

PCS PHOSPHATE – SUWANNEE RIVER

CATHODIC PROTECTION SURVEY

JANUARY 2011

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January, 2011

PCS Phosphate  
Post Office Box 300  
White Springs, Florida 32096-0300  
ATTN: Mr. Ron Spells / Jeff Hackney  
Project Representatives

Suwannee River Chemical Plant Effectiveness of Cathodic Protection Survey Underground Natural Gas System
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## **INTRODUCTION**

The annual cathodic protection survey was conducted for PCS Phosphates during the month of January, 2011. During this survey, PCS Phosphates natural gas system was inspected for the effectiveness of cathodic protection, as applied. The cathodic protection system for PCS Phosphates consists essentially of Galvomag Magnesium anodes placed in various locations throughout the natural gas distribution system.

## **RESULTS AND ANALYSIS**

A total of Five [5] readings were taken during this survey. As can be seen by the structure-to-soil potential measurements and the enclosed data sheet, 80% of the readings obtained were indicative of cathodic protection. A structure-to-soil potential of 850 millivolts or more negative is the basis used in this report to confirm cathodic protection.

## **SURVEY TEST INSTRUMENTATION**

The Cathodic Protection Analyzer, developed by Universal Rectifiers, Inc, (Hereinafter referred to as CPA), is a handheld instrument used with a reference electrode to measure the uninterrupted characteristics of the signal generated from a transformer/rectifier. It can be used to evaluate the coating of a pipeline to ensure that the pipe is fully protected from corrosion. The CPA is designed for use with any pipeline system or structure at risk to corrosion factors. Aging pipes and changing conditions can cause significant problems, such as an increase in applied CP levels and enlarged holidays in coating. In addition, increased environmental concerns also emphasize the need to minimize leaks as much as possible.

The CPA has computer capabilities of filtering interfering signals. The instrument is also capable of measuring several facets of the protection waveform. The software-driven instrument reads the minimum, average, and maximum voltage levels emanating from the pipe, thereby allowing an overview of the entire CPv signature. Digital signal processing makes the accuracy and precision of the CPA possible. It utilizes software to provide the extra speed and flexibility that is becoming increasingly important in the field. Upgrades are made available as they are developed.

The CPA can be operated in conjunction with a shielded reference electrode know by its model number SPI, which allows the user to make a measurement of the cathodic protection without interrupting the rectifiers.

**RECOMMENDATIONS**  
**PCS Phosphates – Suwannee River**  
**Underground Natural Gas System**  
**January, 2011**

The sacrificial anode arrangement designed to protect the coated and wrapped steel natural gas system is not providing adequate current to afford complete cathodic protection to the steel distribution system. Structure-to-soil readings obtained from Cathodic Test Points and gas risers on the steel distribution system indicate approximately 80% cathodic protection, with One [1] CP reading at CTP #3 being below State and Federal minimum standards. One [1] Railroad casing was inspected during this survey and found to have a sacrificial anode installed on the casing pipe.

The six inch steel gas pipe from the metering station to the limestone unloading area is cathodically protected at this time. Structure-to-soil readings at the limestone unloading area have increased approximately 300 millivolts and remedial action is not required to bring these piping areas into compliance with State and Federal minimum guidelines for applied cathodic protection.

At this time, the Natural Gas Distribution System for PCS Phosphates Suwannee River Chemical Plant complex is not completely Cathodically Protected with One [1] low reading being CTP #3. Remedial action, including anode installation, casing isolation or protection is required to meet the minimum standard State and Federal code. I trust the above information to be satisfactory and in sufficient detail, however, should you require additional information, please contact me.

Sincerely,

J. Scott Roberts  
NACE C.P. Tester  
Certification # 371

## **CATHODIC TEST POINTS**

**CATHODIC TEST POINTS**  
**PCS Phosphates – Suwannee River**  
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CTP - #1

[1] Red Anode Wire	-0.974 MV
[1] Black Gas Pipeline Wire	-0.890 MV
Anode and Gas Line Wires Together	-1.093 MV

CTP - #2

[1] Red Anode Wire	-1.032 MV
[1] Black [Tape] Casing Pipeline Wire	-0.744 MV
[1] Black [No Tape] Gas Pipeline Wire	-0.853 MV
Anode and Gas Line Wires Together	-0.973 MV

CTP - #3

[1] Red Anode Wire	-1.160 MV
[1] Black [Tape] Casing Pipeline Wire	-0.821 MV
[1] Black [No Tape] Gas Pipeline Wire	-0.846 MV
Anode and Gas Line Wires Together	-1.014 MV

**STRUCTURE-TO-SOIL POTENTIALS**  
**GAS PIPE CASINGS**

**STRUCTURE-TO-SOIL POTENTIAL - GAS PIPE CASINGS**  
PCS Phosphates – Suwannee River  
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\*Railroad Casing @ CTP #3 -0.821

Scale House Drive Casing @ CTP #2 -0.744

\*Casing Anode Installed

**STRUCTURE - TO - SOIL POTENTIAL DATA**

# STRUCTURE – TO – SOIL POTENTIAL DATA

PCS Phosphates – Suwannee River

Underground Natural Gas System

January, 2011

Test Location	Energized Potentials Volts
Metering Station [6" Steel Line Outlet]	-0.890
Limestone Loading [6" Riser Inlet]	-0.941