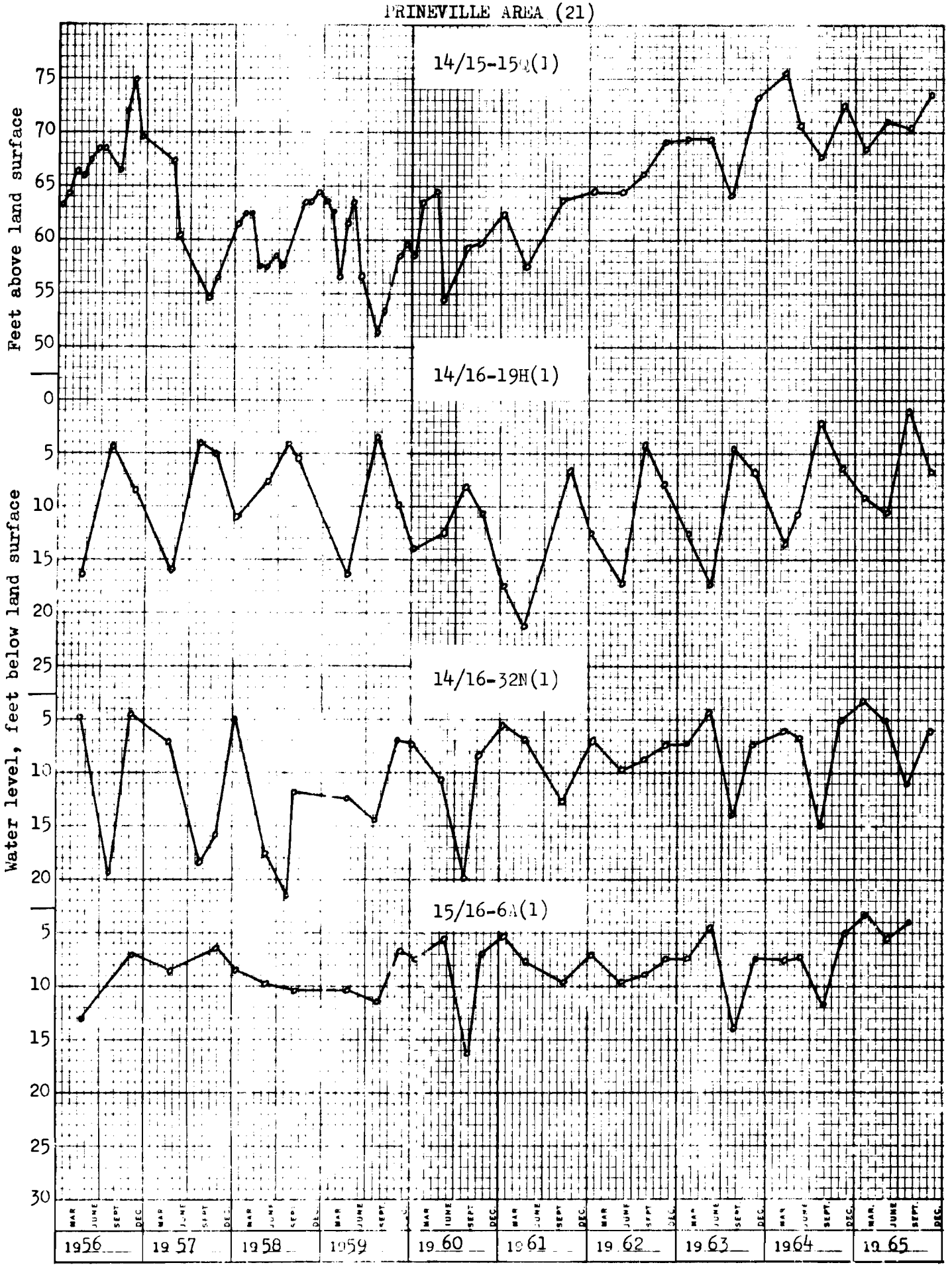
14/16-19H(1) (Leslie Clauson) is a 47-foot drilled well in sand located about two miles northwest of Prineville. Periodic water level measurements available from 1944 and 1947 to date.

14/16-32N(1) (E. E. Wagoner) is a 160-foot drilled well in sand and gravel located in Prineville. Periodic water level measurements available from 1944 to date.

15/16-6A(1) (M. E. Gerow, et. al.) is a 240-foot drilled well in sand and gravel located in Prineville. Periodic water level measurements available from 1944 to date.

REFERENCES

Robinson, J. W., and Price, Don, 1963, Ground water in the Prineville Area, Crook County, Oregon: U. S. Geological Survey Water Supply Paper 1619-P.


PRINEVILLE AREA (21)
14/15-15Q(1)
14/16-19H(1)
14/16-32N(1)
15/16-6A(1)
Feet above land surface
Water level, feet below land surface
75
70
65
60
55
50
0
5
10
15
20
25
5
10
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5
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MEDFORD AREA (22)

The Medford area, like other parts of southwestern Oregon, is noted for its lack of permeable ground-water reservoirs. Most wells produce adequate domestic or small group domestic supplies. The development of large ground-water supplies in this area for irrigation or industrial purposes is not likely.

OBSERVATION WELLS

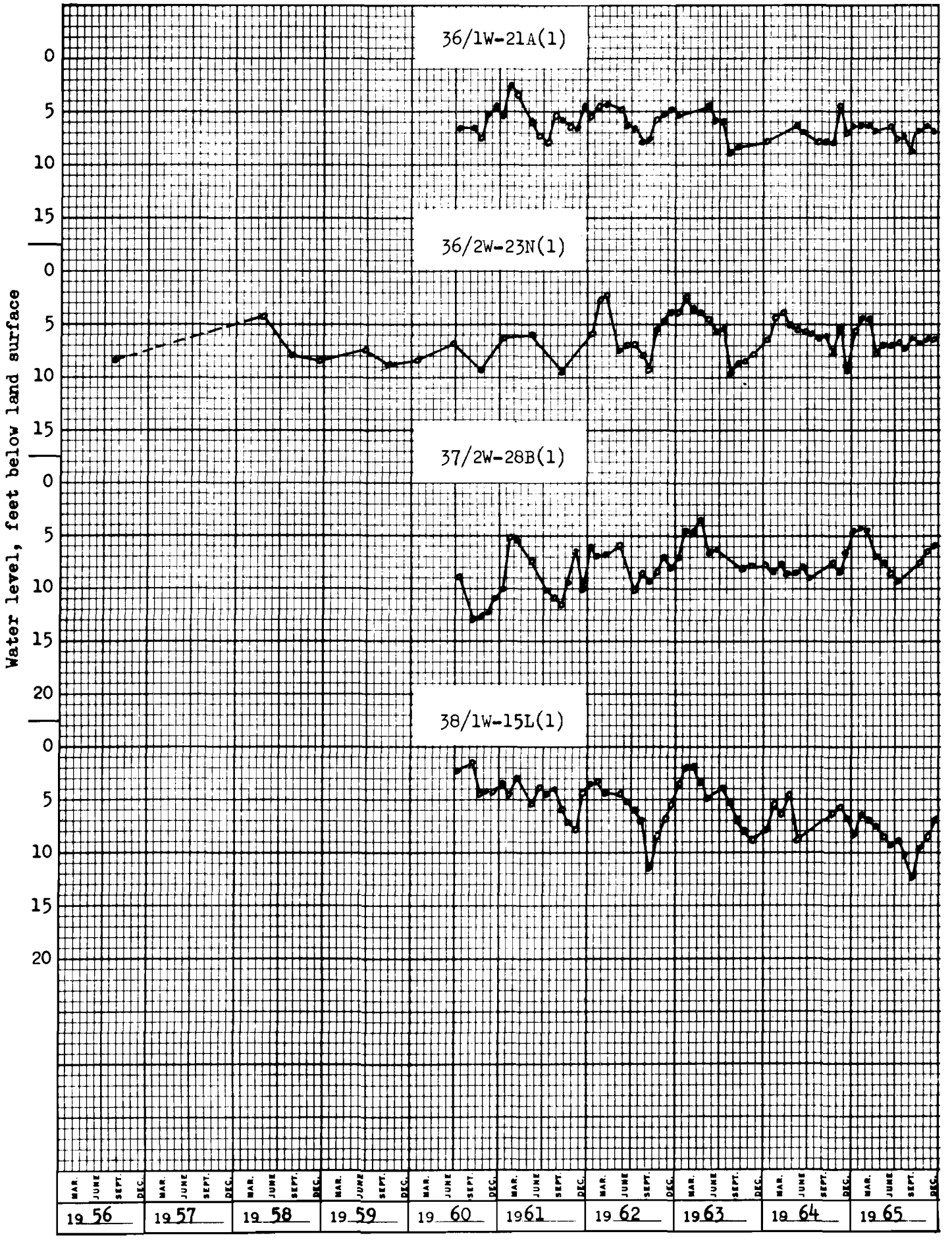
36/1W-21A(1) (Bud Hoover) is a 95-foot drilled well in shale located near White City.

36/2W-23N(1) (U.S.G.S.) is a 110-foot drilled well in sand and gravel located about three miles west of White City.

37/2W-28B(1) (Southern Oregon Experimental Station) is a 145-foot drilled well in sedimentary rock located about two miles northeast of Jacksonville.

38/1W-15L(1) (City of Phoenix) is a 41-foot drilled well in sedimentary rock located in Phoenix. (Erroneously reported as their 700 foot well in Ground Water Report No. 5).

MEDFORD AREA (22)



GRANTS PASS AREA (23)

The Grants Pass area, like other parts of southwestern Oregon, is noted for the lack of permeable ground-water reservoirs. Most wells produce adequate domestic supplies or small group domestic supplies. The development of large ground-water supplies in this area for irrigation or industrial purposes is not likely.

OBSERVATION WELLS

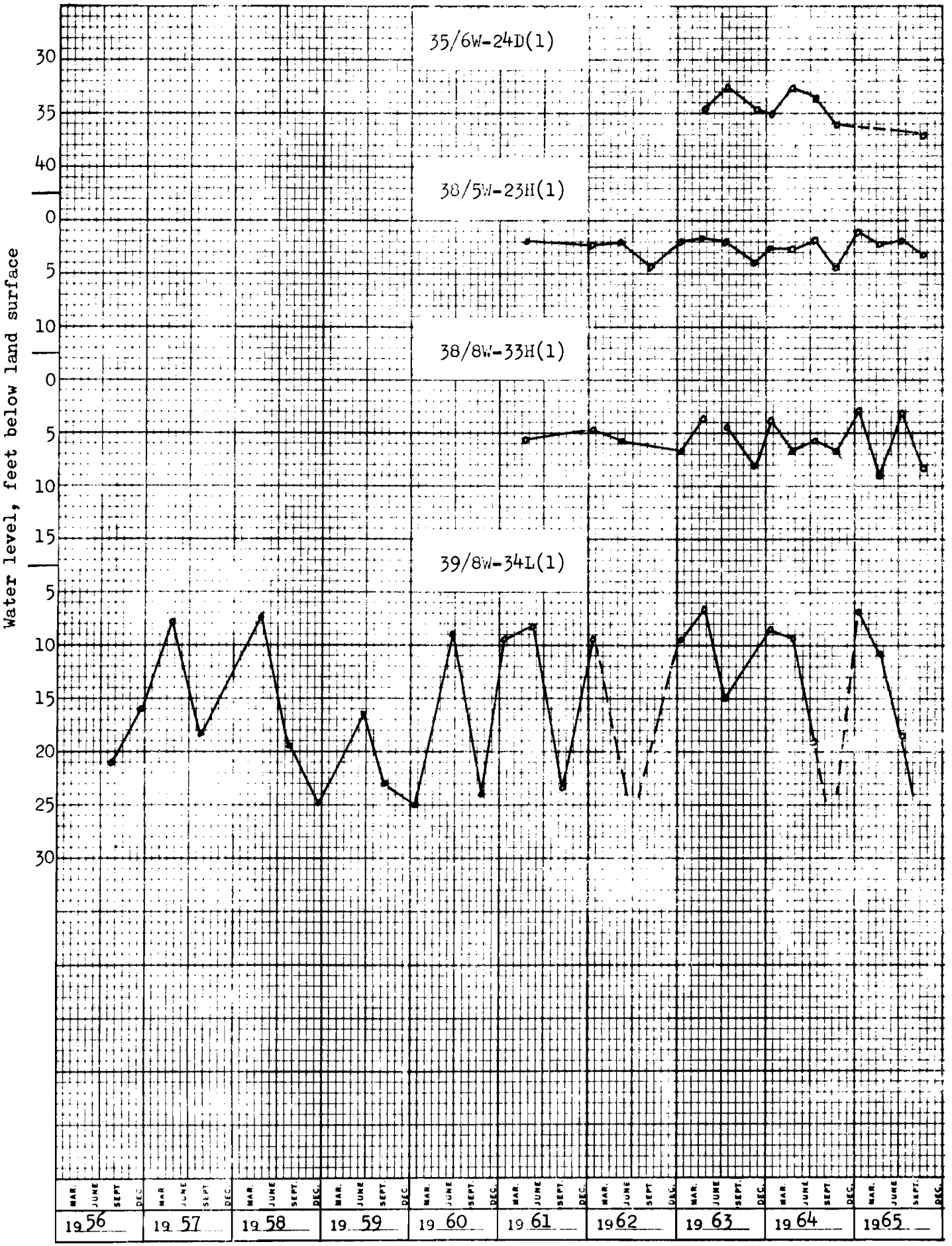
35/6W-24D(1) (Oregon State Highway Department) is a 123-foot drilled well in granite located about five miles northwest of Grants Pass.

38/5W-23H(1) (J. Katzenbach) is a 62-foot drilled well located about two miles southwest of Provolt.

38/8W-33H(1) (J. R. Smith) is a 29-foot drilled well in sand and gravel located about two miles north of Kerby.

39/8W-34L(1) (U.S.G.S.) is a 119-foot drilled well in sand and gravel located about three miles southeast of Cave Junction. Periodic water level measurements available from 1952 to date.

GRANTS PASS AREA (23)



COOS BAY AREA (24)

The sand dune area lying along the coast north of Coos Bay contains tha most productive ground-water reservoirs in the entire coastal area. The dune sands which exceed several hundred feet in thickness, absorb large amounts of the relatively heavy precipitation. It is estimated that the sand dunes in this area are capable of sustaining a yield of over 2,000,000 gallons per day per square mile.

To date only a small part of the ground-water supply in this area has been developed and put to use.

OBSERVATION WELLS

27/13W-27C(1) (City of Coquille) is a 150-foot drilled well in sandstone located about three miles northwest of Coquille.

23/13W-34G(1) (Pacific Power & Light Co.) is a 137-foot drilled well in sand located about nine miles north of North Bend.

24/13W-10L(1) (Pacific Power & Light Co.) is a 505-foot drilled well in sand located about six miles north of North Bend. Water level information relates to sand formation encountered in first 120 feet.

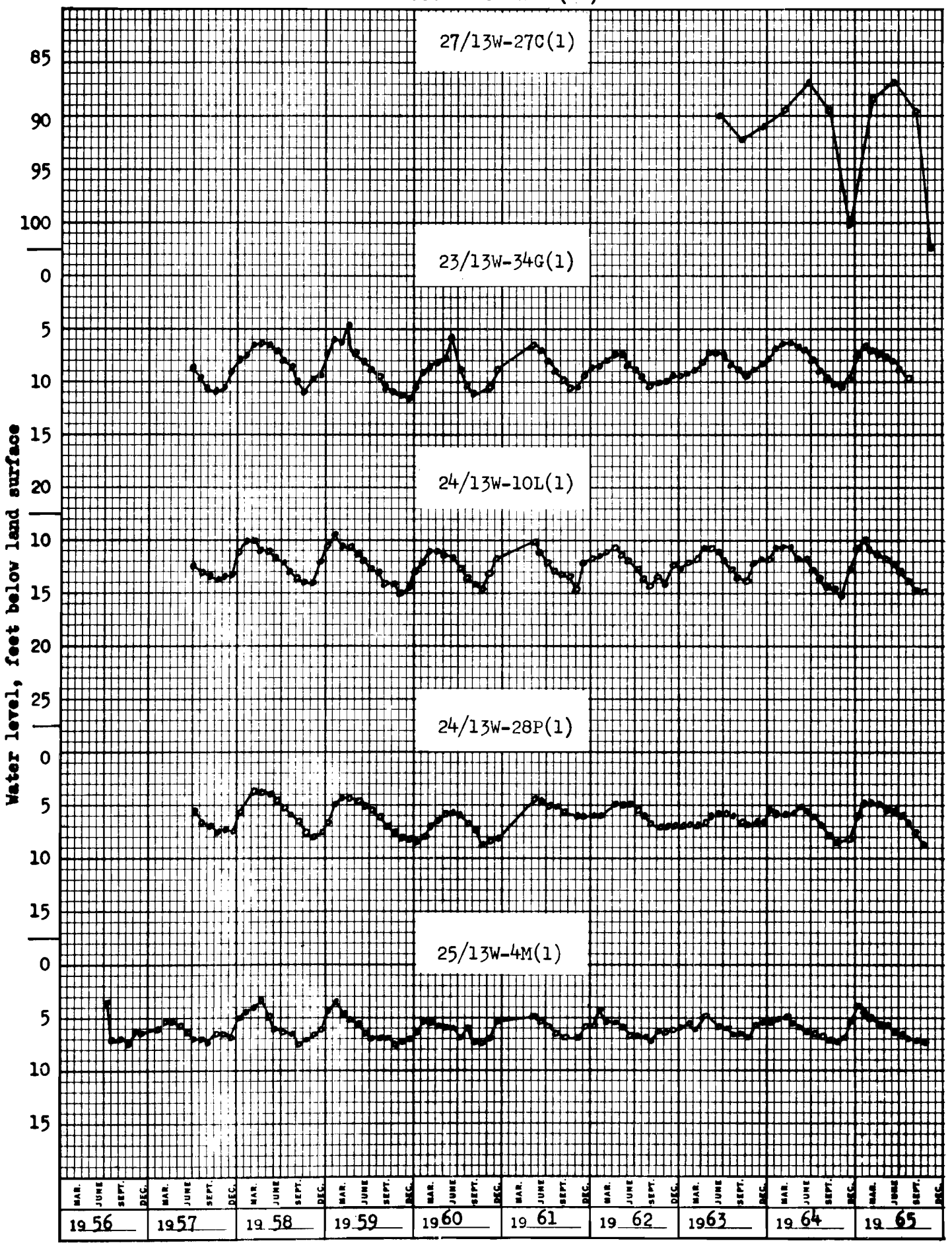
24/13W-28P(1) (Pacific Power & Light Co.) is a 179-foot drilled well in sand located about five miles northwest of North Bend.

25/13W-4M(1) (Pacific Power & Light Co.) is an 18.5-foot jetted well in sand located about one mile north of North Bend.

REFERENCES

Brown, S. G. and Newcomb, R. C., 1963, Ground-water resources of the coastal sand dune area north of Coos Bay, Oregon: U. S. Geological Survey Water Supply Paper 1619-D.

COOS BAY AREA (24)



UMPQUA RIVER VALLEY (25)

The Umpqua River Valley, like most of southwestern Oregon, is underlain by relatively impermeable rock formations. Wells in this area generally yield only small supplies of water. The development of large ground-water supplies for irrigation or industrial purposes in this area is unlikely.

OBSERVATION WELLS

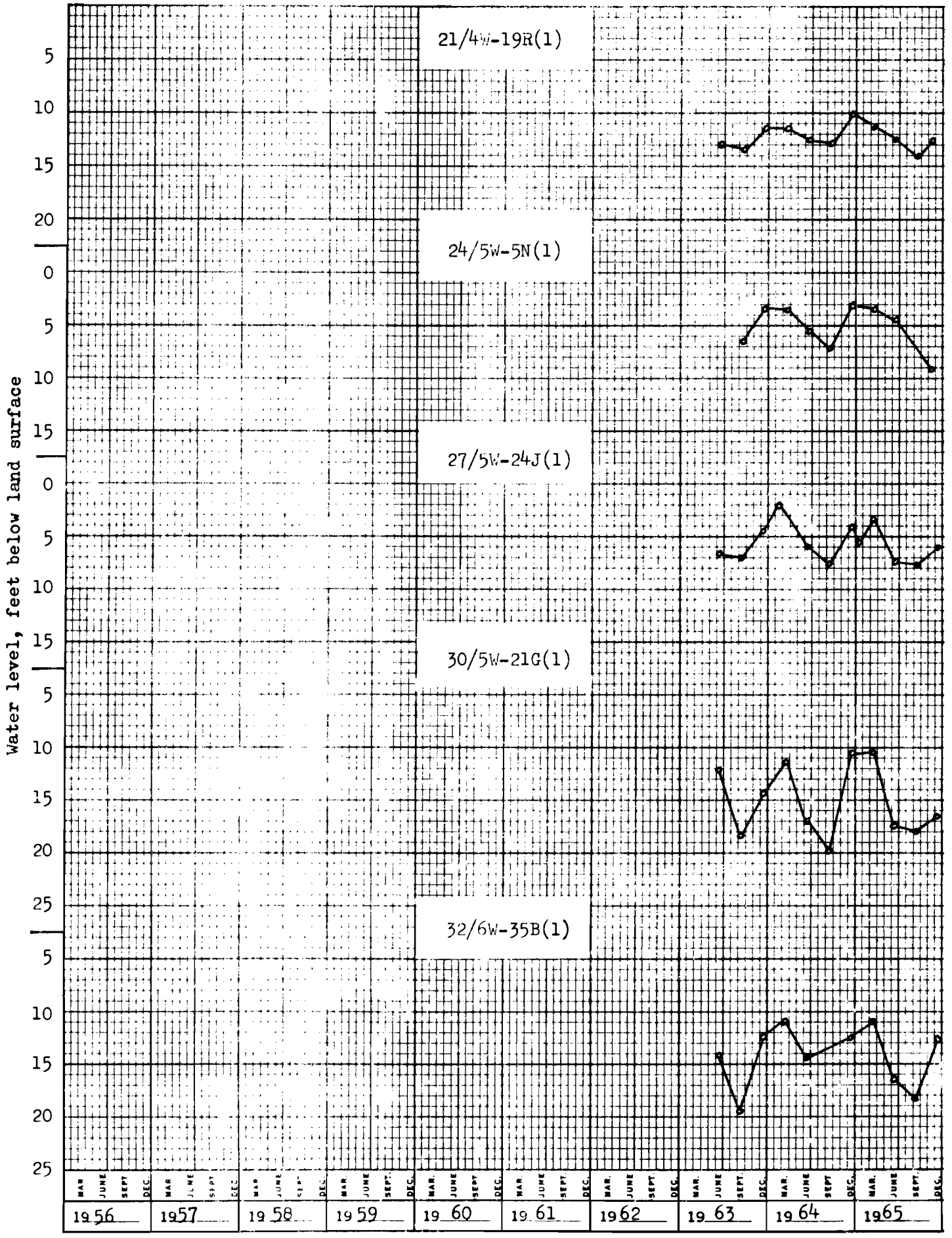
21/4W-19R(1) (Douglas County Parks Department) is a 110-foot drilled well in Curtin.

24/5W-5N(1) (Robert M. Crawford) is an 80-foot drilled well in shale located about six miles north of Oakland.

27/5W-24J(1) (Douglas County Parks Department) is a 116-foot drilled well located about six miles east of Roseburg.

30/5W-21G(1) (Douglas County Parks Department) is a 90-foot drilled well located about one mile north of Canyonville.

32/6W-35B(1) (George H. Wells) is a 100-foot drilled well located about two miles southeast of Glendale.


21/4W-19R(1)
24/5W-5N(1)
27/5W-24J(1)
30/5W-21G(1)
32/6W-35B(1)
Water level, feet below land surface
5
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WILLAMETTE BASIN - LANE COUNTY (26)

The Willamette River Valley has large quantities of water available for recharge, but the varied character and extent of the geologic units causes major differences in the availability of ground water. One of the major differences is caused by the difference in rock types in the Cascade Mountains and the Coast Range, and the difference in the runoff characteristics of these two areas. The Cascade Mountains are in large part composed of young volcanic rocks, while large areas of the Coast Range are composed of marine sedimentary rock and older volcanic rocks. The swift mountain streams flowing off the volcanic terrane of the Cascade Range carry coarse alluvial sediments that have been deposited in the alluvial fans along the eastern margin of the Willamette Valley. Slower moving streams flowing off the softer marine sediments and weathered volcanic rocks of the Coast Range deposited relatively fine-grained deposits of clay, silt and sand along the western margin of the Valley. (Continued on Page 90).

OBSERVATION WELLS

16/2W-34P(1) (M. A. Nadeau) is a 73-foot drilled well in sand and gravel located about one mile south of Mohawk.

16/3W-32G(1) (Leo Sidwell) is a 39-foot drilled well in sand and gravel located near Coburg. Periodic water level measurements available from 1928-30, 1935-36 and 1938 to date.

17/2W-32C(1) (Weyerhaeuser Timber Co.) is a 175-foot drilled well in sand and gravel located near Springfield.

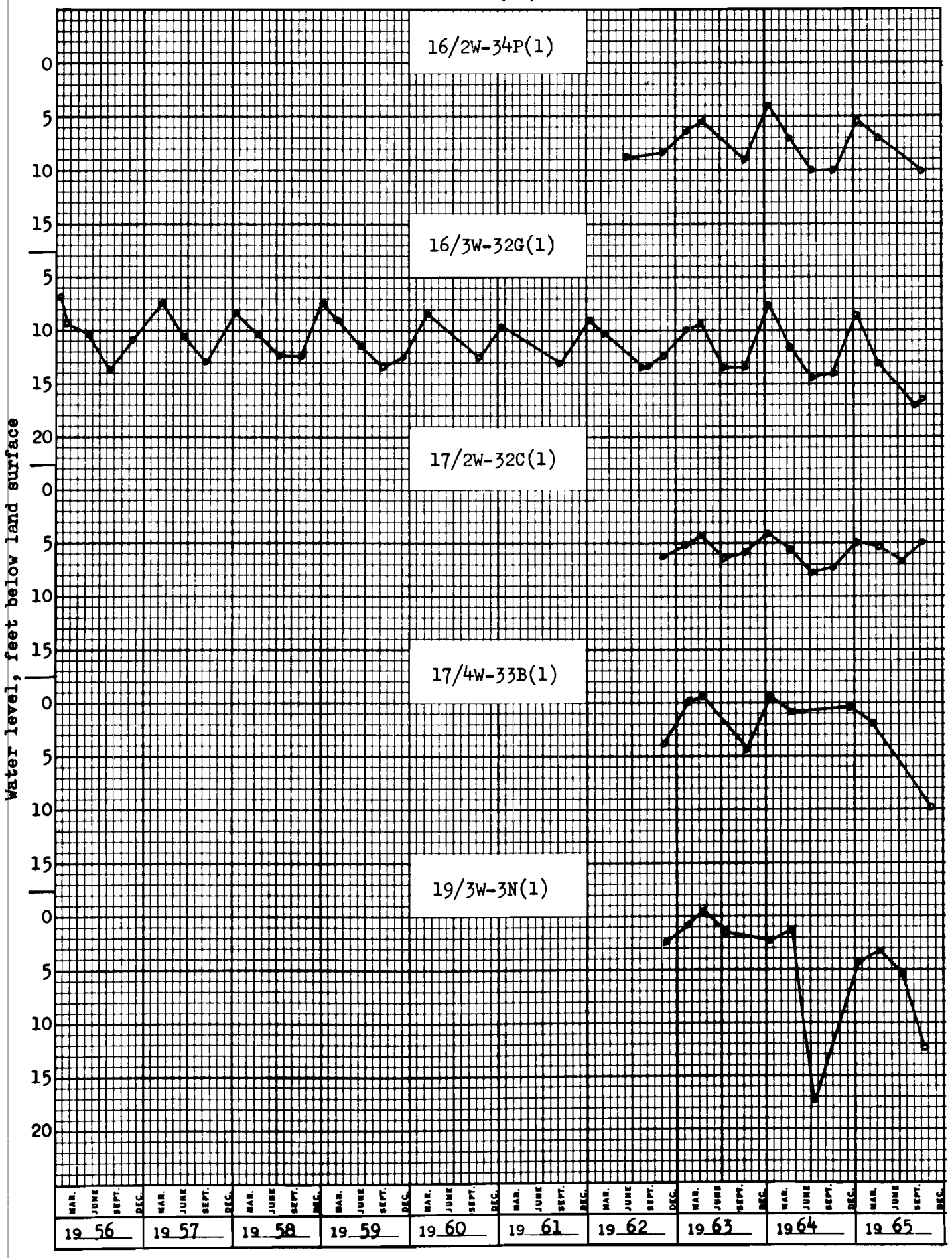
17/4W-33B(1) (Westlawn Memorial Cemetery) is a 150-foot drilled well in sand and gravel located about three miles west of Eugene.

19/3W-3N(1) (Oregon State Game Commission) is a 200-foot drilled well in sandstone located about four miles northwest of Creswell.

REFERENCES

Piper, Arthur, 1942, Ground-water resources of the Willamette Valley, Oregon: U. S. Geological Survey Water Supply Paper 890.

WILLAMETTE BASIN (26) - LANE COUNTY



The difference in character of the alluvial sediments from one side of the valley to the other accounts for the great difference in the availability of ground water in these two areas. Productive ground water reservoirs are common along the eastern half of the valley but are missing along most of the western side of the valley.

In Lane County the productive ground water reservoirs are chiefly related to the alluvial deposits of the McKenzie and Willamette Rivers. Older marine and volcanic rocks underlying the alluvial deposits are generally fine-grained and are capable of yielding only small supplies of ground water. The permeable character and shallow occurrence of the alluvial deposits creates a serious problem as this source of ground water can be easily polluted.

In Linn County, the productive ground water reservoirs are similar to those in Lane County being chiefly the alluvial deposits along the Willamette and Santiam Rivers. The older formations underlying the alluvial deposits are generally of low permeability and not capable of yielding large supplies of ground water.

OBSERVATION WELLS

9/1W-23P(1) (Charles Hecht) is a 93-foot drilled well in rock located about two miles southeast of Stayton.

10/1W-28L(1) (Grant Farris) is a 172-foot drilled well in blue shale located about three miles southeast of Scio.

10/4W-12F(1) (Henry Hoefer) is a 25-foot dug well in gravel located about seven miles north of Albany. Periodic water level measurements available from 1928-30, 1935-36 and 1938 to date.

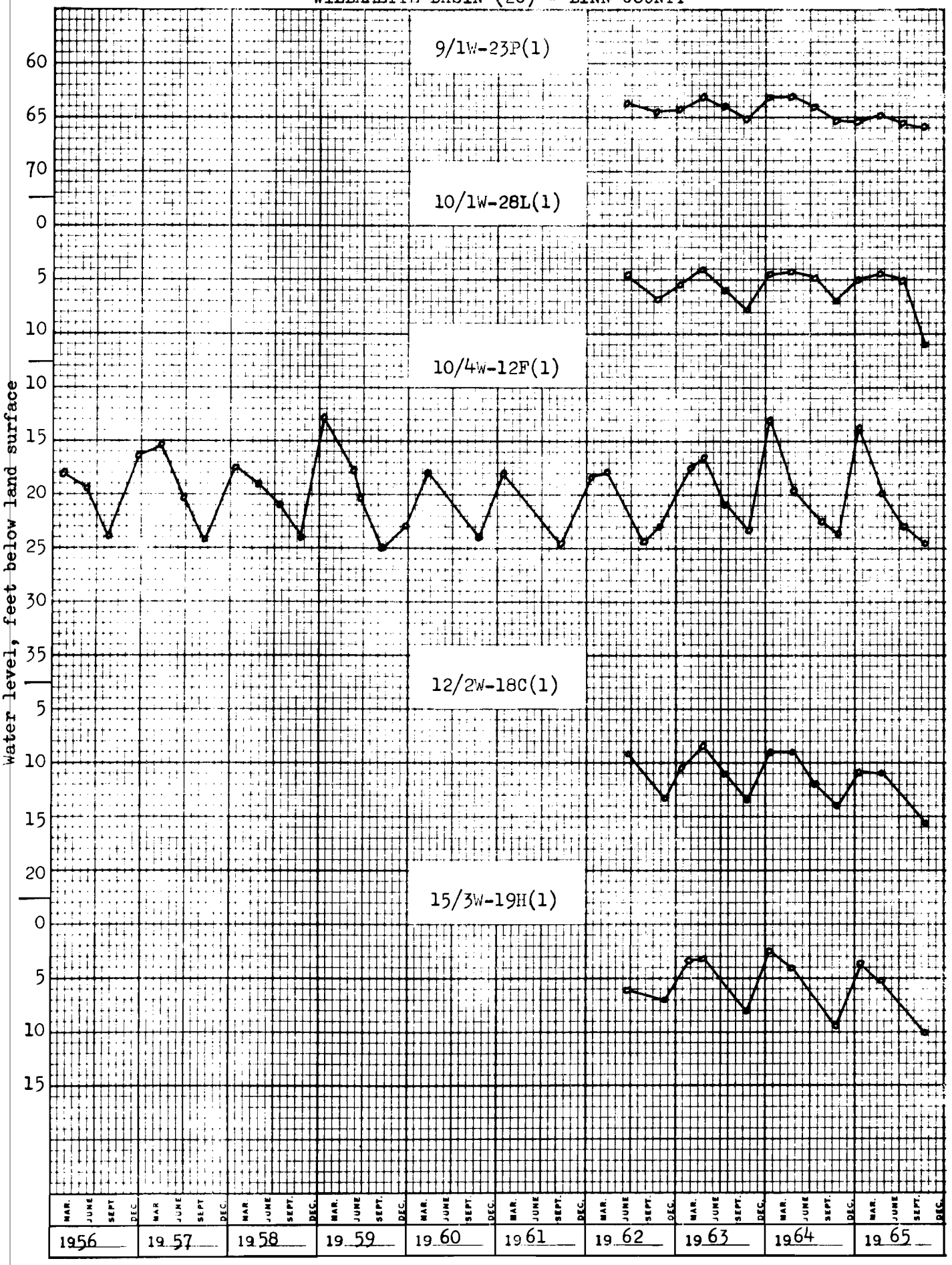
12/2W-18C(1) (Henry DeManette) is a 175-foot drilled well in rock located about four miles west of Lebanon.

15/3W-19H(1) (Edgar Grimes) is a 98-foot drilled well in sand and gravel located about four miles southeast of Harrisburg.

REFERENCES

Piper, Arthur, 1942, Ground-water resources of the Willamette Valley, Oregon: U. S. Geological Survey Water Supply Paper 890.

WILLAMETTE BASIN (26) - LINN COUNTY



WILLAMETTE BASIN - BENTON COUNTY (26)

Most of the upland areas in Benton County are underlain with volcanic rocks or marine sedimentary rocks. These formations have low permeability and are generally capable of yielding only small supplies of ground water. The older alluvium along the western margin of the Willamette Valley, which was derived from the Coast Range, is generally fine-grained and capable of yielding only small supplies of ground water. The most productive ground-water reservoir is the alluvial gravels underlying the flood plain of the Willamette River along the eastern edge of the county. Many of the shallow wells in the gravel alluvium have been developed to yields ranging from 500 to 1,000 gallons per minute. The extreme permeability of these materials and their near surface occurrence makes this source of ground water subject to pollution problems.

OBSERVATION WELLS

10/3W-32E(1) (D. E. Nebergall) is a 90-foot drilled well in sand located about one mile northeast of Albany.

11/5W-1P(1) (Edward C. Skoubo, formerly Karl Bruinsma) is an 89-foot drilled well in sand rock located about four miles northeast of Corvallis.

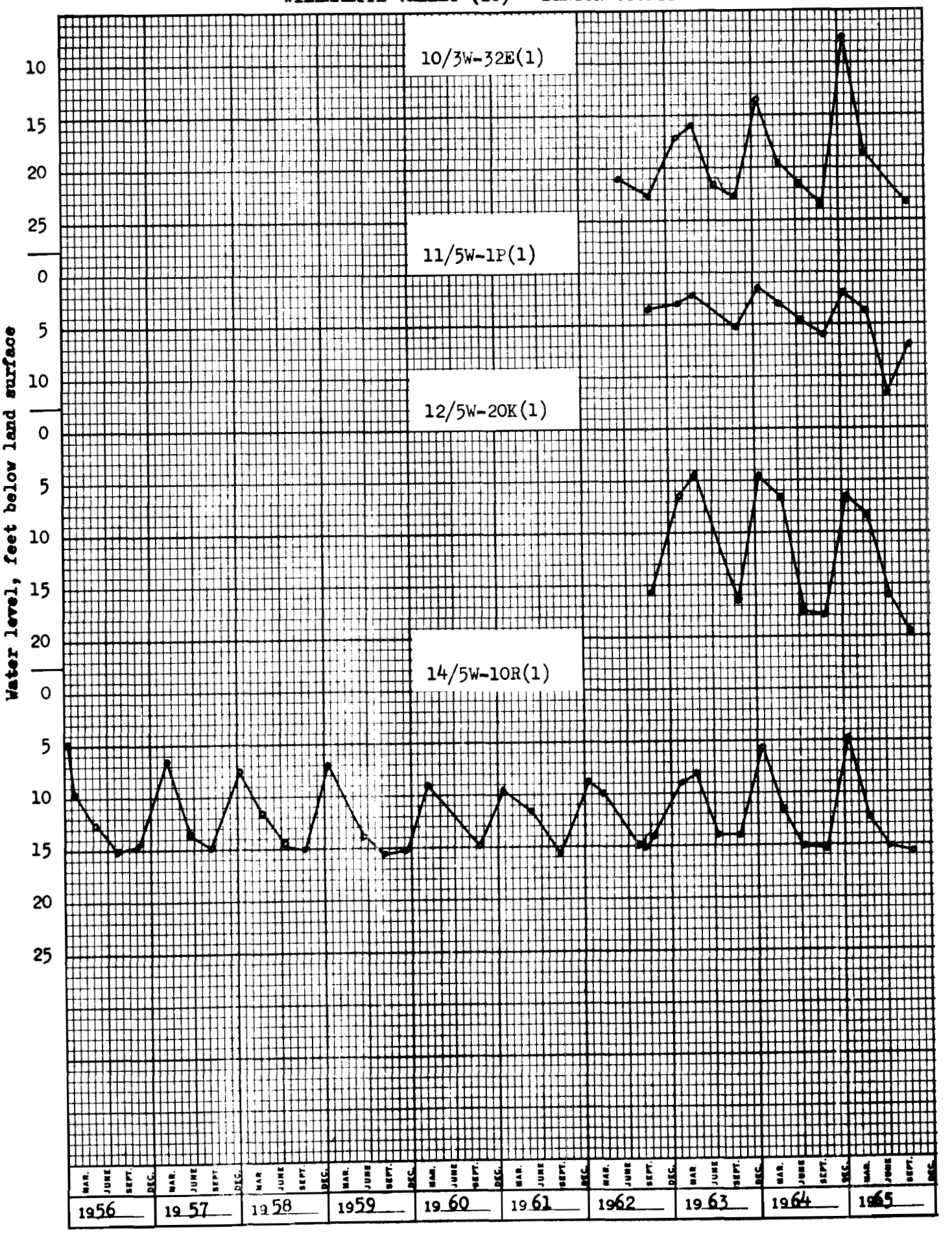
12/5W-20K(1) (C. A. McDonald) is a 100-foot drilled well in sand and gravel located about three miles southwest of Corvallis.

14/5W-10R(1) (Chris Lindseth) is a 19-foot driven well in silt located about four miles north of Monroe. Periodic water level measurements available from 1929-30, 1935-36 and 1938 to date.

REFERENCES

Piper, Arthur, 1942, Ground-water resources of the Willamette Valley, Oregon: U. S. Geological Survey Water Supply Paper 890.

WILLAMETTE VALLEY (26) - BENTON COUNTY



The most productive ground-water reservoirs in Polk County are the sand and gravel deposits underlying the flood plain of the Willamette River. At places, these deposits are capable of yielding more than 1,000 gallons per minute to properly constructed wells. A high iron content of the ground water in some of these alluvial deposits may restrict the use of this supply.

Most of the other rock units in Polk County, with the exception of the basaltic lava flows underlying the Eola Hills are fine-grained and are generally capable of yielding only small supplies of ground water. Deep wells drilled into the marine sedimentary rocks which underlie a large part of the county often encounter salt water. The lavas underlying the eastern slope of the Eola Hills are generally capable of yielding small to moderate supplies of water.

OBSERVATION WELLS

7/3W-10E(1) (Leland Brandt) is a 150-foot drilled well in sand and gravel about three miles north of Salem.

8/4W-3B(1) (Theodore Muller) is a 60-foot drilled well in gravel located about four miles southeast of Rickreall.

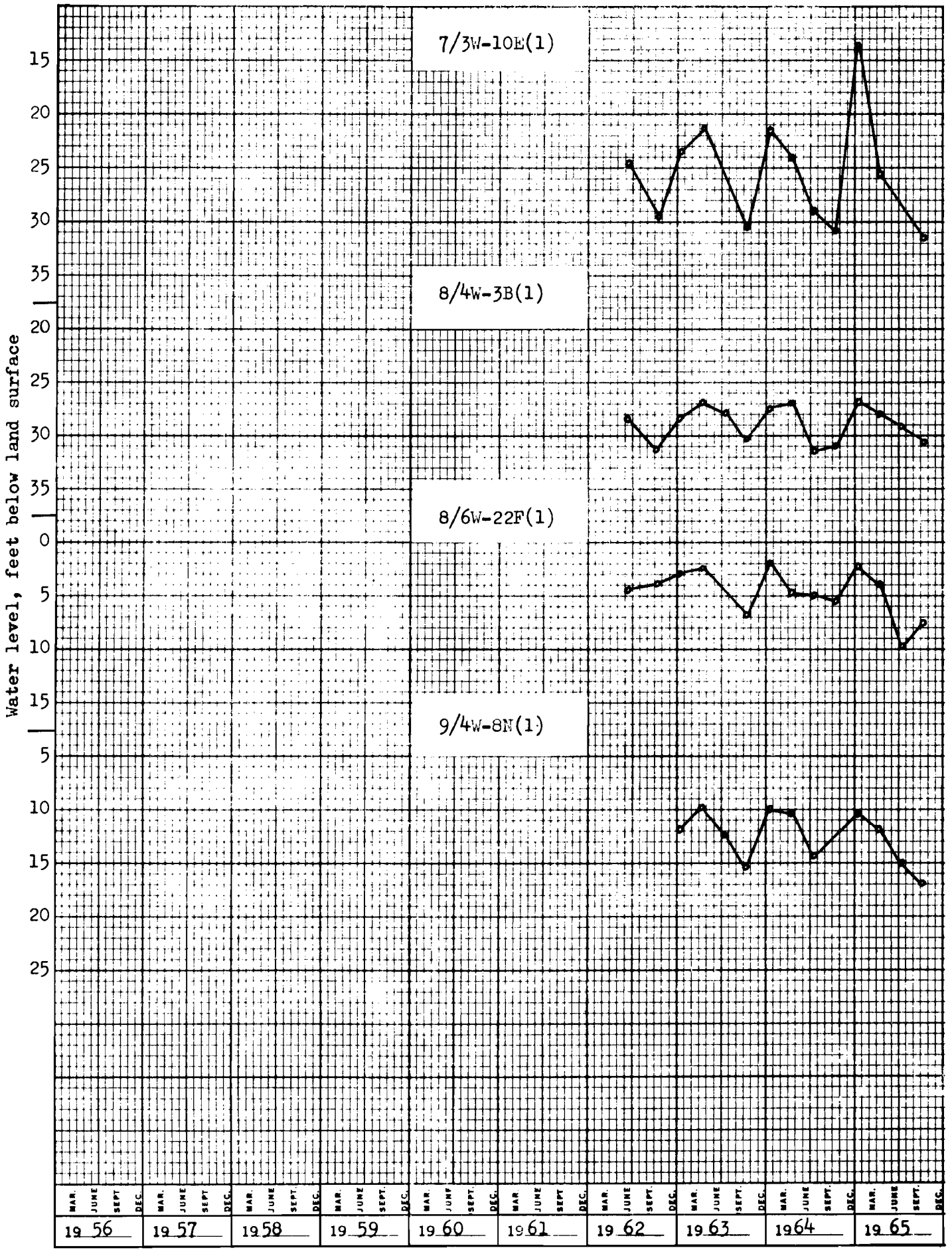
8/6W-22F(1) (Edward Bakke) is a 79-foot drilled well located near Falls City.

9/4W-8N(1) (D. W. Christianson) is a 120-foot drilled well in sand and gravel located about eight miles south of Independence.

REFERENCES

Price, Don, and Johnson, Nyra A., 1965, Selected Ground Water Data in the Eola-Amity Hills Area, Northern Willamette Valley, Oregon: State Engineer Ground Water Report No. 7.

WILLAMETTE BASIN (26) - POLK COUNTY



The most productive ground-water reservoirs in Marion County are the alluvial gravels underlying the flood plain of the Willamette River and the older gravel strata underlying the French Prairie area.

The Geological Survey investigation has found that recharge has been more than ample to replace the annual discharge from the ground-water reservoir underlying the French Prairie area. During 1960 the pumpage was in the order of 20,000 acre feet, which represented only about 8% of the total volume naturally discharged from the area each year. The total natural discharge was estimated to have been 258,000 acre feet. They concluded that an additional lowering of the water table by 5 feet each irrigation season would result in a more efficient utilization of the ground water reservoir by providing additional storage space to hold water that is now generally rejected during the spring months. This would increase the total available ground water supply in this area to as much as 388,000 acre feet per year. As the amount of water required to irrigate the area is estimated to be about 100,000 acre feet, there appears to be an ample ground water supply available to irrigate the entire area without fear of an overdraft on the ground-water reservoir.

OBSERVATION WELLS

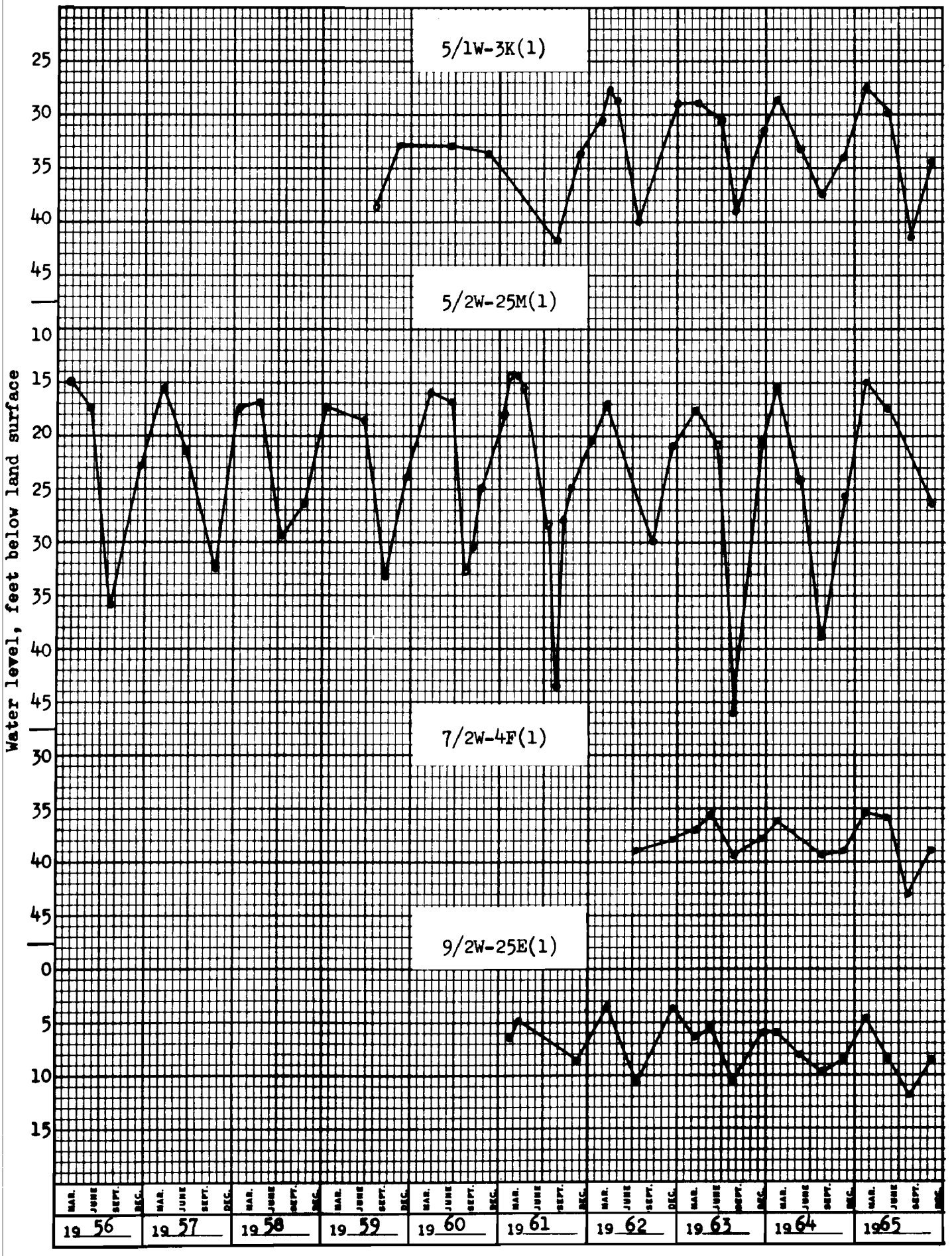
5/1W-3K(1) (Julius Ramlo) is a 102-foot drilled well in gravel located about one mile south of Hubbard.

5/2W-25M(1) (Sam Brown) is a 252-foot drilled well in sand and gravel located about one mile east of Gervais. Periodic water level measurements available from 1929-30, 1935-36 and 1938 to date.

7/2W-4F(1) (P. W. Woelke) is a 165-foot drilled well in sand and gravel located about four miles northeast of Salem.

9/2W-25E(1) (Louis Scofield) is a 25-foot drilled well in gravel located about three miles south of West Stayton.

WILLAMETTE VALLEY (26) - MARION COUNTY



4/1W-23G(1) (Donald Olmstead - formerly Julius Sather) is a 57-foot dug well in silt and sand located about three miles southwest of Aurora. Periodic water level measurements available from 1945 to date.

4/2W-22M(1) (Kirk Bros.) is a 117-foot drilled well in sand located about three miles east of St. Paul.

6/2W-18G(1) (E. A. Hillyer) is a 140-foot drilled well in sand and gravel located about two miles southwest of Brooks.

8/3W-3M(1) (Salem Heights Water District - Madronna Well) is a 350-foot drilled well in basalt located near Salem. Ground-water withdrawal from this reservoir greatly reduced in August 1961 because of completion of pipeline to the Salem municipal water system. Well destroyed in 1965.

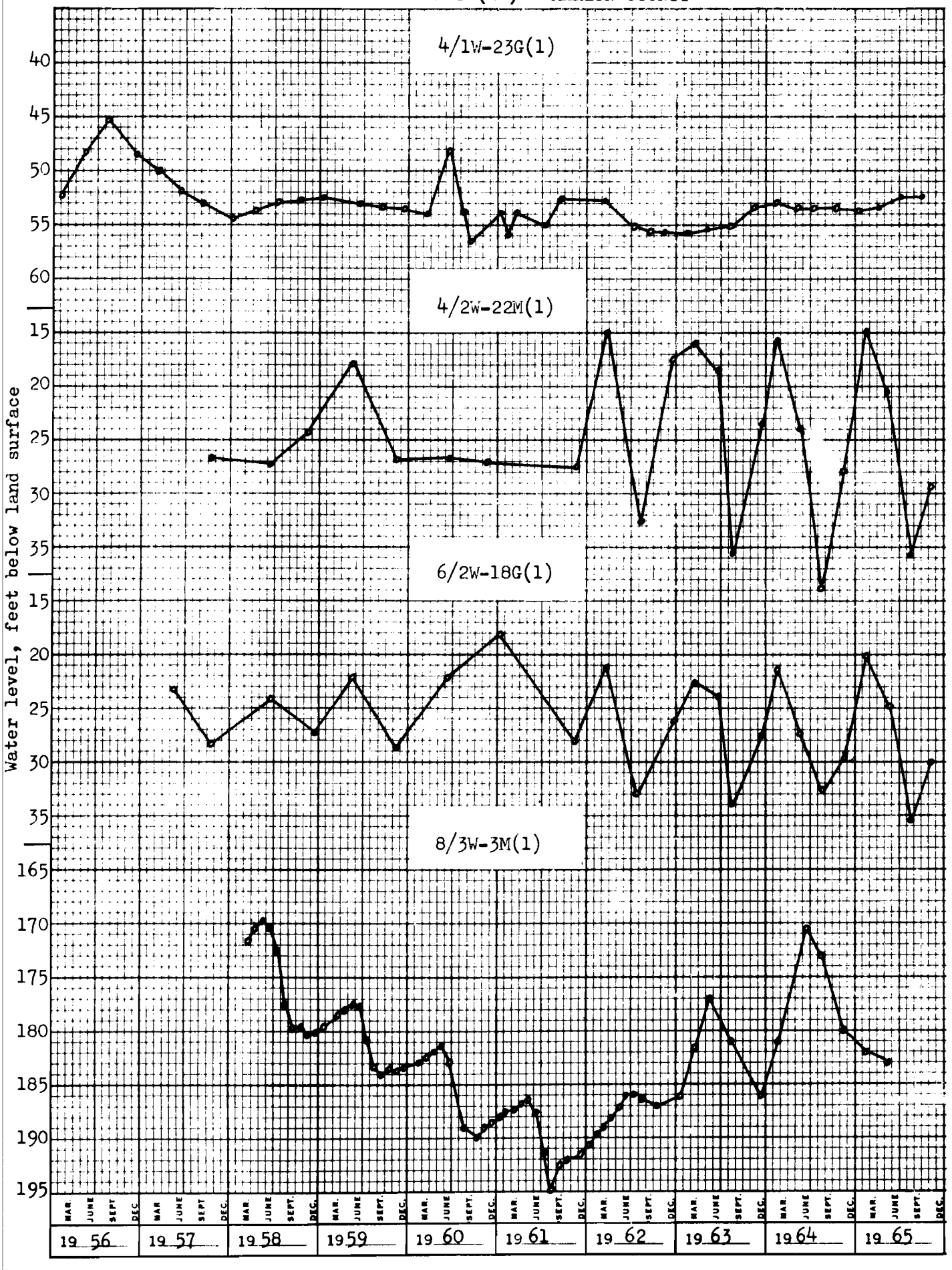
REFERENCES

Hampton, E. R., 1963, Records of wells, water levels and chemical quality of ground water in the Molalla-Salem Slope area, Northern Willamette Valley, Oregon: State Engineer Ground Water Report No. 2.

Price, Don, 1961, Records of wells, water levels and chemical quality of ground water in the French Prairie-Mission Bottom Area, Northern Willamette Valley, Oregon: State Engineer Ground Water Report No. 1.

Price, Don, 1965, Ground-water conditions and availability in the French Prairie Area, Northern Willamette Valley, Oregon: Geological Survey open file report.

WILLAMETTE VALLEY (26) - MARION COUNTY



WILLAMETTE BASIN - YAMHILL COUNTY (26)

The most productive ground-water reservoirs in Yamhill County are the alluvial sand and gravel deposits along the Willamette River. Some of these have been developed to yields ranging from 500 to 800 gallons per minute. The alluvial deposits along the Yamhill River are thin and fine grained and are generally capable of furnishing only small supplies of ground water. The marine sedimentary rocks that underlie large parts of Yamhill County have low permeability and yield only small supplies of ground water. Some of the wells drilled into these marine rocks have encountered salt water.

OBSERVATION WELLS

3/2W-17A(1) (Mack Bennett) is a 200.5-foot drilled well in basalt located about one mile northeast of Newberg.

4/3W-33K(1) (Clayton Trent) is a 220-foot drilled well in sand located about four miles south of Dayton.

5/4W-11D(1) (Norman Longhurst) is a 96-foot drilled well in black sand located about three miles east of Whiteson.

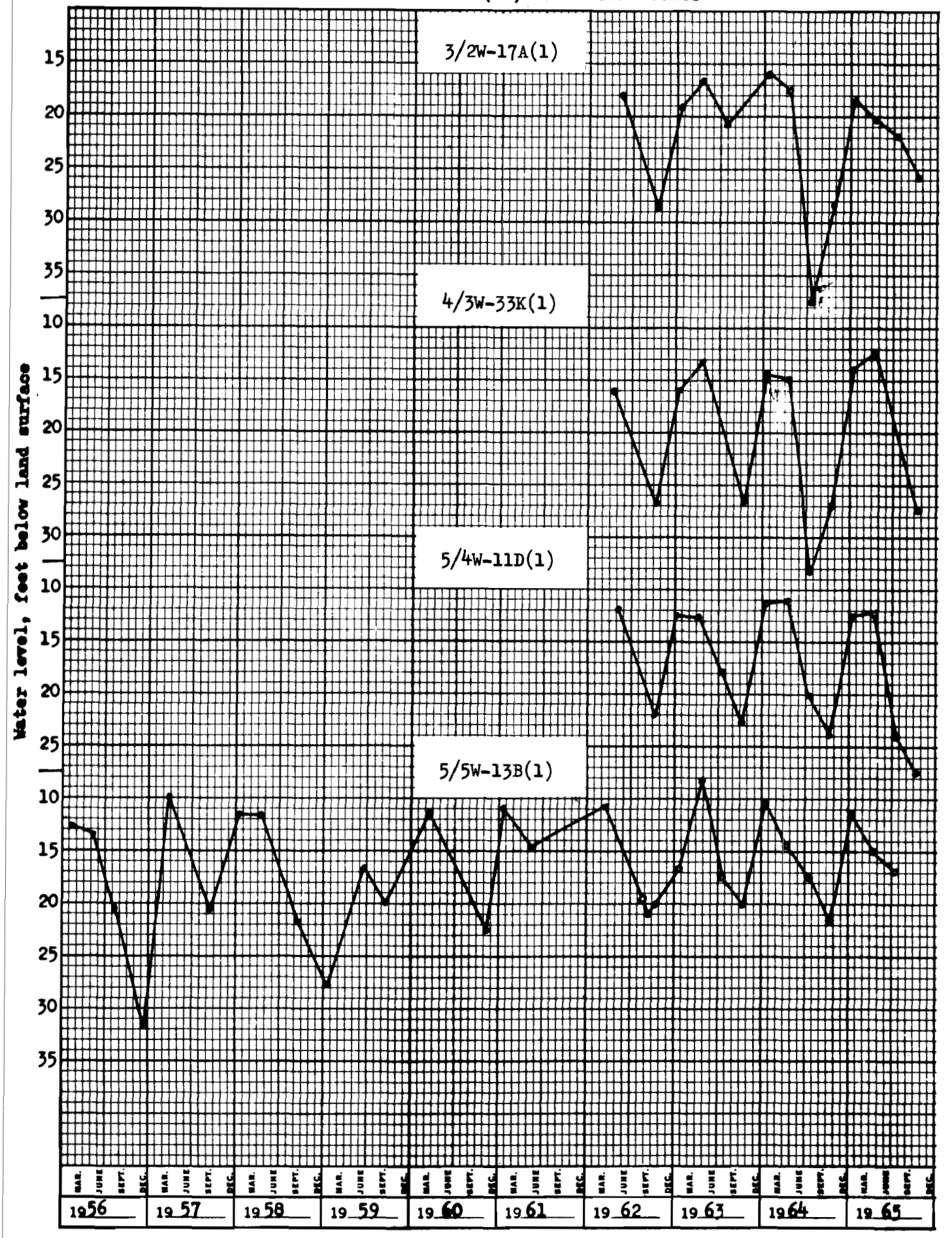
5/5W-13B(1) (George Fuller) is a 64-foot drilled well in sand and gravel located about seven miles southwest of McMinnville. Periodic water level measurements available from 1928-30, 1935-36 and 1938 to date.

REFERENCES

Piper, Arthur, 1942, Ground-water resources of the Willamette Valley, Oregon: U. S. Geological Survey Water Supply Paper 890.

Price, Don, and Johnson, Nyra A., 1965, Selected Ground Water Data in the Eola-Amity Hills Area, Northern Willamette Valley, Oregon: State Engineer Ground Water Report No. 7.

WILLAMETTE BASIN (26) - YAMHILL COUNTY



WILLAMETTE BASIN - CLACKAMAS COUNTY (26)

The Columbia River Basalt Formation is an important source of ground water in Clackamas County. It serves as a source of water in the Wilsonville, Lake Oswego, and Milwaukie areas. Water from basalt is often high in dissolved iron and some areas of "red water" exist in the county. A clay mantle formed by the weathering of the basalt on many of the uplands tends to restrict recharge by shedding precipitation like an umbrella.

In the Canby-Aurora area, moderately large supplies of ground water have been developed in alluvial deposits.

OBSERVATION WELLS

2/2-15D(1) (Byrum Morehouse) is a 347-foot drilled well in sand and gravel located near Gladstone.

2/4-4R(1) (M. K. Smith) is a 400-foot drilled well in sand and gravel located about two miles east of Boring.

3/1W-10N(1) (Charles Jenkins) is a 115-foot drilled well in Columbia River Basalt located about two miles north of Wilsonville. Periodic water level measurements available from 1951 to date.

3/1-34P(1) (Frank Delforge) is a 218-foot drilled well in sand and gravel located about one mile east of Canby.

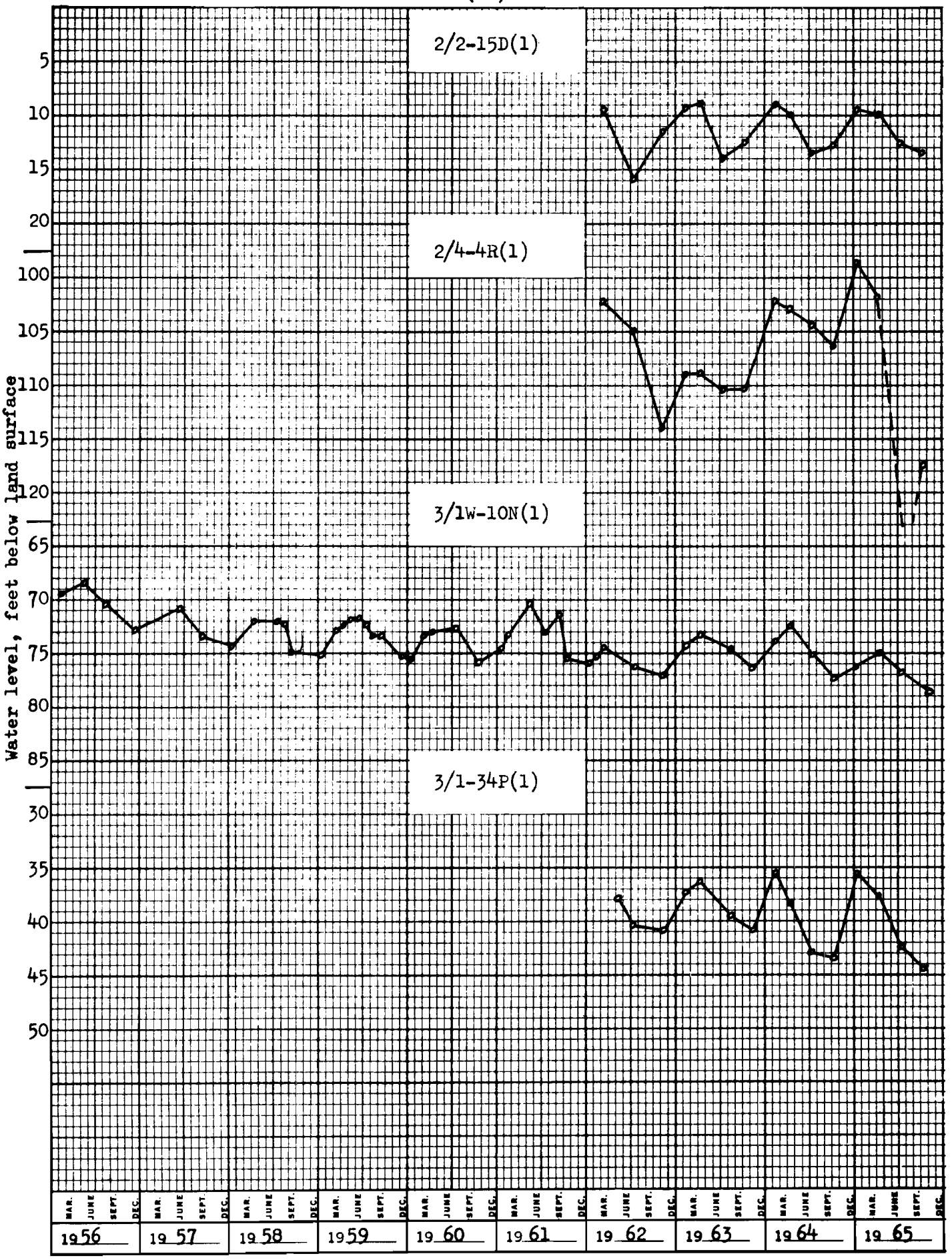
REFERENCES

Foxworthy, B. L., et. al., 1964, Records of wells and springs, water levels and chemical quality of ground water in the East Portland area, Oregon: State Engineer Ground Water Report No. 3

Hampton, E. R., 1963, Records of wells, water levels and chemical quality of ground water in the Molalla-Salem Slope area, Northern Willamette Valley, Oregon: State Engineer Ground Water Report No. 2.

Hogenson, G. M., and Foxworthy, B. L., 1965, Ground Water in the East Portland Area, Oregon: U. S. Geological Survey Water Supply Paper 1793.

WILLAMETTE VALLEY (26) - CLACKAMAS COUNTY



TILLAMOOK AREA (27)

The Tillamook area includes the broad valley occupied by the Wilson, Trask and Tillamook Rivers in and adjacent to the town of Tillamook. The present valley was formed by the gradual filling of Tillamook Bay with alluvial deposits. These deposits, which at places extend to depths of 150 feet or more, form the only productive ground water reservoir in the area. Some of the wells drilled into these deposits have been developed to yield as much as 600 gallons per minute.

The marine sedimentary rocks which underlie the alluvial deposits and form the surrounding hills have low permeability and are capable of yielding only small supplies of ground water.

The large amount of precipitation incident to the area fills the ground water reservoirs early in the winter and large amounts of the water available for recharge is rejected.

OBSERVATION WELLS

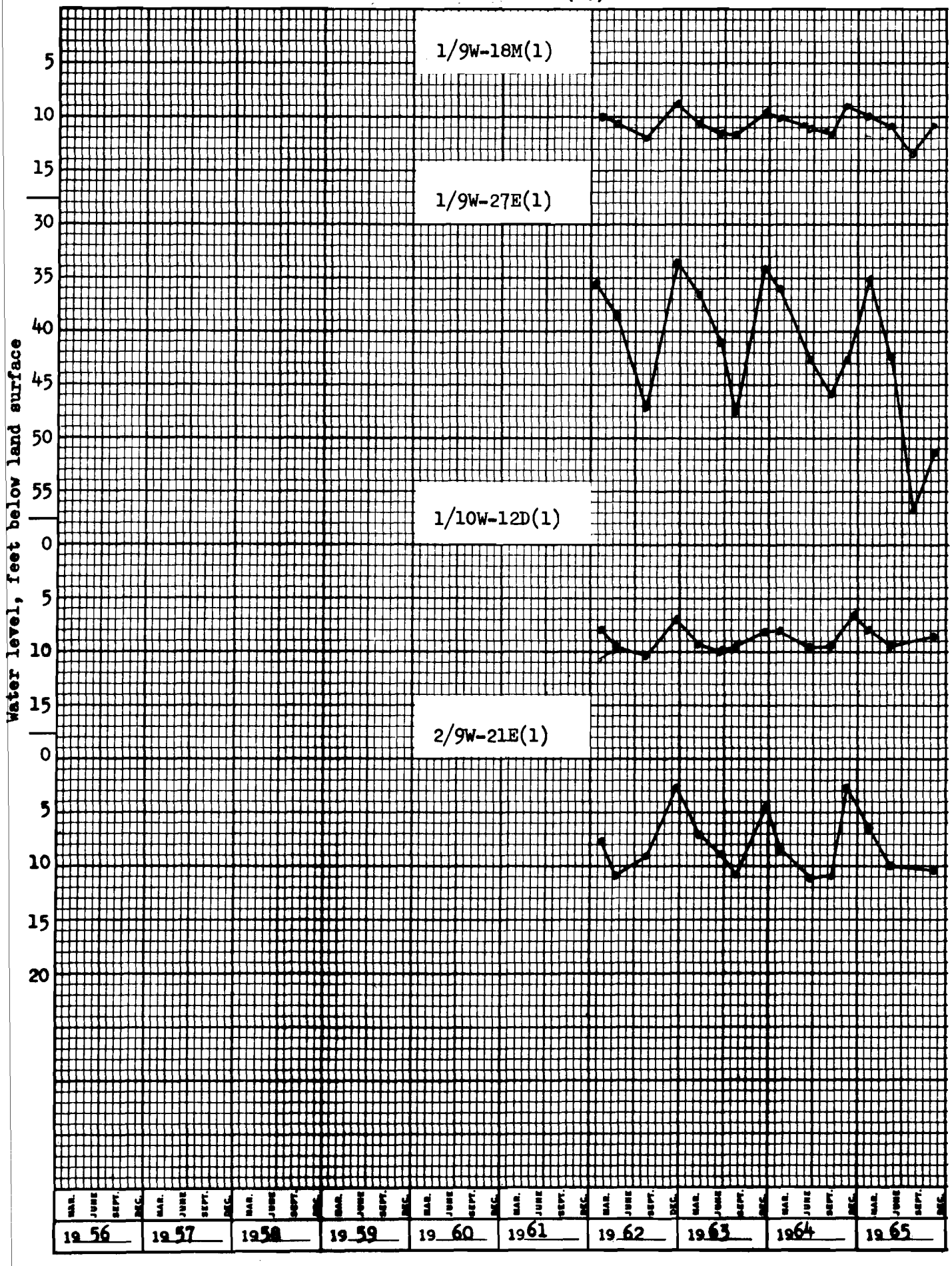
1/9W-18M(1) (Green Acres Motel) is a 187-foot drilled well located about two miles north of Tillamook.

1/9W-27E(1) (Vergil Chadwick) is a 197-foot drilled well in gravel located about 2½ miles east of Tillamook.

1/10W-12D(1) (Leo & Robert Wassmer) is an 80-foot drilled well located near Idaville.

2/9W-21E(1) (Vern Darby) is a 128-foot drilled well in gravel located about seven miles southeast of Tillamook.

TILLAMOOK AREA (27)



LIST OF OBSERVATION WELLS

WELL NO.	OWNER	RECORDS AVAILABLE
BAKER COUNTY		
7/39-3B(1)	L. H. Williams	1963-
7/39-20N(1)	City of Baker	1936-
7/39-28D(1)	Martha Traverso et. al.	1963-
7/40-33K(1)	Walter Colton	1964-
8/39-22F(1)	Baker County	1936- 1/
8/40-19D(1)	Baker County	1936- 1/
8/40-23A(1)	Baker County	1936-
8/41-14E(1)	Steward-Morrissey	1963-
8/46-15B(1)	Lewis Laird	1964-
9/39-2N(1)	Kermit Hansen	1949- 1/
9/40-1N(2)	Arlie Patton	1964-
9/40-18Q(1)	Paul V. Hill	1963- 1/
13/37-17G(1)	Unity School Dist. (Morgan)	1964-
BENTON COUNTY		
10/3W-31B(1)	Spring Hill Country Club	1965-
10/3W-32E(1)	D. E. Nebergall	1962- 1/
10/4W-10N(1)	George Ambrosek	1965-
10/6W-21B(1)	John Maloney	1965-
11/4W-5P(1)	Oregon State University Farm	1965-
11/4W-5R(1)	Oregon State University Farm	1965-
11/4W-19L(1)	Oregon Dairy Breeders Ass'n.	1962-
11/5W-1P(1)	Edward Skoubo (Bruinsma)	1962- 1/
12/5W-8A(1)	Donald Russell	1962-
12/5W-20K(1)	C. A. McDonald	1962- 1/
12/6W-12P(1)	Hobin Lumber Company	1962-
13/5W-7B(1)	Consolidated School Dist.#509CJ	1965-
13/5W-22B(1)	Malcolm Thompson	1965-
14/5W-10R(1)	Chris Lindseth	1962- 1/
CLACKAMAS COUNTY		
2/1-2N(1)	City of Lake Oswego	1964-
2/1-4L(1)	Chester Bohlman	1963-
2/1-21N(1)	Paul Riegelmann	1963-
2/2-15D(1)	Byrum Morehouse	1962- 1/
2/3-2G(1)	Vernon DeYoung	1962-
2/3-6F(1)	Lewis Isaacs	1962-
2/3-10C(1)	Mas Fujimoto	1962-
2/3-31L(1)	Howard DeLano	1962-
2/4-4R(1)	M. K. Smith	1962- 1/
2/4-5M(1)	Earl Meiers (Kemp)	1962-
2/4-7B(1)	William O'Shia	1962-
2/4-27D(1)	Sandy Farms	1962-
2/4-29J(1)	Virgil Nelson	1962-
2/5-18G(1)	Frank Leitheiser	1962-
3/1W-10N(1)	Charles Jenkins	1951-
3/1W-14K(1)	Black Inc. (Seely)	1951-
3/1W-15L(1)	Dammasch State Hospital	1959-
3/1W-16R(1)	Dammasch State Hospital	1961-
3/1W-23A(1)	Teufel Holly Farm	1964-
3/1W-25K(1)	Oregon State Experimental Farm	1963-
3/1-7H(1)	Frank Hoyt	1963-
3/1-26E(1)	Amil Slaby	1962-
3/1-32R(1)	D & S Farm Inc. (Schluneggar)	1962-
3/1-34F(2)	Ivan Arneson	1962-
3/1-34P(1)	Frank Delforge	1962- 1/
3/1-36N(1)	Joe Demsher, Jr.	1960-
3/1-36N(2)	L. H. Davis	1960-
3/2-35B(1)	F. H. Hunt	1965-
3/2-35G(1)	Burt Deardorff	1964- 2/
3/4-26F(1)	W. O. Youngberg	1963-
4/1-4G(1)	John W. Beck	1962-
4/1-20C(1)	Robert May	1965-
5/1-5R(1)	A. D. Rogie	1962-
5/1-18F(1)	Warren Bremer	1962-
5/2-5M(1)	Norman Simmons	1965-
5/2-17G(1)	Howard Brockart	1963-
5/3-5A(1)	Marvin O'Dell	1965-
6/2-14A(1)	Harry Schoenborn	1963-
CLATSOP COUNTY		
8N/7W-24A(1)	Oregon State Game Commission	1963-
8N/8W-27C(1)	Howard T. Multhauf	1963-
COLUMBIA COUNTY		
4N/2W-13F(1)	Paul DeShazer	1963-
5N/1W-17R(1)	Shell Oil Company	1965-
COOS COUNTY		
23/13W-34G(1)	Pacific Power & Light Company	1957- 1/
24/13W-10L(1)	Pacific Power & Light Company	1957- 1/
24/13W-28P(1)	Pacific Power & Light Company	1957- 1/
24/13W-33G(1)	Pacific Power & Light Company	1957-
25/13W-4M(1)	Pacific Power & Light Company	1956- 1/
27/13W-27C(1)	City of Coquille	1963- 1/
28/14W-18H(1)	Bullard Beach State Park	1965-
CROOK COUNTY		
14/15-15Q(1)	L. H. McPhetridge	1945- 1/
14/16-19H(1)	Leslie Clauson	1944- 1/
14/16-31D(1)	Pacific Power & Light Company	1964-
14/16-31Q(1)	Pacific Power & Light Company	1964-
14/16-32M(1)	Pacific Power & Light Company	1964-
14/16-32N(1)	E. E. Wagoner	1944- 1/
15/16-5E(1)	Pacific Power & Light Company	1964-
15/16-5E(3)	Pacific Power & Light Company	1964-
15/16-6A(1)	M. E. Gerow et. al.	1944- 1/
20/22-25R(1)	G. I. Ranch (Lelco Inc.)	1964-
21/22-3D(1)	G. I. Ranch (Lelco Inc.)	1963-
DESCHUTES COUNTY		
14/10-7Q(1)	Indian Ford Guest Ranch	1963-
15/10-8G(2)	Ross Hammond	1960- 1/
21/10-25A(1)	Inez Kellems	1945- 1/
22/21-8G(1)	Elton Jackson (Bar T Cattle Co)	1959-
22/21-16D(1)	Elton Jackson (Bar T Cattle Co)	1961-
DOUGLAS COUNTY		
21/4W-19R(1)	Douglas County Parks Dept.	1963- 1/
23/5W-15N(1)	W. S. Carlson	1963-
24/5W-5N(1)	Rex Tollefson (Crawford)	1963- 1/
26/5W-6B(1)	Stanley Mohr	1963-
27/5W-24J(1)	Douglas County Parks Dept.	1963- 1/
30/5W-21G(1)	Douglas County Parks Dept.	1963- 1/
32/6W-35B(1)	George H. Wells	1963-
GILLIAM COUNTY		
1N/22-5K(1)	Gene Mulkey	1965-
1N/22-8B(1)	D. L. Lemon	1964-
3N/21-28D(1)	City of Arlington	1964-
3N/21-34B(1)	E. M. Hulden	1964-
GRANT COUNTY		
12/26-34J(1)	Dayville Cemetery	1963- 1/
13/29-22L(1)	Curtice Martin	1962- 1/
13/30-27A(1)	Oregon State Highway Dept.	1964- 1/
13/31-21N(1)	Mt. View Country Club	1963- 1/
13/31-23M(1)	City of John Day	1962-
13/31-26F(1)	City of John Day	1962-
HARNEY COUNTY		
22/31-34N(1)	L. F. Lazaus	1930- 1/
22/31-36C(1)	Harry Pon	1963-
23/26-28D(1)	Unknown	1961-1964 2/
23/27-30B(1)	Green Valley Ranch	1962- 1/
23/31-3D(2)	Harney County	1936-
23/31-5B(1)	Harry Pon	1962-
23/31-11Q(1)	E. Sewell	1959- 1/
23/31-11Q(2)	E. Sewell	1959-
23/31-14A(3)	Harney County	1936-
23/31-16E(1)	Harney County	1936-
23/31-16K(1)	T. Allen Jones	1930- 1/
23/31-33E(1)	Harney County	1936-
23/32-3A(1)	Meadowland Ranches	1963-1965 2/

LIST OF OBSERVATION WELLS

HARNEY COUNTY

WELL NO.	OWNER	RECORDS AVAILABLE
23/32-3A(2)	Meadowland Ranches	1965-
23/32-7L(2)	Emmett Ray	1928-
23/32-30R(1)	Harney County	1936-
23/32½-1D(1)	Dick & Ed McConville	1965-
24/30-26R(1)	John Campbell	1960- 1/
24/31-28E(1)	Harney County	1936- 1/
24/32½-30R(1)	Ralph Catterson	1963-
24/34-31C(1)	John Rossberg	1959- 1/
24/34-31N(1)	John Rossberg	1963-
24/34-31P(1)	John Rossberg	1960-
24/34-31R(2)	John Rossberg	1959-
25/30-34B(1)	Forrest Reed	1963-
25/31-4M(1)	James Stahl	1962- 1/
25/31-29N(1)	Edgar Koeneman	1964-
25/34-30Q(1)	Forrest Skinner	1960-
26/31-26D(1)	Harney Co. Land Development Corp.	1965-
26/31-34R(1)	Marcus Haines	1964-
26/33-13J(1)	Lester Thompson	1962-
26/33-19N(1)	De B. Forslund (Corbin)	1959-
26/33-19R(1)	De B. Forslund (Corbin)	1959-
26/33-28Q(1)	De B. Forslund (Hann)	1958-
26/33-33C(1)	De B. Forslund	1958- 1/
26/33-34G(1)	Guy Leslie	1956-
26/33-34N(2)	George H. Merrick	1958-
26/34-6C(1)	John J. Fecht	1960- 1/
26/34-6J(1)	H. C. Fitchett	1960-
26/34-19K(1)	F. E. Jones	1959-
27/31-1G(1)	John Crow	1961- 1/
27/33-2D(1)	R. F. Upton	1956- 1/
27/36-33G(1)	FloLea Holly	1963-
31/35-2D(1)	Fred Pallock	1954- 1/
33/34-24D(1)	Alvord Ranch	1965-
34/34-15G(1)	Alvord Ranch (Rocky Hill, Inc.)	1962- 1/
35/33-34Q(1)	Andrew Shull	1958- 1/
36/33-3B(1)	Allied Properties, Inc.	1962-
37/36-10(1)	Whitehorse Ranch	1962-
37/36-14A(1)	Whitehorse Ranch	1962- 1/
37/36-15M(1)	Whitehorse Ranch	1962-
39/35-4N(1)	Warren McLean	1964-

HOOD RIVER COUNTY

2N/8-5J(1)	U. S. Forest Service	1965-
2N/10-4K(1)	Gerald White	1964-
2N/10-4K(2)	B. Ross Evans	1964-

JACKSON COUNTY

36/1W-21A(1)	Bud Hoover	1960- 1/
36/2W-23N(1)	U. S. Geological Survey	1953- 1/
36/2W-25H(1)	Alex Legler	1960-
37/2W-28B(1)	So. Oregon Experimental Station	1960- 1/
38/1W-15L(1)	City of Phoenix	1960- 1/

JEFFERSON COUNTY

11/12-21A(1)	Portland General Electric Co.	1962-
11/12-26J(1)	Portland General Electric Co.	1962-
11/13-1D(1)	City of Madras	1964-
12/13-6D(1)	Fred Degner	1964-
12/15-21N(1)	Morrow Bros.	1965-
13/14-33J(1)	Buckner Bros.	1964-

JOSEPHINE COUNTY

33/6W-15N(1)	Southern Pacific Railroad	1963-
35/6W-21F(1)	Bate Lumber Company	1961-
35/6W-24D(1)	Oregon State Highway Dept.	1963- 1/
36/5W-31L(2)	Grants Pass Golf Club, Inc.	1964-
38/5W-23H(1)	John Katzenbach	1961- 1/
38/8W-33H(1)	J. R. Smith	1961- 1/
39/5W-6K(1)	Brown Bros. Lumber Co., Inc.	1962-
39/8W-17J(1)	Joseph Ollis	1961-
39/8W-34L(1)	U. S. Geological Survey	1952- 1/

KLAMATH COUNTY

WELL NO.	OWNER	RECORDS AVAILABLE
24/9-30P(1)	U. S. Forest Service	1962-1964 2/
27/8-20A(1)	U. S. Forest Service	1963-
28/8-17K(1)	Winema Lumber Company	1962- 1/
30/7-11G(1)	Crown Zellerbach, Inc.	1954- 1/
31/7-1H(1)	Yamsay Land & Cattle Co.	1962-
34/7-9B(1)	Collier State Park	1955-
35/7-34M(1)	H. C. Spicer	1965-
35/8-1E(1)	Henry Wolff	1954- 1/
35/10-19B(1)	Ted Chrume	1954- 1/
36/10-14G(1)	K. R. Newlun	1962- 1/
36/11-20Q(1)	B.E. Bertran (Wm. & D.M. Hess)	1962-
36/11-36A(1)	Frank McBain	1954- 1/
36/12-12Q(1)	Weyerhaeuser Timber Co.	1962-
36/12-14M(1)	Beatty Recreation Hall	1954-
36/12-28H(1)	Mike Deely	1962-
36/14-7H(1)	Harry Obenchain	1962-
36/14-25E(1)	Gerber & Campbell	1962-
36/14-27P(1)	Henry Gerber	1962- 1/
36/14-35R(1)	Basil Hall	1962-
37/10-8N(1)	Edgewood Ranch	1961- 1/
37/10-18B(1)	Mario Marengo	1961-
37/10-19H(1)	H. D. Whiteline	1961-
37/10-29K(1)	Edgewood Ranch	1949-
37/10-29K(2)	Edgewood Ranch	1949- 1/
37/10-30C(1)	Fred Coleman	1961-
37/11½-36H(1)	Donald Schreiner	1957-
38/10-9N(3)	Frank Riley	1949-
38/10-13D(1)	Swan Lake Ranch (Hankins)	1949-
38/10-16Q(2)	Mrs. Maude Liskey	1957-
38/10-16R(2)	Daniel House	1962-
38/10-22C(1)	Mike Short	1957- 1/
38/10-23F(1)	Gene Carl	1957-
38/10-25A(1)	Garrison Mitchell	1957- 1/
38/11-6R(1)	B. J. Jendrzejewski	1957- 1/
38/11½-6L(1)	Swan Lake Ranch (Hankins)	1957-
38/11½-7R(1)	Swan Lake Ranch (Hankins)	1952-
38/11½-11H(1)	Frank & Mathilda Challis	1957-
38/11½-12N(2)	Frank Challis	1949- 1/
38/11½-13G(1)	R. M. Robertson	1948-
38/11½-13N(1)	William Konig	1948- 1/
38/11½-15R(1)	Frank R. White (Hankins)	1948- 1/
38/11½-25M(1)	Richard Hoefler	1949-
38/11½-26H(1)	Cliff Sewald	1957-1965 2/
38/11½-30M(1)	Swan Lake Ranch (Hankins)	1957-
38/11½-30R(1)	Arthur L. Wheeler	1957-
38/11½-30R(3)	Arthur L. Wheeler	1948-
39/9-34P(1)	Harry Wagner	1964-
39/10-8J(1)	Mt. Calvary Cemetery	1965-
39/11-10R(1)	Lost River Cemetery	1963-
39/11-20A(1)	Homer Holt	1964-
39/11½-3B(1)	L. J. Horton	1957- 1/
39/11½-28R(1)	W. Tuback	1954-
39/12-29K(1)	Robert Vogel (Adams)	1954-
39/12-36L(1)	Lloyd Crawford	1954-
40/11-11C(1)	A. W. Schaup	1954-
40/11-13F(2)	Laddie Rajnus & Sons	1963-
40/12-33C(1)	Clark Unruh	1965-
41/10-10L(1)	Fotheringham Bros.	1964-
41/12-3M(1)	George Rajnus	1954-
41/12-19G(1)	D. P. Reid	1954-
41/14-7R(1)	Charles Kilgore	1954-

LAKE COUNTY

25/14-15E(1)	Ira A. Dutcher	1932-
25/14-16H(1)	Marion Cook (U.S.B.L.M.)	1956-
25/14-19R(1)	R. A. Long	1948-
25/14-22D(1)	C. B. Webster	1949-
25/14-29J(1)	R. A. Long	1956-
25/14-36N(1)	Joe & Minnie Stitz	1956-
25/19-31Q(1)	O. E. White	1963-
26/14-2D(1)	U.S.B.L.M. (Kittridge)	1948-
26/14-3D(1)	Andy Hergert	1956-
26/14-5A(1)	V. A. Wagers (Busch)	1940- 1/

LIST OF OBSERVATION WELLS

WELL NO.	OWNER	RECORDS AVAILABLE
LAKE COUNTY		
26/14-12A(1)	Sheldon D. Kelley	1948-
26/14-12C(1)	Elmer Kohler	1958- 1/
26/14-13N(1)	Andrew Bettencourt (Grabar)	1957-
26/14-20N(1)	G. R. Boatwright (Long)	1940-
26/14-21R(2)	U. S. B. L. M.	1940-
26/14-23D(1)	U. S. B. L. M.	1959-
26/14-24P(1)	Jack Kittridge	1956-
26/14-33C(1)	U. S. B. L. M. (Long)	1940-
26/15-5C(2)	George Wirth	1957-
26/15-6B(1)	Glenn Irwin	1955-
26/15-6H(1)	Glenn Irwin	1960-
26/15-17R(1)	Morehouse Ranch	1940-
26/15-20D(1)	U.S.B.L.M. (Schaub)	1940-
26/15-20Q(1)	Hugh L. Wahl	1956-
26/15-22B(2)	M. Y. Parks (U.S.B.L.M.)	1932-
26/15-28J(1)	M. Y. Parks	1948-1964 2/
26/15-29B(1)	Delbert M. Wilson	1956-1964 2/
26/15-29E(1)	Hugh Wahl (Schaub)	1940-
26/15-31A(3)	Nick Klerk	1949-
26/15-31E(1)	Nick Klerk	1949-
26/15-31J(1)	Robert R. Tuttle (Schaub)	1956-
26/15-32E(1)	Robert R. Tuttle (Schaub)	1956-
26/15-32E(2)	Robert R. Tuttle (Schaub)	1956-
26/15-33H(1)	Merritt Parks	1962-
26/15-34N(1)	Merritt Parks	1956-
26/15-34Q(1)	C. W. Boley	1956-
26/18-26B(1)	Robert Bothern	1963-
26/18-30H(1)	Sam K. Morehouse	1959-
27/15-2E(1)	C. C. Miles	1949-
27/15-2E(2)	C. C. Miles	1956-
27/15-2H(2)	L. B. Iverson	1949-
27/15-3B(1)	Easton Claridge	1956-
27/15-3J(1)	Easton Claridge	1949-
27/15-4G(1)	M. Y. Parks	1932- 1/
27/15-4G(2)	M. Y. Parks	1932-
27/15-11H(1)	K. O. Buick	1961-
27/15-11J(1)	K. O. Buick	1956-
27/15-13D(1)	Jess Miles	1949-
27/15-24C(1)	Darrell Bowen	1959-
27/15-24M(2)	Darrell Bowen	1961-
27/15-24N(1)	Darrell Bowen	1948-
27/15-25E(1)	Herman Koehler (Lander)	1956-
27/16-7D(1)	Wayne Dubois	1956-
27/16-7F(1)	Wayne Dubois	1961-
27/16-7L(1)	Doris Liebhart	1960-1964 2/
27/16-13A(1)	Robert Morehouse	1955-
27/16-13B(1)	Robert Morehouse	1958- 1/
27/16-13M(1)	Robert Morehouse	1955-
27/16-26P(1)	John Beck	1963-
27/16-32F(1)	Ralph Rawie	1956-
27/16-32Q(1)	Miller E. Follis (Shafer)	1957-
27/16-34L(1)	Dr. George Mallett	1957-
27/17-10R(2)	M. Penn Phillips Co.	1961-
27/17-14N(1)	U. S. B. L. M. (Pitman)	1961-
27/17-21Q(1)	Century Ranch	1956-
27/17-22D(1)	Helmar Gustafson (Daly)	1961-
27/17-22R(2)	Century Ranch	1938- 1/
27/17-27K(1)	Century Ranch	1961-
27/17-27L(1)	Century Ranch	1952-
27/18-6E(2)	Rose T. Morici (Aiassa)	1940-
27/18-6F(1)	Marianne Aiassa (Morici Aiassa)	1959-
27/18-6G(1)	Clinton R. Carrico (Wahl)	1956-
27/18-6H(1)	Clinton R. Carrico	1957-1964 2/
27/18-6K(1)	Clinton R. Carrico	1956-
27/18-12A(1)	John Pettus	1961-
27/18-18N(1)	Jack Gillette	1959-
27/18-21A(1)	U. S. B. L. M.	1955-
27/19-18N(1)	View Point Ranch, Inc.	1957-
27/19-19Q(1)	View Point Ranch, Inc.	1957-
27/19-32C(1)	View Point Ranch, Inc.	1961-
27/19-32F(1)	View Point Ranch, Inc.	1958-
28/14-20B(1)	Lawrence Iverson	1965-
28/14-21K(1)	U. S. Forest Service	1963-
28/14-25C(1)	ZX Ranch	1964-
28/15-13P(1)	View Point Ranch, Inc.	1958-
28/15-14H(2)	View Point Ranch, Inc.	1956-
28/16-4B(1)	U. S. B. L. M. (Gray)	1958- 1/
28/16-4D(1)	U. S. B. L. M. (Gray)	1956-
28/16-5F(1)	Miller E. Follis (Shafer)	1959-
28/16-5P(1)	Miller E. Follis (Shafer)	1959-
28/16-5Q(1)	Miller E. Follis (Shafer)	1959-
28/16-19C(1)	View Point Ranch, Inc.	1960-
29/23-3J(1)	U. S. B. L. M.	1945-
30/16-1F(1)	Oregon State Game Comm.(Williams)	1963-
32/23-5A(1)	U. S. B. L. M.	1964-
33/18-13A(1)	Alan VanWithers (Harris)	1963-
34/19-16N(1)	Howard Beachler	1962-
34/19-23G(1)	ZX Ranch	1959-
35/24-9J(1)	U. S. B. L. M.	1949- 1/
36/21-6B(1)	S. V. Carroll	1950-
36/24-4B(1)	Joe Banascc	1962-
36/24-27D(2)	Con Lynch	1961- 1/
36/24-28M(1)	Lloyd Grisel	1949-
36/24-28N(1)	Joe Rombo	1960-
36/24-32A(1)	James Kiely	1940-
36/24-33B(3)	Con Taylor Ranch, Inc.	1960- 1/
37/20-34R(1)	Robert Weir	1962- 1/
38/20-33F(1)	Jack Stocksberry	1964-
38/24-27M(1)	Charles Crump	1948- 1/
39/19-34H(1)	William Hoffman	1960- 1/
39/20-9A(1)	Lakeview Mining	1965-
39/24-21F(2)	J. G. Dyke	1948- 1/
40/19-19K(1)	Clyde Fenimore	1965-
40/20-14D(1)	Snider & Alexis	1957- 1/
40/20-26L(2)	Neal Elliott	1959- 1/
LANE COUNTY		
16/2W-34P(1)	M. A. Nadeau	1962- 1/
16/3W-32G(1)	Leo Sidwell	1950- 1/
16/4W-4B(1)	John Hentze	1965-
16/4W-16L(2)	Shadow Hills Golf Course	1965-
16/4W-29J(2)	Elbert Hill	1965-
17/1W-29G(1)	Glen Vaughn	1965-
17/1W-29R(1)	Ed Hull	1965-
17/2W-32C(1)	Weyerhaeuser Timber Co.	1962- 1/
17/3W-17D(1)	Smith Gardens	1962-
17/3W-28Q(1)	Chase Gardens	1962-
17/4W-4Q(1)	Seneca Sawmill	1962-
17/4W-33B(1)	West Lawn Memorial Cemetery	1962- 1/
17/5W-13F(1)	Leo Burtis (McClelland)	1962-
17/6W-36Q(1)	Oscar Williams	1962-
18/2W-27F(1)	George Potter	1965-
18/2W-35L(1)	Richard Lyday	1965-
18/4W-3L(1)	Niles Hult	1963-
18/10W-11A(1)	United States Plywood	1963-
18/12W-14P(4)	U. S. Geological Survey	1961-
18/12W-34Q(1)	Camp Florence	1964-
19/2W-7R(1)	J. L. Getchell	1962-
19/3W-3N(1)	Oregon State Game Comm.	1962-
19/3W-11C(1)	O. C. Luchterhand	1963-
LINCOLN COUNTY		
6/10W-33F(1)	A. A. Corkhill	1964-
8/10W-17K(1)	A. E. Howard	1964-
10/10W-3M(1)	Don Pressley	1964-
11/9W-9H(1)	Eddyville High School	1964-
11/10W-20L(1)	Joe W. Brown	1964-
LINN COUNTY		
9/1W-14Q(1)	John Fery	1964-
9/1W-23P(1)	Charles Hecht	1962- 1/
10/1W-5L(1)	A. M. Hendrickson	1962-
10/1W-28L(1)	Grant Farris	1962- 1/
10/2W-8N(2)	William Uppstad	1957-
10/2W-21R(1)	H. C. Robertson	1962-
10/4W-12F(1)	Henry Hoefer	1928- 1/
11/2W-3D(1)	Sam Looney	1962-
11/2W-6B(1)	George C. Scheler	1962-
11/2W-29H(1)	Neal Hollingsworth	1962-
11/3W-13A(1)	Loren A. Nelson	1962-
11/3W-15C(1)	Joe Kennel	1962-
11/3W-26A(1)	Leonard Roth	1962-
12/1W-29N(1)	Pineway Golf Club, Inc.	1964-
12/1W-29P(1)	Herbert J. Griffiths	1964-

LIST OF OBSERVATION WELLS

WELL NO.	OWNER	RECORDS AVAILABLE
LINN COUNTY		
12/1W-30R(1)	Pineway Golf Club, Inc.	1962-
12/2W-2E(1)	Ken Watters	1962-
12/2W-14B(1)	Sigurd H. Lanstrom	1941-
12/2W-18C(1)	Henry DeManette	1962- 1/
12/3W-5K(1)	George N. Chandler	1962-
12/3W-29F(1)	R. L. Wirth	1962-
12/4W-21L(1)	R. C. Mang	1962-
12/4W-35P(1)	Paul Pugh	1962-
13/3W-13A(2)	Frank Cochran	1962-
13/3W-34N(1)	Pete Williams (Keeney School)	1928-
13/3W-36H(1)	Thomas P. Irwin	1962-
13/1-27B(1)	U. S. Government	1964-
13/1-27F(1)	U. S. Government	1964-
13/1-27F(2)	U. S. Government	1964-
13/1-27F(3)	Paul Tucker (U.S. Government)	1964-
13/1-27F(4)	U. S. Government	1964-1965 2/
13/1-27F(5)	U. S. Government	1964-1965 2/
13/1-27G(1)	Warren Vasey	1964-
13/1-27G(2)	U. S. Government	1964-
13/1-27G(3)	Lawrence Alvin	1964-
13/1-27L(1)	U. S. Government	1964-
13/1-27M(1)	Verdge Stephenson	1964-
13/1-27M(2)	Willard Frick	1964-
13/1-27M(3)	U. S. Government	1964-1965 2/
13/1-27N(1)	Roy Lewis	1964-
13/1-27N(2)	Denver Davis	1964-
14/3W-7R(1)	Henry H. Kirk	1962-
15/3W-19H(1)	Edgar B. Grimes	1962- 1/
MALHEUR COUNTY		
14/38-27F(1)	Jerry Farley	1964-
14/39-21F(2)	Ralph Duncan	1962-
14/39-21Q(1)	Mary J. Molthan	1962-
14/39-29C(1)	John Molthan	1962-
14/39-29E(1)	John Molthan	1962-
14/39-32H(1)	Ray Duncan	1962-
14/41-32N(1)	Rankin Crow	1956-
15/40-1C(1)	Altha Anderson (Ed Anderson)	1953- 1/
15/40-2J(1)	Max Holloway	1949- 1/
15/40-2L(1)	Max Holloway	1955-
15/40-2M(1)	Max Holloway	1952- 1/
15/40-2N(1)	Rankin Crow	1950- 1/
15/40-2Q(1)	Rankin Crow	1956-
15/40-10B(1)	Rankin Crow	1950-
15/40-10K(1)	Rankin Crow	1953- 1/
15/40-11P(1)	Rankin Crow	1950-
15/40-12M(1)	Guss Davis	1955- 1/
15/40-12Q(1)	Guss Davis	1954-
15/40-13D(1)	Guss Davis	1955- 1/
15/40-13G(1)	Guss Davis	1955-
15/40-14Q(1)	Rankin Crow	1951- 1/
15/41-6M(1)	Rankin Crow	1958-
15/41-8N(1)	Rankin Crow	1951- 1/
15/42-25B(1)	Mark J. Velsmeyer	1961-
16/43-16Q(1)	Ralph Altig	1962-
17/44-11K(1)	John Stringer	1961-
17/44-25H(1)	C. N. Durrett	1961-
18/41-8Q(1)	Roy C. Stewart	1963-
18/44-18G(1)	Paul Fleming	1965-
18/45-21D(1)	K. T. Loomis	1962-
18/46-19N(1)	Glen Hutchinson	1962-
18/46-23Q(1)	Kay Teramura	1962-
18/47-17D(1)	Earl Weaver	1950-
19/42-35D(1)	John E. O'Toole	1963-
19/43-2M(1)	Trenkel Bros.	1961-
19/43-3E(1)	Floyd Vaughn	1961-
19/43-3K(1)	Floyd Vaughn	1961-
19/43-10H(1)	Thomas J. Davis	1961-
20/46-28G(1)	George Mendazona	1962-
21/38-17Q(1)	Walter Bodkin (Wilson)	1955-
21/38-17R(1)	U. S. Geological Survey	1958-
21/46-2F(1)	Willis Bertram	1955-
28/37-23R(1)	Earl Obenchain	1950-
29/37-17N(1)	Fred Pallock	1965-
29/37-19A(1)	George Renick	1950-1964 2/
30/46-2H(1)	Jordan Valley Cemetery Dist.	1962- 1/
30/46-5D(1)	Cowgill Ranch	1964-
30/46-10N(5)	Jaca Brothers	1963- 1/
32/40-18K(1)	Keith Wallace	1950-
34/39-13L(1)	U. S. Government	1954-
36/41-26J(1)	Oregon State Highway Dept.	1961- 1/
41/42-22C(1)	Lucky 7 Ranch	1962- 1/
41/43-19A(1)	Victor Albisu	1955-
MARION COUNTY		
3/1W-33H(1)	Klupenger Nursery	1965-
4/1W-2C(1)	W. F. Keil	1928-1965 2/
4/1W-2C(2)	Will E. Dreher	1965-
4/1W-5P(1)	Joseph Leavy	1965-
4/1W-23G(1)	Donald Olmstead	1945- 1/
4/1W-32H(1)	Emmett T. Rose	1960-
4/2W-2G(1)	Champoeg State Park	1963-
4/2W-4C(1)	Dr. C. A. Bump	1928-
4/2W-4F(1)	John A. Gearin	1957-
4/2W-8G(1)	Nelson Tribbett	1960-
4/2W-15F(1)	W. O. Wildmar (DuRette)	1957-
4/2W-17M(1)	Lester Ernst	1957-
4/2W-18A(1)	John P. McCarthy	1957-
4/2W-22M(1)	Kirk Brothers	1957- 1/
4/2W-28N(1)	J. B. Wolf	1957-
4/2W-29H(1)	Richard McKay	1960-
4/2W-34R(1)	Charles Johnson (Johnson School)	1928-
5/1W-3K(1)	Julius Ramlo	1959- 1/
5/1W-7P(1)	City of Woodburn	1963-
5/1W-9L(1)	S. Gayken	1963-
5/1W-17L(2)	General Foods Corp.	1963-
5/1W-17M(2)	General Foods Corp.	1962-
5/1W-17N(1)	General Foods Corp.	1962-
5/1W-17N(2)	General Foods Corp.	1962-
5/1W-18C(1)	City of Woodburn	1962-
5/1W-18C(2)	City of Woodburn	1962-
5/1W-18C(3)	City of Woodburn	1962-1965 2/
5/1W-18Q(1)	Lawrence J. Paradis	1962-
5/1W-18R(1)	Lawrence J. Paradis	1962-
5/2W-1J(3)	City of Woodburn	1965-
5/2W-5E(1)	William J. Manegre	1957-
5/2W-16D(1)	James E. Davidson	1958-
5/2W-19Q(1)	Jess W. Lucas	1957-
5/2W-25M(1)	Sam H. Brown	1929- 1/
6/1W-1G(1)	James Butsch	1962-
6/1W-1P(1)	Mark Purdy	1962-
6/1W-18D(1)	James Hollin	1962-
6/1W-28F(1)	Tony Schultz	1962-
6/2W-5N(1)	Fred Zelinsky	1957-
6/2W-17J(2)	Sam Ramp	1962-
6/2W-18G(1)	E. A. Hillyer	1957- 1/
6/2W-35B(1)	Richard Tuve	1963-
6/3W-34C(1)	Juanita Manuel (Pierce)	1957-
6/3W-34N(1)	Henry Schmidt	1963-
6/1-7M(1)	Sheldon Johnson	1928-
7/1W-8J(1)	Merle Kaufman	1964-
7/1W-27N(1)	Keith Johnson	1962-
7/2W-4F(1)	P. W. Woelke	1962- 1/
7/2W-18B(1)	Emery Alderman	1962-
7/2W-26G(1)	Cornelius Bateson	1962-
7/2W-31D(1)	William Roth (Foreman)	1963-
7/3W-11L(1)	Harvey Machine Co., Inc.	1960-
7/3W-23N(1)	Pacific Mutual Life Ins. Co.	1962-
7/3W-27A(3)	State Labor & Industries Bldg.	1963-
7/3W-31G(1)	Carl Heyden	1962-
7/3W-31L(1)	E. C. Boje	1962-
7/3W-31P(1)	Illahe Country Club	1962-
7/3W-31Q(1)	Illahe Country Club	1962-1965 2/
7/3W-32K(1)	Salem Golf Course	1962-
7/1-28A(1)	Willard Benson	1962-
8/1W-28G(1)	Josephine Gerspacher	1962-
8/1W-32D(1)	Earl Weight (Elbert)	1962-
8/1W-35C(1)	Richard Schumacher	1962-
8/2W-11P(2)	Reich Brothers	1962-
8/2W-33K(1)	Anna Etzel	1963-
8/3W-3M(1)	City of Salem (Salem Heights)	1958- 1/
8/3W-4M(1)	Carroll Nelson	1962-
8/3W-4M(2)	David Van Dyke	1964-

LIST OF OBSERVATION WELLS

WELL NO.	OWNER	RECORDS AVAILABLE
MARION COUNTY		
8/3W-5R(4)	E. A. Meola	1964-
8/3W-6B(1)	Illahe Country Club	1962-
8/3W-6D(1)	Harry Eyerly	1962-
8/3W-9P(1)	City of Salem (Salem Heights)	1960-1965 2/
8/3W-11N(1)	City of Salem	1962-
8/3W-18R(1)	Adrian Withers	1962-
8/3W-23M(2)	W. G. Steveley	1962-
8/3W-28J(2)	Friends Church	1962-
8/3W-33J(1)	L. J. Philpott	1962-
8/4W-27M(1)	4-D Farms	1963-
9/1W-1E(1)	Etzel Brothers	1958-
9/1W-2R(1)	Al Etzel	1963-
9/1W-12B(1)	William Ripp	1961-
9/2W-24L(2)	Boyd Hilton	1963-
9/2W-24R(1)	A. F. Keithley	1957-
9/2W-25E(1)	Louis Scofield	1961- 1/
9/3W-34J(2)	Ted Riggle (Wimbush)	1964-
9/1-3E(1)	Ted Etzel	1965-
9/3-30J(1)	Howard Fenner	1964-
10/3W-13C(1)	E. W. Hart	1962-
10/3W-13F(1)	E. W. Hart	1962-
MORROW COUNTY		
1N/26-10A(2)	William Doherty	1965-
1N/26-26M(1)	Kenneth Turner (Beach)	1963-
1N/27-3A(1)	George Luciani	1965-
1N/27-3R(1)	Earl Wattenburger	1961-
1N/27-10G(1)	Earl Wattenburger	1963-
1N/27-10H(1)	W. Floyd Hoskins (School Dist.)	1961-
1N/27-24R(1)	A. J. Vey	1961-
1N/28-28C(1)	A. J. Vey	1960-
1N/28-28D(1)	A. J. Vey	1958-
2N/23-17R(1)	Hynd Brothers Co.	1964-
2N/27-20J(1)	Ed Tucker	1961-
2N/27-28H(1)	Ed Tucker	1953-
3N/26-4A(1)	Mildred F. Cramer	1962-
3N/26-4C(1)	Mildred F. Cramer	1962-1965 2/
3N/26-4L(1)	Luther W. Cramer	1962- 1/
3N/26-5M(1)	Otto J. Hellberg	1962-
3N/26-10G(1)	Waldo H. Cramer	1962-
3N/26-10J(1)	Ernest R. Cramer	1962-
3N/26-10K(1)	Ernest R. Cramer	1962-
4N/25-9G(1)	Boardman Cemetery Assoc.	1965-
4N/26-25E(1)	Fred Andrews (Unknown)	1953-
4N/27-5B(1)	Umatilla Army Depot	1960- 1/
4N/27-5C(1)	Umatilla Army Depot	1962-
4N/27-8R(1)	Umatilla Army Depot	1961- 1/
4N/27-18P(1)	Umatilla Army Depot	1960-
4N/27-19B(1)	Umatilla Army Depot	1962- 1/
4N/27-20M(1)	Union Pacific Railroad	1965-
4N/27-28E(2)	Scott Chapman	1962-
4N/27-32B(1)	R. Holzapfel	1962-
4N/27-32J(1)	R. Holzapfel	1962- 1/
4N/27-33H(1)	McDole Brothers	1962-
1/24-7F(1)	A. H. Marick	1965-
1/29-3A(1)	A. J. Vey	1963-
2/24-36J(1)	Terrell Benge	1964-
MULTNOMAH COUNTY		
1N/1-33C(2)	Good Samaritan Hospital	1961- 1/
1N/1-33L(1)	Fred Meyer Inc.	1961- 1/
1N/1-33Q(1)	U. S. National Bank	1946-
1N/1-34N(1)	Weisfield's Inc.	1940- 1/
1N/1-34N(3)	Equitable Savings & Loan	1961-
1N/1-34N(4)	Equitable Savings & Loan	1961-1964 2/
1N/1-34N(5)	Equitable Savings & Loan	1958-1964 2/
1N/1-34N(6)	Pittock Block Inc.	1961- 1/
1N/1-34N(8)	Lipman Wolfe & Co.	1961-
1N/1-34N(10)	Dirks Medical Center	1961-1964 2/
1N/1-34N(11)	Dirks Medical Center	1961- 1/
1N/1-34N(12)	Federal Reserve Bank	1961- 1/
1N/1-34N(13)	U. S. National Bank	1961-
1N/1-34N(14)	First National Bank	1959-
1N/1-34N(17)	Pacific Tel. & Tel. Co.	1961-1965 2/
1N/2-9N(1)	Port of Portland	1963- 1/
1N/3-26R(1)	Kazuo Fujii	1963- 1/
1/1-3D(3)	Pacific Power & Light Co.	1961- 1/
1/1-3D(4)	Pacific First Federal	1961-1965 2/
1/1-3D(6)	Pacific Service Building	1961-
1/1-3E(1)	Oregonian Publishing Co.	1961-
1/1-3E(2)	Oregonian Publishing Co.	1961-
1/1-3E(3)	Oregonian Publishing Co.	1961-
1/1-3M(1)	Pacific Northwest Bell	1963-
1/1-3M(2)	Pacific Northwest Bell	1963-
1/1-4A(2)	Medical-Dental Building	1958-
1/1-10P(1)	J. Donald Kroeker	1961- 1/
1/3-7N(1)	Meadowland Dairy	1964- 1/
1/3-10N(1)	Forest Lawn Memorial Park	1963- 1/
POLK COUNTY		
6/3W-7H(1)	D. L. Gingerrich	1963-
6/4W-17K(1)	John Romig	1963-
7/3W-10E(1)	Leland P. Brandt	1962- 1/
7/3W-18E(1)	Orchard Heights Water Dist.	1965-
7/3W-18E(2)	Orchard Heights Water Dist.	1965-
7/3W-30F(1)	R. L. Forster	1965-
8/4W-3B(1)	Theodore C. Muller	1962- 1/
8/4W-21E(2)	Boise Cascade Corporation	1962-
8/5W-13H(1)	Milo Jensen	1963-
8/6W-22F(1)	Edward Bakke	1962- 1/
8/6W-25R(1)	Ray Norton	1963-
9/4W-8N(1)	D. W. Christianson	1963- 1/
9/4W-11F(1)	Donald Cobine	1965-
SHERMAN COUNTY		
1N/17-4L(1)	Phillip G. O'Meara	1963-
1N/17-16C(1)	L. P. Haven	1964-
3/16-10N(1)	E. J. Hartley	1963-
TILLAMOOK COUNTY		
1/9W-18M(1)	Green Acres Motel	1962- 1/
1/9W-19C(1)	Tillamook Veneer	1962-
1/9W-27B(1)	Gaylord Shively	1962-
1/9W-27E(1)	Vergil Chadwick	1962- 1/
1/9W-29E(1)	Norman Burdick	1962-
1/9W-29K(1)	Fairview Water Dist., Inc.	1962-
1/9W-29L(1)	Fairview Water Dist., Inc.	1962-
1/9W-31E(1)	Lester E. Armstrong	1962-
1/9W-31P(1)	Tillamook Water Comm.	1962-
1/9W-32Q(1)	Elbert Leonnig	1962-
1/10W-12D(1)	Leo & Robert Wassmer	1962- 1/
1/10W-25E(1)	Alfred Marolf	1962-1965 2/
1/10W-26B(1)	Rudolph John Fenk	1962-
1/10W-36R(1)	Frank Emmenegger	1962-
2/9W-5E(1)	Tillamook Water Comm.	1962-
2/9W-6G(1)	M. J. Jenck	1962-
2/9W-6J(1)	Connie & Judy Dye	1962-
2/9W-21E(1)	Vern Darby	1962- 1/
4/10W-27F(1)	Victor Werth	1965-
UMATILLA COUNTY		
2N/27-1F(1)	Claussie Ammon	1961-
2N/27-11H(1)	Clarence L. Hansen	1961-
2N/27-12D(1)	Clarence L. Hansen	1961-
2N/27-26L(1)	Sarvis Springs Farm	1962-
2N/27-27E(3)	John F. Kilkenny	1961-
2N/30-28F(1)	Cunningham Sheep Co.	1961-
2N/32-2N(1)	City of Pendleton	1961- 1/
3N/27-25R(1)	George Wallace	1961-
3N/27-36H(2)	George Wallace	1961-
3N/28-18K(1)	Harry J. Andrews	1956-
3N/34-3D(1)	Berkley Davis	1953-
4N/27-22K(1)	Umatilla Army Depot	1960- 1/
4N/27-22P(1)	Umatilla Army Depot	1960-
4N/27-36D(1)	Lyle Miller	1961-
4N/29-5R(1)	John Hershey	1963-
4N/29-17N(2)	Kenneth Casper (Dreyer)	1961- 1/
4N/29-18J(1)	Milton Culp	1961-
4N/29-32L(1)	City of Stanfield	1964-

LIST OF OBSERVATION WELLS

WELL NO.	OWNER	RECORDS AVAILABLE
UMATILLA COUNTY		
4N/32-2M(1)	L. King	1953-
5N/28-22D(1)	Munson Auto Court	1953- 1/
5N/34-16R(1)	R. M. Thompson	1953-
5N/35-1C(1)	William A. Bingman (Brodie)	1933- 1/
5N/35-1E(1)	City of Milton-Freewater	1963-
5N/35-2C(1)	K. A. Townsend (McSherry)	1933- 1/
5N/35-2J(1)	City of Milton-Freewater	1954-
5N/35-2L(1)	City of Milton-Freewater	1954- 1/
5N/35-3H(1)	Walter Miller	1933-
5N/35-12F(1)	City of Milton-Freewater	1954-
5N/35-12F(2)	City of Milton-Freewater	1954- 1/
5N/36-18M(1)	City of Milton-Freewater	1964-
6N/35-14L(1)	Conrad Miller	1933-
6N/35-20G(1)	J. E. Courtney	1933-
6N/35-24Q(1)	George H. Ransom (Miller)	1933- 1/
6N/35-26C(2)	Earl Ransom	1933- 1/
6N/35-28H(1)	W. J. Rand	1933-
6N/35-28N(1)	Lottie McKnight	1933-
6N/35-30M(1)	Dan Selleck (Shepard)	1933-
6N/35-34C(1)	Jas. A. Reese (Mrs. Jessie Reese)	1933-
6N/35-36C(1)	James Busch	1933-
6N/35-36H(1)	Walter Herman	1933-
1/32-9L(1)	Wayne Chapman	1961-
1/32-17G(1)	City of Pilot Rock	1961- 1/
1/32-17K(1)	City of Pilot Rock	1961- 1/
1/32-19P(1)	Arnold Hoeft	1964-
1/32-23J(1)	Hilmer Horn	1961- 1/
3/30½-1b(1)	Joseph Pedro	1953- 1/
UNION COUNTY		
1N/38-21C(1)	Robert Burr (Schmittel)	1957- 1/
1N/39-4M(1)	Lee Smith	1964-
1N/39-15M(1)	Jim Morgan	1964-
1/38-24R(1)	H. L. Wagner	1950- 1/
1/39-17L(1)	A. F. Furman	1940- 1/
1/39-20C(1)	Clayton Fox	1964- 1/
2/39-33P(3)	Wilfred Hamann	1964- 1/
3/38-3C(1)	Glen Lester	1963- 1/
3/38-6H(1)	City of La Grande	1957-
3/38-6Q(1)	Dr. Gilstrap	1957-
3/38-10B(1)	Union County	1936- 1/
3/38-25B(1)	Union County	1936-
3/39-7R(2)	Stanley Weishaar	1964- 1/
4/39-11H(2)	W. H. Woodruff	1964-
5/40-7L(1)	Emmitt Briegel	1964-
6/39-20C(1)	Edson R. McCanse	1962- 1/
6/39-20Q(1)	Edson R. McCanse	1962-
WASCO COUNTY		
1N/12-13N(1)	Julius Sandoz	1957- 1/
1N/12-13Q(1)	Kenneth Kortge	1957-
1N/12-23D(2)	Paul M. Martin	1962-
1N/12-26P(1)	Dalles City	1963-
1N/13-1F(1)	3-Mile Irrigation Coop. Inc.	1959-
1N/13-3E(1)	Dalles City	1959- 1/
1N/13-3G(2)	Columbia Fruit Growers	1956-
1N/13-4C(1)	P. J. Stadelman	1960-
1N/13-4E(1)	Odd Fellows Cemetery	1956- 1/
1N/13-4F(1)	Dalles City	1959-
1N/13-4P(1)	Dalles City	1959- 1/
1N/13-5G(1)	Cherry Heights Irr. Coop.	1959-
1N/13-8A(1)	G. S. Williams	1960- 1/
1N/13-8M(1)	Mill Creek Irr. Coop.	1959-
1N/13-14L(1)	Joseph Douthit (Wagonblast)	1959- 1/
1N/13-15G(2)	Parklawn Memorial Gardens	1959-
1N/13-17C(1)	George M. Davis et. al.	1958-
1N/13-18M(1)	Gladys L. Rogers	1957-
1N/13-32G(1)	Milton F. Martin	1946-
1N/13-32G(2)	Milton F. Martin	1956-
1N/13-32M(1)	Dr. John H. Skirving	1957-
1N/13-33M(1)	Sanders Brothers	1960-
1N/13-34L(1)	W.O. Wright & W. Cruikshank	1960- 1/
2N/12-7E(1)	Darrel Evans	1963-
2N/12-7H(2)	A. Francois	1963-
2N/12-25R(1)	E. A. Kuck	1947-
2N/12-36F(1)	William Hertel	1962-
2N/12-36L(1)	Karl Thomsen	1962-
2N/12-36L(2)	J. Kenneth Fleck	1962-
2N/12-36L(3)	W. S. Nelson	1962- 1/
2N/13-28L(1)	Harvey Aluminum Co.	1957-
2N/13-28N(1)	Harvey Aluminum Co.	1957- 1/
2N/13-28N(1)	Harvey Aluminum Co.	1957-
2N/13-28P(1)	Harvey Aluminum Co.	1957-
2N/13-32A(1)	Chenowith Irrigation Coop.	1957- 1/
2N/13-32J(4)	Chenowith Irrigation Coop.	1957-
1/13-31Q(1)	Bill Hulse (McAllister)	1962- 1/
4/13-9C(1)	E. J. Schilling	1962-
WASHINGTON COUNTY		
1N/1W-21L(1)	Cecil C. Schaefer	1964-
1N/2W-8E(1)	T. R. Connell	1951-
1N/2W-11C(1)	Albert Zander	1951-
1N/2W-35E(1)	E. L. Lewis	1951- 1/
1N/3W-15H(1)	Art Salzwedel	1951-
1N/3W-19C(1)	A. J. Giesbers	1951-
1N/3W-36R(2)	General Foods Corp.	1951- 1/
2N/2W-30D(1)	Felix Devlaeminck	1964-
2N/3W-16A(1)	Dennis Hall	1964-
2N/4W-24F(1)	Erwin Mead	1963-
2N/4W-33G(1)	Julius Winterfield	1963-
1/1W-11L(1)	City of Beaverton	1964-
1/1W-17P(1)	Schuepbach Bros.	1959-
1/1W-19R(3)	Earle L. Miller	1961- 1/
1/1W-21R(1)	Elinore Shively	1948-
1/2W-13Q(1)	L. T. Wright	1961-
1/2W-23G(1)	Ed M. Jannsen	1965-
1/2W-24E(1)	Edward Berger	1957-
1/2W-26F(1)	Karl Schaefer	1958- 1/
1/2W-26G(1)	Baker Rock Crushing	1961-
1/2W-26Q(1)	Warren Northwest Inc.	1961-
1/3W-21C(2)	Ernest Meyer	1964-
1/4W-2H(1)	Myron Sheelar	1951- 1/
2/1W-3Q(1)	Leonard S. Davis	1962- 1/
2/1W-4C(2)	Harris H. Hanson	1962- 1/
2/1W-4G(1)	Tigard Water District	1962-
2/1W-10D(1)	Tigard Water District	1962-
2/1W-11E(1)	Tigard Water District	1962-
2/1W-11M(1)	Walter Engler	1962-
2/1W-13B(2)	Ralph Sittel	1960- 1/
2/1W-13K(2)	L. C. Endicott	1960-
2/1W-14N(1)	A. J. Martinazzi	1951-
2/1W-18J(1)	James Hasuike	1962-
2/1W-31A(1)	Ralph Reynolds	1963- 1/
2/1W-32F(3)	City of Sherwood	1963-
2/2W-2Q(1)	Louis Hesse	1965-
2/2W-6D(1)	S. R. Rotchstrom	1951- 1/
2/2W-16N(1)	Mountainside Cemetery	1964-
WHEELER COUNTY		
12/23-14R(1)	Lillie Collins	1963-
YAMHILL COUNTY		
2/3W-30Q(1)	E. W. Leffler	1963-
2/4W-13G(1)	George Woell	1962-
3/2W-17A(1)	Mack Bennett	1962- 1/
3/2W-19N(1)	Valley View Memorial Park	1965-
3/3W-26G(1)	City of Dundee	1962-
3/3W-30J(2)	Trappist Abbey	1962-
3/4W-19N(1)	Austin Warner	1962-
4/3W-6N(1)	City of Lafayette	1962-
4/3W-33K(1)	Clayton J. Trent	1962- 1/
4/4W-24R(1)	Ross Cruickshank	1962-
4/4W-27D(1)	J. L. Wilcox	1962-
5/3W-9P(1)	Howard Baker	1962-
5/3W-21C(1)	Louis W. McGee	1962-
5/3W-21N(1)	Fred C. Stockhoff	1962-
5/3W-30R(1)	Russ Rogers	1962-
5/4W-1B(1)	Earle F. Day	1962-
5/4W-11D(1)	Norman J. Longhurst	1962- 1/
5/4W-20N(1)	City of Amity	1962-
5/4W-25G(1)	Peter Parvin	1962-
5/4W-27B(1)	Alf DeRaeve	1962-
5/5W-13B(1)	George Fuller	1928- 1/
6/3W-4D(1)	Lloyd L. Lind	1962-

1/ Hydrograph of this well shown in this report.
2/ Measurements discontinued.