

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Andritz, Inc.
Facility Address: 35 Sherman Street, Muncy, PA 17756
Facility EPA ID #: PAD 003 031 903

1. Has all available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

X If yes - check here and continue with #2 below.
 If no - re-evaluate existing data, or
 If data are not available skip to #8 and enter "IN" (more information needed) status code

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for nonhuman (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Controls" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program, the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993 (GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated groundwater and contaminants within groundwater (eg., non aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is groundwater known or reasonably suspected to be "contaminated"¹ above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action anywhere at, or from, the facility?

_____ If yes – continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_____ If no – skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated." *(In order to present a more complete representation of the site, the reviewer has chosen not to skip to #8.)*

X

_____ If unknown (for any media)– skip to #8 and enter "TN" status code.

Rationale and Reference(s): _____

See following two pages for response to Question 2 (Rationale and Reference(s)).

¹"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

QUESTION #2 - GROUNDWATER MIGRATION - RATIONALE & REFERENCE(S)

RESPONSE:

AREAS OF CONCERN (AOCs)

Various areas of concern for groundwater were identified during the course of the investigations performed at the site. These areas and the associated investigations and remedial actions areas are summarized below:

Former Drum Storage Area

This area is near the facility's southern property line. In 1990, chlorinated solvents were detected in a nearby monitoring well (MWE-43). Also, TPH and 1,1,1-trichloroethane (1,1,1-TCA) were detected in the soil, exceeding PADER Groundwater Protection Level 2 standards. Soil removal and off-site disposal was performed in 1994. Confirmation samples indicated that the site-specific cleanup standards were met. The excavation was backfilled. PADEP approved No Further Action for the site on May 2, 1995.

Groundwater at Main Plant Complex (including Building 66 and Building 18)

The Main Plant Complex is a large building that is sectioned into various connected "buildings", including Building 66 and Building 18. Investigation of the soil and groundwater at the Main Plant Complex was performed by EnSafe in 1991. Floating product was detected in monitoring well MWE-05, which is near the property line. However, after the initial accumulation of free product was removed, it was not detected again. Borings and observation points in the immediate vicinity of MWE-05 did not indicate the presence of free product, so the previous free product observations were not considered to represent a source of free product contamination. Also, groundwater contamination from chlorinated solvents appeared minimal.

No remediation was performed and there is no ongoing monitoring. The risk evaluation performed during the Act 2 investigation determined that the risks posed by contaminants remaining in the groundwater at the facility, including the Main Plant Complex, are less than the goals established by Act 2 (e.g., incremental lifetime cancer risk $< 10^{-4}$ - 10^{-6} and hazard quotient < 1). PADEP approved closure of this site when it approved the *Act 2 Final Report* (EnSafe, 3/99).

Building 70

Building 70 housed the Die Department from 1971 to 1995. In 1989, cutting oil contamination was discovered by PADEP. Investigation was performed during 1991-93. Extensive soil and groundwater contamination were detected. From 1990 to 1992, soil removal was performed and free oil recovery wells were installed and operated. In 1995, additional contaminated soil was removed, down to the confining unit. Verification samples met Act 2 Background Remediation standards for TPH and volatile organic compounds (VOCs).

There is no ongoing monitoring. PADEP approved closure of this site when it approved the *Act 2 Final Report, Building 70, Area 1* (EnSafe, 7/96) on January 3, 1997; and the *Act 2 Final Report* (EnSafe, 3/99).

Groundwater at Plant 2

Investigations of the Plant 2 soil and groundwater were performed in 1991-92. Chlorinated solvents detected in the groundwater exceeded Federal Drinking Water Standards. No soil source was located. Andritz operations appeared to be downgradient of the affected wells, so an offsite source was suspected.

The risk evaluation performed during the Act 2 investigation determined that the risks posed by contaminants remaining in the groundwater at the facility, including the Plant 2 area, are less than the goals established by Act 2 (e.g., incremental lifetime cancer risk $< 10^{-4}$ - 10^{-6} and hazard quotient < 1). PADEP approved closure of this site when it approved the *Act 2 Final Report* (EnSafe, 3/99).

QUESTION #2 - GROUNDWATER MIGRATION - RATIONALE & REFERENCE(S)

RESPONSE: (CONTINUED)

AQUIFER USAGE

The aquifer at the facility was used for potable water supply for residents located downgradient of the site, until institutional controls were implemented during the 1991-96 time period. (*Act 2 Remedial Investigation Report*, EnSafe, 9/98) Any current and future anticipated direct exposures to groundwater through potable or domestic use were eliminated by Andritz, by connecting residences to the Muncy Borough Water Authority and abandoning all private downgradient residential wells. The aquifer is currently not used for commercial, agricultural, or potable purposes.

Since the downgradient area between the facility and the West Branch Susquehanna River is classified as a floodplain, new construction is prohibited by Muncy Township at elevations lower than 1½ feet above the level of the 100-year flood or that could restrict the passage of the 100-year flood. This makes future construction and new groundwater usage highly unlikely.

Andritz, Inc. asserts that the groundwater pathway of exposure has been eliminated.

SITEWIDE GROUNDWATER

During the various facility investigations, 54 monitoring wells were installed and sampled at Plant 1, and Plant 2, and off-site. Solvents and TPH are the most common contaminants detected.

During the Act 2 closure process, groundwater was investigated for the facility as a whole, rather than as individual AOCs. A risk evaluation was performed to establish site-specific groundwater cleanup standards. The attached Table 2-1, from the *Act 2 Final Report* (EnSafe, 3/99) presents the maximum detection in groundwater of each contaminant of concern, along with the site-specific cleanup standard. The maximum detection is below the site-specific standard for each compound.

PADEP approved the *Act 2 Final Report*, which included sitewide groundwater. All monitoring wells have been abandoned, and no monitoring has been performed since the *Act 2 Final Report* was issued, according to the site contact.

Since the maximum detections of contaminants of concern do not exceed the approved site-specific standards, it can be concluded that groundwater is not contaminated above applicable standards.

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3. Has the migration of contaminated groundwater stabilized (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"² as defined by the monitoring locations designated at the time of this determination)?

If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"²)

 X

If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"²) - skip to #8 and enter "NO" status code, after providing an explanation.

If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Andritz has installed and sampled wells outside the facility property lines north and west of Plant 1. Groundwater from five of the wells (MWE-14, MWE-15, MWE-16, MWE-17, and MWE-19) was never found to contain VOCs. At various times during the sampling period from 1991 to 1995, groundwater from wells MWE-18, MWE-20, MWE-21, MWE-22, MWE-23, and MWE-24 contained one or more of the following: 1,1-dichloroethane, 1,1,1-trichloroethane, chloroethane, 1,2-dichloroethylene, trichloroethylene, tetrachloroethylene, chloroform, 2-butanone, and acetone. These were all detected at levels less than 0.100 mg/L, with the exception of acetone, which was detected in MWE-23 at 0.130 mg/L. (*Act 2 Remedial Investigation Report, EnSafe, 9/98*)

The groundwater investigations also indicate that groundwater contamination is confined to the aquifer located in the alluvial material above bedrock. Analysis of samples collected by PADEP from a deep residential well (approximately 100 feet deep) did not indicate the presence of target compounds. A 140-foot production well located adjacent to Building 70 was sampled at discrete intervals. Analyses of samples from the discrete zones resulted in acetone detections only, in the upper two intervals. Andritz concluded, with PADEP concurrence, that the acetone was introduced during the sampling process or was a result of the decontamination of the packers used to seal the borehole for discrete testing. (*Act 2 Final Report, EnSafe, 3/99*)

Since off-site sampling for VOCs has resulted in non-detections or very low detections at some wells, and site-related contamination is confined to the aquifer located in the alluvial material above bedrock, it appears that the migration of site-related groundwater contamination has stabilized. However, all site monitoring wells have been abandoned, and no future monitoring, to verify that further migration is not occurring, is planned.

² "Existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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4. Does "contaminated" groundwater discharge into surface water bodies?

- If yes - continue after identifying potentially affected surface water bodies.
- If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.
- If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

Groundwater from the facility flows west or northwest to the West Branch Susquehanna River. During the Act 2 investigation, a dilutional factor of 32,000 was calculated based on the maximum flow expected from the aquifer to the river, and the minimum flow of the river as reported by PADEP. The dilutional factor was used along with applicable water quality criteria and risk analyses, to calculate site-specific groundwater standards for each contaminant of concern. None of the detections of contaminants of concern exceeded the site-specific groundwater standards (*Act 2 Final Report*, EnSafe, 3/99). Based on the fact that the contaminants of concern did not exceed the site-specific groundwater standards, it does not appear that contaminated groundwater is discharging into the surface water.

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5. Is the discharge of "contaminated" groundwater into surface water likely to be "insignificant" (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate "level(s)," and if estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the discharge of "contaminated" groundwater into surface water be shown to be "currently acceptable" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented)?

If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment⁴ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "currently acceptable") – skip to #8 and enter a "NO" status, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems..

_____ If unknown – skip to 8 and enter "IN" status code.

Rationale and Reference(s):

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7. Will groundwater monitoring / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

 X

If no - enter "NO" status code in #8.

If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

All site monitoring wells have been abandoned, and no future monitoring is planned.

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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

YE - Yes, "Migration of contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Andritz, Inc. facility, EPA ID # PAD, 003 031 903 located at 35 Sherman Street, Muncy, PA 17756. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

 X

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Completed by: (signature) _____ Date _____
 (print) Joe Figured (PADEP) _____
 (title) Facilities Section _____

Supervisor: (signature) Paul J. Gotthold Date 5-1-11
 (print) PAUL J. GOTTHOLD
 (title) ASSOCIATE DIRECTOR
 (EPA Region or State) EPA R3

(original signed 5-30-2003)
PPJ

Locations where References may be found

References have also been appended to the Environmental Indicator Report and can
also be found at PADEP's Williamsport Office and USEPA's Region III Office.

Contact telephone and e-mail numbers:

(name) Joe Figured (PADEP) _____
 (phone #) 570-327-3730 _____
 (e-mail) jfigured@state.pa.us _____

Facility Name: Andritz Inc.
 EPA ID #: PAD 003 031 903
 Location: 35 Sherman Street; Muncy, PA 17756

**MIGRATION OF CONTAMINATED GROUNDWATER
 UNDER CONTROL (CA 750)**

