Russ

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW
ATLANTA, GEORGIA 30303-8909

QUICK REFERENCE FOR STATUS OF ENVIRONMENTAL INDICATORS					
Name and EPA I.D. Number	Location (City or Town)	Current CA725 Decision	Current CA750 Decision	If Current Decision is Negative, Projected Date for Positive EI	
				CA725	CA750
International Paper Company	Wiggins, Mississippi		YE		

4WD-RPB

SUBJ: Evaluation of International Paper Company's status under the RCRAInfo Corrective Action Environmental Indicator Event Code CA750)
EPA I.D. Number: MSD 980 600 084

FROM: Russ McLean
Environmental Engineer RM 9/25/01

THRU: Doug McCurry, Chief
South Programs Section DM 9/25/01

TO: Narindar M. Kumar, Chief
RCRA Programs Branch

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of International Paper Company's status in relation to the following corrective action event code defined in the Resource Conservation and Recovery Information System (RCRAInfo):

Migration of Contaminated Groundwater Under Control (CA750).

Concurrence by the RCRA Programs Branch Chief is required prior to entering this event code into RCRAInfo. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendation is satisfied by dating and signing at the appropriate location within the Attachment.

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 100% Recycled Paper (40% Postconsumer)

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This particular evaluation is the second evaluation for International Paper Company. The initial evaluation was performed on September 30, 1998 and resulted in a CA750 status code of IN. This status code was assigned based on the lack of information regarding releases to soils from SWMUs with the potential to affect ground water in areas of the facility removed from the current ground-water corrective action program. This information has been collected in the RFI which culminated in the Draft RFI Report dated July 2001.

III. FACILITY SUMMARY

The International Paper Company's facility is located in Stone County, Mississippi, approximately two miles south of Wiggins, Mississippi, just east of Highway 49. The site is situated on 125 acres, of which approximately 85 acres are currently utilized for plant operations. The subject site is located at latitude 30°51' 59" north, and longitude 89°10'54" west. The facility has been operating since December 1969 and currently treats utility poles, pilings and structural timbers with pentachlorophenol (PCP) and chromated copper arsenate (CCA). Creosote was also used as a wood preservative from 1970 to 1986. Facility operations associated with pressure treating of wood products generated a wastewater stream and associated listed waste (K001). The facility operates a Wastewater Treatment Plant for the pretreatment of process waste waters before release to the Wiggins Publicly Owned Treatment Works (POTW).

The facility has five RCRA-regulated units which have undergone a State approved closure. These units consist of one land treatment demonstration unit (SWMU 1) and four surface impoundments which include the contact cooling water pond, creosote, PCP and cellon recovery ponds (SWMUs 7-10). Five sludge pits (SWMUs 2-6), used to manage sludges generated while cleaning the treating cylinders, were filled and covered prior to 1976. Closure, post-closure and corrective action of these units were addressed under the Hazardous Solid Waste Amendments (hereafter referred to as the HSWA permit) issued by EPA in March 1987. A Corrective Action Program (CAP), to remediate ground water impacted by these units, has been in operation under the State of Mississippi Hazardous Waste Management Permit since May 1989. To date, 49 monitoring wells have been installed at the facility. Currently nine (9) ground-water extraction wells are operating and 21 monitoring wells are being sampled in accordance with the CAP. A facility site map showing the various units, CAP well network and facility boundaries is shown in Figure 1.

A second RCRA Facility Assessments(RFA) was performed in 1991 on International Paper's Wiggins Treated Wood Plant and identified 39 SWMUs (including the ten closed units listed above) and two (2) Areas of Concern (AOCs). On January 4, 1993, the EPA issued a modification to the HSWA permit to the subject facility. The HSWA permit required confirmatory sampling and/or structural integrity testing (CS/SIT) for 19 SWMUs and the two AOCs to determine if soils and sediments had been affected by the release of constituents of concern. Results of the CS/SIT were reported to EPA in April 1997. Results of the CS/SIT lead to the requirement for an RFI to delineate and characterize soil and sediment contamination,

identify actual and potential receptors and perform limited removal actions at twelve SWMUs and one AOC. This information was submitted to EPA in the Draft RFI Report and dated July 2001.

IV CONCLUSION OF CA750

It is recommended that the status code YE be entered into RCRAInfo for CA750, as ground-water releases are controlled. A ground-water extraction system has been operating since 1989 to remove contaminants and provide hydraulic control for the contaminant plumes on-site. Success of the current system has been demonstrated by a ground-water monitoring network which has shown that the lateral and downgradient extent of the contaminant plumes have decreased with time and remains on-site. It has also been demonstrated that ground-water contamination is not currently being discharged into surface water bodies.

Attachment:. CA750: Migration of Contaminated Groundwater Under Control

ATTACHMENT
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action

Environmental Indicator (EI) RCRAInfo Event Code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: International Paper Company
Facility Address: Wiggins, Mississippi
Facility EPA ID #: MSD 980 600 084

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 non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "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 ground water and contaminants within groundwater (e.g., 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 RCRAInfo national database ONLY as long as they remain true (i.e., RCRAInfo status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., 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?

   _X_ 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."

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

Rationale and Reference(s): Ground water at the facility has been impacted by PCP and creosote constituents. This impact to ground water is attributed to the closed Cellon, Creosote, and Penta Recovery Ponds and the Contact Cooling Water Pond. Two ground-water contaminant plumes containing constituents of creosote and pentachlorophenol are identified on-site in the Citronelle Formation. One plume is located downgradient of the closed Contact Cooling Water Pond. The second plume, located downgradient of the closed Penta, Cellon and Creosote Recovery Ponds, is the larger of the two plumes. Ground water monitoring was initiated at the site in February 1982. This monitoring network is composed of 49 monitoring wells completed in the Citronelle of which 21 are currently utilized to monitor constituent concentrations in accordance with the CAP. These wells consist of: one upgradient well, five wells dedicated to the plume associated with the contact cooling water pond and 15 wells dedicated to the plume associated with the recovery ponds. International Paper currently collects and analyzes ground-water samples to determine the presence and concentrations of 22 creosote constituents, two volatile organic compounds and pentachlorophenol and its breakdown products, under the CAP. During the latest monitoring event the concentration of the following seventeen compounds; cresols, phenol, fluoranthene, 2,4-dichlorophenol, 2,3,4,6-tetrachlorophenol, 4-chloro-3-methylphenol, 2,4-dimethylphenol, 2,4,6-trichlorophenol, 2,4-dinitrophenol, acenaphthylene, acenaphthene, anthracene, fluorene, 2-methylnaphthalene, pyrene, ethylbenzene, and xylene did not exceed the ground-water protection standard (GWPS) established for each. The remaining eight constituents; phenanthrene, carbazole, pentachlorophenol, chrysene, naphthalene, benzo(b)fluoranthene, benzo(k)fluoranthene, and dibenzofuran exceeded the GWPS. The GWPS for each constituent was established using the EPA Region 3 Risk Based Concentration (RBC) for tap water. If no RBC is

---

[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).

listed for a constituent then the GWPS is the method detection limit (MDL). Contaminant plumes are characterized by the concentrations of total creosote constituents, PCP and its daughter products, and VOCs which had maximum detections during the latest round of sampling of 13.07 mg/l, 11.241 mg/l and .014 mg/l respectively. The aereal extent of the two plumes, as measured by the concentrations of naphthalene, which is used as an indicator of creosote because it is the most mobile of the PAH constituents and is the PAH found at the highest concentration in creosote, and pentachlorophenol are shown in Figure 2.

References: 1) Walk, Haydel Environmental, Hazardous Waste Permit Renewal Application for Post-Closure Care and Groundwater Corrective Actions, December 1996; 2) Walk Haydel, Cofirmatory Sampling and Structural Integrity Testing Results for Solid Waste Management Units and Areas of Concern, April 1997; 3) E^{x}ponent®, Evaluation of the Groundwater Extraction and Treatment System and Assessment of the Potential for Natural Attenuation, November 2000; 4) International Paper, RCRA Facility Investigation Report, July 2001. 5) URS Greiner Woodward Clyde, Semi-Annual Groundwater Monitoring Reports.

---

3. Has the **migration** of contaminated groundwater **stabilized** such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[7] as defined by the monitoring locations designated at the time of this determination?

__X__ 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]).

_____ 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): The primary source of the ground-water contamination at the facility is attributed to the leaching of wood preserving constituents from the closed Cellon, Creosote and Pentachlorophenol Recovery Ponds, the Contact Cooling Water Pond. These units have all undergone closure which included the removal of all liquids, removal and disposal of sludges and contaminated soils, the backfilling with clean soils and the installation of low permeability covers. These actions have effectively removed the major source of the ground-water contamination. In addition to the closure of these units, a ground-water corrective action program (CAP) has been operating continuously at the site under the Mississippi Hazardous Waste Management Operating Permit since May 1989. The CAP includes the withdrawal of ground water from the Citronelle water-bearing zone at the two plumes described in item 2) which are affected by the presence of wood preserving constituents. The Citronelle Formation is the uppermost water-bearing zone. The average thickness of the Citronelle beneath the facility is approximately 78 feet and consists primarily of silty sand with discontinuous silt layers and gravelly sand. Ground-water flow direction, as determined prior to the initiation of the recovery system, is to the south toward Red Creek. Underlying the Citronelle is the Pascagoula Formation of Miocene age. The uppermost member of the Pascagoula is characterized as a clayey silt which is 25-30 feet thick and acts an aquitard.

---

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.

The CAP currently consists of nine ground-water extraction wells, eight of which recover impacted ground water downgradient of the closed cellon, penta and creosote ponds and one extraction well which recovers impacted ground water downgradient of the closed contact cooling pond.

The extent of ground-water contamination is totally contained to on-site areas of the facility. The downgradient edge of the plume is approximately 1700 feet from the south property boundary of the facility. Ground-water monitoring of the contaminant plumes over the past fifteen years, indicates that contaminant mass reduction is occurring and the lateral and downgradient extent of the contaminant plumes has decreased with time. Additionally, since 1989, the yearly average measured constituent concentrations in the recovered ground water, based on monthly monitoring conducted in accordance with the CAP, have generally decreased from an average of 6.55 mg/l in 1989 to an average of 2.65 mg/l in 2000. The majority of this decrease occurred within the first three years after initiating the CAP and has leveled off to the current level since, indicating a stabilization of contaminant distribution. This demonstrates that the removal of the major source of wood preserving constituents through closure of the former ponds, operation of the ground-water extraction system and natural attenuation mechanisms, which are discussed below, have acted to reduce contaminant concentrations and control plume migration.

References: See Question 2.

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

_____ If yes - continue after identifying potentially affected surface water bodies.

__X__ 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): Church House Branch (CHB) is a small stream that originates in the southeastern portion of the city of Wiggins and flows southward about six miles to join Red Creek, a major tributary of the Black Creek system of the Pascagoula River Drainage. CHB is a perennial stream throughout most of its length except for the uppermost reach extending from its origin in Wiggins to the northern property boundary of International Paper. Virtually all of CHB within and downstream from International Paper property contains perennial aquatic habitat. Red Creek is located approximately three miles south of the facility and is not currently used as a water supply. The stream is classified as recreational between U. S. Highway 49 and Black Creek.

The plume map depicted in Figure 2 indicates the northeast edge of the plume is currently located about 200 feet from Church House Branch. Additionally, eleven monitoring wells, which are currently nondetect for the constituents of concern, are located between the plume and Church House Branch.

References: See Question 2.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[8] 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 concentration[8] 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) providing a statement of professional judgement/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[8] 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 concentrations[3] greater than 100 times their appropriate groundwater "levels," providing the 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 identifying 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.

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[4])?

_____ 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-assessment,[5] 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 "NO" status code, 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.

---

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.

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?"

__X__ 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."

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

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

Rationale and Reference(s): The facility has recently submitted an evaluation of the current ground-water remediation system and a proposal for operating a monitored natural attenuation system. One of the major observations made in this study was that temporal trends in historical analytical data indicate that contaminant concentration in monitoring wells located on the periphery of the plume decreased more rapidly prior to the initiation of the ground-water remediation system than has occurred since that time. Another observation made during this study indicates that the current and historical hydraulic capture zones for the extraction wells have been relatively small compared to the areal extent of the contaminant plumes. These observations suggest that natural attenuation is contributing to the observed control and size reduction of the contaminant plumes. The facility has proposed data collection activities to collect additional geochemical data to confirm that conditions are conducive to biodegradation and that it is occurring. This data is also to be used to refine the parameters used for transport and fate modeling. BIOSCREEN®, a screening model that simulates natural attenuation of contaminated ground water was used to predict plume stability in the event that ground-water extraction ceased. Results indicated that the maximum migration of the PCP and naphthalene plumes would still be within the current monitoring well network and inside the property boundary. The current ground-water extraction system will remain in place should it be shown that natural attenuation is not providing control of the contaminant plumes. The system will be reactivated in that event and continue to operate to control plume migration until the time that contaminant concentrations fall below the GWPS for each constituent.

RCRA Corrective Action
Environmental Indicator (EI) RCRAInfo Event Code (CA750)

8. Check the appropriate RCRAInfo 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).

__X__ 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 International Paper Company facility , EPA ID MSD 980 680 084 , located at Wiggins, Mississippi. 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.

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

____ IN - More information is needed to make a determination.

Completed by _____ Date 9/25/01
Russ McLean
Environmental Engineer
South Programs Branch
EPA Region 4

Supervisor _____ Date 9/25/01
Doug McCurry
Chief, South Programs Section
RCRA Programs Branch
EPA Region 4

Branch Chief _____ for Date 9/25/01
Narindar M. Kumar
Chief, RCRA Programs Branch
EPA Region 4

RCRA Corrective Action
Environmental Indicator (EI) RCRAInfo Event Code (CA750)

Locations where References may be found:

EPA Region 4 RCRA File Room
10th Floor, 61 Forsyth Street SW
Atlanta, Georgia 30303

Contact telephone and e-mail numbers

Russ McLean
(404) 562-8504
mclean.russ@epa.gov

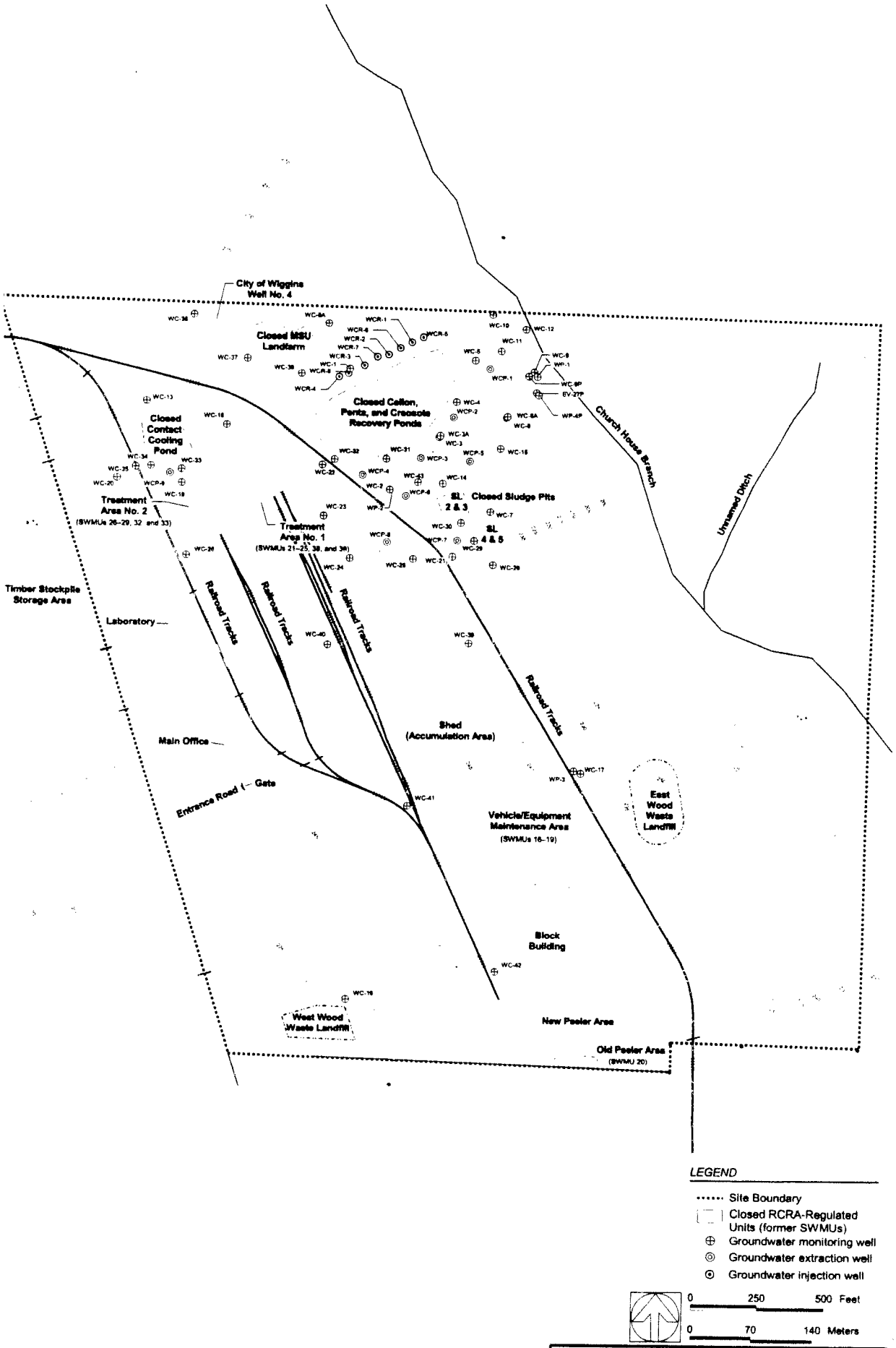

Figure 1 Wiggins facility site map