

September 24, 2008

Alan Luttrell, P.E.
EBH & Associates, P.A.
306 S. Main St.
Pratt, KS 67124

Re: City of Rozel Water Well and Water Treatment Improvements

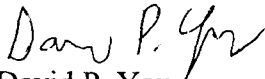
Dear Mr. Luttrell,

The Kansas Geological Survey (KGS) has received your August 25, 2008 letter requesting us to review the above referenced project. The project consists of piping the City of Rozel wells together and treating the water to solve the high manganese and total dissolved solids contamination problem.

A review of regional geologic information and project information provided by you indicates that there are no unduly adverse geologic conditions that should affect this project. However, the USDA Soil Survey of Pawnee County indicates that the high shrink-swell potential, the slow permeability, and the flooding severely limit engineering uses of the soil underlying Rozel. The Soil Survey states that if engineering structures are built on this soil, an open drainage system is needed to protect the structures against flooding; and that structures or buildings should be designed and constructed to reduce the risk of damage caused by shrinking and swelling. These factors should be taken into account, especially for any foundation design. A completed project review form is enclosed.

This letter is an assessment based on information about the regional geologic conditions available via the KGS and cannot be used in substitute of a detailed site characterization. Other geologic conditions, not discussed herein, or for which the KGS has no knowledge, may affect the viability of the project. It is the responsibility of the applicant to provide any necessary characterization, geotechnical or environmental testing, or design by a licensed professional geologist or engineer to complete the project.

Sincerely,


David P. Young,
Hydrologist

Encl

cc: Dan Suchy, KGS Data Resources Library

AGENCY REVIEW TRANSMITTAL FORM

Comments by: D. Young

8/24/08
Transmittal Date

Rozel Water Well and Water Treatment Improvements

PROJECT TITLE:

☐ Notification of Int.
☒ Pre-application
☐ Final Application
☐ Direct Development

CONTACT PERSON:

Alan Luttrell, P.E.

This form provides notification and the opportunity for your agency to review and comment on this proposed project as required by Executive Order 12372. Please complete Parts II & III as appropriate. Your prompt response will be appreciated.

RETURN TO:
EBH & Associates
306 S. Main St.
Pratt, KS 67124

PART I
REVIEW AGENCIES/COMMISSIONS

☐ Aging	☐ Education	☐ State Forester
☐ Agriculture- DWR	☒ Geological Survey, KS	☐ Transportation
☐ Biological Survey, KS	☐ Health & Environment	☐ Water Office, KS
☐ Conservation Comm.	☐ Historical Society	☐ Wildlife & Park
☐ Corporation Comm.	☐ Human Resources	☐
☐ Commerce	☐ Social & Rehab. Serv.	☐

PART II (To be completed by review agency and returned to contact person)
AGENCY REVIEW COMMENTS
COMMENTS:

PLEASE SEE COVER LETTER.

PART III (To be completed by review agency and returned to contact person)
RECOMMENDED ACTION COMMENTS

☒ Clearance of the project should be granted;
☐ Clearance of the project should not be granted.
☐ Clearance of the project should be delayed until the issues or questions have been clarified.
☐ Request a State Process Recommendation in concurrence with above comments.

☐ Clearance of the project should not be delayed but the Applicant should (in the final application) address clarify the questions or concerns indicated above.
☐ Request the opportunity to review final application prior to submission to the federal funding agency.

Reviewer's Name DIVISIONS/AGENCY/COMMISSION Date

EBH & Associates

Evans - Bierly - Hutchison & Associates, P.A.

306 S. Main

Pratt, Kansas 67124

(620) 672-1112

FAX (620) 672-1909

ENGINEERS • SURVEYORS

E-Mail: alanl@ebhengineering.com

August 25, 2008

Dr. William Harrison
Kansas Geological Survey
University of Kansas
1930 Constant Ave., Campus West
Lawrence, KS 66047 0

Re: City of Rozel, Kansas
Water System and Water Treatment Improvements

Dear Sir,

The City of Rozel, Kansas is preparing an application to the United States Department of Agriculture for a Rural Development loan and grant, and to Kansas Department of Commerce and Housing for a Community Development Block Grant, for a water system and water treatment improvement project. The Project Description, Site Map, Opinion of Probable Cost and Project Review Form are enclosed.

We would appreciate your review of the project description and location, and any comments you may have, by September 25, 2008. A project review form is enclosed for your use.

Please return the Project Review Form to me at:
EBH & Associates, P.A.
306 S. Main St.
Pratt, KS 67124

Please call me at 620-672-1112 if you have any questions.

Sincerely,



Alan Luttrell, P.E.
EBH Engineers

encl.

EBH & Associates

Evans - Bierly - Hutchison & Associates, P.A.

306 S. Main
Pratt, Kansas 67124
(620) 672-1112
FAX (620) 672-1909

ENGINEERS • SURVEYORS

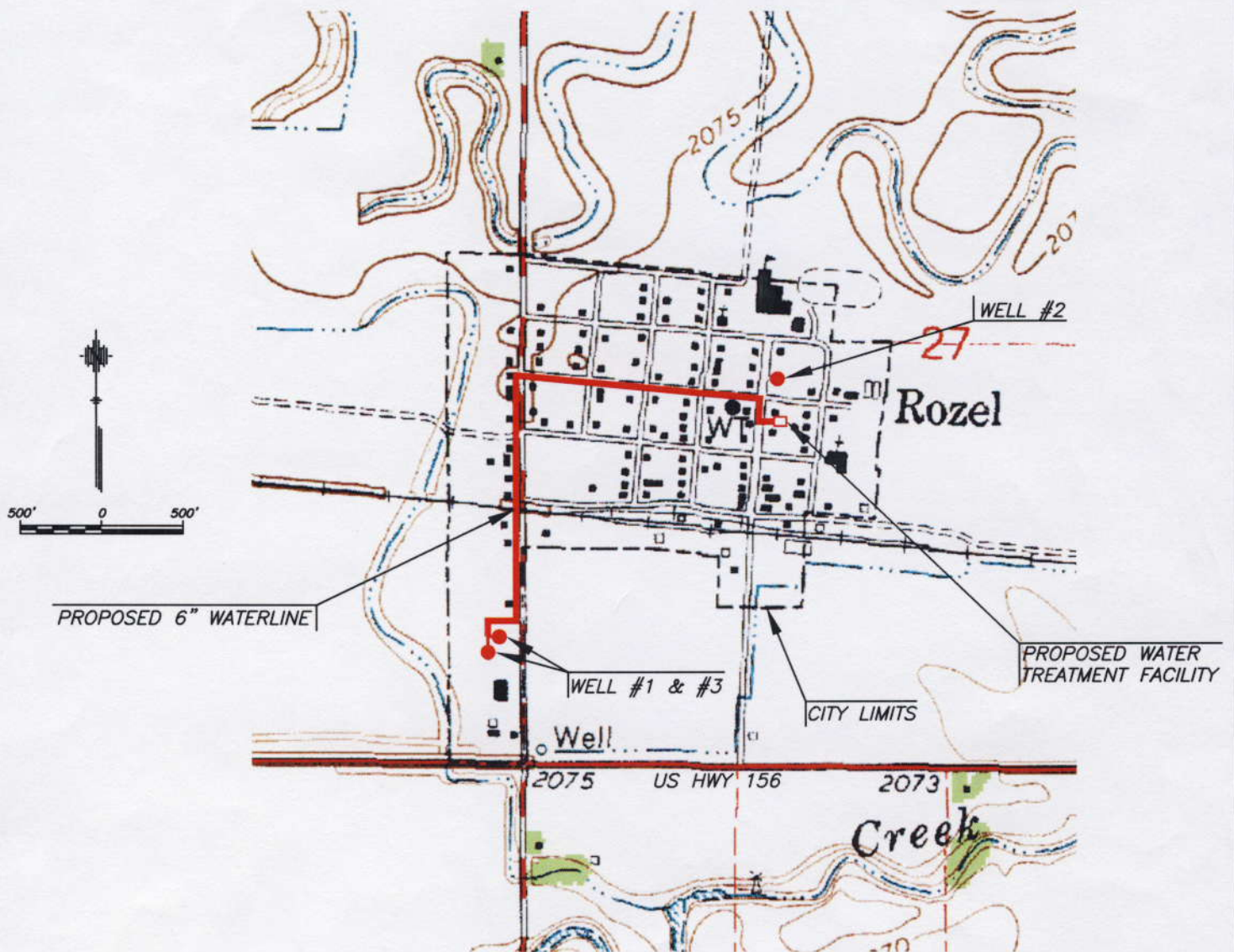
E-Mail: alanl@ebhengineering.com

**OPINION OF PROBABLE COST
WATERWORKS IMPROVEMENTS
ROZEL, KANSAS
August 11, 2008**

Scope of Work: The following is our Opinion of Probable Cost to install treatment facility to reduce the level of manganese in the three city wells and to pipe the water from the three wells to one location for treatment.

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	EXTENSION
1	6" Water pipe	3800	LF	\$ 30	\$ 114,000
2	6" valves	4	Each	\$ 800	\$ 3,200
3	Boring	600	LF	\$ 35	\$ 21,000
4	Railroad Crossing	1	LS	\$ 20,000	\$ 20,000
5	Fire Hydrant	2	Each	\$ 3,500	\$ 7,000
6	Water Line Connections	2	Each	\$ 2,500	\$ 5,000
7	Construction Staking	1	LS	\$ 4,200	\$ 4,200
8	Install manganese reduction treatment equipment	1	LS	\$ 510,000	\$ 510,000
9	Water Well	1	LS	\$ 100,000	\$ 100,000
10	Telemetry system	1	LS	\$ 35,000	\$ 35,000
	Construction Cost				\$ 819,400
	Engineering				\$ 79,200
	Property and Topographic Survey				\$ 8,000
	Construction Engineering & Observation				\$ 95,000
	Stormwater & Railroad Permits				\$ 6,000
	Rural Dev. Interest & Legal Costs				\$ 29,000
	CDBG Grant Administration				\$ 18,000
	Total Opinion of Probable Cost				\$ 1,054,600


EVANS, BIERLY, HUTCHISON & ASSOC., P.A.
Alan Luttrell, P.E.



PROJECT LOCATION MAP
2008 WELL IMPROVEMENTS
ROZEL, KANSAS

FIGURE 1

**PRELIMINARY ENGINEERING REPORT
WATERWORKS IMPROVEMENTS PROJECT
ROZEL, KANSAS
July 28, 2008**

EXISTING CONDITIONS:

All three existing city water wells have such high levels of manganese and total dissolved solids that they exceed the EPA stated secondary maximum contaminant level (MCL). The secondary MCL for manganese is 50 ug/L with wells no. 1 and 3 recording a level of 330 ug/L and well no. 2 recording a level of 390 ug/L. Manganese causes a black to brown color; black staining; and a bitter metallic taste in the water. The secondary MCL for total dissolved solids (TDS) is 500 mg/L with wells no. 1 and 3 recording a level of 940 mg/L and well no. 2 recording a level of 830 mg/L. High levels of TDS results in high hardness levels; deposits; colored water; staining and salty taste.

The high manganese and total dissolved solids has resulted in two **odor complaints** and one **discolored water complaint** in the past year. Since October 31, 2005 complaints of **low water pressure** resulted in 25 water meters being replaced due to the fowling and plugging of the meter assembly. In the picture to the right, the debris in the meter is typical of the scaling of manganese and carbonate hardness which is **plugging up the water service meters, service line from the meters to the house fixtures and the filters and and strainers in such fixtures as water faucets, dishwashers and ice makers.**



PROBLEM CAUSES:

The low water pressure, odor complaints, discolored water and plugging of the meters, service lines and house fixtures is a **direct result** of the **extremely high concentrations** of **manganese, total dissolved solids and hardness** in the water from **all three city wells**

ALTERNATIVES & POSSIBLE SOLUTIONS:

1. **No Action:** Considered unacceptable since the level of manganese is 6 to times the acceptable level and total dissolved solids is about twice the acceptable level.
2. **Regionalization:** The closest community for connection is the city of Burdett and their water exceeds the maximum contaminant level for radiological contaminants. In addition they are 7 miles from the Rozel. The cost to connect to Burdett and solve their radiological problem is in excess of \$2 million.
3. **Blending Well Water from the Three Wells:** All three wells are high in manganese, total dissolved solids and hardness. Blending the water will not solve the problem.

4. **Constructing a New Source of water:** The area is closed to new water rights and the three wells are approximately 3800 feet apart and all in excess of the secondary MCL for manganese and total dissolved solids. The surrounding area is high in these contaminants.
5. **Piping the Wells together and Treating the Water:** Piping the three wells together and treating the water to reduce the high concentrations of manganese and total dissolved solids to acceptable levels.

RECOMMENDED IMPROVEMENTS:

Option No. 5, Piping the Wells together and Treating the Water, is the recommended solution to solve the high manganese and total dissolved solids contamination problem.

ESTIMATED COSTS:

The Opinion of Probable Cost for implementing the recommended improvements listed above is summarized as follows:

Treatment Equipment	\$ 510,000.
Piping	\$ 174,400.
Telemetry System	\$ 35,000.
Construction Cost	\$ 719,400.
Engineering	\$ 70,900.
Property & Topographic Surveys	\$ 8,000.
Construction Engineering & Observation	\$ 85,100.
Stormwater & Railroad Permits	\$ 6000.
Rural Dev. Interest & Legal Costs	\$ 26,000.
Grant Administration	\$ 18,000.
	\$ 933,400.

OPERATION, MAINTENANCE, & REPLACEMENT BUDGET:

After the improvements, the annual operation and maintenance cost will increase from \$22,000 to \$45,000.

LAND REQUIREMENTS:

The work will be constructed within City right-of-way and on land owned by the City.



Alan Luttrell, P.E.
Evans, Bierly, Hutchison & Associates, P.A.
Consulting Engineers