Honeywell

Honeywell
P.O. Box 1057
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April 4, 2011

VIA EMAIL AND REGULAR MAIL

Mr. Galo Jackson
Remedial Project Manager
US EPA Region 4
61 Forsyth St. S.W.
Atlanta, Georgia 30303-8960

Re: Revised Draft Work Plan for the Development, Design and Implementation of Conventional Treatment Measures to Enhance the Existing Caustic Brine Pool (CBP) remedy at the LCP Chemical Company NPL Site in Brunswick, Georgia

Dear Mr. Jackson,

The purpose of this letter is to provide Honeywell's response to EPA's letter dated March 6, 2011, commenting on Honeywell's Draft Work Plan for the Development, Design and Implementation of Conventional Treatment Measures to Enhance the Existing Caustic Brine Pool (CBP) remedy at the LCP Chemical Company NPL Site in Brunswick, Georgia.

In its letter, EPA acknowledges that the "overall approach proposed to meet the removal action objectives, appears acceptable." However, EPA requested a number of specific changes to the Draft Work Plan. On March 28, 2011, in a conference call with you and Karen Singer, we discussed a number of questions that Honeywell had regarding EPA's comments in the letter. Based on EPA's letter and our discussions during that conference call, Honeywell has revised the Draft Work Plan related to CBP treatment options, which is enclosed for your review and approval.

Please do not hesitate to call me at (973) 722-1656 if you have any questions.

Sincerely,

Prashant K. Gupta

Enclosure

cc: Kirk Kessler, EPS

Work Plan for the Development, Design, and Implementation of Conventional Treatment Measures to Enhance the Existing Caustic Brine Pool (CBP) Remedy at the LCP Chemicals Site

Prepared for

Honeywell

Prepared by

EPS

CH2MHILL

December 17, 2010
Revised: April 4, 2011

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SECTION 1

Introduction

This revised work plan was prepared by Environmental Planning Specialists, Inc. (EPS) and CH2M HILL for submittal to the U.S. Environmental Protection Agency (EPA) on behalf of Honeywell International Inc. (Honeywell). It is being submitted in response to EPA's letter dated November 1, 2010, directing Honeywell to prepare a work plan for implementing metals removal from the extracted caustic brine pool (CBP) fluid using traditional treatment technologies, with revisions addressing EPA's letter dated March 9, 2011.

By way of background, Honeywell constructed and initiated operation of a treatment system for the CBP. That system included the following treatment steps:

- Extraction of the brine from 13 extraction wells;
- Equalization and reduction of silica concentration;
- pH adjustment;
- Infiltration into groundwater of the neutralized brine via galleries.

This CBP treatment system was designed to address the remedial goals identified in the Administrative Order of Consent (AOC) for the CBP; namely, to reduce pH below the target 10-10.5 Standard Units and reduce the density of the CBP. In response to the limitations experienced during operation of the treatment system, Honeywell and its consultants explored other means to achieve the objectives of the CBP remedy in a timely manner. Based on this analysis, Honeywell developed and presented an approach for injection of gaseous carbon dioxide (CO_2) into the CBP to reduce pH to EPA and the Georgia Environmental Protection Division (EPD). That approach was subsequently rejected by the EPA and EPD, and Honeywell was directed by the EPA to develop a new work plan to use conventional treatment technologies to address metals reduction of the fluids extracted from the CBP.

In response to EPA's request, Honeywell is proposing to explore the means of implementing alternative treatment of the CBP including both onsite and offsite conventional treatment alternatives. Preliminary testing has been completed to evaluate both alternatives, but additional steps are necessary to further evaluate and verify their potential for effectiveness. The preliminary testing results and additional data needs for each approach is detailed in the remainder of this document as follows:

- Section 2: summary of completed off-site treatability and onsite treatability alternatives tests;
- Section 3: summary of the technical approach to complete the evaluation, design, and implementation of the off-site treatment and disposal alternative;
- Section 4: summary of the technical approach to complete evaluation, design, and implementation of the onsite treatment alternative; and
- Section 5: anticipated deliverables that will be produced as part of the development of each alternative and a preliminary schedule for their delivery to EPA.

SECTION 2

Background

2.1 Summary of Off-site Treatability Tests

Honeywell evaluated companies that offered commercial treatment services for their potential to treat CBP fluids, including Water Recovery, LLC (WRI). Honeywell contacted WRI, located in Jacksonville, FL, regarding their ability and interests in potentially serving this project in an off-site treatment capacity. Honeywell shared chemical characterization data from the CBP wells and received positive feedback from WRI in their interests and capabilities to treat the water extracted from the CBP. Honeywell subsequently requested approval from EPA to conduct a preliminary treatability test involving approximately 10,000 gallons of CBP fluid. EPA approved the testing and the proposed treatment facility in a letter to Honeywell dated November 1, 2010.[1] A copy of EPA's approval letter is provided in Appendix 1.

Following EPA's approval, Honeywell advised the site personnel to operate the extraction wells in a manner that would pump equal volume from all extraction wells (approximately 750 gallons each) with the exception of well EW-6 (the most concentrated CBP) where one-half the volume (approximately 375 gallons) would be extracted. The extraction occurred over the period of November 2–5, 2010. Table 1 shows the volumes extracted from each well during this extraction period.

TABLE 1
Extraction Wells and Volumes

Extraction Well #	**Volume (gal)**
EW-1	755.9
EW-2	772.7
EW-3	756.5
EW-4(1)	51.6
EW-5	753.8
EW-6	373.0
EW-7	756.8
EW-8	759.8
EW-9	751.7
EW-10	760.4
EW-11	752.5
EW-12	755.0
EW-13(2)	0.0
Total:	8000

(1) Well EW-4 experienced PLC control problems early in the extraction period that could not be resolved during the test. Thus the well did not pump the full intended volume.

(2) Well EW-13 experienced PLC control problems at the onset of the extraction period that could not be resolved during the test.

[1] EPA provided a certification of WRI to receive and treat the 10,000 gallons for the initial treatability test, effective through December 18, 2010.

CBP fluid from the wells was directed to the onsite influent tank. Once the total volume goal was reached, the pumps were deactivated and a tank sample was collected for laboratory analysis. The composite sample showed that the liquid was non-hazardous, with a mercury concentration of 180 micrograms per Liter (µg/L) and a pH of 11.13. The material was then shipped to WRI for treatability testing.

WRI conducted the treatability testing utilizing their existing equipment and has reported favorable results. All parameters met WRI's effluent discharge permit limits (see WRI's report in Appendix 2). The JEA permit is provided as Attachment 1 to WRI's report in Appendix 2 of this work plan. WRI processed the CBP wastewater using aerobic treatment in accordance with the Wastestream 3 designation in their permit with JEA (Categorical Industrial User Discharge Permit #009) - "contaminated groundwater clean-up from non-petroleum sources" - which is derived from the EPA regulations for Centralized Wastewater Treatment (CWT) operations, 40 CFR 437.29(r). See page 1-2 of the JEA permit, provided as an attachment to the WRI report in Appendix 2, for the Wastestream Category 3 description. WRI receives other industrial wastewaters in the same CWT division that have an acidic pH, and thus the alkaline pH of the CBP wastewater is complimentary. Pretreatment requirements under the JEA permit for Wastestream Category 3 is provided in page 1-3 of the permit. The aerobic operation applied to Wastestream 3 does generate solids, which are periodically removed from tanks during cleaning and inspection.

Table 2 presents a summary of the CBP composite influent characteristics and the treated effluent characteristics, in comparison to WRI's permit limitations for treated effluent:

TABLE 2
CBP Composite Influent Characteristics and the Treated Effluent Characteristics

Analyte	Units	CBP Composite (Influent)	c	WRI Treated Effluent	c	WRI Permit Limit (Outfall SP2)
Oil & grease, total (HEM)	mg/L	1.9	J	5.1		100
pH	std. units	11.13		7.44 (WRI test)		5.5–12
Cadmium	µg/L	0.484		0.390	J	1200
Chromium	µg/L	770		5.3		10000
Copper	µg/L	26.1		0.8		3380
Lead	µg/L	15.0		0.455	J	1400
Mercury	µg/L	180		2.25		6
Molybdenum	µg/L	97.8		CBP influent meets Permit Limit (not tested)		2660
Nickel	µg/L	112		12.4		3980
Silver	µg/L	0.090	J	0.200	U	430
Zinc	µg/L	28.0		34.5		2610

Qualifiers [c]: J – estimated value; U – undetected.

2.2 Summary of Solids Reduction Treatability Tests

In order to determine the efficacy and approach to onsite treatment of extracted CBP fluids, several interrelated issues must be considered before a process can be selected, designed, and constructed.

Previous bench-scale treatability work conducted in support of the current pH neutralization system onsite has shown that the CBP fluids are amenable to chemical treatment; however, additional study to quantify possible metals reduction and process optimization is required.

In light of testing performed to date, and the endpoint objective for onsite treatment, the following additional tasks must be addressed:

- Collect a composite sample to define the target concentrations of site-related contaminants that are treated in the combined groundwater stream extracted from the CBP;
- Identify possible physical and chemical treatment regime through laboratory jar testing to coagulate, flocculate, and precipitate solids and dissolved metals present in the extracted CBP fluid;
- Evaluate the suitability of process equipment to separate, concentrate, and dewater the solid phase reaction process generated in the treatment of the extracted CBP fluid;
- Apply findings from the laboratory treatability testing and process equipment evaluations previously described to demonstrate proof of concept for a conceptual treatment system design; and
- Develop a formal basis of design for a full-scale system capable of treating groundwater extracted from the CBP fluid.

Some of the treatability testing has been completed to date and is summarized below. However, additional testing and design development is needed. Additional tasks necessary to fully evaluate and design onsite solids removal are discussed in Section 4.

CH2M HILL has evaluated treatability of groundwater from the CBP several times prior to completion of the current neutralization system design. In addition to the studies performed by CH2M HILL, several vendors of water treatment equipment and chemicals independently evaluated conventional treatment alternatives for groundwater extracted from the CBP. The basis of system design was subsequently established from the collective testing observations. However, after initial operation of the constructed neutralization system, precipitation products were observed in system piping. In March 2010, an additional laboratory study was commissioned and completed with brine collected from the CBP. An overview of historical testing activities and observations is presented in the following sections.

2.2.1 January 2008: Testing Using Composite CBP Fluids

Treatability testing commenced in January 2008 with a focused evaluation of CBP fluids collected from EW-4, EW-6, and EW-11. Testing activities performed included neutralization of individual brine samples and brine mixtures by mineral acid addition. The feasibility for brine treatment using a conventional approach (coagulation and flocculation) was also evaluated. Specific observations at that time included the following:

- pH reduction of the most concentrated CBP fluid (from wells EW-4, EW-6, and EW-11) caused silica-gel formation.
- In all samples evaluated, acidification below pH 2 resulted in precipitation of dissolved organic matter (DOM).
- When an equal-volume mixture of brine from EW-4, EW-6, and EW-11 was mixed with laboratory makeup water in a ratio of 1:4 (volume per volume), discernable solid phase precipitation products were not visually observed in samples acidified to near neutral values (pH 7).
- pH adjustment of the mixture (prepared by an equal-volume of brine from EW-4, EW-6, and EW-11 mixed with laboratory makeup water at a ratio of 1:4 (volume per volume)) did not gel, suggesting that acidification without gel formation can be achieved by controlling the volume of brine extracted from individual wells or through the addition of makeup water low in dissolved silica concentration.

- Metal salts (ferric chloride and aluminum chloride) and an organic polymer were capable of precipitating DOM in the mixture.
- Sludge production was high (approximately 50 percent of the sample tested), and while supernatant clarity was improved, it retained an intense orange-brown coloring.

2.2.2 March 2008: Additional Testing of Composite CBP Fluids

A second round of testing was completed in March 2008 by CH2M HILL and an independent evaluation performed by four vendors of water treatment chemicals was also conducted during this timeframe. This evaluation was performed using a composite formulated by combining one part (volume) each from wells EW-1, EW-2, EW-3, EW-5, EW-7, EW-8, EW-9, EW-10, and EW-12 with half part (each) from wells EW-4, EW-6, and EW-11. The objective of this round of testing was to evaluate chemical coagulation, flocculation, and solids separation. Specific observations at that time included the following:

- Precipitation products, including silica, were not observed when composite samples were neutralized to pH 7 using mineral acid or carbon dioxide.
- By blending brine from the 12 extraction wells in a prescribed manner, the concentration of silica in the composite could be controlled to minimize the potential for silica precipitation following pH neutralization.
- Reduction in DOM was visually demonstrated, but it required significant quantities of treatment chemicals (coagulants, flocculants, and specialty polymers) to achieve.
- While some precipitation of DOM was demonstrated, there was limited reduction in total dissolved solids measurements in the treated samples.
- Density reduction appeared to be minimal and large amounts of treatment chemicals (mineral salt coagulants) were needed to initiate solids precipitation.
- Some precipitated solids initially settled, but most solids floated using the chemical treatments evaluated. Clarified supernatant of the mixtures retained color under all but the highest coagulant doses.
- NALCO, GE Infrastructure Water & Process Technologies, and Ciba reported results similar to CH2M HILL's observations. SNF/Polydyne reported they were unable to treat the composite sample.
- The formation of silica gel was neither acknowledged nor negated by any of the vendors that tested the composite sample.

2.2.3 April 2009: Acid Demand Testing of the Extracted Composite CBP Fluid

In April 2009, CH2M HILL performed an additional study to support detailed neutralization and density reduction system design activities. The focus of this study was to refine the acid demand for neutralization equipment sizing, evaluate the potential for precipitation products following acid addition, and further confirm that the proposed mixing strategy for brine and production well makeup water would result in the reduction of pH and specific gravity. This evaluation was conducted using a composite brine formulated by combining one part (volume) each from wells EW-1, EW-2, EW-3, EW-5, EW-7, EW-8, EW-9, EW-10, and EW-12 with half part (each) from wells EW-4, EW-6, and EW-11 could be neutralized by sulfuric acid addition. Specific observations at that time included the following:

- Titration curves were developed for the composite brine and for various ratios of composite brine to makeup water (ratios of 1:1, 1:2, 1:3, and 1:4) to support neutralization equipment sizing during design.

- Total suspended solids (TSS) analyses were performed to evaluate the potential for precipitation product formation under four scenarios: (1) after composite generation, (2) after production well water introduction, (3) after acid addition to pH 7, and (4) after acid addition to pH 4.3.
- Evaluation results indicated TSS in the composite sample measured 31 mg/L and was reduced to 14 mg/L following the addition of production well makeup water. After neutralization to pH 7, a TSS concentration of 18 mg/L was reported, and finally at pH 4.3, a TSS value of 21 mg/L was observed.

2.2.4 April 2010: Testing of CO_2 as Acidifying Agent

CH2M HILL's Applied Sciences Laboratory in Corvallis, OR, conducted a laboratory study using brine collected from the site to further evaluate the acid demand of brine from each extraction well as well as from representative mixtures for strong, medium, and weak brine. Sulfuric acid titration was used to determine acid demand, and an evaluation of CO_2 was conducted to determine whether this alternate material would be feasible for neutralization. Specific observations at this time included the following:

- Laboratory testing confirmed that neutralization using gaseous CO_2 to form carbonic acid provides a distinct advantage over using sulfuric acid. Results indicated that CO_2-neutralized brine contains four times the residual acidity over comparable sulfuric acid–neutralized brine mixtures.
- Results suggested that when silica is present above 300 ppm, precipitation may be delayed as long as 120 hours following neutralization to pH 10. Precipitation products were observed 48 hours after samples with a silica content above 300 ppm were neutralized to pH 7.
- Neutralization endpoint pH is tied to TSS production through both silica concentration and reaction kinetics. When weak brine is mixed 1:1 with production water and neutralized by acid addition, increasing TSS values were observed with increasing time.
- After over 120 hours of monitoring, no increase in TSS concentration was noted for brine samples containing between 108 and 161 ppm silica that had been neutralized to pH values ranging from 6.9 to 10.4.

SECTION 3

Technical Approach for Offsite Treatment and Disposal of Extracted CBP Brine

3.1 Introduction

As set forth in the AOC, the goals for a CBP treatment system include: (1) reduce pH to 10-10.5 in the CBP and (2) achieve density reduction.

CBP extraction with offsite treatment is one option available to accomplish the goals in the AOC. The basic infrastructure already exists at the site to extract and store a finite quantity of CBP for shipment (noting that additional infrastructure may be warranted if this option proves viable for full-scale operation). Here, CBP would be extracted from the various extraction wells at the site in a manner that generates a composite characteristic below hazardous waste thresholds—the two critical parameters for the CBP in this regard are mercury and, to a lesser extent, pH. The programmable logic controller (PLC) currently allows the site operator to individually set and monitor the flow rate and pumping duration from each extraction well in the network. Thus, the system can be operated in a manner to pump less volume per unit time from the most concentrated CBP extraction well(s) in order to maintain a bulk liquid composition below hazardous waste characteristics. "Desktop" analysis using the known chemical characteristics of the individual CBP wells shows that a CBP composite can be generated with a nonhazardous characteristic profile (pH under 12.5 units, mercury under 200 micrograms per liter (µg/L)). Recent testing validates the desktop analysis.

The CBP extraction wells are screened in the lower part of the surficial aquifer to allow preferential extraction of the most dense groundwater. As described in the original May 2007 work plan for the CBP removal action, the wells are intended to be operated at relatively low extraction rates in order to maintain laminar (horizontal) flow of CBP groundwater from the aquifer into the well. Step drawdown testing performed in 2007 indicated the specific yield of the aquifer ranges from a low of about 1 gpm to in excess of 10 gpm. This provides an operational range for routine operational extraction from the wells.

Additional work with one or more offsite treatment facilities is required to refine the analysis of whether an offsite treatment facility has the ability to cost-effectively treat the CBP liquid (at full scale operational rates) while meeting the treatment facility's permit effluent characteristics limits. This will be the focus of the forthcoming pilot-scale testing.

3.2 Technical Approach for Offsite Treatment Evaluation

Based on the initial positive results of the preliminary WRI treatability test, Honeywell proposes to initiate a pilot-scale test with WRI involving a routine but moderate volume of CBP extraction and treatment.[2] WRI has suggested a plan involving one to two tanker trucks per day over a 4-day work week (20,000-40,000 gallons of CBP extracted per week). This plan would be executed over a 3- to 4-month period, providing sufficient time to evaluate a range of CBP fluid bulk compositions (all to be nonhazardous). CBP fluid bulk compositions would be maintained as constant as possible for a given test run, through operating according to a set extraction rate schedule. The CBP fluid chemical

[2] Honeywell requests that EPA certify WRI for the processing and treatment of non hazardous CBP liquids for a period of one year, effective 1 January 2011, to facilitate the pilot scale testing and possible use of WRI beyond the currently proposed pilot phase.

characteristics would be confirmed at the beginning of a given test run though laboratory analysis of the bulk liquid prior to shipment of the CBP liquid.

In addition to WRI, Honeywell may investigate other potential industrial wastewater treatment facilities in parallel to this pilot testing phase with WRI. If Honeywell identifies additional potential treatment facilities, Honeywell will notify EPA in writing of such facilities and its intention to conduct a pilot test at that facility or facilities. Prior to conducting such pilot test(s), Honeywell will request that EPA certify the facility prior to conducting the test.

Honeywell, in conjunction with the wastewater treatment facility, will prepare a report of the pilot-phase test to summarize the results and present to EPA a more in-depth evaluation of the viability of offsite treatment at a full-scale operations perspective.

SECTION 4

Technical Approach Enhancement of the Existing Onsite System

The infrastructure that is currently installed for the current CBP treatment system is functional. As previously described, however, its capacity to infiltrate treated brine is constrained by the slow infiltration capacity of the soils in the infiltration galleries. The development of an onsite treatment design will be performed in parallel to the implementation of pilot-testing of offsite treatment described in Section 3.

Preliminary treatability work conducted during the previous pH neutralization design phase has shown that the fluid extracted from the CBP is amenable to conventional treatment approaches involving precipitation and settling of solids from the liquid phase. Additional information, however, is needed to define the following objectives:

1. Efficacy of metals reduction by conventional treatment regimes;
2. Optimal method for solids separation (i.e., sedimentation, flotation, etc.); and
3. Optimal process equipment to separate, concentrate, and dewater solids removed from the caustic brine.

Previous testing efforts summarized above have focused primarily on treatment chemistry, while the proposed additional study will focus on the process equipment required to support treatment. Although several chemical treatment regimes capable of driving solids reduction from the brine were tentatively identified, the efficacy of each approach for removal of dissolved constituents from the brine requires further evaluation. Similarly, the physical and chemical characteristics of sludge produced through the various solids removal approaches previously tested needs additional study to determine disposal requirements or to support process equipment selection. Therefore, additional investigation to refine both treatment chemistry and process equipment is required to develop an onsite treatment process for metals reduction. The following tasks outline the components of the technical approach to integrate solids removal capacity to the existing neutralization system.

4.1 Brine Treatability Testing

To make use of the benefits of previously conducted treatability testing and ongoing operations experience, pertinent observations and conclusions for ex-situ brine treatment will be assembled. The data will be analyzed and summarized relative to treatment chemistry, efficacy of solids removal, and indentified process constraints. This material will be provided to treatment vendors in order to conduct treatability tests to identify the conventional process equipment that may be capable of removing, separating, or concentrating solids from extracted brine.

A primary focus for vendor treatability testing will include a determination of the most appropriate conventional method for solids removal to facilitate the reduction of metals also present in the brine. Conventional metals removal processes typically incorporate pH adjustment, coagulation, flocculation and sedimentation. Thus, vendor treatability testing is designed to identify the process conditions where optimal removal of dissolved silica, DOM, and metals from the brine occurs.

As outlined previously, establishing the process conditions for optimal removal of target constituents is one of several steps required to develop a viable onsite treatment process for extracted brine. Prior experience suggests that multiple unit operations may be required to separate, concentrate, and dewater

sludge formed during brine treatment. Thus, vendor analysis is expected to define the physical and chemical characteristics of solid phase reaction products formed during brine treatment. Conventional analytical tools will be used by the selected vendors to establish sludge dewatering characteristics and projected disposal requirements.

Honeywell will prepare a report of the treatability testing to include a conceptual approach to the proposed treatment system and expected removal efficiencies. This report will be presented to EPA for review and approval. This report will also include an evaluation of the discharge methods and possible requirements, dependent upon the expected treatment efficiency and effectiveness.

As noted in Section 5 (deliverables and schedule), there is an alignment of the schedule between completion of the pilot-scale offsite treatment evaluation and the first task of the onsite treatment system design (i.e., vendor treatability testing). This will present an opportunity for a decision point, with input from EPA, to determine the efficacy of onsite versus offsite treatment of the CBP. Based on this interaction with the EPA, a decision will be made whether onsite treatment evaluation progresses further to a pilot testing scale and system design or if full scale offsite treatment is implemented (see Section 5.3 below).

SECTION 5

Deliverables and Preliminary Schedule

As set forth in more detail below, the offsite and onsite treatment approaches will be further developed and tested according to a methodical yet expeditious progression to establish optimal treatment approaches and expectations of treatment efficiencies specific to both options. Evaluation of offsite treatment will involve a significant and routine amount of CBP extraction from the site, similar (or greater) to the volume presently being extracted and treated through the pH neutralization system. Honeywell will also continue to operate the pH neutralization system (with discharge of treated brine to the infiltration galleries) during periods when no offsite treatment testing is occurring. Therefore, there will be continued progress towards achieving the AOC goals (in terms of the condition within the CBP in the subsurface) while the treatment design progresses towards completion.

Honeywell proposes to provide the EPA with monthly status reports that will contain a summary of work performed during the reporting period, along with supporting test results and planned work for the coming month. Honeywell also suggests that a schedule be established for monthly conference calls, to be convened shortly after receipt of the status report. These calls will enable the Honeywell design team to discuss ongoing issues with the offsite and onsite testing, rather than waiting for the end of the testing period.

5.1 Offsite Treatment and Disposal

The AOC requires EPA to certify any offsite facility commissioned to receive and treat CBP liquids. EPA granted a limited term certification for the previous treatability study conducted by WRI and based on the positive test results, Honeywell requests that EPA re-certify WRI for continued treatment evaluations consistent with the plan presented herein. Honeywell respectfully requests that EPA provide an annual (year 2011) certification for WRI.

Following completion of each phase of the evaluation of offsite treatment, Honeywell will submit a report to EPA. Appendix 2 is an example of such a deliverable, which is a report from WRI on their perspective of results of the November 2010 treatability test and a proposal for scale-up of operations. The next deliverable will be a short-term operations plan that will identify the specific operational parameters (e.g., extraction rates and duration for each well, sampling regime for composite CBP and treated effluent from the offsite facility, facilities to be used in the study). The short-term operations plan will be delivered within 15 business days after EPA's review and approval of this work plan. The purpose of the operations plan is to direct the onsite system operators on the specifics of the system operations and to ensure that Honeywell will be prepared to begin the pilot-scale offsite treatability test upon EPA's approval.

Once the pilot-scale, offsite treatment evaluation is completed, Honeywell will prepare a comprehensive short-term operations report to present pertinent operational and laboratory testing data generated during this phase, along with an assessment and plan (if appropriate) for full-scale operations of this alternative.

5.2 Onsite Enhancement of Existing System

In parallel with the evaluation of the offsite treatment option, vendor testing will be completed and results gathered and summarized. The vendor results and conceptual approach will be presented for EPA review and discussion with Honeywell as to whether the evaluation progresses to pilot-scale testing. This discussion will be based upon the efficiencies of what the two approaches have to offer, and include the consideration of projected economics of onsite versus offsite treatment.

If the decision is to continue with the design development for onsite treatment, the next step will involve onsite pilot-scale treatability testing. This work will culminate in the submittal of a Pilot Test Report and Preliminary Full-Scale Design.

5.3 Integrated Project Schedule

Early in the design and evaluation process, there will be parallel development of both the onsite and offsite treatment options. Honeywell will be submitting monthly status reports to EPA summarizing work completed and key information gained during the reporting period and with this regularly scheduled interaction, the comparative viabilities of onsite versus offsite treatment will become more apparent. The project schedules for offsite and onsite treatment evaluations are provided in Figure 1.

The first milestone in the schedule is EPA's approval of the revised CBP work plan and certification of WRI for the offsite treatability test. The first deliverable will be submission of the Short-term Operations Plan for the offsite treatment option – Honeywell assumes this will require EPA approval before proceeding with the offsite treatability test. The offsite treatability test is planned for four months (120 day duration), and it will conclude with preparation of a report to summarize results of the offsite pilot testing. This will coincide with the timing of completion for the Onsite Treatment Process Development (Task 2 on the project schedule). Honeywell anticipates discussions with the Agencies at this point in the process, to decide whether to opt for full-scale offsite treatment or process with further design development for onsite treatment.

If the determination is made at this stage that offsite treatment is not viable, Honeywell will resume the pH neutralization treatment system presently installed at the site while proceeding with design of the onsite treatment system.

FIGURE 1
Task Duration Schedule

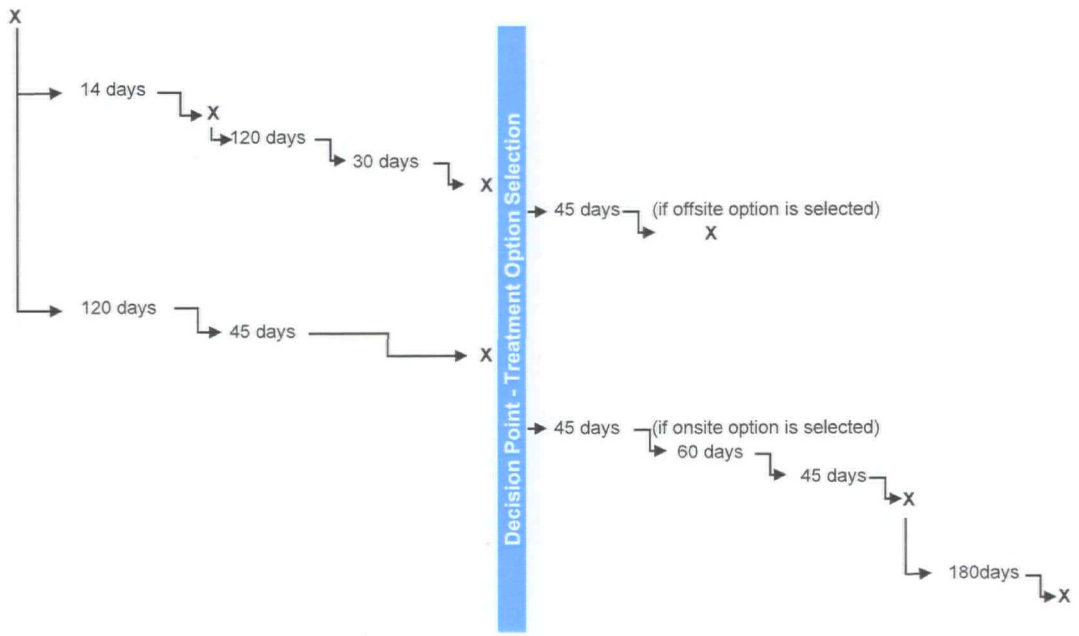
EPA Approval of Workplan and Certification of WRI

Task 1 Offsite Treatment Evaluation
- Short-term Operations Plan Preparation
- Agency Review & Approval
- Treatability Testing Phase
- Report of Short-term Offsite Treatment Operations
- Decision Point - Discussion of Results with EPA
- Plan for Full-scale Offsite Treatment Operations
- Agency Review & Approval

Task 2 Onsite Treatment Process Development
- Vendor Testing Period
- Treatability Test Report Preparation
- Agency Review & Approval

Task 3 Onsite Pilot Testing (onsite treatment)
- Planning & Equipment Setup
- Pilot Testing Period
- Report of Onsite Treatment Pilot Testing
- Agency Review & Comment

Task 4 Preliminary Full-scale Design Onsite Treatment System
- Preliminary Full-scale Design Development
- Agency Review & Approval



Notes: **X** Indicates milestone event
Agency review duration is unknown

APPENDIX 1

Letter from EPA to Honeywell, Re: Certification of Proposed Receiving Facility, Water Recovery, Inc., 1819 Albert Street, Jacksonville, FL

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
SAM NUNN
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA GEORGIA 30303-8960

NOV 0 1 2010

Ref: 4WD-SRB

Via Delivery as Email-attachment to (Prashant.gupta@honeywell.com) and U.S. Mail

Mr. Prashant K. Gupta
Honeywell, Inc.
4101 Bermuda Hundred Road
Chester, VA 23836

Re: EPA Certification of Proposed Receiving Facility, Water Recovery, Inc., 1819 Albert Street, Jacksonville, FL: LCP Chemical Company National Priorities List Site, Brunswick, Glynn County, GA

Dear Mr. Gupta:

In your October 7, 2010 letter, you indicated that Honeywell International, Inc. (Honeywell) is proposing to send 10,000 gallons of caustic brine pool (CBP) wastewater to the Water Recovery, Inc. (WRI) facility in Jacksonville, Florida for the purpose of conducting a treatability test utilizing traditional treatment processes. You asked, pursuant to Paragraph 21 of the Administrative Settlement Agreement and Order on Consent for Removal Action, Docket No. CERCLA-04-2007-3760, for EPA's certification that the proposed receiving facility is operating in compliance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

I have received written confirmation, which is enclosed, that the WRI facility mentioned above is in compliance with all necessary requirements, pursuant to Section 121 of the CERCLA), 42 U.S.C. Section 9621, and the Off-Site Rule, through December 18, 2010. If Honeywell plans to send CBP liquids to the WRI facility for arrival after that date, please contact me two weeks prior to December 18, 2010 so that EPA can conduct another verification of continued acceptability, which is valid for 60 days.

I understand from our phone conversation that the mercury concentration of the 10,000 gallons will be blended so that the transported caustic brine will have a concentration below 200 parts per billion. All other metals governed by the Resource Conservation and Recovery Act should also be treated in a similar fashion. I further understand that the transport of these 10,000 gallons is a one time event, designed for Honeywell to understand the performance conventional treatment methods and its economics.

If you have any questions about this letter, you may contact me by telephone at (404) 562-8937 or by e-mail at jackson.galo@epa.gov.

Sincerely,

Galo Jackson, P.G.
Remedial Project Manager
Superfund Remedial Branch

Enclosure

cc: J. McNamara, EPD

CERCLA Offsite Acceptability of Water Recovery , Inc., Jacksonville, FL

Paula Whiting to: Galo Jackson
Cc: Karen Singer, Larry Lamberth

10/18/2010 12:06 PM

History: This message has been replied to and forwarded.

The OSR acceptability status is dynamic in nature and subject to change, Region 4 has instituted a policy where EPA conducts a verification of continued acceptability (VCA) on facilities that have been previously found acceptable under the CERCLA Off-site Rule (OSR) such as the Water Recovery, Inc., Jacksonville, FL facility. The purpose of a VCA is to provide a periodic check to assure that the facility continues to be acceptable. VCAs are conducted when a request for OSR status is received and the previous VCA had been conducted more than 60 days prior. VCA are valid for 60 days.

A VCA was completed for the Water Recovery, Inc., Jacksonville, FL facility on October 18, 2010, so the VCA is valid until December 18, 2010. CERCLA waste shipments sent to the Water Recovery, Inc., Jacksonville, FL facility up until December 18th, are in full compliance with the OSR. If CERCLA wastes are planned to be sent after this date, please contact me about a week or so prior to December 18th, so that a new VCA can be conducted at that time.

Thanks,

Paula A Whiting
Environmental Engineer
South Enforcement and Compliance Section
RCRA and OPA Enforcement and Compliance Branch
US Environmental Protection Agency - Region IV
Sam Nunn Atlanta Federal Center
61 Forsyth Street SW
Atlanta, GA 30303
Phone: 404-562-9277
FAX: 404-562-8566

Galo Jackson — Paula: Attached below is a request to ship 10.00 gallons of groundwater from th... — 10/08/2010 01:40:34 PM

APPENDIX 2

Report of Treatability Test Results from Water Recovery, LLC.

Water Recovery, LLC
1819 Albert Street
Jacksonville, FL 32202
904-475-9320
www.wrijax.com

December 10, 2010

Mr. Kirk Kessler
Vice President
Environmental Planning Specialists Inc.
900 Ashwood Parkway, Suite 350
Atlanta, GA 30338

Re: Project Report for Transportation and Disposal Evaluation of LCP Chemicals Site, Brunswick, GA Contaminated Groundwater

Background

Water Recovery, LLC (WRI) has engaged with Environmental Planning Specialists Inc. to evaluate the feasibility of transportation, treatment and disposal of the non-hazardous contaminated groundwater from the LCP Chemicals Site in Brunswick, Georgia.

On November 12, 2010 Water Recovery, LLC picked up 8,000 gallons of non-hazardous contaminated groundwater at the Brunswick, Georgia site for transportation, treatment and disposal at our Centralized Wastewater Treatment (CWT) plant in Jacksonville, Florida. Prior to conducting the scale evaluation, WRI received and reviewed considerable analytical data characterizing the material, completed in house laboratory analysis and treatability evaluations of a representative sample of the material, and conducted a site visit of the subject property. The purpose of this report is to document and discuss the results of the scale evaluation.

Results

- Prior to dispatching 2 tanker trucks to the site, WRI received and reviewed analytical data confirming that the material was non-hazardous for mercury
- On November 12, 2010 two tankers trucks were loaded with 8,000 gallons total at the site, manifested as non-hazardous contaminated groundwater, and transported to our Jacksonville, Florida CWT.
- The incoming loads were sampled and fingerprint tested in our laboratory to verify conformance with this materials approved waste profile
- The material was accepted and unloaded for treatment and disposal
- Aerobic biological treatment continued the through November 16, 2010 when the entire 8,000 gallon volume was contained in the plants discharge event to our receiving POTW via sample point SP002

WRI
Water Recovery, LLC
1819 Albert Street
Jacksonville, FL 32202
904-475-9320
www.wrijax.com

- As per the monitoring requirements of our discharge permit, a flow proportional autosampler was employed to collect a composite sample for analysis by our contract NELAP Certified laboratory (Advanced Environmental Laboratories, Inc.)
- At the request of Environmental Planning Specialists, Inc. a split of our composite discharge sample was also prepared for submission to Columbia Analytical Services for evaluation
- Water Recovery, LLC has received and reviewed the analytical data reported from both Advanced Environmental Laboratories, Inc. and Columbia Analytical Services on the composite sample form our discharge event, November 16, 2010
- The were absolutely no violations of our discharge permit parameters
- WRI plant management and technical staff concur that our CWT is capable of treatment and disposal of the contaminated groundwater from the LCP Chemicals site in Brunswick, Georgia

Discussion

After reviewing the results of the scale evaluation, WRI projects that our CWT would be capable of treatment and disposal of an annual volume of 2 million gallons. This annual volume estimate is based on the nature and composition of the material as delivered for the scale evaluation. Given the possibility that the nature and composition of the groundwater may change, and also the potential extension of technical treatment capabilities of the CWT, the annual treatment and disposal capacity of WRI could range from 1 million to 4 million gallons.

Sincerely,

Gregory G. Reynolds
Vice President and General Manager
Water Recovery, LLC

Attachment

JEA Industrial Pretreatment Categorical Industrial User Discharge Permit #099

Industrial Pretreatment

CATEGORICAL
INDUSTRIAL USER DISCHARGE PERMIT #099

In accordance with the provisions of JEA's *Industrial Pretreatment Regulation*:

Water Recovery, LLC.
(hereinafter referred to as "Permittee"), located at
1819 Albert Street

is hereby authorized to discharge industrial wastewater from the above location into the District I (Buckman) Publicly Owned Treatment Works (POTW), in accordance with the conditions set forth in this permit. Compliance with this permit does not relieve Permittee of its obligation to comply with any or all applicable pretreatment regulations, standards or requirements under local, State and Federal laws, including any such regulations, standards, requirements, or laws that may become effective during the term of this permit. Noncompliance with any term or condition of this permit shall constitute a violation of JEA's *Industrial Pretreatment Regulation* and may subject Permittee to enforcement action pursuant thereto.

This permit shall become effective on: **July 01, 2008**.

This permit shall expire at midnight on: **June 30, 2013**.

The deadline to apply for permit reissuance is: **March 01, 2013**.

This permit was modified effective on: **June 29, 2009**.

Dan Parnell, Manager
Industrial Pretreatment

TABLE OF CONTENTS

SECTION 1 – FACILITY DESCRIPTION

1.1 General

The Permittee operates a centralized waste treatment (CWT) facility. The Permittee receives non-hazardous wastewater and used oil from a variety of industrial generators. Wastewater received by the Permittee contains oils, metals, or organic pollutants and/or a combination thereof. The Permittee reclaims oil and sells it on the used oil market. Solids generated at the Permittee's facility receive the appropriate off-site treatment and/or disposal.

1.2 Wastestream Descriptions

Wastewater discharged to the POTW from this facility is described below:

Wastestream Designation	Wastestream Description
Wastestream 1	Receipts of metal-bearing wastes as defined by 40 CFR 437.2(l). This wastestream is regulated by 40 CFR 437. Such receipts include: • Spent electroplating baths and/or sludges • Metal finishing rinse water and sludges • Chromate wastes • Air pollution control blow down water and sludges • Spent anodizing solutions • Incineration wastewaters • Waste liquid mercury • Cyanide containing wastes • Waste acids and bases with or without metals • Cleaning, rinsing, and surface preparation solutions from electroplating or phosphating operations • Vibratory deburring wastewater • Alkaline and acid solutions used to clean metal parts or equipment • Pressure wash or "hydroblast" water used to clean metal and/or painted metal surfaces • X-ray and photographic film processing wastewaters • Ink-bearing wash and rinse wastewaters from printing operations

Wastestream Designation	Wastestream Description
Wastestream 2	Receipts of oily wastes as defined by 40 CFR 437.2(p). This wastestream is regulated by 40 CFR 437. Such receipts include: • Used oils • Oil-water emulsions or mixtures • Lubricants • Coolants • Contaminated groundwater clean-up from petroleum sources • Used petroleum products • Oil Spill clean-up • Bilge water • Rinse/wash waters from petroleum sources • Interceptor wastes • Off-specification fuels • Underground storage remediation waste • Tank clean-out from petroleum or oily sources • Non-contact used glycols • Aqueous and oil mixtures from parts cleaning operations • Wastewater from oil bearing paint washes
Wastestream 3	Receipts of organic wastes defined by 40 CFR 437.2(r) and regulated by 40 CFR 437. Such wastes include: • Landfill leachate • Contaminated groundwater clean-up from non-petroleum sources • Solvent-bearing wastes • Off-specification organic products • Still bottoms • Byproduct glycols • Wastewater from paint washes • Wastewater from adhesives and/or epoxies • Wastewater from chemical product operations • Tank clean-out from organic, non-petroleum sources.
Wastestream 4	Wastewater generated on-site (i.e., within the boundaries of the CWT facility) from used oil processing. This wastestream is regulated by 40 CFR 437.

Wastestream Designation	Wastestream Description
Wastestream 5	Wastewater generated on-site (i.e., within the boundaries of the facility) from CWT operations besides used oil processing. This wastestream is regulated by 40 CFR 437. Such wastewater includes: • equipment/area washdown • water separated from recovered/recycled materials • contact/wash water from recovery and treatment operations (e.g. centrate and/or filtrate from solids de-watering) • CWT internal facility transport container washdown • solubilization wastewater • laboratory-derived wastewater • air pollution control wastewater • contaminated storm water (e.g. storm water collected within secondary containment structures)
Wastestream 6	This wastestream consists of sanitary wastewater from lavatories, lavatory floor drains, sinks, showers, water coolers, etc.

1.3 Pretreatment Systems

Permittee employs the following pretreatment equipment and/or procedures:

Wastestream Designation	Pretreatment Description
Wastestream 1	This wastestream is batch treated in treatment tanks 1W-9W via chemical precipitation, liquid-solid separation, alkaline chlorination, chromium reduction, and/or cyanide oxidation prior to discharge. Wastestream(s) requiring further treatment with O/W separation and/or dissolved air flotation (DAF) pass into the 50,000 gallon equalization tank. Wastewater in the equalization tank is air mixed and gravity fed into the DAF and/or O/W separator for additional treatment prior to discharge into a final 50,000 gallon compliance testing and discharge tank. Water in the final discharge tank may be redirected into the equalization tank for further treatment on an as needed basis.
Wastestream 2	This wastestream is batch treated in treatment tanks 1P-9P via gravity separation, and/or chemical emulsion breaking prior to the treatment described for Wastestream 1 above.
Wastestream 3	This wastestream is batch treated in treatment tanks 101 and/or 102 (tank 102 is only used for excess organics wastewater storage during periods of increased business) as needed via aeration, and/or chemical oxidation prior to discharge.
Wastestream 4	This wastestream is batch treated the same as Wastestream 2.
Wastestream 5	This wastestream is batch treated the same as Wastestream 1 or 3.

Wastestream Designation	Pretreatment Description
Wastestream 6	This wastestream is sanitary wastewater; therefore, no pretreatment is required.

1.4 Outfall(s) and Sample Point(s)

The following table lists the outfall(s) and sample point(s) approved under this permit.

An "outfall" is a point of discharge to the POTW. Permittee is strictly prohibited from discharging non-domestic wastewater to the POTW through an unlisted outfall. Permittee is also strictly prohibited from discharging non-domestic wastewaters not in accordance with the outfall description(s) and outfall designation(s) indicated below.

A "sample point" is the designated location where Permittee shall conduct periodic self-monitoring of the wastewater discharged to the POTW. Each sample point shall be readily accessible to JEA for the purposes of inspection, monitoring, and sampling to verify compliance with any applicable pretreatment standards. Sample point(s) and monitoring equipment shall be subject to approval by JEA.

Permittee shall permanently label each sample point, clearly indicating the Industrial User Discharge Permit Number and Sample Point Designation (e.g. IUDP #099 – SP001):

Outfall Designation	Outfall Description	Sample Point Designation	Sample Point Description
A	This outfall consists of a gravity discharge line from Permittee's final holding tank. This line discharges to the off-site monitoring station located in the north right-of-way of Albert Street, approximately 50 feet west of Bryan Street. Wastestreams 1, 2, 4 and 5 are discharged to the POTW via this outfall.	SP001	Samples shall be taken from the monitoring station located in the north right-of-way of Albert Street immediately adjacent to the facility. This is the sample point for effluent from metal-bearing and oily wastes treatment.

Outfall Designation	Outfall Description	Sample Point Designation	Sample Point Description
B	This outfall consists of a force main discharge line from Permittee's organics batch treatment tanks on Bryan Street. The line discharges to the organics sampling and monitoring building and gravity flows into the sewer line in Bryan Street. Wastestreams 3 and 5 are discharged to the POTW via this outfall.	SP002	Sample shall be taken from the sample port, downstream of the magnetic flow meter in the organics sampling and flow monitoring building at the northeast corner of the main treatment facility near Bryan Street. This is the sample point for organics wastes treatment.
A	Same as above	SP003 [A]	Samples shall be taken from the discharge line immediately downstream from the cyanide destruction process, prior to additional treatment steps. This is the sample point for cyanide waste.
C	This outfall consists of a gravity drain line discharging from the office building located in the northwest corner of the facility to the sewer main along Albert Street, east of Talleyrand Avenue and west of Bryan Street. Wastestream 6 is discharged to the POTW via this outfall. Discharge of non-domestic wastewater via this outfall is prohibited.	N/A	N/A

[A] In-plant cyanide monitoring and compliance at this sample point is only required if Permittee accepts a wastestream that contains more than 136 mg/l of total cyanide.

1.5 Monitoring Equipment

The following table describes the equipment approved under this permit for monitoring wastewater discharged to the POTW.

Sample Point	Parameters Monitored	Equipment Description
SP001	Flow rate and volume	Parshall flume with totalizing ultrasonic flow meter
SP001	Conventional and non-conventional pollutants	Flow integrated automatic composite sampler and grab sampling equipment
SP001	pH	pH meter
SP002	Flow rate and volume	3" Endress + Hauser electromagnetic flow meter with totalizer
SP002	Conventional and non-conventional pollutants	Flow integrated automatic composite sampler and grab sampling equipment
SP002	pH	pH meter
SP003	Cyanide	Grab sampling equipment