

PCS PHOSPHATE – SWIFT CREEK
CATHODIC PROTECTION SURVEY
MARCH 2012

TABLE OF CONTENTS

CATHODIC TEST POINTS-----6

GAS PIPE CASING-----8

INTRODUCTION-----3

RECOMMENDATIONS-----5

RESULTS AND ANALYSIS-----3

STRUCTURE-TO-SOIL POTENTIAL DATA-----10

SURVEY TEST INSTRUMENTATION-----4

March, 2012

PCS Phosphate
Swift Creek Mining Plant
Post Office Box 300
White Springs, Florida 32096-0300
ATTN: Mr. Bill Bradford / Keith Tomlinson
Project Representatives

<p>Swift Creek Mining Plant Effectiveness of Cathodic Protection Survey Underground Natural Gas System</p>
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INTRODUCTION

The annual cathodic protection survey was conducted for PCS Phosphate – Swift Mining Creek Plant during the month of March, 2012. During this survey, PCS Phosphate – Swift Creek Mining Plant natural gas system was inspected for the effectiveness of cathodic protection, as applied. The cathodic protection system for PCS Phosphate – Swift Creek Mining Plant consists essentially of Galvomag Magnesium anodes placed in various locations throughout the natural gas system.

RESULTS AND ANALYSIS

A total of Six [6] structure readings, Two [2] anode readings and Three [3] casing readings were taken during this survey. As can be seen by the structure-to-soil potential measurements and the enclosed data sheet, 100% 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 Phosphate – Swift Creek Mining Plant Underground Natural Gas System March, 2012

The sacrificial galvanic anode arrangement designed to protect the coated and wrapped steel natural gas system is providing current to afford 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 100% cathodic protection. One [1] highway casing and Two [2] Railroad casings were inspected during this survey. All carrier casing pipes were found to be isolated from the natural gas piping.

Cathodic Test Point #3 is no longer in service due to severance of wires connecting the anode and steel gas main to the test point. Reconnection could not be established due to depth (approx. 18 feet) of the steel gas pipe. Cathodic Protection levels around the Swift Creek complex are comparable to levels reported on the last CP survey and continue to provide protection to approximately 100% of the steel gas system.

At this time, the Natural Gas Distribution System for the PCS – Swift Creek complex is approximately 100% cathodically protected. 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
C.P. Tester

CATHODIC TEST POINTS

CATHODIC TEST POINTS
PCS Phosphates – Swift Creek Mining Plant
Underground Natural Gas System

March, 2012

CTP - #1

Black Anode Wire	-1.014 MV
Black Gas Pipeline Wire	-0.839 MV
White Casing Pipe Wire	-0.533 MV

CTP - #2

Black Anode Wire	-1.850 MV
Black Gas Pipeline Wire	-1.337 MV
White Casing Pipe Wire	-1.421 MV

CTP - #3

No Longer Used - Disconnected

STRUCTURE-TO-SOIL POTENTIALS
GAS PIPE CASINGS

STRUCTURE-TO-SOIL POTENTIAL - GAS PIPE CASINGS

**PCS Phosphate – Swift Creek Mining Plant
Underground Natural Gas System**

March, 2012

Railroad Casing - #1 -0.605

Railroad Casing - #2 -0.621

Highway Casing - #3 -0.513

STRUCTURE - TO - SOIL POTENTIAL DATA

STRUCTURE – TO – SOIL POTENTIAL DATA
PCS Phosphate – Swift Creek Mining Plant
Underground Natural Gas System

March, 2012

Test Location	Energized Potentials Volts
Gas Metering Station - Inlet	-1.261
Gas Metering Station – Outlet	-1.276
4" Gas Riser @ Plant	-1.590
2" Gas Riser @ Boiler Room	-1.412