PCS PHOSPHATE – SWIFT CREEK

CATHODIC PROTECTION SURVEY

MAY 2011

TABLE OF CONTENTS

May, 2011

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

Swift Creek Mining Plant
Effectiveness of Cathodic Protection
Survey Underground Natural Gas System

INTRODUCTION

A follow-up cathodic protection survey was conducted for PCS Phosphate – Swift Mining Creek Plant during the month of May, 2011. This survey was conducted to determine the effectiveness of remedial action and repairs conducted during the month of May, 2011. 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 combined total of Six [6] main line and service riser 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.

Swift Creek Mining Plant
May 2011

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
May, 2011

The sacrificial 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 have increased since the last Cathodic Protection survey and now provide complete protection to 100% of the steel gas system. The lowest reading obtained [-1.194 VDC] is at the inlet of the gas metering station.

At this time, the Natural Gas Distribution System for the PCS – Swift Creek complex exhibits complete cathodic protection with all IR drop free readings above the minimum acceptable level. 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
City Services, Inc.

CATHODIC TEST POINTS

CATHODIC TEST POINTS

PCS Phosphates – Swift Creek Mining Plant
Underground Natural Gas System
May, 2011

CTP - #1

Black Anode Wire	-1.472 MV
Black Gas Pipeline Wire	-1.217 MV
White Casing Pipe Wire	-0.697 MV

CTP - #2

White Anode Wire	-1.658 MV
Black Gas Pipeline Wire	-1.422 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
May, 2011

Railroad Casing - #1	-0.593
Railroad Casing - #2	-0.697

STRUCTURE - TO - SOIL POTENTIAL DATA

STRUCTURE – TO – SOIL POTENTIAL DATA

PCS Phosphate – Swift Creek Mining Plant
Underground Natural Gas System
May, 2011

Test Location	Energized Potentials Volts
Gas Metering Station - Inlet	-1.194
Gas Metering Station – Outlet	-1.340
4” Gas Riser @ Plant	-1.602
2” Gas Riser @ Boiler Room	-1.418