

STAFF REPORT  
(One-Step Final Plat)

**CASE NUMBER:** SUB 2001-118 - FOREST RIDGE ESTATES

**OWNER/APPLICANT:** Earl F. Raymond, c/o Robert E. Johnson, 1708 N. Custer, Wichita, KS 67203

**SURVEYOR/ENGINEER:** Savoy, Ruggles & Bohm, 924 N. Main, Wichita, KS 67203

**LOCATION:** East side of 119th St. West, South of 109th St. North.

**SITE SIZE:** 80 Acres

**NUMBER OF LOTS**

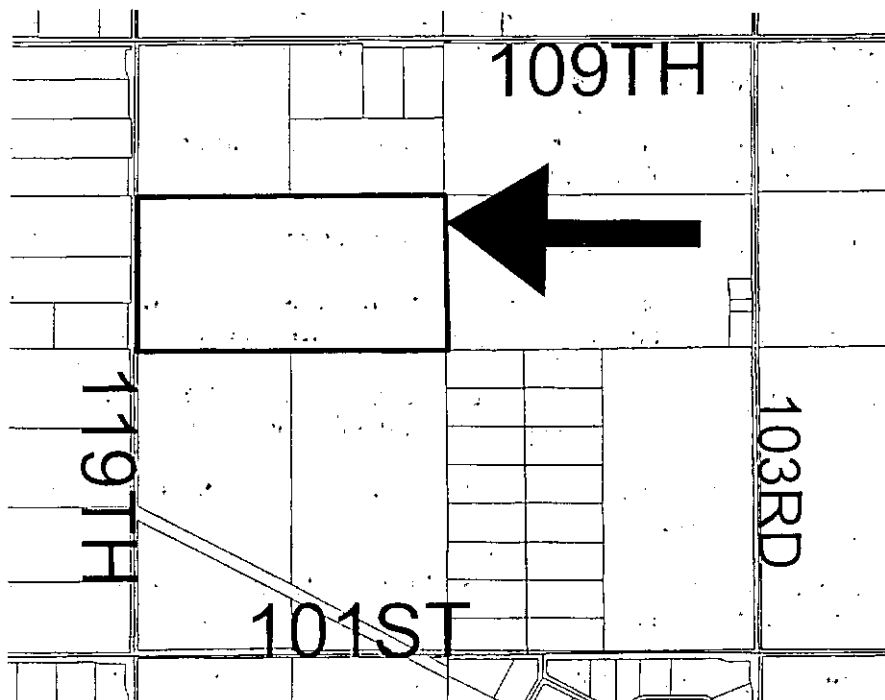
Residential:	72
Office:	
Commercial:	
Industrial:	
Total:	<u>72</u>

**MINIMUM LOT AREA:** 40,256 sq. ft.

**CURRENT ZONING:** RR, Rural Residential

**PROPOSED ZONING:** SF-20, Single-Family Residential

VICINITY MAP



SUB 2001-118 – One-Step Final Plat of FOREST RIDGE ADDITION  
December 13, 2001 - Page 2

**Note:** This site is located in the County in an area designated as "rural" by the 1999 Update to the Wichita-Sedgwick County Comprehensive Plan. The applicant has requested a zone change (ZON 2001-72) to SF-20, Single-Family Residential to allow for the lot sizes being platted.

This site is located within a one mile radius of five City of Wichita Community wells. The applicant is advised that the City Water and Sewer Department, Equus Beds Management and MAPD have recommended denial of this plat due to concerns regarding groundwater contamination from septic tanks in this area.

Should denial occur, the applicant must first formally request the Subdivision Committee decision be appealed to the MAPC prior to any action being taken by the governing bodies. Should the Subdivision Committee approve this plat, the following conditions shall apply:

**STAFF COMMENTS:**

- A. Prior to this plat being scheduled for Planning Commission review, the zone change of the property will need to be completed to allow for the lot sizes being platted.
- B. This plat will be subject to approval of the associated zone change and any related conditions of such a zone change.
- C. Since neither municipal water nor sanitary sewer is available to serve this property, the applicant shall contact the Environmental Health Division of the Health Department to find out what tests may be necessary and what standards are to be met for approval of on-site sewerage facilities and water wells. A memorandum shall be obtained specifying approval. Due to the size of the platted lots, approval will be needed for the use of septic systems.
- D. This site is located within a one mile radius of five City of Wichita Community wells. The applicant is advised that the City Water and Sewer Department and Equus Beds Management have recommended denial of this plat due to concerns regarding groundwater contamination from septic tanks in this area.
- E. If improvements are guaranteed by petition, a notarized certificate listing the petitions shall be submitted to the Planning Department for recording.
- F. County Engineering needs to comment on the status of the applicant's drainage concept.
- G. County Fire Department has advised that the streets need to be installed and approved prior to any construction being permitted or building permits being issued.
- H. Complete access control needs to be dedicated along 119<sup>th</sup> St. West. The final plat shall reference the dedication of access controls in the plat's text.
- I. The Applicant shall guarantee the installation of the proposed interior streets to the suburban street standard.
- J. The street guarantee shall include the installation of temporary turnarounds at the north and south ends of Karma Lane.
- K. The County Fire Department/GIS needs to comment on the plat's street names.
- L. The Applicant is advised that if platted, the building setbacks along 119<sup>th</sup> St. West must be 35 feet to conform with the Zoning setback standard for County section line roads.

SUB 2001-118 – One-Step Final Plat of FOREST RIDGE ADDITION  
December 13, 2001 - Page 3

- M. The Applicant is reminded that a platting binder is required with the final plat. Approval of this plat will be subject to submittal of this binder and any relevant conditions found by such a review.
- N. The platting text shall include language that a drainage plan has been developed for the plat and that all drainage easements, rights-of-way, or reserves shall remain at established grades or as modified with the approval of the applicable City or County Engineer, and unobstructed to allow for the conveyance of stormwater.
- O. The applicant shall install or guarantee the installation of all utilities and facilities which are applicable and described in Article 8 of the MAPC Subdivision Regulations. (Water service and fire hydrants required by Article 8 for fire protection shall be as per the direction and approval of the Chief of the Fire Department.)
- P. The applicant's engineer is advised that the Register of Deeds is requiring the name(s) of the notary public, who acknowledges the signatures on this plat, to be printed beneath the notary's signature.
- Q. To receive mail delivery without delay, and to avoid unnecessary expense, the applicant is advised of the necessity to meet with the U.S. Postal Service Growth Management Coordinator (Phone 316-946-4556) prior to development of the plat so that the type of delivery, and the tentative mailbox locations can be determined.
- R. The applicant is advised that various State and Federal requirements (specifically but not limited to the Army Corps of Engineers, Kanopolis Project Office, Rt. 1, Box 317, Valley Center, KS 67147) for the control of soil and wind erosion and the protection of wetlands may impact how this site can be developed. It is the applicant's responsibility to contact all appropriate agencies to determine any such requirements.
- S. The owner of the subdivision should be aware of the fact that the development of any subdivision greater than five (5) acres in size may require an NPDES Storm Water Discharge Permit from the Kansas Department of Health and Environment in Topeka. Further, on all construction sites, the City of Wichita requires that best management practices be used to reduce pollutant loadings in storm water runoffs.
- T. Perimeter closure computations shall be submitted with the final plat tracing.
- U. Recording of the plat within thirty (30) days after approval by the City Council and/or County Commission.
- V. The representatives from the utility companies should be prepared to comment on the need for any additional utility easements to be platted on this property.
- W. The applicant is reminded that a disk shall be submitted with the final plat tracing to the Planning Department detailing this plat in digital format in AutoCAD. This will be used by the City and County GIS Department.

**EQUUS BEDS GROUNDWATER MANAGEMENT DISTRICT NO. 2  
GROUNDWATER QUALITY PLANNING STATEMENT**

**PRESENTED TO THE  
METROPOLITAN AREA PLANNING DEPARTMENT  
and the  
SEDGWICK COUNTY ENVIRONMENTAL DEPARTMENT**

**CONCERNING  
FOREST RIDGE ESTATES ADDITION**

**November 19, 2001**

Prepared by Michael T. Dealy L.G., Manager  
Equus Beds Groundwater Management District No. 2

**SITE LOCATION**

The Forest Ridge Estates Addition is described as an 80 acre tract located in the South half of the Northwest quarter of Section 18, Township 25 South, Range 1 West, Sedgwick County. It is located about 1.6 miles southeast of the corporate limits for the City of Bentley. The site is within the boundaries and jurisdiction of the Equus Beds Groundwater Management District and overlies a portion of the Equus Beds aquifer.

The site has been designated a sensitive groundwater area by the Kansas Corporation Commission rule and regulation K.A.R. 82-3-600, Table III.

**BACKGROUND INFORMATION**

The Equus Beds Groundwater Management District No. 2 was contacted by the Wichita-Sedgwick County Metropolitan Area Planning and Sedgwick County Environmental Departments by letter dated October 24, 2001 and by telephone requesting the District to review and comment on the development of the plat. The request concerns the sketch plat for the Forest Ridge Estates Addition before the planning and environmental departments. The tract owner is Earl F Johnson and the contract purchaser is Robert E Johnson, 1718 N Custer, Wichita, Kansas, 67203.

The Equus Beds Groundwater Management District No. 2 has: 1) reviewed the sketch plat for the Forest Ridge Estates Addition, 2) the Metropolitan Area Planning Department staff letter of review dated October 24, 2001, for Forest Ridge Estates Addition, 3) contacted local, county and city officials to discuss water quality planning considerations, and 4) reviewed the Equus Beds aquifer management program, other published reports and basic hydrologic and geologic data in the preparation of this document for the Wichita-Sedgwick County Metropolitan Area Planning and Environmental Departments.

The planned subdivision consists of 76 residential lots with lot area ranging from 0.88 acre to one acre for single-family dwellings. Drinking water and waste disposal systems for each lot will consist of small capacity domestic water well and on-site septic system consisting of a septic tank and a lateral field.



The volume of wastewater discharged by a septic tank system from a typical household ranges from 40 gallons per day per person to 45 gallons per day per person (U.S. Environmental Protection Agency, 1977). Assuming the following: a) that all 76 subdivision lots are developed, b) the average household consists of 4 persons and c) septic tanks and laterals are installed for waste disposal; the annual volume of effluent discharged from the septic tanks and laterals to the unsaturated material above the water table of the Equus Beds aquifer ranged from 4,438,400 gallons to 4,993,200 gallons. An amount equal to covering a football field with waste effluent to a depth of nearly 15 feet each year.

The effluent which passes through the septic tank and laterals and the unsaturated soil represent a concern relative to groundwater quality contamination. Based on previous studies (Canter and Knox, 1985) of septic tank influent; the average domestic wastewater contains 50 mg/L Total Nitrogen, 12 mg/L Ammonia, 30,000 MPN/100ml Fecal bacterial and 32 - 7,000 PFU/1 Enteric virus.

Data also indicate that septic tank effluent contains fecal coliform bacteria, certain virus and nitrates and are a groundwater pollution concern. Additionally, there have been several reported cases of organic compounds from household cleaning products passing through septic systems and contaminating groundwater (U. S. Environmental Protection Agency, 1980).

Soils with a high infiltration rate can be rapidly overloaded with organic and inorganic chemicals and micro-organisms, thus allowing rapid movement of contaminants from the laterals through the unsaturated soil material to the underlying groundwater (Canter and Knox, 1985). This type of septic system failure is largely overlooked or ignored until nearby water wells are contaminated.

## **SURFACE TOPOGRAPHY AND SOIL**

Surface elevation at the proposed site ranges from 1377 to 1379 feet above mean sea level. The land surface is nearly level. Surface drainage is predominantly to the southeast.

The predominant soil at the site is classified as Farnum loam characterized as ranging from clay loam to sandy loam. It is described as nearly level having well drained soils. Soil permeability or infiltration rate ranges from 0.2 to 20.0 inches per hour increasing with depth. The soil is suitable for building site development, but has severe limitations for onsite waste disposal. The severe limitation is due to a shallow groundwater level and a substratum consisting of medium sand from 40 inches to 60 inches below land surface (Soil Conservation Service, 1979).

## **HYDROGEOLOGY**

The proposed site overlies a portion of the unconsolidated freshwater aquifer known as the Equus Beds aquifer. The aquifer is the principal source of freshwater for the site area as well as for a four county area in south-central Kansas.

Lithologic logs (Meyers and others, 1996) described the unsaturated zone above the aquifer's water-table as consisting of unconsolidated material consisting of clay, silt, sand and gravel. Data indicates that north of the site a clay unit underlies the soil profile, while south of the site the clay unit is absent and underlain by sand grading from fine to medium. The logs were prepared from data collected at groundwater monitoring sites EB 201 and EB 202 located about one-half mile north and one mile southwest of the site, respectively.

Based on the lithologic logs, permeability in the unsaturated zone ranges from 0.00001 to 0.001 gallons per day per foot squared for clay, 10 to 1,000 gal. per day/ft<sup>2</sup> for fine sand, 100 to 1,000 gal. per day/ft<sup>2</sup> for medium sand and 100 to 10,000 gal. per day/ft<sup>2</sup> for coarse sand and gravel.

Water-level data collected from groundwater monitoring well EB 201-A, located north of the site, show the water-level is shallow and averaged 26.9 feet below land surface for the period from December 1986 to October 2001. The water-level ranged from a low of 33.6 feet below land surface October 1991 to a high of 17.9 feet below land surface April 2000.

Water-level data collected from groundwater monitoring well EB 202-A, located south of the site, show the water-level is shallow and averaged 14.4 feet below land surface for the period from December 1986 to October 2001. The water-level ranged from a low of 19.4 feet below land surface July 1991 to a high of 8.9 feet below land surface January 2001.

The average saturated thickness of the aquifer is 176 feet thick. Depth to bedrock (bottom of the aquifer) ranged from 170 feet to 190 feet below land surface. The site overlies the northern flank of the Arkansas River Palo-bedrock channel having an axis trending northwest to southeast. Data indicate that the water table slope and groundwater movement is to the southeast.

Groundwater development in the area consists of small capacity domestic (household) use. Based on the U. S. Geological Survey 7.5 minute series topographic map for the site, there are several domestic wells, four irrigation wells and three City of Wichita public water supply wells located within one mile of the proposed subdivision.

The safe yield allowable within the 2-mile radius area of consideration is 4,021 acre-feet per year. Existing groundwater appropriations or pumpage within the 2-mile radius around the proposed addition exceed the safe-yield allowable. Based on the region average per capita usage of 113 gallons, it is projected that the 76 domestic wells in the 80 acre addition will annually withdraw approximately 12.5 million gallons.

Inorganic water quality data collected from groundwater monitoring site EB 202 show nitrate-nitrogen concentrations at a depth of 55 feet to 65 feet have exceeded the maximum concentration level of 10.0 mg/L for drinking water established by the U.S. Environmental Protection Agency's. Nitrate-nitrogen concentrations for the period from December 1986 to July 2001 ranged from low of 8.8 mg/L to high of 17.4 mg/L. Inorganic water quality data at a depth of 133 feet to 143 and from 180 feet to 190 feet indicate groundwater is suitable for most uses.

## FINDINGS

Based on the case review the following findings were made:

1. The Equus Beds Groundwater Management District No. 2 was contacted by the Wichita-Sedgwick County Metropolitan Area Planning and Sedgwick County Environmental Departments by letter dated October 24, 2001 and by telephone requesting the District to review and comment on the development of the plat.
2. The Forest Ridge Estates Addition is described as an 80 acre tract located in the South half of the Northwest quarter of Section 18, Township 25 South, Range 1 West, Sedgwick County.
3. The planned subdivision consists of 76 residential lots with lot area ranging from 0.88 acre to one acre for single-family dwellings.
4. Drinking water and waste disposal systems for each lot will consist of small capacity domestic water well and on-site septic system consisting of a septic tank and a lateral field.
5. The proposed subdivision overlies a portion of the unconsolidated freshwater aquifer known as the Equus Beds aquifer. The aquifer is the principal source of freshwater for the site area as well as for a four county area in south-central Kansas, including the City of Wichita and adjacent domestic well owners.
6. The site is within the boundaries and jurisdiction of the Equus Beds Groundwater Management District.
7. Based on the region average per capita usage of 113 gallons, it is projected that the 76 domestic wells in the 80 acre addition will annually withdraw approximately 12.5 million gallons.
8. Existing groundwater appropriations or pumpage within the 2-mile radius area around the proposed addition exceed the safe-yield allowable for the aquifer.
9. The area overlying the Equus Beds aquifer has been designated a sensitive groundwater area by the Kansas Corporation Commission because of hydrogeologic, climatic, and soil conditions.
10. The predominant soil at the site is classified as Farnum loam characterized as ranging from clay loam to sandy loam. The soil is suitable for building site development, but has severe limitations for onsite waste disposal. The severe limitation is due to a shallow groundwater level and a substratum consisting of medium sand from 40 inches to 60 inches below land surface.
11. Soil permeability or infiltration rate ranges from 0.2 to 20.0 inches per hour increasing with depth.
12. The unsaturated zone immediately above the water-table consists of unconsolidated deposits of clay to fine sand north of the site and fine sand to coarse gravel south of the site.

13. Materials in the unsaturated zone have a permeability ranging from 0.00001 gal per day/ft<sup>2</sup> up to 10,000 gal per day/ft<sup>2</sup>.
14. Over a 15 year period, depth to water was shallow and averaged 14.4 feet below land surface south of the site and 29.6 feet below land surface north of the site.
15. The calculated volume of effluent discharged from the 76 subdivision septic tanks and laterals to the unsaturated material above the water table of the Equus Beds aquifer ranged from 4,438,400 gallons to 4,993,200 gallons annually.
16. Inorganic water quality data collected from groundwater monitoring site EB 202 located south of the proposed addition show nitrate-nitrogen concentrations at a depth of 55 feet to 65 feet have exceeded maximum concentration level of 10.0 mg/L for drinking water established by the U.S. Environmental Protection Agency.
17. Soils with a high infiltration rate can be rapidly overloaded with organic and inorganic chemicals and micro-organisms, thus allowing rapid movement of contaminants from the laterals through the unsaturated soil material to the underlying groundwater.
18. Rapid overloading in this soil type leads to a septic system failure which remains undetected until nearby domestic wells are contaminated.

## RECOMMENDATIONS

Based on the case findings of the groundwater management district, hydrologic and geologic data and the information provided by Sedgwick County Environment and Wichita-Sedgwick County Metropolitan Area Planning Departments, the Equus Beds Groundwater Management District recommends the following:

1. Prohibit the use of septic tank and lateral systems for disposal of the proposed addition's septic waste.
2. To eliminate the risk of septic waste contamination to the Equus Beds aquifer and to area water wells, either:
  - a) connect to the existing public sewer treatment system located within 1.75 miles of the addition, or
  - b) properly install, operate and maintain a community waste treatment system in the Forest Ridge Estates Addition to properly treat and dispose of the addition's septic waste stream.
3. Prohibit the use of individual domestic water wells for the proposed addition's water supply needs.
4. To prevent over-development of the Equus Beds aquifer and to insure the residents of Forest Ridge Estates Addition have a safe drinking water supply, connect to the public water supply system located within 0.5 mile of the proposed addition.

## SELECTED REFERENCES

Canter, Larry W., and Knox, Robert C., *Septic Tank System Effects on Groundwater Quality*, 1985, Lewis Publishers, pp. 333

U.S. Department of Agriculture, Soil Conservation Service, *Soil Survey of Sedgwick County, Kansas*, 1979, pp. 126

U.S. Environmental Protection Agency, *The Report to Congress: Waste Disposal Practices and Their Effects on Ground Water*, EPA 570/9-77-001, June 1977, Washington, D.C., pp. 294-321

U.S. Environmental Protection Agency, *Planning Workshop to Develop Recommendations for a Ground Water Protection Strategy, Sections I, II and III*, May 1980, Washington, D.C.

U.S. Geological Survey, *Hydrologic and Chemical Interaction of the Arkansas River and the Equus Beds Aquifer Between Hutchinson and Wichita, South-Central Kansas*, WRIR 95-4191, 1996, Lawrence, Kansas, pp. 100

BRAD FRANZ, PRESIDENT  
DENNIS CLENNAN, VICE PRESIDENT  
JOE MIES, SECRETARY  
JERRY BLAIN, TREASURER  
MICHAEL T. DEALY, MANAGER  
THOMAS A. ADRIAN, ATTORNEY



RECEIVED

NOV 20 2001

METROPOLITAN PLANNING  
ROUTE

DIRECTORS:  
WILLIAM FOLEY  
FRANK HARPER  
JAMES SCHWARZ  
ROBERT SEILER  
DAVID STROBERG

## EQUUS BEDS GROUNDWATER MANAGEMENT DISTRICT NO. 2

313 SPRUCE • HALSTEAD, KANSAS 67056-1925 • equusbed@ink.org • VOICE (316) 835-2224 • FAX (316) 830-2210

November 19, 2001

Neil Evan Strahl, Senior Planner  
Current Plans Division  
Wichita-Sedgwick County Metropolitan Area Planning Department  
City Hall 10th Floor  
455 North Main.  
Wichita, Kansas 67202-1688

RE Forest Ridge Estates Addition - 832.231  
Sketch Plat

Dear Mr. Strahl:

In response to the Sedgwick County Environmental and Wichita-Sedgwick County Metropolitan Area Planning Departments request concerning the referenced sketch plat, the Equus Beds Groundwater Management District is submitting the enclosed groundwater quality planning statement to the Departments.

Please contact me if you have any questions or need additional information.

Thank you for the opportunity to provide comments on the proposed plat.

Sincerely,  
EQUUS BEDS GROUNDWATER  
MANAGEMENT DISTRICT NO. 2

Michael T. Dealy  
Manager  
MTD/td

pc - Jerry Blain, City of Wichita  
Rachelle Meyeres, Sedgwick County Environmental Department  
Mark Savoy, Savoy, Ruggles & Bohm

Copy to Ned's Memo



INTEROFFICE MEMORANDUM

RECEIVED

TO: Chris Cherches, City Manager  
FROM: David Warren, Dir. of Water and Sewer  
SUBJECT: Forest Ridge Estates Addition  
DATE: November 26, 2001

NOV 28 2001

METROPOLITAN PLANNING  
ROUTE  \_\_\_\_\_  
 \_\_\_\_\_

We have been informed that there is an effort to plat a new subdivision known as Forest Ridge Estates. This plat envisions having 76 lots on 80 acres, with each lot having its own septic-tank and water supply well. The location and density of this plat is a cause for concern. It is located about one mile east of Bentley, and there are five water supply wells located within one mile of the proposed development. While septic tanks are an effective way to remove heavy materials and bacteria from wastewater, septic tanks do not remove nitrates. Research has found that septic tank effluent can contain from 20 and 50 parts per million of nitrates. The drinking water standard is 10 parts per million or less. In a properly operating septic tank lateral field, some of that nitrogen is adsorbed by the soil, and some is used by the grass that grows above the laterals, but some is still discharged into the surrounding geology. Unfortunately, this area also has relatively high ground water levels, with the ground water being between 9 and 30 feet below land surface. When the effluent is discharged into the surrounding geology, there is a very high risk that the materials in the effluent will reach the groundwater. When septic tanks are spread out over a large area, the impact of septic tank discharges can be minimized, mostly because of dilution. However, when there is a dense concentration of septic tanks, that dilution cannot occur, and there is a significant risk to the groundwater. Water samples from a well near this development have already detected nitrate levels above 10 parts per million in the shallow groundwater, which demonstrates how vulnerable the aquifer in this area is to nitrate pollution. With five existing water supply wells (M-36, M-37, M-38, M-39 and M-40) all located within one mile of this proposed development the pollution risk to the City's water supply is significant.

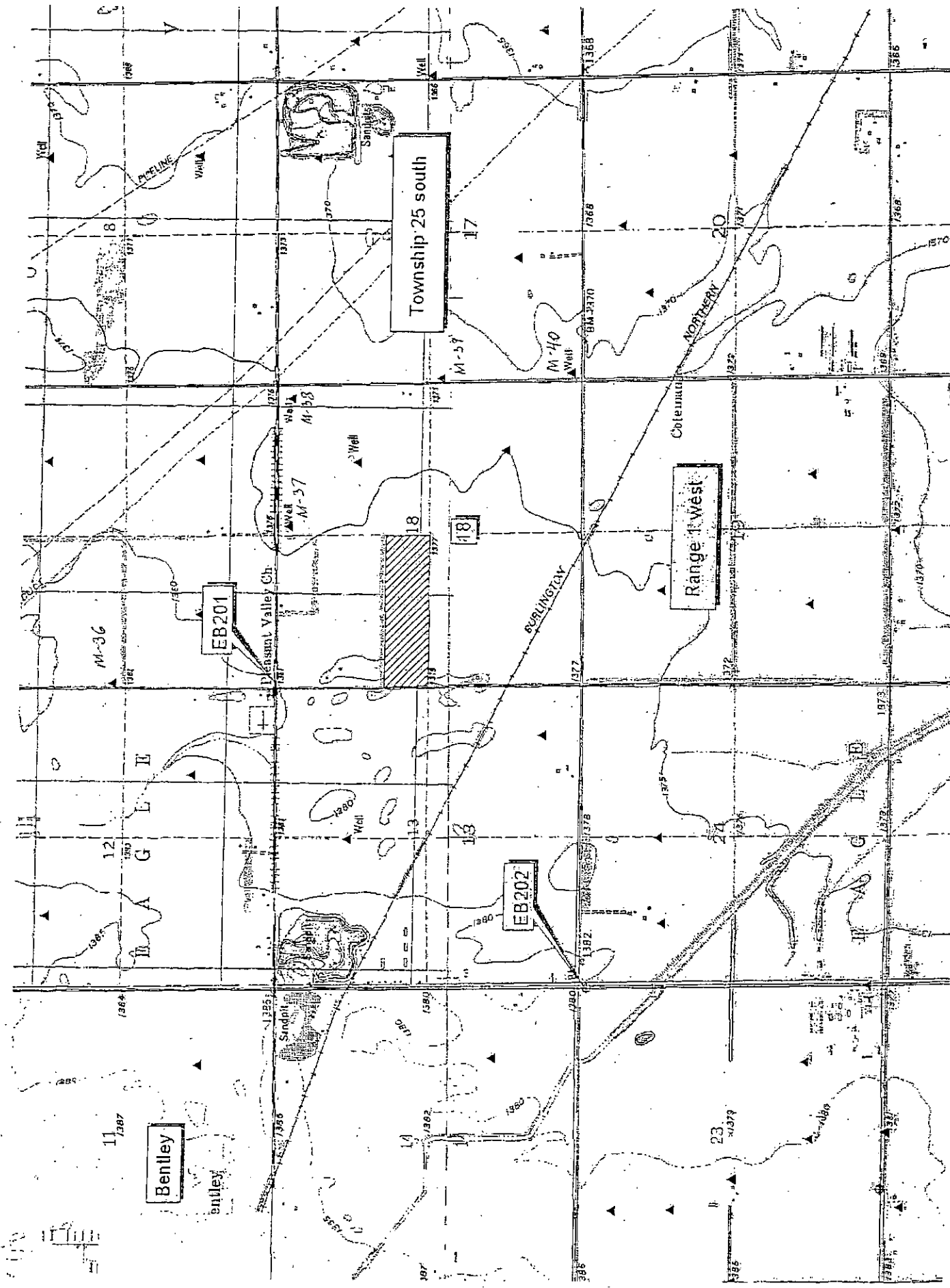
Another area of concern is water usage in the development. The water rights in this area have already been fully allocated, and the developer would not be able to get a permit to drill a single supply well to serve the development, but because of a loophole in state water regulations, there are no restrictions on individual wells for each home site. It is estimated that this development would use 12.5 million gallons per year. If each lot had its own well, the impact on the aquifer would be the same as having a single well, which would reduce the amount of water available to other existing water rights, including our water supply wells.

Because of the potential for groundwater pollution from the dense septic tank spacing proposed in this development, and its potential impact on water quantity and due to the potential negative water supply quantity impact on the City's water supply wells, I recommend that the City oppose this development unless community wastewater disposal and a public water supply are provided for the development.

Cc: Jerry Blain, Water Supply Projects Manager  
Mike Hughes, Water Production Superintendent  
Marvin Krout, Planning Director  
Jack Brown, Environmental Health Director

**TO:** Chris Cherches  
**SUBJECT:** Water Supply Plan Workshop  
**DATE:** November 20, 2001  
Page 2

Terry Cassady, Development Assistance Director  
Mike Taylor, Governmental Relations Director



Township 25 south

Range 1 west

EB201

EB202

Bentley