PREDICTED COVERAGE CONTOURS

The locations of the predicted coverage contours shown in exhibits E-8 and E-14 were computed according to computer methods outlined in F.C.C. publication PB-249144, **Field Strength Calculations for TV And FM Broadcasting**. The computer methods involve the use of digitized data taken directly from the graph of §73.333 Figure 1. Intermediate values are obtained through the use of bivariate interpolation techniques for surface fitting.

The average elevations from 3 to 16 kilometers (2 to 10 miles) on radials for each 45 degrees of azimuth starting with True North from the antenna were determined from topographic data obtained from the computerized 30-second point elevation database version of **Elevation Data For North America**, available from the Department of Commerce, National Geophysical Data Center, National Oceanic and Atmospheric Administration. A total of 81 points along each radial were linearly interpolated according to the requirements of §73.312(d).

The height of the antenna radiation center above average terrain was determined from these data. Finally, the height above average terrain (HAAT) was computed by averaging the radial elevations below the antenna radiation center in accordance with §73.313(d).

A supplemental radial at 324 degrees true north was also evaluated to show the nature of the terrain between the proposed site and portions of the Community of Shafter. The terrain profile of exhibit E-9I depicts these terrain data. The Community of Shafter is shown in exhibits E-8 and E-14.

Exhibit E-14 is a cartographic representation of the proposed 70 and 60 dBu F(50,50) contours overlaid with terrain shielding lines. The distances to the contours were based on the antenna radiation center above average terrain elevations

from 3 to 16 kilometers (2 to 10 miles) on 72 radials spaced at five degree azimuthal intervals, as extracted from the aforementioned terrain database.

POPULATION AND AREA CALCULATIONS

The 60 dBu (1.0 mV/m) contour was decomposed and described mathematically by a polygonal area which was used in conjunction with the computerized **Master Area Reference File** 1980 Census database made available by the U.S. Department of Commerce, Bureau Of The Census, to determine the population residing within the predicted 60 dBu contour.

The smallest census levels considered within Minor Civil Divisions and Census County Divisions include Tracts and Block Groups within tracted and block-numbered areas, Enumeration Districts within tracted and partially block-numbered or nonblock-numbered areas, and Block Numbering Areas within areas not tracted. When the centroid coordinates fell within the predicted contour, the entire population was considered to reside within the contour. When the centroid fell outside the contour, no portion of the population was counted.

The land area within the 60 dBu contour was computed using the trapezoidal approximation method employing the computed distances to the contour along the aforementioned bearings. Distances to intermediate azimuths of one degree were obtained mathematically by application of a cubic spline under tension.

LONGLEY-RICE FIELD STRENGTH PREDICTIONS

Exhibits E-10A through E-10I are a series of graphs depicting the expected F(50,50) signal in dBu as a function of distance along each of the nine radials shown in exhibits E-9A through E-9I.

To determine the signal strength at each point along a radial, the vertical plane radiation characteristics of the proposed six-bay π-spaced-element FM broadcast antenna with 0.0 degrees beam tilt and 0.0 percent null fill were computed at each vertical depression angle from horizontal. The vertical angle was obtained by assuming a transmitting antenna radiation center of 200.6 meters (658 feet) above mean sea level, and a receiving antenna height of 9 meters above ground at each point considered, and the horizontal distance to such point.

In cases where a point was shielded from direct line-of-sight from the transmitting antenna, the vertical angle was taken to be the angle to the top of the highest apparent obstruction between the transmitting antenna and the point of interest assuming an effective earth radius 4/3 that of the actual radius to account for atmospheric refraction.

The field strength at each point was then computed using a computerized implementation of the tropospheric radio propagation model developed at the Institute for Telecommunications Sciences and Aeronomy, Environmental Science Services Administration, National Bureau of Standards, by P. L. Rice, Anita G. Longley, Kenneth A. Norton and A. P. Barsis, and published for the first time in 1965. This model, known as the Longley-Rice propagation model is also commonly referred to as "Tech Note 101".

The model depends on propagation path geometry and atmospheric refractivity near the surface of the earth. Calculations of expected transmission loss for paths within the radio horizon are based on geometric-optics ray theory. For paths with a common horizon, Fresnel-Kirchoff knife-edge diffraction theory is applied. For double horizon paths that extend only slightly over the horizon, a modification of the Van der Pol-Bremmer method for computing field intensity in the far diffraction region is used. For longer paths, extending well beyond the radio horizon, predictions are based on forward scatter theory. When some doubt exists as to which propagation

mechanism predominates, transmission loss is calculated by two methods and the results are combined.

Correlation between a terrain profile and the predicted field strength along each point can be made by comparing each exhibit in E-9 with its counterpart in exhibit E-10. The dashed line in each exhibit E-10 depicts the free-space field strength based solely on antenna vertical radiation characteristics, receiving antenna elevation and distance from the antenna.

PROTECTION TO FCC MONITORING STATIONS

The proposed site is located 343.1 kilometers (213.2 miles) from the Livermore, California, FCC monitoring station in a direction of 137.6 degrees true. The monitoring station is in a direction of 319.1 degrees true from the site.

Clearly, because of this great distance, this proposal does not necessitate notification to the Chief of Field Operations Bureau, FCC, of the proposed construction in accordance with the requirements of §73.1030(c).

EMERGENCY POWER GENERATOR

The applicant herein proposes to install and maintain emergency backup power generators at both its transmitter and studio locations so broadcast service will not be interrupted during utility power outages or local emergency conditions.

MINIMUM SPACING REQUIREMENTS

Table One shows a listing of the nearest licensed facilities and allocations currently on file along with the

required distance separations for pertinent channels. For clarity, facilities which are greater than 300 kilometers beyond the minimum required separations are not shown.

All distances were computed by the methods outlined in §73.208(c) of the Commission's Rules.

TABLE ONE

SPACING REQUIREMENTS OF §73.207

AND ALLOCATION-PERTINENT STATIONS

Call	Channel	North Latitude	West Longitude	Actual Distance	Required Distance
KMRO	212-B	34:24:47	119:11:10	111.65 Km	74.0 Km
KUFW	213-B	36:17:09	118:50:15	101.50	74.0
KILA	213-C	35:56:44	115:02:34	379.78	105.0
KFSR	214-A	36:48:42	119:44:43	162.14	113.0
KPFK	214-B	34:13:45	118:04:03	167.74	169.0 (1)
KHDC	215-A	36:34:54	121:26:34	239.97	178.0
KXPR	215-B	38:42:38	121:28:54	418.20	241.0
KCPB	216-B	34:24:47	119:11:10	111.65	169.0 (1)
XETRA	216-C	32:30:24	117:04:49	378.15	215.0
KCPR	217-A	35:17:58	120:40:26	134.77	69.0
KUOP	217-B	37:28:48	121:21:02	299.18	74.0
KSJV	218-B	36:38:15	118:56:35	137.10	74.0
KGFM	268-B	35:26:20	118:44:23	41.70	20.0
KLIT	269-A	34:27:55	119:40:37	114.53	15.0

(1) See Interference Considerations To Shortspaced Facilities with respect to these authorized stations.

INTERFERENCE CONSIDERATIONS TO SHORTSPACED FACILITIES

Interference studies have been conducted to determine the extents of the protected 60 dBu (1.0 mV/m) contours of two existing stations which are shortspaced to this proposal by §73.207.

The geographic coordinates, antenna radiation center above mean sea level and the effective radiated power for stations KPFK(FM) and KCPB(FM) were obtained from the latest release of the FCC FM engineering database.

Terrain profiles between 3 and 16 kilometers along 72 azimuths spaced at five degree intervals were evaluated to establish the antenna radiation center above average terrain along these azimuths. Aforementioned techniques were then used to determine the distances to the protected 60 dBu F(50,50) contours and to the 54 dBu F(50,10) interference contours from stations KPFK(FM) and KCPB(FM). These contours are shown cartographically in exhibit E-11A.

From the distances to these contours, maximum permissible radiation limits were computed from the proposed site and antenna radiation center which would result in protection to the service contours of the proposed and existing facilities, and insure that no prohibited overlap would occur.

These radiation limits were submitted to Electronics Research, Inc., who provided the applicant with a directional antenna design that met the requirements.

The proposed 60 dBu F(50,50) service and the 54 dBu F(50,10) interference contours are shown in exhibit E-11A. From this presentation it is clear that no prohibited overlap will result from the proposed operation.

TELEVISION CHANNEL SIX PROTECTION

The proposed site is located within 180 kilometers of an existing channel six television station, KSBY-TV, and therefore, falls within the requirements of §73.525. KSBY-TV is located 132.5 kilometers west of the proposed site.

From the KSBY-TV site, terrain profiles between 3 and 16 kilometers along 72 azimuths spaced at five degree intervals were evaluated to establish the antenna radiation center above average terrain along these azimuths. The distances to the protected KSBY-TV 47 dBu F(50,50) service contour were computed and plotted in exhibit E-11B. Also shown is the proposed 80 dBu F(50,10) interference contour toward KSBY-TV's protected contour.

From the exhibit it can be seen that a minute portion of the KSBY-TV service contour is overlapped by the proposed interference contour. A supplemental large scale map was prepared to evaluate this area of overlap. Using a compensating polar planimeter, the area of overlap was measured to be 1.34 square kilometers. The area of overlap occurs entirely over an unpopulated area which is used exclusively for oil drilling operations. Therefore, the population residing within the area was determined to be zero.

A further supplemental showing was prepared to determine the extent of service from KSBY-TV and is included as exhibits E-16 and E-17. The terrain profile of exhibit E-16 shows that a substantial terrain obstruction occurs at approximately 44 miles and imposes a practical limit to KSBY-TV's service area. Exhibit E-18 graphically depicts the predicted field strength using the Longley-Rice propagation model. The Model predicts that the 47 dBu F(50,50) contour extends 101.07 kilometers (62.8 miles) toward the proposed site. As such, in actuality, there is a clearance of some 15.07 kilometers (9.36 miles) between the

protected KSBY-TV 47 dBu F(50,50) contour and the proposed 80 dBu F(50,10) interfering contour.

Even so, should interference result within KSBY-TV's protected contour, from operation of the proposed facility, the applicant will accept responsibility to correct such interference at the applicant's expense.

ENVIRONMENTAL ASSESSMENT OF NON-IONIZING RF RADIATION

In accordance with the requirements of the FCC Public Notice dated November 14, 1985, entitled **Environmental Processing Rules For Broadcasting**, the worst-case power density in mW/cm^2 has been calculated using equation four of Section II of the Office of Science & Technology Bulletin No. 65 entitled, **Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation**. Equation four has been reduced so the constant reflects both the factor 1.64 used to obtain ERP relative to EIRP and the factor 1000 for the number of milliwatts/watt. Further consideration includes the Environmental Protection Agency (EPA) recommendation that a more realistic approximation should include ground reflection by assuming a maximum 1.6-fold increase in field strength or an increase in power density of 1.6^2 (2.56).

Therefore,

$$S_{mW/cm^2} = \frac{0.10496 \cdot (ERP_H + ERP_V)}{\pi \cdot R^2}$$

$$S_{mW/cm^2} = \frac{0.10496 \cdot (97958.8)}{\pi \cdot 97.2^2}$$

$$S_{mW/cm^2} = 0.346 \ mW/cm^2$$

where,

S_{mW/cm^2} = Power Density in milliwatts/centimeter^2

ERP_H = 50,000 watts max, horizontally polarized ERP

ERP_V = 47,958.8 watts max, vertically polarized ERP

R = 97.2 meters from antenna radiation center to base of tower (319 feet)

The American National Standards Institute (ANSI) has established a maximum power density exposure limit of 1.0 mW/cm^2 averaged over any six-minute period, for radio frequency radiation in the band from 30 to 300 Megahertz.

In the aforementioned report, reference is made to studies conducted by the EPA in which a mathematical model of antenna behavior was developed to predict the required distance from the antenna radiation center to the bottom of the antenna supporting structure in order that the ANSI limit will not be exceeded anywhere on the ground. By linear interpolation of tabulated values in appendix B, table 1 of the report, it was determined that a maximum "worst" case distance of 57.2 meters would be required assuming a single dipole element with an effective radiated power of 97.9588 kilowatts (the sum of horizontal and vertical polarized power), and a "best" case distance of 14.6 meters using typically available six-bay broadcast antennas.

Exhibit E-15A graphically represents the predicted power density two meters above ground as a function of distance from the base of the proposed tower. Exhibit E-15B represents the composite predicted power density from both the proposed and the KKBB(FM) operations together. As can be seen, the composite sum of both contributors will produce a worst-case power density which is far below this standard. In fact, the ANSI limit of 1.0 mW/cm^2 will theoretically occur 57.2 meters below the antenna center of radiation which is 40.0 meters above ground. This conclusion is based on an unrealistically high vertical

(downward) field strength equal to the maximum horizontal effective radiated power.

After the proposed facility is constructed, the applicant will conduct radio frequency nonionizing radiation measurements in the vicinity of the tower to verify compliance with the requirements. Should measurements show that the ANSI limit of 1.0 mW/cm^2 is exceeded then the applicant will enclose this hazardous area within a locked fence.

Furthermore, in order to protect the public and warn of possible radio frequency radiation danger, the applicant is proposing to liberally mark the area around the tower with warning signs which comply with the ANSI standard C95.2-1982 Radio Frequency Radiation Hazard Warning Symbol.

Therefore, it is concluded that the operation proposed herein will not significantly affect the quality of the human environment and that an environmental assessment as described in Part 1, Subpart I of the Commission's Rules is not required.

DISTANCE TO 115 DBU BLANKETING CONTOUR

By use of the formulas outlined in §73.318(a), the distance to the 115 dBu (562 mV/m) blanketing contour is computed to be 2.79 kilometers (1.73 miles).

The proposed site is in a remote area with virtually no population. Therefore, the population residing within the 115 dBu (562 mV/m) contour is determined to be zero.

In compliance with §73.318, the applicant will accept full responsibility of resolving all reasonable complaints of new blanketing interference at no cost to the complainant, except those resulting from malfunctioning or mistuned receivers, improperly installed antenna systems, high gain antennas, antenna booster amplifiers, mobile receivers, and non-RF devices

such as tape recorders, phonographs and hi-fi amplifiers. In these exception cases, the applicant will provide technical information on possible remedies for blanketing interference.

CONCLUSION

It is concluded that the facility proposed herein is in compliance with all applicable F.C.C. requirements.

It is further believed that all methods employed in making the determinations contained within these Engineering Exhibits were in accordance with applicable F.C.C. Rules and Regulations and good engineering practice.

Lawrence L. Morton, P.E.
Consulting Telecommunications Engineers
October 20, 1989

AFFIDAVIT

State of California)
) ss:
County of Santa Barbara)

Lawrence L. Morton, being first duly sworn upon oath, deposes and says:

- That he is a qualified engineer,
- That he is a Registered Professional Engineer in the State of California,
- That he is a member of the Association of Federal Communications Consulting Engineers,
- That his qualifications are a matter of record with the Federal Communications Commission,
- That he has prepared many broadcast applications and engineering exhibits which have been filed with and granted by the Federal Communications Commission,
- That he has carried out such engineering work and that the results thereof are attached hereto and form part of this affidavit, and
- That the foregoing statement and the report regarding the aforementioned engineering work are true and correct of his own knowledge.

Date: October 20, 1989

Lawrence L. Morton, P.E.

On October 20, 1989, before me, Nancy A. Chase, a Notary Public, in and for the State of California, personally appeared Lawrence L. Morton known to me to be the person whose name is subscribed to the within instrument, and acknowledged to me that he executed the same.

My Commission expires 11/30/90

Notary Public

OFFICIAL SEAL
NANCY A. CHASE
Notary Public California
ORANGE COUNTY
My Comm. Expires Nov. 30, 1990

EXHIBIT E-2

DISTANCES TO PROPOSED CONTOURS

Shepherd Communications, Inc.

October 1989

AZIMUTH IN DEG	ANTENNA RADIATION CENTER ABOVE AVE. TERRAIN ELEVATION IN METERS	EFFECTIVE RADIATED POWER IN KW	------DISTANCES TO CONTOURS IN KM----- 80 DBU F(50,10)	70 DBU F(50,50)	60 DBU F(50,50)	54 DBU F(50,10)
0.0*	77.2	50.00	13.43	24.05	40.36	64.88
5.0	74.1	50.00	13.17	23.60	39.69	64.11
10.0	70.2	50.00	12.85	23.03	38.84	63.14
15.0	66.9	50.00	12.59	22.55	38.11	62.31
20.0	64.3	50.00	12.37	22.16	37.51	61.62
25.0	62.0	50.00	12.18	21.82	36.98	61.02
30.0	59.9	50.00	12.01	21.50	36.48	60.44
35.0	57.2	50.00	11.77	21.05	35.77	59.64
40.0	50.0	50.00	11.02	19.69	33.55	57.11
45.0*	47.3	50.00	10.70	19.09	32.59	55.96
50.0	45.3	50.00	10.46	18.65	31.88	55.07
55.0	44.4	50.00	10.35	18.46	31.57	54.66
60.0	44.3	50.00	10.33	18.42	31.51	54.59
65.0	45.4	50.00	10.47	18.68	31.91	55.12
70.0	49.0	50.00	10.90	19.47	33.20	56.70
75.0	55.2	50.00	11.57	20.70	35.20	59.00
80.0	62.1	50.00	12.19	21.83	37.00	61.04
85.0	66.4	49.69	12.52	22.43	37.93	62.07
90.0*	70.3	48.96	12.80	22.94	38.71	62.86
95.0	74.3	47.82	13.05	23.38	39.37	63.48
100.0	77.9	46.29	13.24	23.73	39.89	63.88
105.0	81.9	44.40	13.42	24.07	40.37	64.19
110.0	83.2	42.15	13.36	23.96	40.21	63.72
115.0	84.9	39.59	13.28	23.85	40.04	63.20
120.0	85.9	36.75	13.12	23.58	39.63	62.37
125.0	85.7	33.74	12.83	23.09	38.91	61.16
130.0	86.8	31.09	12.66	22.80	38.46	60.31
135.0*	87.9	28.87	12.52	22.56	38.09	59.61
140.0	89.8	27.04	12.45	22.45	37.92	59.17
145.0	90.9	25.58	12.36	22.29	37.68	58.69
150.0	91.7	24.45	12.28	22.16	37.47	58.31
155.0	92.6	23.64	12.23	22.09	37.37	58.08
160.0	93.0	23.13	12.19	22.02	37.25	57.88
165.0	94.2	22.92	12.24	22.11	37.40	58.01
170.0	95.0	22.92	12.29	22.21	37.55	58.17
175.0	95.8	22.92	12.34	22.31	37.69	58.33
180.0*	97.0	22.92	12.42	22.44	37.88	58.55
185.0	98.0	22.92	12.48	22.55	38.06	58.74
190.0	99.2	22.92	12.55	22.69	38.26	58.97
195.0	99.7	22.92	12.58	22.75	38.35	59.06
200.0	100.4	23.13	12.65	22.87	38.52	59.29
205.0	100.9	23.64	12.74	23.04	38.78	59.65
210.0	102.4	24.45	12.94	23.38	39.29	60.34
215.0	102.6	25.58	13.10	23.65	39.69	60.94
220.0	103.6	27.04	13.35	24.06	40.29	61.82

AZIMUTH IN DEG	ANTENNA RADIATION CENTER ABOVE AVE. TERRAIN ELEVATION IN METERS	EFFECTIVE RADIATED POWER IN KW	------DISTANCES TO CONTOURS IN KM----- 80 DBU F(50,10)	70 DBU F(50,50)	60 DBU F(50,50)	54 DBU F(50,10)
225.0*	103.8	28.87	13.58	24.44	40.86	62.72
230.0	104.0	31.09	13.85	24.87	41.49	63.75
235.0	104.7	33.74	14.19	25.41	42.26	65.01
240.0	105.5	36.75	14.56	25.99	43.10	66.37
245.0	106.4	39.59	14.92	26.53	43.86	67.59
250.0	106.7	42.15	15.20	26.95	44.45	68.56
255.0	107.7	44.40	15.50	27.37	45.05	69.48
260.0	108.9	46.29	15.78	27.77	45.59	70.30
265.0	109.1	47.82	16.28	27.99	45.91	70.81
270.0*	109.1	48.96	16.40	28.13	46.11	71.14
275.0	108.7	49.69	16.44	28.18	46.17	71.29
280.0	106.4	50.00	16.25	27.96	45.85	70.97
285.0	105.2	50.00	16.13	27.81	45.65	70.75
290.0	104.2	50.00	15.73	27.69	45.49	70.57
295.0	103.7	50.00	15.68	27.62	45.39	70.46
300.0	102.7	50.00	15.59	27.50	45.22	70.28
305.0	100.3	50.00	15.38	27.20	44.81	69.82
310.0	98.0	50.00	15.18	26.91	44.40	69.38
315.0*	97.1	50.00	15.10	26.79	44.24	69.20
320.0	95.2	50.00	14.94	26.54	43.90	68.83
325.0	92.4	50.00	14.70	26.17	43.39	68.27
330.0	91.9	50.00	14.65	26.10	43.29	68.16
335.0	89.4	50.00	14.43	25.76	42.81	67.63
340.0	87.8	50.00	14.31	25.54	42.50	67.29
345.0	85.2	50.00	14.09	25.18	41.99	66.72
350.0	83.6	50.00	13.95	24.95	41.67	66.37
355.0	80.8	50.00	13.72	24.56	41.11	65.73

* Indicates radials included in HAAT computation.

OCTOBER 6, 1989

CIRCULAR POLARIZED DIRECTIONAL ANTENNA SYSTEM PROPOSED FOR THE NEW STATION LOCATED IN SHAFTER, CALIFORNIA

Electronics Research Inc. proposes to provide a custom fabricated directional antenna system that is specially designed to meet the F.C.C. requirements and the general needs of the new station.

The antenna is the E.R.I. LP-6E-DA-SP type configuration. The proposed circular polarized system consists of 6 half-wavelength spaced bays using one driven circular polarized radiating element, 2 horizontal parasitic elements and 4 vertical parasitic elements per bay. The antenna will be tested on a 18" face tower, which is the structure the station plans to use to support the proposed array. All tests will be performed on a frequency of 90.9 megahertz which is the center of the FM broadcast channel assigned to the new station.

Pattern measurements will be made on fifty-acre antenna pattern range which is owned and operated by Electronics Research, Inc. The tests will be performed under the direction of Thomas B. Silliman, president of Electronics Research, Inc. Mr. Silliman has both the Bachelor of Electrical Engineering and the Master of Electrical Engineering degrees from Cornell University, and is also a registered professional engineer in the states of Indiana, Maryland and Minnesota.

DESCRIPTION OF THE TEST PROCEDURE

The test antenna consists of two bay levels of the circular polarized system with the associated vertical and horizontal parasitic elements. The elements and brackets that will be used in this test are electrically equivalent to those that will be supplied with the proposed antenna. Sections of 3 1/8inch o.d. rigid coaxial line will be used to feed the test antenna, and sections of 3 1/8inch o.d. rigid outer conductor only will be attached above the test antenna. All these lines will be over one half-wave in length. The lines will be properly grounded during all the test. The power distribution and phase relationship to the driven elements will be fixed in order to achieve the directional radiation pattern for both horizontal and vertical polarization components.

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CIRCULAR POLARIZED DIRECTIONAL ANTENNA SYSTEM
PROPOSED FOR THE NEW STATION
LOCATED IN SHAFTER, CALIFORNIA

(Continued)

The 18" face tower will be erected vertically on a turntable mounted on a non-metalic building with the antenna centered vertically on the structure, making the center of radiation of the test approximately 25 feet above ground. The turntable is equipped with a motor drive and azimuth indicating mechanism, resolution of this azimuth measuring system is one-tenth of a degree.

The antenna under test will be operated in the transmitting mode and fed from a Wavetek Model 3000 signal generator. The frequency of the signal source will be set at 90.9Mhz and will be constantly monitored by a Heathkit Model IM4110 frequency counter.

A broad-band horizontal and vertical dipole system, located approximately 628 feet from the test antenna, and mounted at the same height above terrain as the center of the antenna under test, will be used to receive the emitted test signals. The signals received by the dipole system will be fed to test building by way of two buried Heliax cables to an Anritsu Model ML521B measuring receiver. This data will be interfaced to a Hewlett-Packard Model 9872C plotter by means of a Hewlett-Packard Model 86 computer system. Relative field strength will be plotted as a function of azimuth.

The measurements will be performed by rotating the test antenna in a counter-clockwise direction and plotting the received signal on polar co-ordinated graph paper in a clockwise direction. Both horizontal and vertical components will be recorded separately.

CONCLUSIONS

The proposed circular polarized system consists of 6 half-wavelength spaced bays using one driven circular polarized radiating element, 2 horizontal parasitic elements and 4 vertical parasitic elements per bay. The power distribution and phase relationship between the driven elements will be fixed when the antenna is manufactured. Proper maintenance of the elements in good condition should be all that is required to maintain the pattern in adjustment.

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CIRCULAR POLARIZED DIRECTIONAL ANTENNA SYSTEM
PROPOSED FOR THE NEW STATION
LOCATED IN SHAFTER, CALIFORNIA

(Continued)

The LP-6E-DA-SP array is to be orientated on the 18" face tower at a bearing of North 0 degrees East. Blue prints provided with the antenna will show the proper antenna orientation alignment. The antenna alignment procedure should be directed by a licensed surveyor as prescribed by the FCC.

Deicers are not supplied and are not available. The use of radomes is recommended if icing conditions will exist at the proposed site.

The proposed horizontal plane relative field pattern, for both the horizontal and vertical polarization components, is shown on Figure #1 attached. The attached horizontal plane relative field pattern shown on Figure #1 is based on measured data. The actual measured pattern achieved on the 18" face tower at 90.9MHz may differ from the proposed pattern but will resemble the proposed pattern as closely as possible. A calculated vertical plane relative field pattern is shown on Figure #3 attached.

1. The power in the maximum will reach 50 kilowatts (16.9897000434 dbk).

2. The RMS of the vertically polarized horizontal plane component does not exceed the RMS of the horizontally polarized horizontal plane component. In addition the level of the vertically polarized component does not exceed the level of the horizontally polarized component at any azimuth as measured in the horizontal plane.

3. Neither the horizontally polarized component nor the vertically polarized component will exceed a rate of change of 2 DB per any ten degree change in azimuth as measured in the horizontal plane.

The approximate weight of the antenna minus the mounting structure is 792 lbs. The approximate windload of the antenna minus the mounting structure is 1436 lbs based on 50/33 PSF(112 MPH wind) with no ice build up. The minimum length of the structure required to support the antenna is 45 feet. The directional antenna should not be mounted on the top of an antenna tower which includes a top-mounted platform larger than the

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CIRCULAR POLARIZED DIRECTIONAL ANTENNA SYSTEM
PROPOSED FOR THE NEW STATION
LOCATED IN SHAFTER, CALIFORNIA

(Continued)

cross-sectional area of the tower in the horizontal plane. No other obstruction other than those that are specified by the blue prints supplied with the antenna are to be mounted at the same tower level as the directional antenna. No obstruction of any type is to be with in 75ft horizontally of the antenna system. The vertical distance to the nearest obstruction should be a minimum of 10ft from the directional antenna.

The calculated maximum power gain of the horizontal component is 2.33 (3.67db). The calculated maximum power gain of the vertically polarized component is 2.23 (3.49db).

The calculated input power to the antenna input flange is 21.4702703583 kilowatts (13.318375132 dbk) to provide a maximum horizontal ERP of 50 kilowatts (16.9897000434 dbk) and a maximum vertical ERP of 47.9587971612 kilowatts (16.8086828217 dbk). The input flange to the antenna is 3 1/8inch female.

Dan Dowdle

ELECTRONICS RESEARCH, INC.
108 Market Street
Newburgh, In 47630

EXHIBIT E-4

OCTOBER 6 1989
HORIZONTAL PLANE RELATIVE FIELD & DBK LIST
FOR THE NEW STATION 90.9MHz

AZIMUTH	H POL RELATIVE FIELD	H POL DBK	H POL POWER KW	V POL RELATIVE FIELD	V POL DBK	V POL POWER KW	AZIMUTH	H POL RELATIVE FIELD	H POL DBK	H POL POWER KW	V POL RELATIVE FIELD	V POL DBK	V POL POWER KW
0.0	1.000	16.99	50.00	.979	16.81	47.96	180.0	.677	13.60	22.92	.664	13.43	22.04
5.0	1.000	16.99	50.00	.976	16.78	47.61	185.0	.677	13.60	22.92	.664	13.43	22.04
10.0	1.000	16.99	50.00	.968	16.70	46.82	190.0	.677	13.60	22.92	.664	13.43	22.04
15.0	1.000	16.99	50.00	.955	16.59	45.58	195.0	.677	13.60	22.92	.664	13.43	22.04
20.0	1.000	16.99	50.00	.937	16.43	43.91	200.0	.680	13.64	23.13	.664	13.43	22.04
25.0	1.000	16.99	50.00	.916	16.22	41.92	205.0	.688	13.74	23.64	.668	13.48	22.28
30.0	1.000	16.99	50.00	.897	16.05	40.27	210.0	.699	13.88	24.45	.676	13.59	22.86
35.0	1.000	16.99	50.00	.884	15.92	39.08	215.0	.715	14.08	25.58	.690	13.76	23.79
40.0	1.000	16.99	50.00	.876	15.84	38.33	220.0	.735	14.32	27.04	.708	13.99	25.08
45.0	1.000	16.99	50.00	.872	15.80	38.01	225.0	.760	14.60	28.87	.732	14.28	26.77
50.0	1.000	16.99	50.00	.876	15.84	38.33	230.0	.789	14.93	31.09	.760	14.61	28.88
55.0	1.000	16.99	50.00	.884	15.92	39.08	235.0	.821	15.28	33.74	.797	15.02	31.74
60.0	1.000	16.99	50.00	.897	16.05	40.27	240.0	.857	15.65	36.75	.841	15.49	35.38
65.0	1.000	16.99	50.00	.916	16.22	41.92	245.0	.890	15.98	39.59	.882	15.90	38.89
70.0	1.000	16.99	50.00	.937	16.43	43.91	250.0	.918	16.25	42.15	.916	16.22	41.91
75.0	1.000	16.99	50.00	.955	16.59	45.58	255.0	.942	16.47	44.40	.942	16.47	44.38
80.0	1.000	16.99	50.00	.968	16.70	46.82	260.0	.962	16.66	46.29	.962	16.65	46.24
85.0	.997	16.96	49.69	.976	16.78	47.61	265.0	.978	16.80	47.82	.974	16.76	47.44
90.0	.990	16.90	48.96	.979	16.81	47.96	270.0	.990	16.90	48.96	.979	16.81	47.96
95.0	.978	16.80	47.82	.974	16.76	47.43	275.0	.997	16.96	49.69	.976	16.78	47.61
100.0	.962	16.66	46.29	.961	16.65	46.20	280.0	1.000	16.99	50.00	.968	16.70	46.82
105.0	.942	16.47	44.40	.941	16.46	44.31	285.0	1.000	16.99	50.00	.955	16.59	45.58
110.0	.918	16.25	42.15	.914	16.21	41.79	290.0	1.000	16.99	50.00	.937	16.43	43.91
115.0	.890	15.98	39.59	.880	15.88	38.70	295.0	1.000	16.99	50.00	.916	16.22	41.92
120.0	.857	15.65	36.75	.838	15.46	35.13	300.0	1.000	16.99	50.00	.897	16.05	40.27
125.0	.821	15.28	33.74	.793	14.98	31.47	305.0	1.000	16.99	50.00	.884	15.92	39.08
130.0	.789	14.93	31.09	.757	14.57	28.65	310.0	1.000	16.99	50.00	.876	15.84	38.33
135.0	.760	14.60	28.87	.730	14.25	26.61	315.0	1.000	16.99	50.00	.872	15.80	38.01
140.0	.735	14.32	27.04	.707	13.98	24.98	320.0	1.000	16.99	50.00	.876	15.84	38.33
145.0	.715	14.08	25.58	.689	13.75	23.73	325.0	1.000	16.99	50.00	.884	15.92	39.08
150.0	.699	13.88	24.45	.676	13.59	22.84	330.0	1.000	16.99	50.00	.897	16.05	40.27
155.0	.688	13.74	23.64	.667	13.48	22.27	335.0	1.000	16.99	50.00	.916	16.22	41.92
160.0	.680	13.64	23.13	.664	13.43	22.04	340.0	1.000	16.99	50.00	.937	16.43	43.91
165.0	.677	13.60	22.92	.664	13.43	22.04	345.0	1.000	16.99	50.00	.955	16.59	45.58
170.0	.677	13.60	22.92	.664	13.43	22.04	350.0	1.000	16.99	50.00	.968	16.70	46.82
175.0	.677	13.60	22.92	.664	13.43	22.04	355.0	1.000	16.99	50.00	.976	16.78	47.61

CITY OF LICENSE: SHAFTER, CALIFORNIA
MOUNTING STRUCTURE: 18" FACE TOWER
ANTENNA TYPE: LP-6E-DA-SP NUMBER OF BAYS: 6
HORIZONTAL MAXIMUM RELATIVE FIELD= 1 AZIMUTH 0
HORIZONTAL MINIMUM RELATIVE FIELD= .677 AZIMUTH 165
VERTICAL MAXIMUM RELATIVE FIELD= .979375282118 AZIMUTH 0
VERTICAL MIMIMUM RELATIVE FIELD= .663865155663 AZIMUTH 160
HORIZONTAL R.M.S.=.90627 VERTICAL R.M.S.=.85990
MAXIMUM HORIZONTAL E.R.P.= 50.0000KW MAXIMUM VERTICAL E.R.P.= 47.9588KW
HORIZONTAL POWER INPUT=11.2985KW VERTICAL POWER INPUT=10.1718KW
TOTAL POWER INPUT=21.4703KW
MAXIMUM HORIZONTAL POWER GAIN OF COMPLETE ARRAY= 2.33 (3.67 db)
MAXIMUM VERTICAL POWER GAIN OF COMPLETE ARRAY= 2.23 (3.49 db)
ANTENNA ORIENTATION: NORTH 0 DEGREES EAST

EXHIBIT E-5

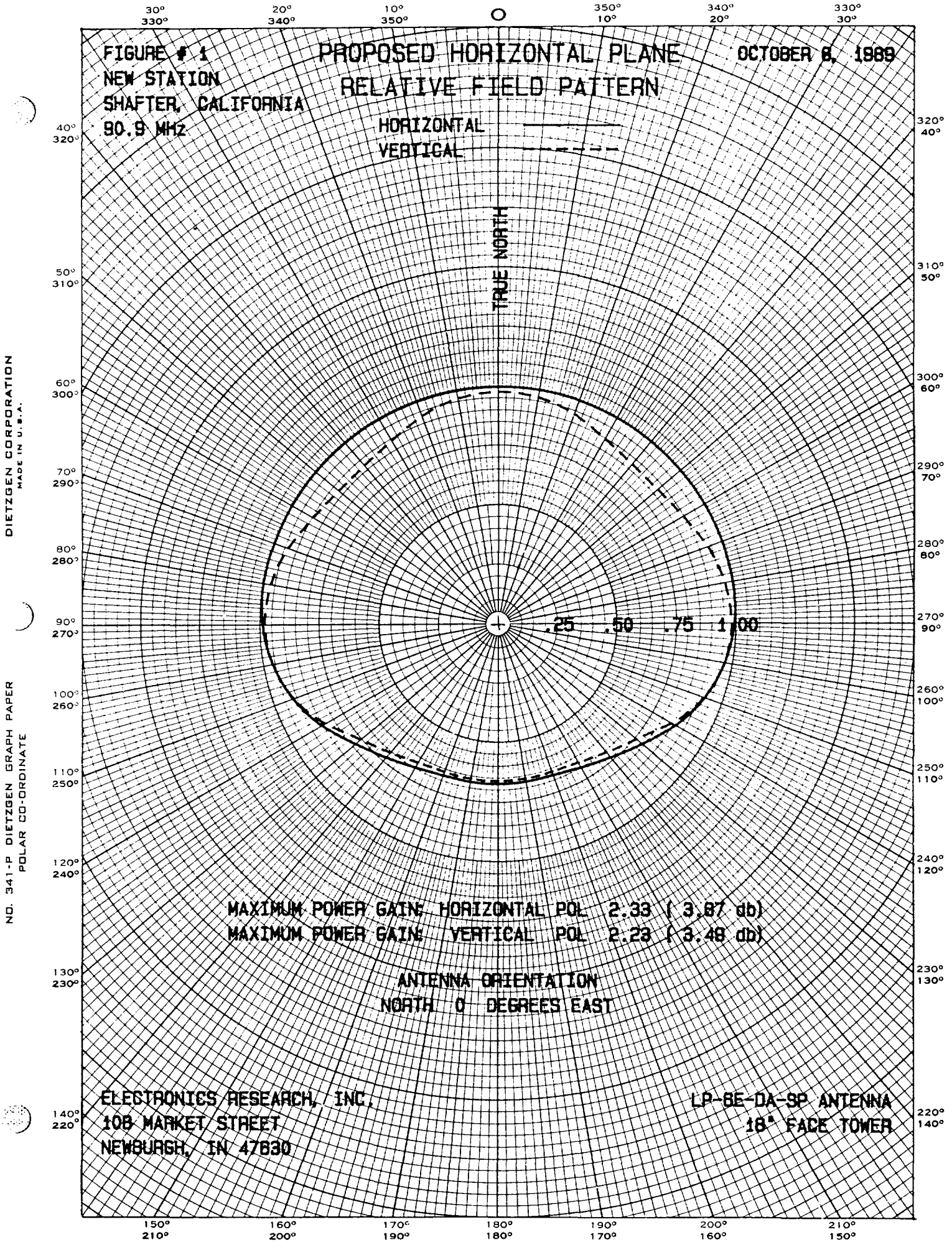


FIGURE # 1
NEW STATION
SHAFTER, CALIFORNIA
90.9 MHz
PROPOSED HORIZONTAL PLANE
RELATIVE FIELD PATTERN
OCTOBER 6, 1989
HORIZONTAL
VERTICAL
TRUE NORTH
.25 .50 .75 1.00
MAXIMUM POWER GAIN HORIZONTAL POL 2.33 (3.67 db)
MAXIMUM POWER GAIN VERTICAL POL 2.23 (3.48 db)
ANTENNA ORIENTATION
NORTH 0 DEGREES EAST
ELECTRONICS RESEARCH, INC.
108 MARKET STREET
NEWBURGH, IN 47630
LP-8E-DA-SP ANTENNA
18" FACE TOWER
DIETZGEN CORPORATION
MADE IN U.S.A.
NO. 341-P DIETZGEN GRAPH PAPER
POLAR CO-ORDINATE

K+E 10 X 10 TO ½ INCH 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.
46 1320

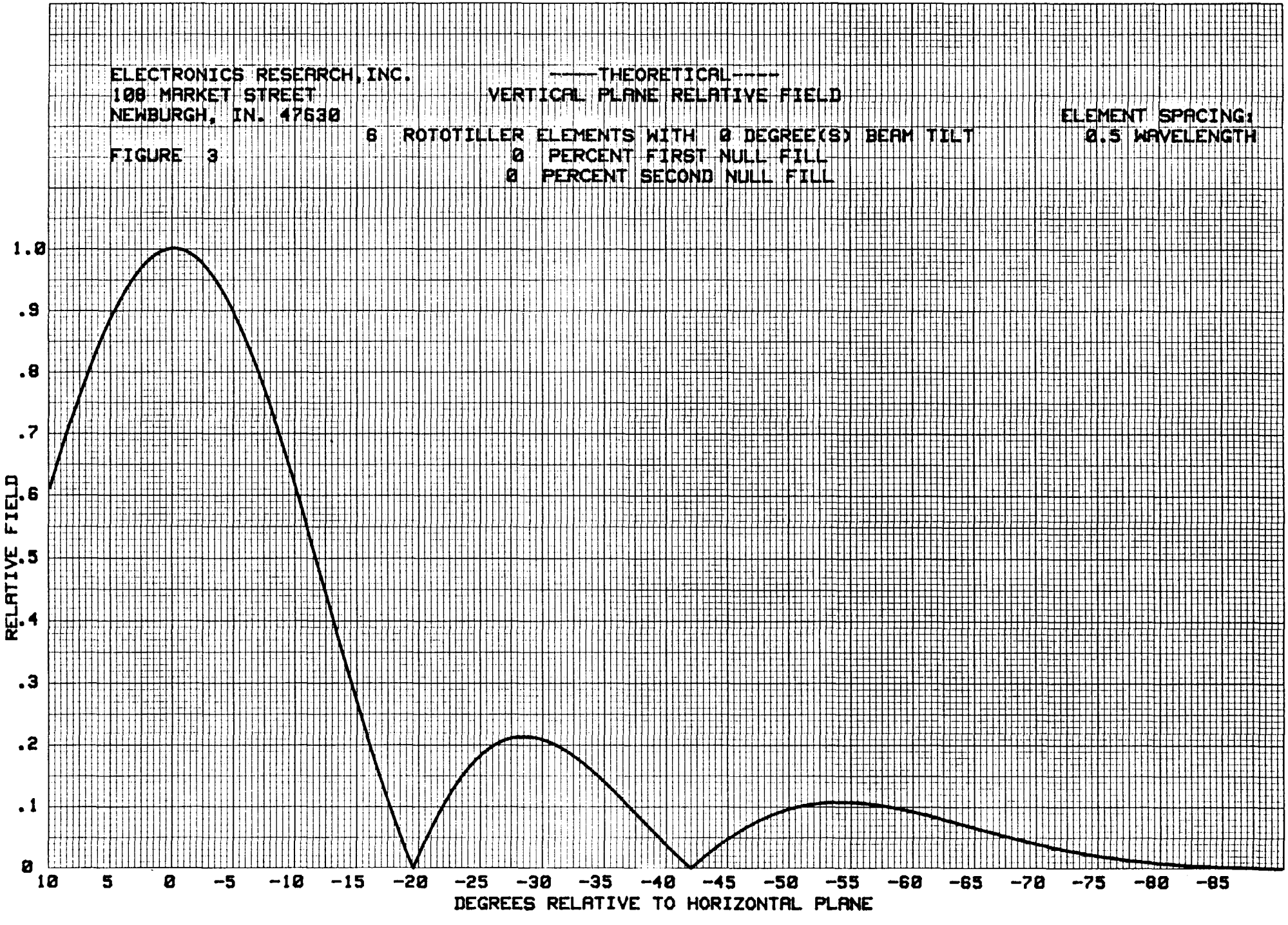


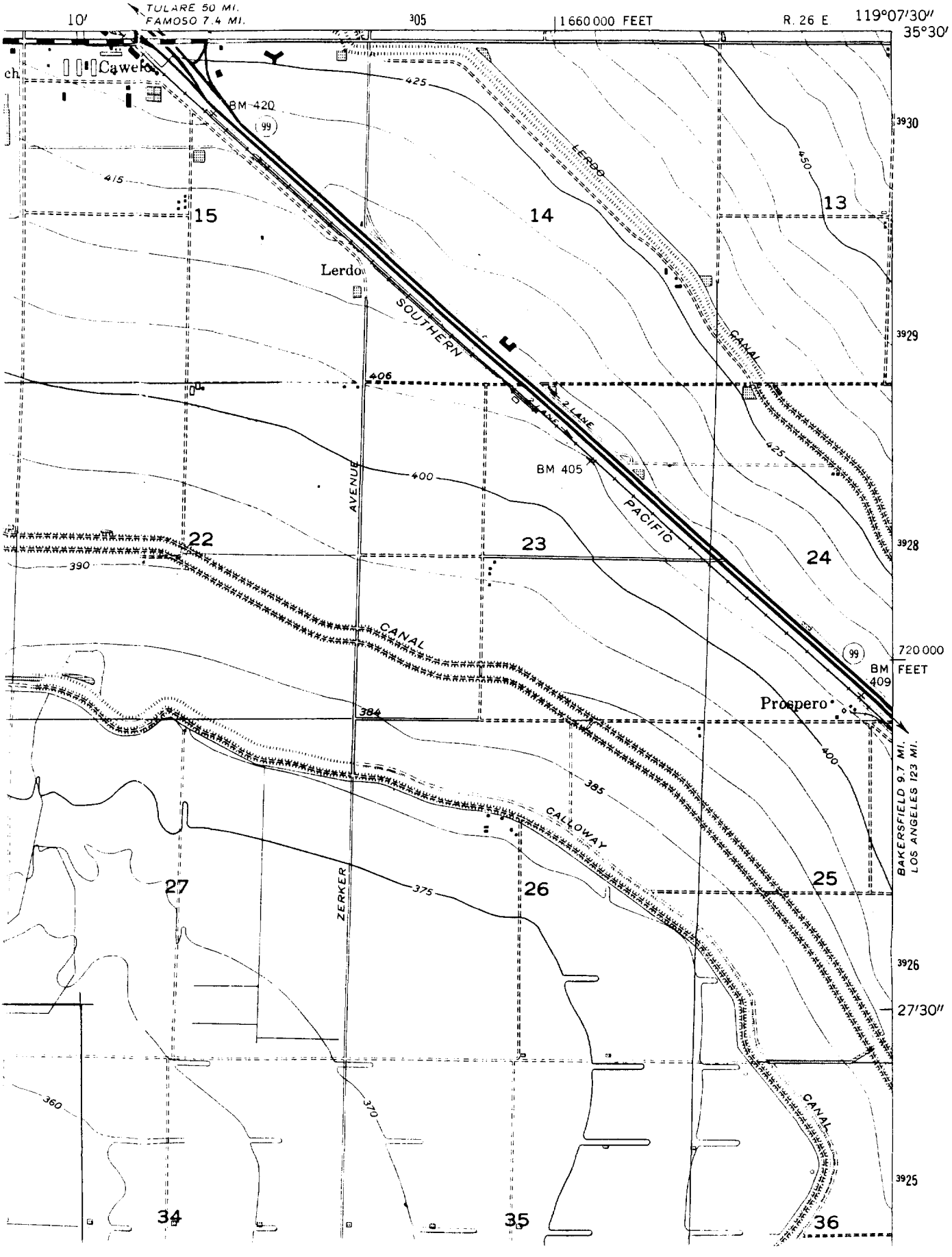
EXHIBIT E-6

ROSEDALE QUADRANGLE

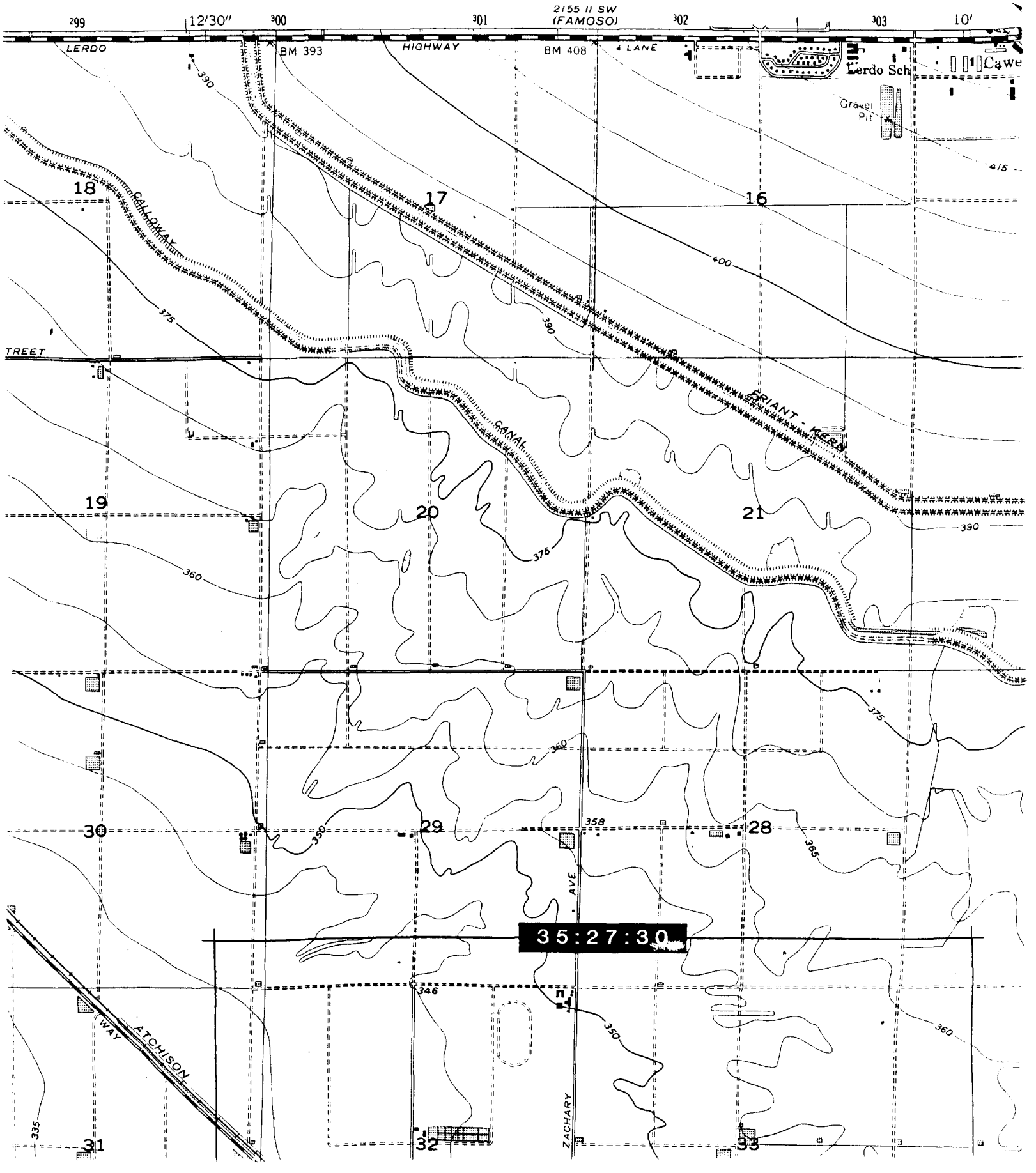
CALIFORNIA—KERN CO

7.5 MINUTE SERIES (TOPOGRAPHIC)

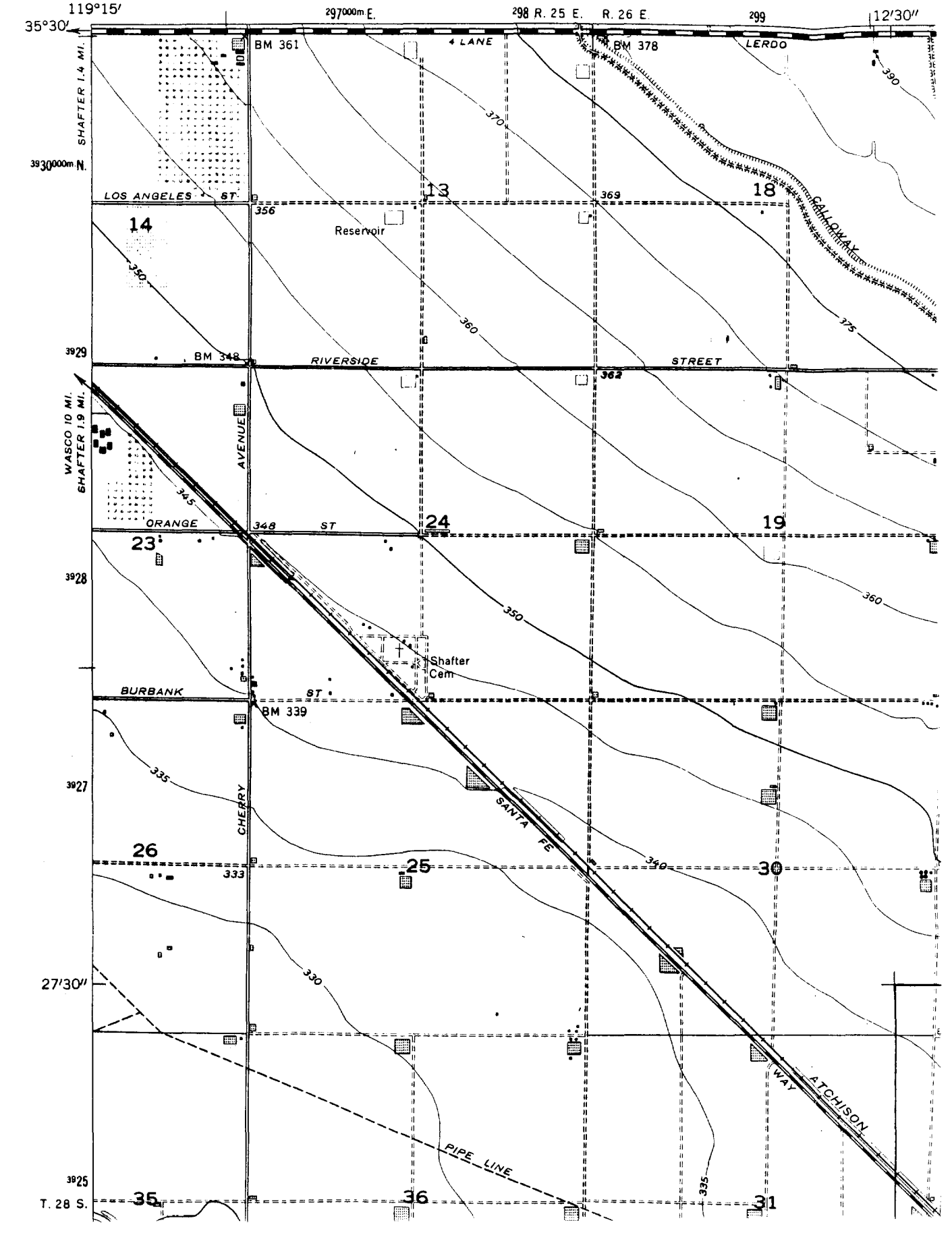
2155 II SE (NORTH OF OILDALE)

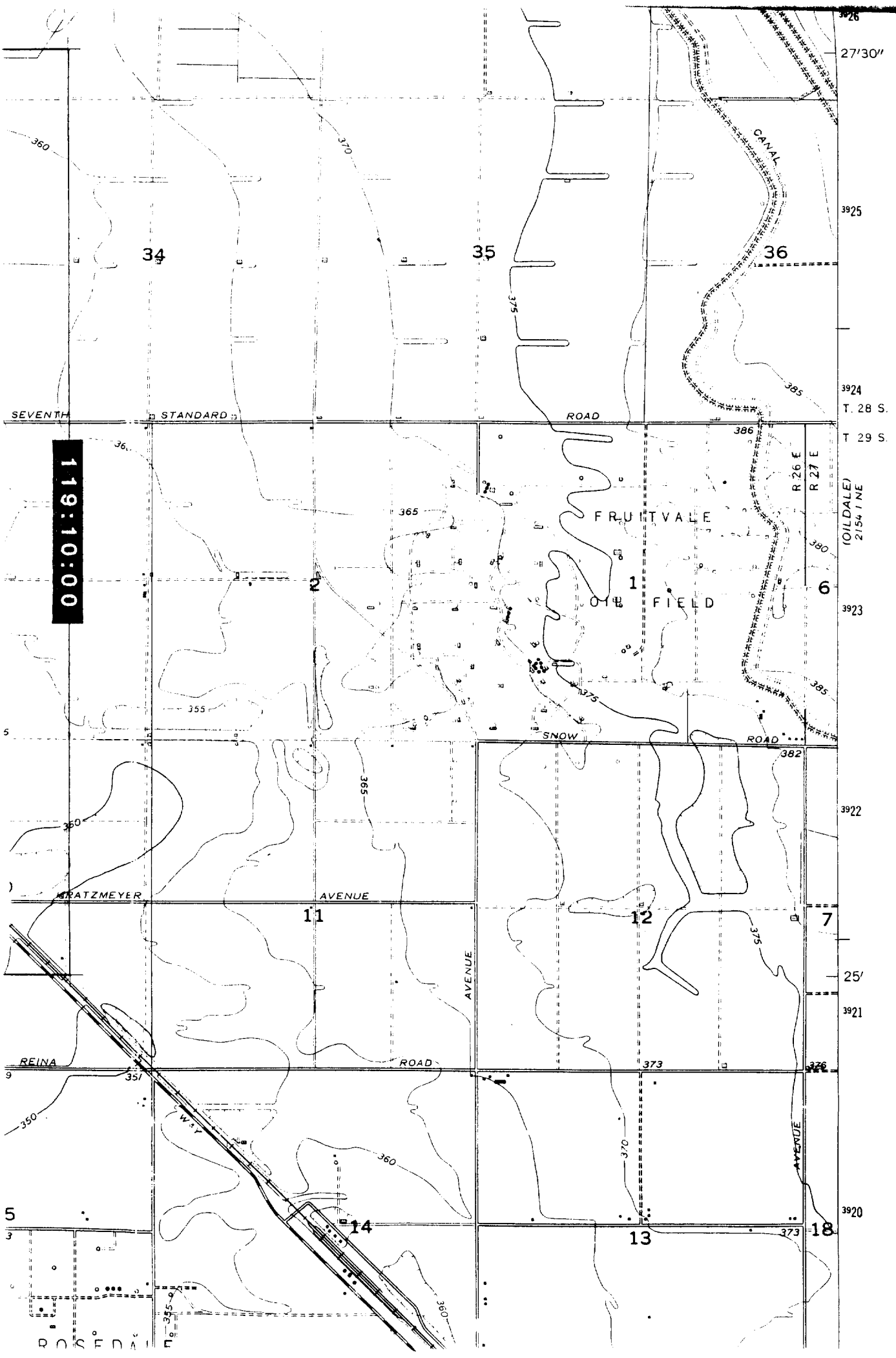


STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY





27'30"
CANAL
34
35
36
SEVENTH
STANDARD
ROAD
T. 28 S.
T 29 S.
R 26 E
R 27 E
(OILDALE)
2154 I NE
FRUITVALE
OIL FIELD
2
1
6
SNOW
ROAD
KRATZMEYER
AVENUE
11
12
7
AVENUE
25'
REINA
ROAD
WAY
AVENUE
14
13
18
ROSEDALE
119:10:00