

Addivant USA, LLC
Bay Minette, Alabama
EPA I.D. Number ALD 010 394 021

FACT SHEET

A draft modification to the Alabama Hazardous Waste Management and Minimization Act (AHWMMA) Post-Closure Agreement has been prepared for Addivant USA, LLC (Addivant) facility. This hazardous waste facility is located in Bay Minette, Alabama. This fact sheet has been prepared to briefly advise the public of the principal permitting, legal and policy issues of the draft permit.

I. PERMIT PROCESS

The purpose of the permitting process is to allow the State and the public to evaluate Addivant's ability to comply with the hazardous waste management requirements of the AHWMMA, as amended. Addivant must comply with hazardous waste management conditions set forth in the Post-Closure Agreement.

II. PROCEDURES FOR REACHING A FINAL DECISION

The Alabama Department of Environmental Management (ADEM or Department) is proposing to issue Addivant a post-closure agreement for care of the Former Acid Lagoon, which has been closed as a single landfill unit with wastes and/or contaminated soils remaining in-place.

ADEM Admin. Code r. 335-14-8-.08(6)(b)1. requires that the public be given a 45-day comment period for each draft permit. The comment period will begin on August 9, 2019, which is the date of publication of the public notice in major local newspaper(s) of general circulation, and will end on September 9, 2019.

Any person interested in commenting on the application or draft permit must do so within the 45-day comment period discussed above.

All persons wishing to comment on any of the permit conditions or the permit application should submit their comments in writing to the Alabama Department of Environmental Management, Permits and Services Division, 1400 Coliseum Blvd. (zip 36110-2059), P.O. Box 301463 (zip 36130-1463) Montgomery, Alabama, ATTENTION: Mr. Russell A. Kelly.

ADEM will consider all written comments received during the comment period while making a permit decision for this facility. When the Department makes its final permit decision, notice will be given to the applicant and each person who has submitted written comments or requested notice of the final permit decision.

III. FACILITY DESCRIPTION

Addivant USA, LLC has applied for a post-closure agreement under the requirements of AHWMMA for post-closure care including corrective action for groundwater contamination. Addivant is a facility that manufactures exclusively dinitrobutylphenol (DNBP) for use as a polymer inhibitor in the production of styrene. DNBP was used primarily as a pesticide until its recent use as a polymer inhibitor was discovered. The hazardous waste which was managed in the Former Acid Lagoon was process wastewater from the production of DNBP. The former waste management unit has an approved cap and cover installed over the remaining waste to mitigate the potential for future

groundwater contamination. The Agreement contains provisions for post-closure care for the Former Acid Lagoon and corrective action for groundwater contamination.

IV. SUMMARY OF PROPOSED MODIFICATIONS

Revised Corrective Measures Groundwater Monitoring Plan

V. CHANGES TO THE EXISTING AGREEMENT

The specific changes to the Agreement are explained below.

<u>Section/Appendix</u>	<u>Reason</u>
Section III.4. thru 7.	Included the language: “(addendum: Revised Corrective Measures Groundwater Monitoring Plan Phase II, October 2018)”
Section V.3.	Removed EPA’s contact information
Signature block	Updated information of facility contact

VI. TECHNICAL CONTACT

Metz Duites
Engineering Services Section
Industrial Hazardous Waste Branch, Land Division
Alabama Department of Environmental Management
1400 Coliseum Blvd (zip 36110-2059)
P.O. Box 301463 (zip 36130-1463)
Montgomery, Alabama
(334) 270-5679

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STATE OF ALABAMA)
)
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT)
)
POST-CLOSURE AGREEMENT# ALD010394021)

POST-CLOSURE AGREEMENT

BETWEEN

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND
ADDIVANT USA, LLC, BALDWIN COUNTY, ALABAMA,
US EPA IDENTIFICATION NUMBER ALD 010 394 021

I. PREFACE

1. The Alabama Hazardous Waste Management and Minimization Act ("AHWMMA"), Code of Alabama (1975), §§ 22-30-1 through 22-30-24, as amended, was enacted, in part, to reduce public health and environmental hazards on existing commercial and industrial sites by providing a regulatory framework under which responsible parties develop and post-closure and implement environmental cleanup plans.
2. The Alabama Department of Environmental Management ("ADEM" or "Department") is the administrative agency of the State of Alabama having the power and duty to protect Alabama's environment and to administer and enforce the provisions of Title 22, Chapters 22A and 30 of the Code of Alabama (1975). Specifically, pursuant to Code of Alabama (1975), § 22-22A-4(n), as amended, the Department is responsible for the promulgation and enforcement of solid and hazardous waste regulations in accordance with the federal Solid Waste Disposal Act, 42 U.S.C. 3251, et. seq, as amended, including §§ 8001 through 11008, as amended. In addition, the Department is authorized to administer and enforce the provisions of the Alabama Hazardous Wastes Management and Minimization Act, Code of Alabama (1975), §§ 22-30-1 through 22-30-24, as amended (the "Act") and regulations promulgated thereunder (the "Rules").
3. The Department, acting through the Environmental Management Commission, has the authority pursuant to Code of Alabama (1975), §§ 22-30-11(a), 22-30-19(b), and 22-22A-5(2) to promulgate, and revise when appropriate, rules and regulations, guidelines, criteria and standards for all

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hazardous waste management practices used to establish criteria for determining the tasks that comprise a post-closure hazardous waste management program.

4. The Department has jurisdiction over the matters addressed in this Post-Closure Agreement.
5. Addivant USA, LLC; formerly known as Chemtura Corporation, Crompton Corporation, and Uniroyal Chemical Company, Inc.; (hereinafter referred to as "Addivant" or "Facility") is the owner of the property located at 43300 Highway 225, Bay Minette, Baldwin County, Alabama ("Property") on which the Addivant site is located ("Bay Minette site" or "Site").
6. This Post-Closure Agreement ("Agreement") is entered into between the Department and Addivant voluntarily to provide a mechanism, subject to the terms hereof, for the performance and oversight of post-closure hazardous waste management and corrective/remedial action at the Bay Minette site by Addivant. This agreement also provides for the payment of fees in accordance with ADEM Admin. Code R. 335-1-6.

In consideration of the mutual covenants and agreements hereinafter contained, the Department and Addivant agree as follows:

II. FINDINGS

1. The Facility constructed and began using the Hypalon-lined lagoon for process wastewater in 1977. This lagoon is hereinafter referred to as the "Acid Lagoon".
2. In September 1979, Hurricane Frederick damaged the Hypalon lining. The material in the lagoon, the liner and impacted soil were removed for off-site disposal prior to August 1, 1981. Neither ADEM nor the facility has any record of the closure being certified pursuant to ADEM Admin. Code R. 335-14-5-.07(6).
3. The Department completed a potential Hazardous Waste Site Preliminary Assessment Form, dated approximately December 31, 1984, which stated that the "closed" impoundments were not "clean closed".
4. A synthetic cap was installed over the Acid Lagoon in 1995 as required by ADEM NPDES Order AL0054399.

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5. Because the Acid Lagoon was not certified closed prior to January 26, 1983, a post-closure permit or an enforceable document in lieu of post-closure permit is required as per ADEM Admin. Code R. 335-14-8-.01(1)(c).
6. Addivant agrees with the Findings presented in this Agreement and, in an effort to cooperate with the Department and to comply with the provisions of the Alabama Hazardous Wastes Management and Minimization Act, Addivant has consented to the terms of this Agreement.
7. The Department has agreed to the terms of this Agreement, and the Department has determined that the terms contemplated in this Agreement are in the best interests of the citizens of Alabama.

III. ACTIVITIES TO BE PERFORMED

1. Addivant agrees to comply with the approved post-closure plan until such time as the Department makes the determination that post-closure care is no longer necessary.
2. Addivant agrees to request a modification to the post-closure plan at least sixty (60) days prior to an expected event, or no later than sixty (60) days after an unexpected event has occurred which affects the post-closure plan.
3. If the proposed modification to the post-closure plan is a major modification according to the criteria of ADEM Admin. Code R. 335-14-8-.04(2) and 335-14-8-.04(3), the parties agree the modification to the plan will be processed according to the procedures in ADEM Admin. Code R. 335-14-6-.07(9)(f), after payment of appropriate fees in accordance with ADEM Admin. Code R. 335-1-6.
4. Addivant agrees to proceed with remediation activities in accordance with the approved CMI Plan (addendum: Revised Corrective Measures Groundwater Monitoring Plan Phase II, October 2018) until such time as the Department makes the determination that target cleanup level(s) have been achieved.
5. Addivant agrees to continue monitoring in accordance with the approved CMI Plan (addendum: Revised Corrective Measures Groundwater Monitoring Plan Phase II, October 2018) throughout the post-closure period.

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6. Addivant agrees to request a modification to the CMI Plan (addendum: Revised Corrective Measures Groundwater Monitoring Plan Phase II, October 2018) at least sixty (60) days prior to an expected event, or no later than sixty (60) days after an unexpected event has occurred which affects the post-closure plan.
7. If the proposed modification to the CMI Plan (addendum: Revised Corrective Measures Groundwater Monitoring Plan Phase II, October 2018) is a major modification according to the criteria of ADEM Admin. Code R. 335-14-8-.04(2) and 335-14-8-.04(3), the parties agree the modification to the plan will be processed according to the procedures in ADEM Admin. Code R. 335-14-6-.07(9)(f), after payment of appropriate fees in accordance with ADEM Admin. Code R. 335-1-6.
8. Addivant shall demonstrate financial assurance for the post-closure care and corrective measures implementation within one hundred eighty (180) calendar days of the date of the change in the ownership or operational control of the facility per ADEM Admin. Code R. 335-14-8-.04(3)(a)1.(vii).
9. Upon execution of this agreement, the requirements of this agreement shall supersede and suspend those requirements of the previous consent agreement executed on February 7, 2005.

IV. QUALITY ASSURANCE

1. Addivant agrees to follow ADEM and EPA guidance for sampling and analysis. Reports submitted pursuant to this Agreement shall describe quality assurance/quality control ("QA/QC") and chain of custody procedures for all sampling, monitoring, and analytical activities. Any deviations from standard QA/QC and chain of custody procedures must be approved by ADEM prior to implementation.
2. Addivant agrees to require that high quality data is obtained pursuant to this agreement. Addivant shall require that its laboratories perform such analysis according to the latest approved edition of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846)," or other methods deemed satisfactory to ADEM which ADEM shall specify in writing. ADEM may reject any data that does not meet the requirements of standard EPA/ADEM analytical methods or other

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methods approved by ADEM in writing and may require re-sampling and additional analysis.

V. REPORTING AND DOCUMENT CERTIFICATION

1. Addivant agrees to provide ADEM with quarterly progress reports and such other reports as are outlined in the approved post-closure plan or CMI Plan. Progress reports are due on the fifteenth day of the first month of each quarter. ADEM may reasonably adjust the frequency of progress reports to be consistent with site-specific activities.
2. Groundwater monitoring results shall be reported at the intervals specified in the approved post-closure plan. To comply with ADEM Admin. Code Rule 335-14-8-.03(1)(j)(3), records of monitoring information shall include:
 - i. The dates, exact place, and times of sampling or measurements;
 - ii. The individuals who performed the sampling or measurements;
 - iii. The dates in which analyses were performed;
 - iv. The individuals who performed the analyses;
 - v. The analytical techniques or methods used; and,
 - vi. The results of such analyses
3. One hard copy and one electronic (an optical character recognition or text-searchable) copy of all reports, notifications, or other submissions that are required by this agreement should be sent via certified mail or hand-delivered to:

Chief, Land Division
Alabama Department of Environmental Management
P.O. Box 301463 (Zip 36130-1463) or
1400 Coliseum Boulevard
Montgomery, Alabama (Zip 36110-2400)
4. Any report or other document submitted by the Facility pursuant to this Agreement which makes any representation concerning Addivant's compliance or noncompliance with any requirement of this Agreement shall be certified by a responsible corporate officer of Addivant who meets the criteria described in 335-14-8-.02(2).
5. The certification required by paragraph four (4) above, shall be in the form required in 335-14-8-.02(2)(d).

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6. Certain information required by this Agreement involves the practice of engineering and/or land surveying, as those terms are defined in Code of Alabama (1975), as amended, §§ 34-11-1 to 34-11-37; and/or the practice of geology, as that term is defined in Code of Alabama (1975), as amended, §§ 34-41-1 to 34-41-24. It is the responsibility of any person preparing or submitting such information to ensure compliance with these laws and any regulations promulgated thereunder, as may be required by the State Board of Registration for Professional Engineers and Land Surveyors and/or the State Board of Registration for Professional Geologists. All submissions, or parts thereof, which are required by State law to be prepared by a licensed engineer, land surveyor, or geologist must include the engineer's, land surveyor's, and/or geologist's signature and/or seal, as required by the applicable licensure laws.

VI. DISPUTE RESOLUTION

1. The parties shall use their best efforts to informally and in good faith resolve all disputes or differences of opinion. The parties agree that the procedures contained in this section are the sole procedures for resolving disputes arising under this Agreement. If the Facility fails to follow any of the requirements contained in this section then it shall have waived its right to further consideration of the disputed issue.
2. If Addivant disagrees, in whole or in part, with any written decision by ADEM pursuant to this Agreement, Addivant shall notify ADEM of the dispute. The parties shall attempt to resolve the dispute informally. In the event of an irresolvable dispute or disagreement between the parties, either party may, upon written notice provided to the other, terminate this Agreement subject to the provisions of Paragraph 7 below.
3. If the parties cannot resolve the dispute informally, Addivant may pursue the matter formally by placing its objections in writing. The Facility's written objections must be directed to the ADEM Industrial Hazardous Waste Branch. This written notice must be sent (via hand delivery, via certified mail posted by the fifteenth business day, or by overnight express mail) to the ADEM Industrial Hazardous Waste Branch within 15 business days of the Facility's receipt of the disputed written decision by ADEM. Addivant's written objection must set forth the specific issues of the dispute, the basis for the Addivant's position, and any matters which it considers necessary for ADEM's determination.

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4. ADEM and Addivant shall have 14 business days from ADEM's receipt of the Facility's written objections to attempt to resolve the dispute through formal negotiations. This time period may be extended by ADEM for good cause. During such time period ("Negotiation Period"), Addivant may request a conference to discuss the dispute and Addivant's objections. ADEM shall agree to confer in person or by telephone in order to seek resolution of any such disagreement as long as Addivant's request for a conference will not extend the Negotiation Period without good cause. Within ten (10) business days after the end of the Negotiation Period, ADEM will provide to the Facility its written decision on the dispute (via hand delivery, via certified mail posted by the tenth business day, or by overnight express mail), which will include a response to Addivant's position and the reasons for ADEM's decision. If ADEM's written decision differs from Addivant's position, ADEM will issue an administrative action, either in the form of a Notice of Violation ("NOV") or administrative order.
5. Addivant may request a hearing before the Environmental Management Commission to contest an NOV or administrative order issued by the Department pursuant to Section 22-22A-7, Code of Alabama (1975), as amended. Accordingly, any request for a hearing to contest an administrative action must be filed with the Commission within 30 days after the issuance of the administrative action.
6. An order of the Environmental Management Commission may be appealed pursuant to the terms defined in Section 22-22A-7(c)(6), Code of Alabama (1975), as amended.
7. Notwithstanding anything herein to the contrary, Addivant and the Department each reserve the right to unilaterally terminate this Agreement. Termination may be accomplished by giving a thirty (30) calendar day written notice (via hand delivery, via certified mail posted by the thirtieth day, or by overnight express mail) of the election to terminate this Agreement to the other party.
8. The Department may properly bring an action to compel compliance with the terms and conditions contained herein in the Circuit Court for Montgomery County. Addivant also agrees that in any action brought by the Department to compel compliance with the terms of this Agreement, the Facility shall be limited to the defenses of Force Majeure, compliance with this Agreement, and physical impossibility.

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VII. FORCE MAJEURE AND EXCUSABLE DELAY

1. *Force majeure*, for purposes of this Agreement, is defined as any event arising from unforeseen causes and beyond the control of the Facility or any person or entity controlled by the Facility, including but not limited to Addivant's primary contractors, that delays or prevents the timely performance of any obligation under this Agreement despite the Facility's best efforts to fulfill such obligation. The requirement that Addivant exercise "best efforts to fulfill such obligation" shall include, but not be limited to, best efforts to anticipate potential *force majeure* events that reasonably would be anticipated and address those before, during, and after its occurrence, such that any delay or prevention of performance is minimized to the extent reasonably possible. *Force majeure* does not include increased costs of the work to be performed under this Agreement, financial inability to complete the work, work stoppages or other labor disputes.

2. If any event occurs or has occurred that may delay the performance of any obligation under this Agreement, whether or not caused by a *force majeure* event, the Facility shall contact by telephone and communicate orally with ADEM within 48 hours of when the Facility first knows that the event will cause a delay. If Addivant wishes to claim a *force majeure* event, then within 14 days after the occurrence of the claimed *force majeure event*, the Facility shall provide to ADEM in writing the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; all other obligations affected by the event, and what measures, if any, have been or will be taken to minimize the effect of the event on those obligations; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Addivant's rationale for attributing such delay to a *force majeure* event if it intends to assert such a claim; and a statement as to whether, in the opinion of Addivant, the delay may cause or contribute to an endangerment to public health or the environment. The Facility shall include with any notice all available documentation supporting its claim, if any, that the delay was attributable to a *force majeure*. Failure to comply with the above requirements shall preclude Addivant from asserting any claim of *force majeure* for that event.

3. If ADEM determines that the delay or anticipated delay is attributable to a *force majeure* event, the time for performance of such obligation under this Agreement that is affected by the *force majeure* event will be extended by ADEM for such time as ADEM determines is necessary to complete such obligation. An extension of the time for performance of such obligation affected

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by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation, unless the Facility can demonstrate that more than one obligation was affected by the *force majeure* event. If ADEM determines that the delay or anticipated delay has been or will be caused by a *force majeure* event, ADEM will notify the Facility in writing of the length of the extension, if any, for performance of such obligations affected by the *force majeure* event.

4. If ADEM disagrees with Addivant's assertion of a *force majeure* event, ADEM will notify Addivant in writing and the Facility may elect to invoke the dispute resolution provision and shall follow the time frames set forth in the Dispute Resolution Section. In any such proceeding, Addivant shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a *force majeure* event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Addivant complied with the requirements of this Section. If Addivant satisfies this burden, the time for performance of such obligation will be extended by ADEM for a time equal to the *force majeure* delay.

Stephen A. Cobb, Chief
Land Division
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, AL 36110-2400
(334) 271-7730

Date

Richard Preziotti, CEO
Addivant USA, LLC
199 Benson Road
Middlebury, CT 06749

Date



HYDROGEOLOGICAL AND ENVIRONMENTAL SERVICES

P.O. BOX 446 ~ FAIRHOPE, ALABAMA 36532 ~ 251-654-2319

October 22, 2018

Mr. Metz Duites
Environmental Engineer, Land Division
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, AL 36610-2400

RE: Revised Corrective Measures Groundwater Monitoring Plan

Dear Metz:

STRATA LLC (STRATA), on behalf of Addivant USA, LLC, is submitting this copy of the revised Corrective Measures Groundwater Monitoring Plan to the Alabama Department of Environmental Management (ADEM). The main changes to the plan are outlined on the attached table.

If you have any questions, please contact me at (251) 654-2319 or Doug Williams at (251) 689-7056.

Sincerely,

A handwritten signature in blue ink that reads "Robert H. Spencer". The signature is written in a cursive style and is placed on a light blue rectangular background.

Robert H. Spencer, PG
STRATA, LLC

attachments

CC: Mr. Chris Vaughn, Plant Manager

Table

Changes to Corrective Measures Groundwater Management Plan

CHANGES TO CORRECTIVE MEASURES GROUNDWATER MANAGEMENT PLAN
 Addivant USA, LLC – Bay Minette, Alabama
Corrective Measures Groundwater Management Plan

Previous GWMP Requirements	Changes to the GWMP requirements
Baseline Monitoring and ISCO effectiveness monitoring 41 wells were sampled as part of Phase I sampling and were analyzed for DNBP.	Phase 2- Post-Corrective Measures Monitoring 24 wells will be sampled as Part of Phase II sampling and analyzed for DNBP.
Quarterly ISCO effectiveness monitoring 6 wells were sampled quarterly to assess ISCO effectiveness	Quarterly ISCO effectiveness monitoring Quarterly ISCO effectiveness monitoring will be eliminated
Phase 3-Post Closure Monitoring of the Acid Lagoon This phase began at beginning of Phase I and will continue through Phase II.	Phase 3-Post Closure Monitoring of the Acid Lagoon This monitoring will continue through the completion of Phase II and after Phase II.
Monitoring Network 41 monitor wells were sampled during Phase I	Monitoring Network It was proposed and approved by ADEM to move into Phase II and delete monitor wells from the sampling network that had been non-detect for at least 4 consecutive sampling events. 24 monitor wells will be sampled during Phase II
Sample frequency and schedule Groundwater samples were collected semi-annually in June and December of each year.	Sample frequency and schedule Groundwater samples will be collected semi-annually in May and November of each year.
Quality Assurance/Quality Control Samples One duplicate sample and one field blank sample were collected during each sampling event and analyzed for DNBP.	Quality Assurance/Quality Control Samples One duplicate sample and one equipment rinse blank will be collected during each sampling event and analyzed for DNBP.
Reporting Semi-annual Corrective Measures Groundwater Monitoring Reports were submitted after the June and December sampling events.	Reporting An annual Corrective Measures Groundwater Monitoring Report will be submitted to ADEM in December of each year following the November sampling event.



**ADDIVANT USA LLC
BAY MINETTE, ALABAMA**
Site EPA ID # ALD010394021

**REVISED CORRECTIVE MEASURES
GROUND WATER MONITORING PLAN
PHASE II**

PREPARED FOR:

**ADDIVANT USA LLC
BAY MINETTE PLANT
POST OFFICE BOX 147
BAY MINETTE, ALABAMA 36507**

October 2018

PREPARED BY:

**STRATA, LLC.
PO Box 446
Fairhope, Alabama 36533
(251) 654-2319**

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- Figure 1 *Locations of Monitoring Wells*

1.0 INTRODUCTION

This revised Corrective Measures Ground Water Monitoring Plan (CMGWMP) has been prepared as part of the Corrective Measures Implementation (CMI) Plan Addendum. The original CMGWMP was submitted by Environmental Resources Management (ERM) to the Alabama Department of Environmental Management (ADEM) in January 2006. This revised plan will be implemented in accordance with provisions III.5 and III.8 of the Post Closure Agreement (the agreement) between Addivant USA LLC (Addivant) (formerly Uniroyal Chemical Company, Inc, formerly Crompton Manufacturing Corporation, Inc, formerly Chemtura USA Corporation) and ADEM, pertaining to Addivant's dinitrobutylphenol (DNBP) production facility in Bay Minette, Alabama. The agreement was executed by ADEM on February 7, 2005.

The Agreement includes two general requirements that affect the scope of groundwater monitoring activities at the site:

- A requirement to implement a Site-Remedy to address releases from certain solid waste management units (SWMUs), including performance monitoring of the various corrective measures incorporated into the Site-wide remedy; and
- A requirement to provide post closure care of the Acid Lagoon, including groundwater monitoring of the unit itself.

The program described herein meets both requirements.

2.0 CORRECTIVE MEASURES GROUNDWATER MONITORING PROGRAM

A summary of the monitoring wells to be sampled as part of the Phase 1, Revised Phase 2 and Phase 3 monitoring is presented in Table 1. During each phase of monitoring, additional wells are monitored to provide groundwater elevation data for constructing the groundwater contour maps. The locations of the site wells are shown in Figure 1. The previous site groundwater monitoring program, designed to document the effectiveness of the groundwater remediation program, was as follows:

- Semiannual site-wide sampling events (Baseline Monitoring), were conducted in June and December as part of the Phase 1 monitoring program;
- Quarterly ISCO Effectiveness Monitoring were also conducted as part of Phase 1 in March, June, September, and December;
- Semiannual Post Corrective Measures Monitoring (Phase 2) will be conducted in June and December at the completion of the Phase 1 monitoring, and
- Post Closure Monitoring of the Acid Lagoon (Phase 3) was commenced upon approval of the Post-Closure Agreement February of 2005 and is conducted semiannually in June and December.

The above-mentioned program was implemented in 2006 and remained in effect until June 2018. Transition into Phase 2 depended upon the following:

The CMGWMP states on page E-2, Section 2.0 that, *“Both components of Phase 1 will terminate either (1) when significant and permanent decreases of DNBP concentration have occurred in all six Effectiveness Monitoring wells, and/or equilibration has occurred (i.e., concentrations have effectively reached an asymptote) or (2) when neither DNBP is detected nor oxidant is visually identified by its distinct purple color in any well (whichever occurs first).”*

Over the twelve years of sampling on the previous plan, concentrations in effectiveness monitor well B-42 did not meet this requirement. This well has been erratic over time and prevented the site from moving into Phase 2. Addivant submitted a proposal to ADEM in May 2018 to eliminate monitor wells that had been non-detect for four consecutive sampling events and move into Phase 2. ADEM approved the proposal in September 2018. The following details the changes to the ground water sampling plan and schedule beginning in 2019.

- Semiannual site-wide sampling events will be conducted in May and November as part of the Revised Phase 2 monitoring program (24 wells);
- Quarterly ISCO Effectiveness Monitoring, conducted as part of Phase 1, will be eliminated;
- An Annual Corrective Measures Ground Water Monitoring Report will be submitted to the Department in December of each year, and
- Post Closure Monitoring of the Acid Lagoon (Phase 3) was commenced upon approval of the Post-Closure Agreement February of 2005 and will be conducted semiannually in May and November.

2.1 REVISED MONITOR WELL NETWORK

A summary of the monitor wells that were sampled as part of Phase 1 and wells to be sampled as part of Phase 2 and Phase 3 monitoring are presented in Table 1. The locations of the monitor wells are presented in Figure 1.

2.2 GROUNDWATER LEVEL MEASUREMENTS

Depth to ground water measurements will be completed at the designated monitor wells during each sampling event. An electronic water-level probe capable of measuring depths with a precision of 0.01 foot will be used to measure the depth to groundwater and the total depth of each well (referenced to top-of-casing) prior to sampling. Depth to water and total depth measurements will be recorded in a field logbook. The water level probe and cable will be deconned between each well with distilled water between each well to prevent cross-contamination.

2.3 COLLECTION OF GROUNDWATER SAMPLES

Groundwater samples will be collected using low-flow techniques in accordance with U.S. EPA guidance (EPA/540/S-95/504, April 1996). The following general procedures will be followed during groundwater sampling events.

- For monitor wells with a depth to water measurement of less than 20 feet below ground surface (bgs), disposable polyethelene tubing will be inserted into the well to a depth where the tubing intake is at the approximate midpoint of the screened interval. The tubing will then be attached to a non-submersible peristaltic pump for purging and sampling;
- Wells with depth to water measurements greater than 20 feet below ground surface will be sampled with either a dedicated QED bladder pump or a deconned stainless-steel Monsoon pump. Both of these options are equipped with polyethene tubing and are either set at the midpoint of the screened interval or inserted, depending on pump type used;
- All purging will be at a set flow rate generally less than 0.5 L/min (within a range of 0.1 L/min to 0.5 L/min);
- The desired drawdown created by the purging process is less than the U.S. EPA recommended 0.1 meter (0.33 feet). In instances where drawdown exceeds 0.1 meter (0.33 feet), a purge rate of less than 0.5 L/min will be maintained; and
- Water quality indicator parameters, such as pH, temperature, conductivity, dissolved oxygen, oxidation reduction potential and turbidity will be collected using an In-Situ Aqua Troll 600 (or equivalent) water quality meter. The Aqua Troll utilizes the Vu Situ

Android application where all water quality parameters are monitored and user is notified when all parameters are stable. When all parameters are stabilized or after 45 minutes of purging, whichever occurs first, a sample will be collected. Sampling personnel will record all measurements in a field logbook immediately after collection. Low flow purging reports are generated by the Vu Situ application and can be printed for reporting purposes.

Ground water samples will be collected immediately after low-flow sampling and parameter stabilization occurs using the appropriate pump and tubing. The submersible pump will be decontaminated between each well using liquinox and plant potable water. A final distilled water rinse will also be conducted. Purge water and decontamination water will be placed in plastic 30 drum or 20-liter carboys and discarded in the plant's wastewater treatment system. If the wastewater treatment system is not available, purge and decontamination water will be containerized in 55-gallon steel drums and managed in accordance with applicable regulations.

Samples to be submitted for laboratory analysis will be placed in new, laboratory-supplied containers. The containers will be labeled and will include the sample identification number (typically well ID), the date and time of collection, and the requested parameter(s) for analysis. Following collection and labeling, sample containers will be placed in coolers with enough ice to maintain a temperature of approximately 4 degrees Celsius, and transported to the laboratory under chain-of-custody documentation.

Additionally, any damage to monitor wells discovered during water level collection or groundwater sampling will be noted in the field logbook. Appropriate repairs will be made prior to subsequent sampling events.

2.4 *QUALITY ASSURANCE/QUALITY CONTROL SAMPLES*

Quality assurance/quality control (QA/QC) samples will be collected included one field duplicate and one equipment rinse blank analyzed for DNBP. The field duplicate will be collected by alternately filling the sample bottles with equal amounts of sample water until sample bottles were full. One duplicate ground water sample will be collected per sampling event.

The equipment rinse blank will be collected by pumping de-ionized (DI) water through the decontaminated pump and tubing and directly into sample containers in the field. This procedure provides data to ensure that the submersible pump used was properly deconned. One equipment rinse blank will be collected per sampling event.

3.0 ANNUAL GROUND WATER MONITORING REPORT

A report will be prepared documenting the sampling events and will be submitted to ADEM annually in December of each year. Reports documenting the sampling events will include:

- A description of the sampling procedures (including deviations from procedures outlined in this plan);
- Tabular presentations of:
 - Historic and current field measurements and resulting calculations (ground water depths/potentiometric surface elevations, last recorded stabilization parameter readings prior to sampling);
 - Historic and current laboratory analytical results (including equipment blank and duplicate samples); and
 - Notations of monitor wells needing maintenance;
- Trend graphs showing DNBP concentrations trends over time for selected monitor wells sampled;
- Maps depicting potentiometric surface elevations and contours for the A, B and C sand units;
- Maps depicting DNBP concentrations for the A, B and C sand units;
- Summary of findings including a discussion of any changes in ground water quality observed in the monitor wells sampled;
- Other recommendations, if any;
- Monitor well sample records and low-flow test reports; and
- Copies of certified analytical reports.

TABLE

**TABLE 1
MONITOR WELLS INCLUDED IN THE THREE PHASES OF THE CORRECTIVE
MEASURES GROUNDWATER MONITORING PROGRAM**

Well No.	Phase 1		Phase 2	Phase 3
	Baseline Monitoring	ISCO Effectiveness Monitoring	Post-Corrective Measures Monitoring Revised	Post Closure Monitoring of the Acid Lagoon
Sampling Frequency	Semiannual	Quarterly	Semiannual	See Note 2
		A-Sand Wells		
B-4	X		X	
B-11	X			
TP90-1	X			
TP90-2	X			
W-1	X		X	
W-2	X			
W-3	X		X	
		B-Sand Wells		
B-2	X			
B-16	X	X	X	
B-42	X	X	X	
FW (Ferrell Well)	X		X	
G-45	X		X	
G-46	X		X	X
G-54	X		X	
B-73	X			
G-79	X	X	X	X
G-81	X		X	
G-82	X	X	X	
G-83R	X		X	X
S-3B	X		X	
S-4B	X			
S-9B	X			
R-2	X		X	
R-4	X		X	
R-9	X	X		
R-10	X			
R-11	X		X	
R-12	X		X	
R-13	X	X	X	
P-1	X			
P-2	X		X	
P-4	X		X	
P-5	X			
G-78	X		X	X
		C-Sand		
C-1	X			
S-2C	X			
S-6C	X		X	X
RC-1A	X			
RC-1B	X		X	
G-44	X			
G-51	X			

FIGURE

