Environmental Response Fund
Abandoned Well Investigation

Northeast Region
API 05-013-05014 (Maxwell #5)

Prepared for:

State of Colorado Department of Natural Resources,
Colorado Oil and Gas Conservation Commission

Prepared by:

S.S. PAPADOPULOS & ASSOCIATES, INC.
Boulder, Colorado

June 2007

3100 Arapahoe Avenue, Suite 203, Boulder, Colorado 80303 • (303) 939-8880

TABLE OF CONTENTS

		Page
List of Figures		ii
1.0	ABANDONED GAS WELL INVESTIGATION FOR MAXWELL#5	3
	1.1 Introduction	3
	1.2 Objectives	3
2.0	SOIL GAS VAPOR SAMPLING	4
	2.1 Sample Location	4
	2.2 Soil Gas Sampling Procedure	4
3.0	QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)	5
	3.1 Soil Gas Sampling	5
	3.2 Location	5
4.0	SOIL GAS SAMPLING RESULTS	5
5.0	REFERENCES CITED	5

APPENDIX

LIST OF FIGURES

Figure 1 Location of API 05-013-05014 (Maxwell #5), Northeast Region, Colorado

LIST OF APPENDICES

Appendix Site Investigation Report

1.0 ABANDONED GAS WELL INVESTIGATION FOR MAXWELL#5

1.1 Introduction

The Colorado Oil & Gas Conservation Commission (COGCC) Environmental Response Fund (ERF) Well Investigation Project consists primarily of locating orphan gas wells that have been abandoned by the COGCC and conducting visual site inspections and shallow soil gas surveys to determine if potentially hazardous environmental conditions exist. The COGCC divided the state into 5 regions: Northeast, East Central, Southeast, Northwest, and Southwest. Under contract to the COGCC, S. S. Papadopulos & Associates, Inc. (SSPA) conducted shallow soil gas surveys for both the Northeast and East Central regions of Colorado during April and May, 2007. Findings from these studies are summarized in two separate reports titled "Environmental Response Fund Abandoned Well Investigation" for the East Central Region and the Northeast Region (SSPA 2007). This report references the Environmental Response Fund Abandoned Well Investigation for the Northeast Region (Northeast Region ERF Report).

During initial site review of well closure documentation, an orphaned well within the Northeast Region, API 05-013-05014 – Maxwell #5 (Boulder County), was found to be within a populated urban area. Based on its proximity to a developed area, this site warranted coordination amongst the sampling team (SSPA), COGCC, and the landowners prior to field activities. Following clearance from the COGCC, this site was surveyed on June 20, 2007. This report summarizes the findings from the soil gas vapor sampling near this well.

1.2 Objectives

The objectives of the ERF Well Investigation field sampling are as follows:

1) Conduct a soil gas survey at the Maxwell #5 abandoned well site for presence of gases related to natural gas; specifically Methane (CH_4), Carbon monoxide (CO), Oxygen (O_2), and Hydrogen sulfide (H_2S).

2) Updated the ERF orphaned well site information database with information from the Maxwell #5 survey including revised well location data, soil gas measurements near the well, and description of site area and observed impacts.

3) If present, indicate any adverse environmental impacts or hazardous conditions.

2.0 SOIL GAS VAPOR SAMPLING

2.1 Sample Location

Figure 1 shows the location of the Maxwell #5 well (API 05-013-05014) within Boulder County, Colorado; Boulder County is within the Northeast Region of the ERF Study. Location information for all wells investigated in this region is detailed in the Northeast Region ERF Report (SSPA, 2007).

The Maxwell #5 well location was determined by visual evidence of the abandoned wellhead sticking above ground approximately two feet. Sampling points began near the wellhead and dispersed outward in all directions, where possible; sample grid spacing near this well was modified to accommodate roads, driveways, landscaped areas and houses. These conditions are shown in the map found in the Site Investigation Report Appendix.

2.2 Soil Gas Sampling Procedure

For further documentation of sampling procedures utilized, refer to the Northeast Region ERF Report (field sampling procedures and field forms are described in the Field Sampling Plan found in Appendix B; specifications of the survey equipment and gas meter used are described in Appendix C and are explained in further detail in Sections 2.3 and Section 2.5, respectively).

A Trimble GeoExplorer XT was used to map the abandoned well location and all sampling points during this survey. This instrument and the settings utilized comply with COGCC Rule 215 (see Section 2.3); sub-meter accuracy location data was obtained. Field personnel collected coordinate location data; differential corrections were made at the end of sampling activities by SSPA using the post-processing software, Trimble Pathfinder.

A slide hammer was used to bore a ½ inch-diameter hole at each sample point to a depth between 1 and 4 feet. A hollow steel rod perforated over the bottom six inches was inserted into the hole created with the slide hammer. Observed soil gas measurements were recorded using a V RAE PGM-7800 hand held 4-gas meter with a built in sampling pump that was attached to polyethylene tubing sealed around the steel rod. Soil gas vapor measurements were recorded with the data logger and documented on a field sampling form; results of these measurements are tabulated the Site Investigation Form Appendix.

Photographs were taken of the site to document conditions and to provide information for relocating the well in the future; site photographs are included the Site Investigation Form Appendix.

3.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

3.1 Soil Gas Sampling

Calibration of the VRAE meter was conducted prior to this field investigation; no errors were reported during calibration procedures.

3.2 Location

The accuracy of wellhead location and subsequent sampling was recorded on the field sampling form as a location confidence factor. In instances, such as this site, where wellheads were found or where the well was located by someone with direct knowledge of the site location, sampling locations were noted as "very confident".

4.0 SOIL GAS SAMPLING RESULTS

Results from all samples collected ranged between zero and one parts per million methane. Carbon monoxide results ranged from zero to twenty-six parts per million. Hydrogen sulfide was not measured in the soil within the area sampled near this well. Percent Oxygen levels ranged from 20.4% to 21.3%. Individual sampling results for this investigation are shown in the Site Investigation Report Appendix. Methane gas is known to be present inside the casing of the Maxwell #5 well; however, significant leakage to the soils in the vicinity of the wellhead was not indicated by the soil vapor survey.

5.0 REFERENCES CITED

S.S. Papadopulos & Associates, Inc., 2007. **Environmental Response Fund Abandoned Well Investigation, Northeast Region.**

Figure

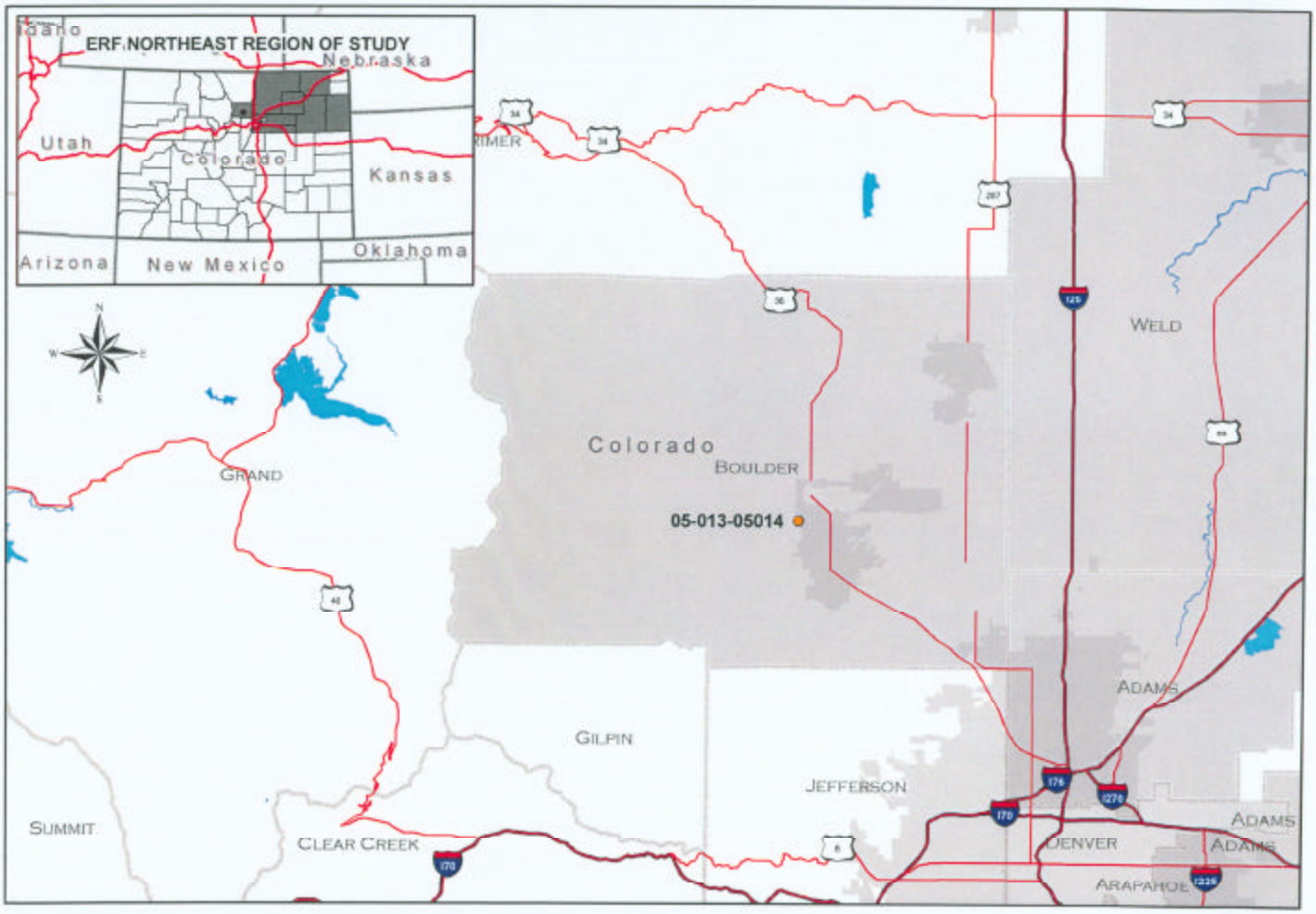

Figure 1. Location of API 05-013-05014 (Maxwell #5), Northeast Region, Colorado

Appendix

Site Investigation Report

API: 05-013-05014 **Date Sampled:** 6/20/2007

Well Name: Maxwell #5

Well Location: Northwest of Spring Valley Road and Cactus Court intersection. Wellhead is visible on the north side of Cactus Ct.

Site Description: Wellhead found in the front yard of 260 Cactus Ct. Wellhead is approximately two feet above ground. Valve appears to be working very well and no gas leakage was detected in the air around the well. Dry, rocky soils. Site investigation completed in conjunction with COGCC. No dead vegeation noticed.

Observed Impacts: Well plugging procedures have not been completed. Methane gas measured near the site.

Corrected GPS Coordinates:

Latitude: 40.044038 **Longitude:** -105.295581 **Datum:** WGS84

Public Land Survey System:

T 1N **R** 71W **SEC** 13 **QQ** SWSW **M** 6

Confidence of Site Location: Very Confident

Legend: CH_4 (ppm) CO (ppm) H_2S (ppm) O_2 (%)					
	1 4 0 20.9	0 4 0 20.9	1 18 0 21.2	0 7 0 21.3	
	1 26 0 20.9	1 19 0 20.7			
		1 2 0 20.7	1 6 0 21.0	0 4 0 20.8	0 1 0 21.0
	1 3 0 20.4	1 9 0 20.7	1 0 0 21.1	0 8 0 20.8	0 4 0 20.6

API: 05-013-05014 (Maxwell #5)

Boulder County, Colorado

API: 05-011-05054
Date Sampled: May 4, 2007

Figure 1: Wellhead of API: 05-013-05014

Figure 2: Wellhead valve information

Figure 3: Looking west along Cactus Ct; wellhead to north