UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
SUPERFUND PROGRAM

EXPLANATION OF SIGNIFICANT DIFFERENCE

BRUNSWICK WOOD PRESERVING SITE
Brunswick, Glynn County, Georgia
November 2015

INTRODUCTION & STATEMENT OF PURPOSE

The U.S. Environmental Protection Agency (EPA) is issuing this Explanation of Significant Difference (ESD) for the Brunswick Wood Preserving Superfund Site both to inform the public of its Site activities and to explain significant differences being implemented in the selected remedy for the Site. This ESD is issued as part of EPA's public participation responsibilities under Section 300.435 (c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). More detailed information can be found at the Information Repository for the Site, which is located at the Three Rivers Regional Library, 208 Gloucester St., Brunswick, Georgia, 31520. The repository contains the Administration Record, including the Remedial Investigation and Feasibility Study documents that form the basis for the selected remedy at this Site, in addition to the Remedial Design (RD) and Remedial Action (RA) documents. EPA and the State encourage the public to review these documents to gain a better understanding of the Site. Additional information on the Site's history and EPA's remedial activities can also be found at the Site's web page: http://www.epa.gov/region4/superfund/sites/npl/georgia/brunwprega.html

If you or someone you know would like to be added to EPA's mailing list for the Brunswick Wood Preserving Site, please contact EPA by email, mail, or phone using the information below:

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SITE HISTORY AND REMEDIAL ACTION STATUS

The Brunswick Wood Preserving Superfund Site is a former wood treating site. While in operation from 1958 to 1991, wood was treated using pentachlorophenol (PCP), creosote, and chromated copper arsenate (CCA). Wastewater from facility operations was disposed in on-site ponds on the eastern and western ends of the 84 acre Site.

EPA's remedial work at this Site has been conducted in two parts, or Operable Units (OUs). Operable Unit One (OU1) addressed the long-term threats to human health posed by the Site, while OU2 focused on the ecological risks posed by the Site, especially those posed to Burnett Creek and the surface water Pathway. No action was taken under OU2 since no unacceptable ecological risks were found. The OU1 remedy signed in 2002 included the following:

- Placement of two subsurface slurry walls around the old creosote ponds to contain mobile contaminants;
- Solidification and/or stabilization of the contaminated soils and sediments from the Site and Burnett Creek. This treatment binds the contaminants to the soil materials, which were subsequently be placed over the old creosote ponds as subcaps;
- Placement of caps on top of the subcaps to prevent human contact with wastes and prevent the infiltration of water into the wastes below;
- Treatment of the contaminated groundwater outside the western slurry wall using a process called *in situ* chemical oxidation;
- Placement of institutional controls to restrict future land and groundwater use; and,
- Long term monitoring to ensure that the remedy remains protective.

Funded in 2006, field activities for the OU1 Remedial Action began in June 2007. Phase One activities ended in late 2007 and included Site preparation, drainage improvements, pond dewatering and treatment, and soil/sediment excavation activities.

Phase Two of the OU1 Remedial Action began in February 2008. The solidification treatment component of the remedy was completed in July 2008 and those treated soils/sediments were placed as subcaps over the old creosote ponds. Construction of the subsurface slurry walls was completed in June 2009. Phase Two ended in December 2009 with additional restoration of Burnett Creek and completion of the western engineered cap. Expenditures through Phase Two totaled approximately $20 million.

Phase Three of the OU1 Remedial Action was funded primarily with $8.3 million provided through the American Recovery and Reinvestment Act of 2009. A secondary subsurface barrier wall was constructed on the western end of the Site to contain additional mobile contaminants outside the primary slurry wall (see the Explanation of Significant Differences, dated June 2011). Also included was construction of the treatment system for contaminated groundwater, which began operation in July 2011.

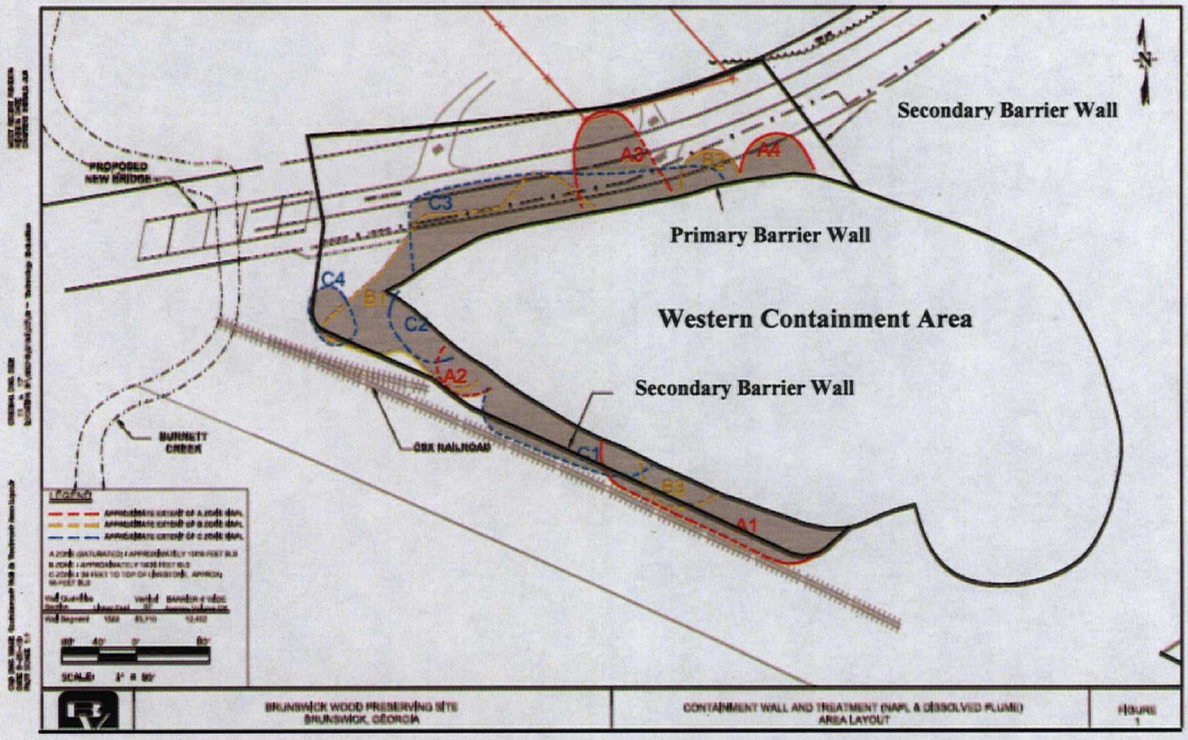
Brunswick Wood Preserving, January 2012

2011 Secondary Barrier Wall

As part of the groundwater treatment design, and due to observations made during construction of the western primary barrier wall, in 2010 EPA conducted several additional subsurface investigations that defined more fully the extent of creosote source areas outside the footprint of the primary barrier wall along Perry Lane Road and the CSX rail line. The significant volume of creosote identified exceeded the basis for the estimate used in the June 2002 OU1 Record of Decision (ROD), making the use of ISCO technology infeasible to address subsurface contamination in this area.

To contain this additional creosote source material, in 2011 EPA constructed a secondary subsurface barrier wall along Perry Lane Road and the CSX railroad tracks. EPA also expanded the engineered cap to prevent rainfall infiltration into the additional walled area. The estimated cost of the secondary barrier wall and cap was $1.9 million.

In June 2011, EPA issued an Explanation of Significant Differences that discusses this secondary wall and cap in more detail. The shaded areas in the figure below shows the known extent of creosote source areas as of June 2011.



2013, 2014 Sampling Investigations

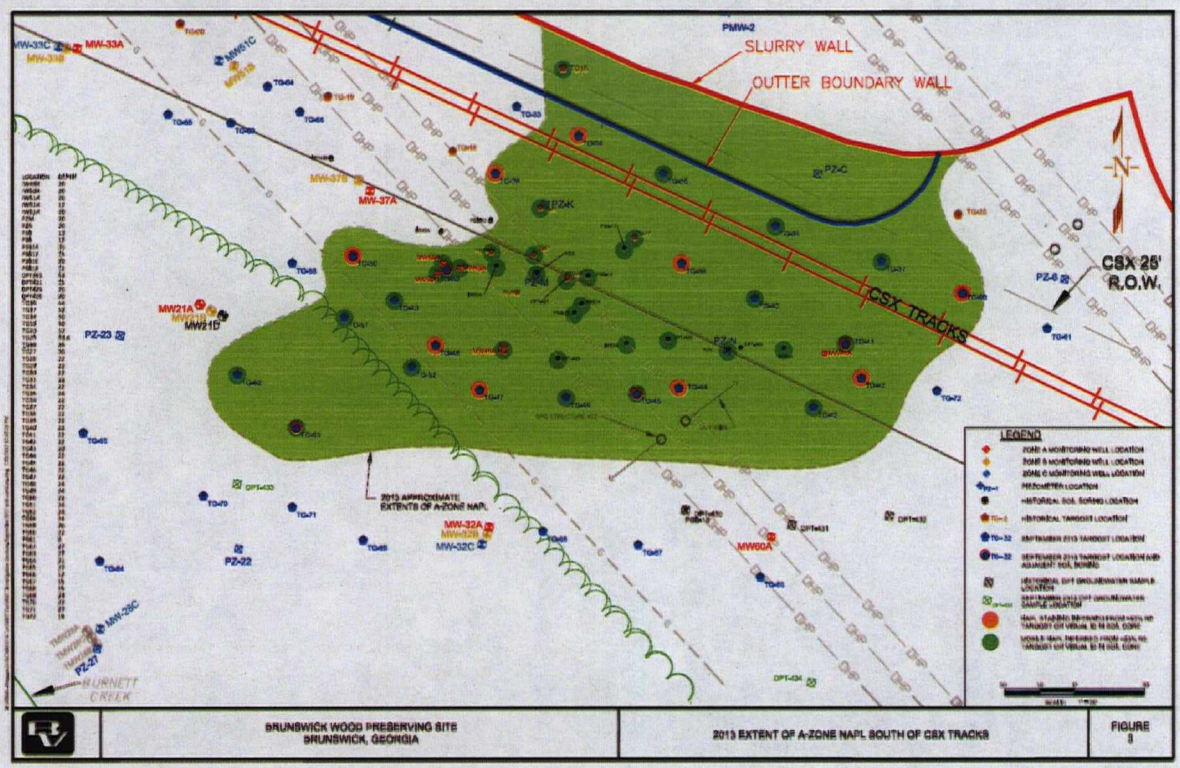
The OU1 Remedial Action overall cleanup strategy is designed to contain contaminant source areas, with contaminated groundwater outside the western containment area treated in-situ via chemical oxidation (ISCO) and enhanced bioremediation. As a result of the groundwater remediation system, contaminant levels have dropped in the dissolved phase portion of the groundwater plume, primarily north of Perry Lane Road. In May 2013, injection of hydrogen peroxide and ozone was discontinued in favor of oxygen injection, while oxygen injection was discontinued in December 2013.

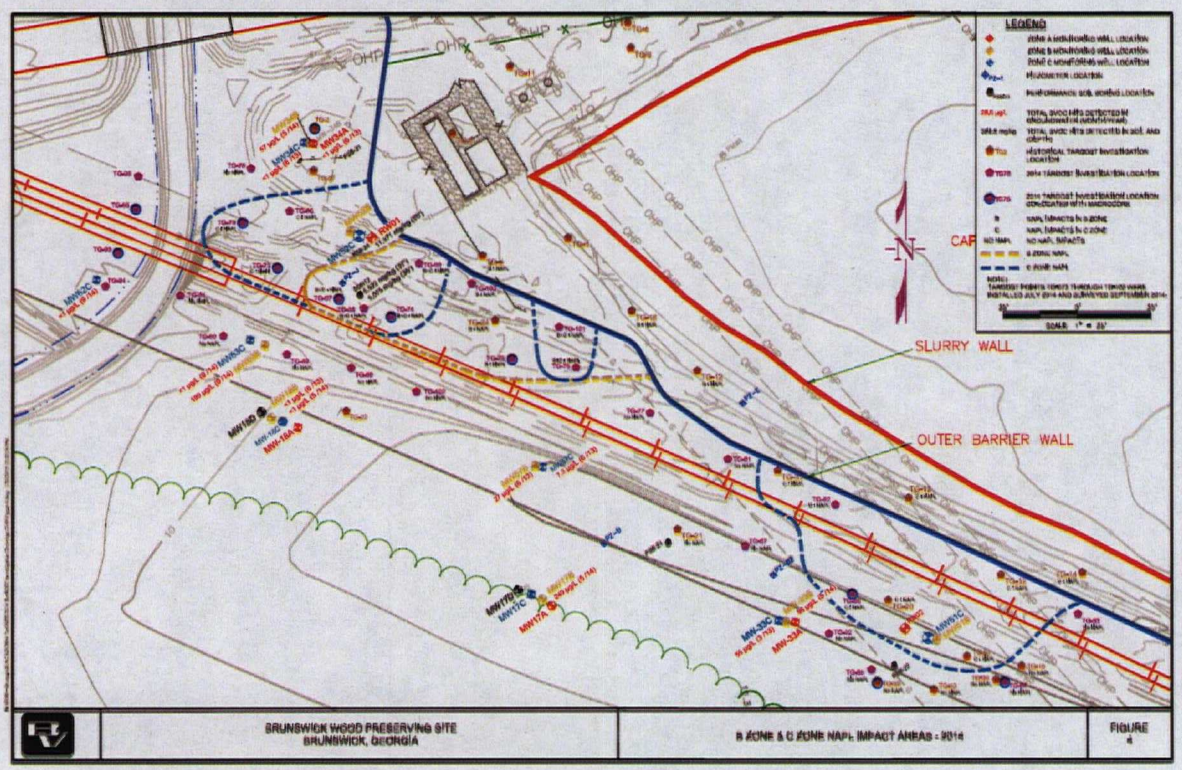
However, in some areas creosote still remains in the subsurface outside the western containment area.

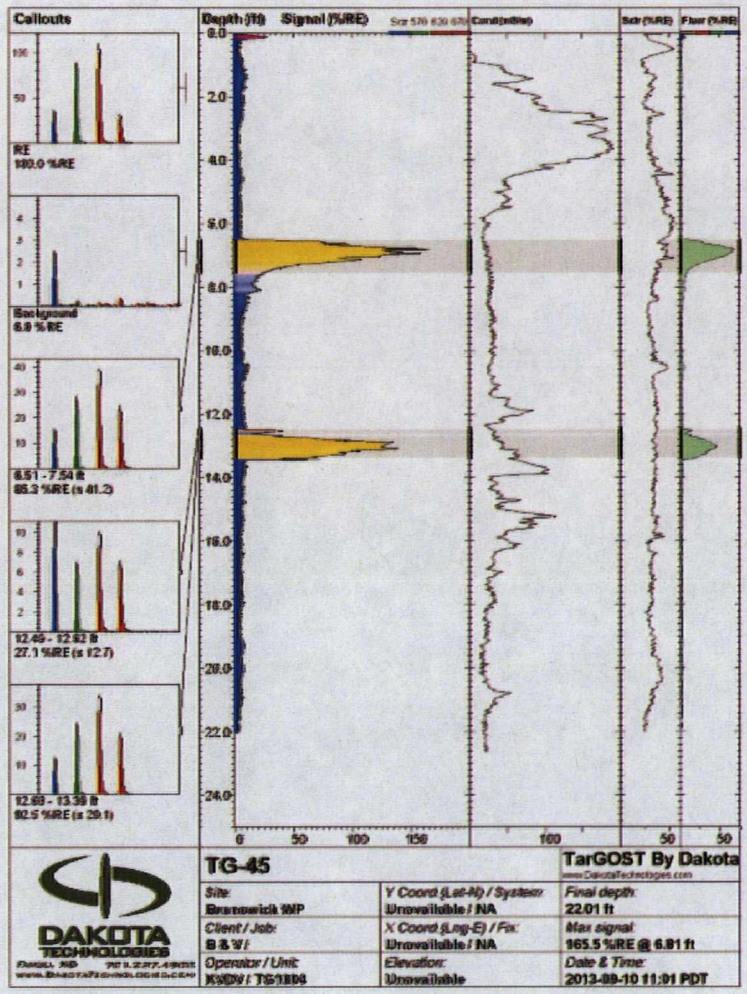
September 2013: Shallow A-Zone
In September 2013, EPA conducted additional sampling using an advanced technology called Tar-GOST that can highlight free product creosote in the subsurface better than groundwater samples can. To the southwest, creosote in the shallow subsurface was shown in thin, tight stringers of 1-3 foot thickness, at depths less than 25 feet below ground surface, and encompassing an area of about 0.75 acres. See the first figure on the following page; also shown are two logs labeled TG-45 and TG-63 that illustrate the creosote in yellow at these locations.

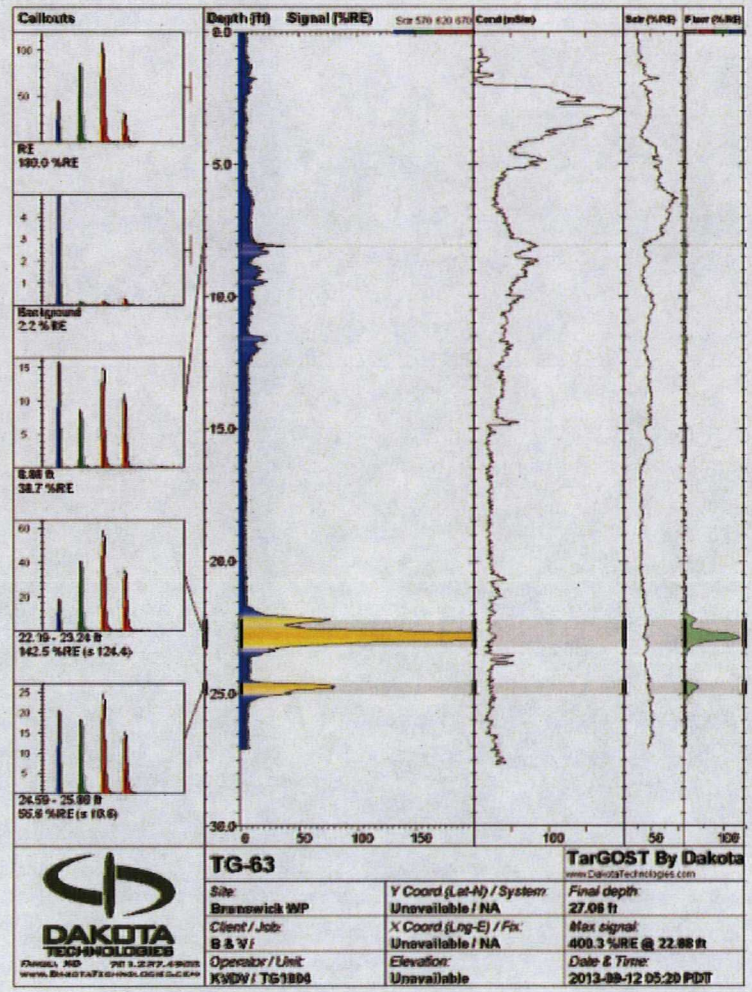
It is unlikely that this creosote has migrated to its present location since the western barrier walls were constructed in 2009 and 2011, respectively. For example, the shallow groundwater south of the CSX railroad tracks has been known to be contaminated since 2000; however, the historical samples collected there were above and below the creosote stringers, indicating dissolved phase contamination as opposed to creosote.

July 2014: Deep B and C Zones
In July 2014, EPA conducted additional sampling using the Tar-GOST technology to highlight free product creosote in the deeper B and C zones near Perry Lane Road. Creosote in these deeper zones was found in two places encompassing areas of about 0.12 acre in the B zone and 0.25 acre in the C zone. These areas are shown on the second figure on the following page. Creosote source material was not found on the west side of Burnett Creek. The MW-62C well was also installed west of the creek and found no impact to groundwater. EPA is not currently proposing additional remedial action for these deeper zones, which will be discussed further in the next Brunswick Environmental Cleanup Newsletter.


SLURRY WALL
OUTTER BOUNDARY WALL
CSX TRACKS
CSX 25' R.O.W.
2013 APPROXIMATE EXTENTS OF A-ZONE NAPL
BURNETT CREEK
LEGEND
BRUNSWICK WOOD PRESERVING SITE
BRUNSWICK, GEORGIA
2013 EXTENT OF A-ZONE NAPL SOUTH OF CSX TRACKS
FIGURE 3


LEGEND
SLURRY WALL
OUTER BARRIER WALL
BRUNSWICK WOOD PRESERVING SITE
BRUNSWICK, GEORGIA
B ZONE & C ZONE NAPL IMPACT AREAS - 2014
FIGURE 4


Callouts
Depth (ft)
Signal (%RE)
Cond (mS/m)
Scr (%RE)
Flwr (%RE)
RE
180.0 %RE
Background
6.9 %RE
6.51 - 7.54 ft
85.3 %RE (± 41.2)
12.49 - 12.82 ft
27.1 %RE (± 12.7)
12.89 - 13.38 ft
92.5 %RE (± 29.1)
TG-45
TarGOST By Dakota
Site:
Brunswick WP
Y Coord (Lat-N) / System:
Unavailable / NA
Final depth:
22.01 ft
Client / Job:
B & W
X Coord (Lng-E) / Fix:
Unavailable / NA
Max signal:
165.5 %RE @ 6.81 ft
Operator / Unit:
KWDW / TG1806
Elevation:
Unavailable
Date & Time:
2013-09-10 11:01 PDT
DAKOTA TECHNOLOGIES


Callouts
Depth (ft)
Signal (%RE)
Cond (mS/m)
Scr (%RE)
Flwr (%RE)
RE
180.0 %RE
Background
2.2 %RE
6.88 ft
38.7 %RE
22.19 - 23.24 ft
142.5 %RE (± 124.4)
24.59 - 25.08 ft
56.8 %RE (± 18.6)
TG-63
TarGOST By Dakota
Site:
Brunswick WP
Y Coord (Lat-N) / System:
Unavailable / NA
Final depth:
27.08 ft
Client / Job:
B & W
X Coord (Lng-E) / Fix:
Unavailable / NA
Max signal:
409.3 %RE @ 22.88 ft
Operator / Unit:
KWDW / TG1806
Elevation:
Unavailable
Date & Time:
2013-09-12 05:20 PDT
DAKOTA TECHNOLOGIES

2015 Remedial Action
Western Containment Area, Shallow A-Zone

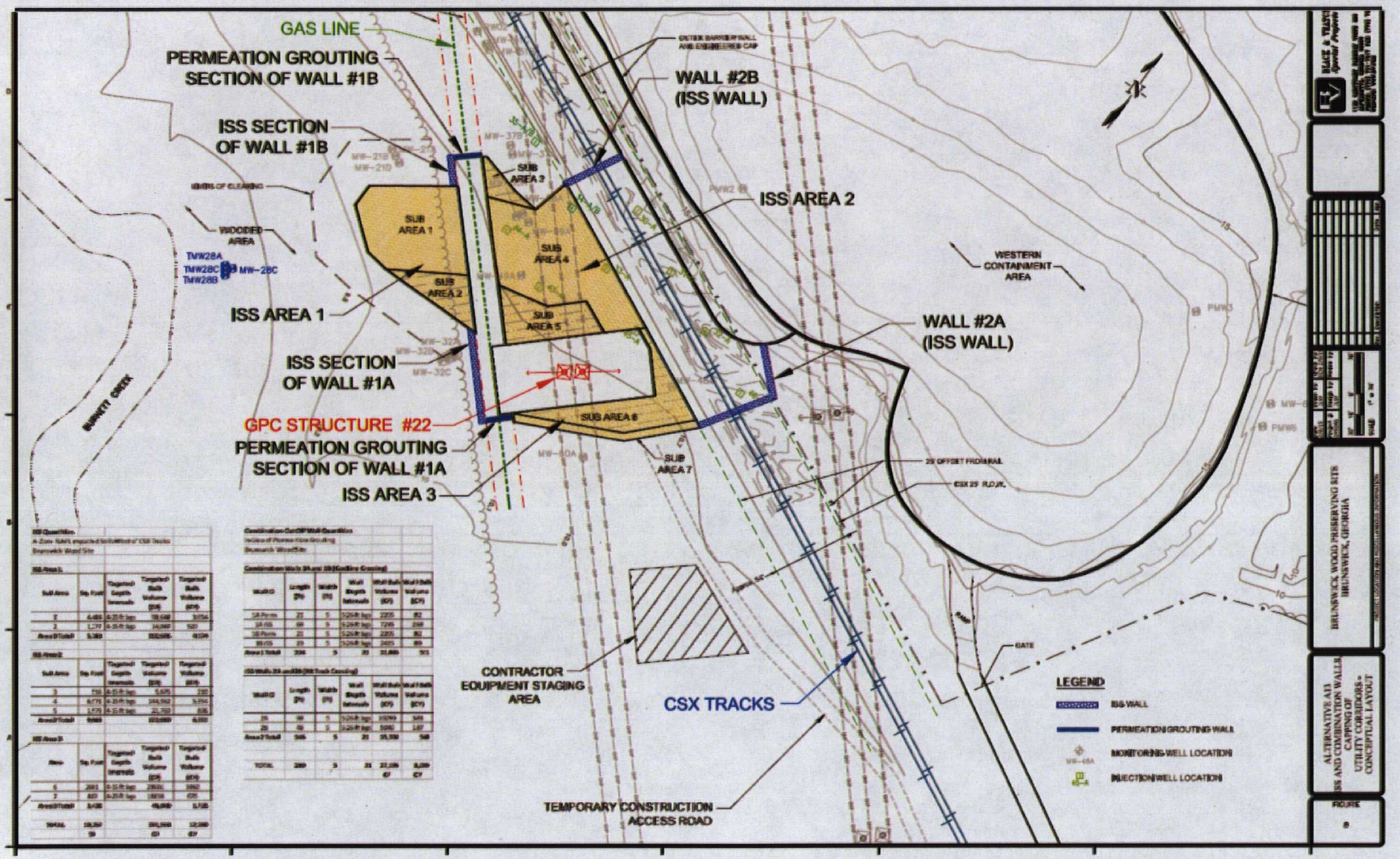
As discussed in EPA's June 2011 Explanation of Significant Differences, treatment of groundwater with in-situ chemical oxidation (ISCO) is technically challenging and cost-prohibitive in cases where the treatment area includes significant source materials such as creosote. EPA has therefore evaluated other available technologies, options, and costs for addressing the source materials remaining outside the western containment area.

For the shallow A-zone, EPA will employ a combination of technologies, beginning with in-situ solidification (ISS). ISS technology uses cement and other selected reagents to physically bind and immobilize contaminants into a solid low permeability soil/cement matrix, so that they are no longer able to migrate in the subsurface. This technology was used in 2008 to construct the two subcaps over the eastern and western containment areas at the site. Using an excavator blender attachment, soil amendments will be mixed with approximately 12,280 cubic yards of contaminated soils in the shallow A-zone, shown on the figure on the next page as ISS Area 1 and ISS Area 2.

ISS technology will also be one of three technologies used to address the source materials under the utility corridors in this area. At the railroad, ISS will be used to construct subsurface barrier walls, shown as walls 2A and 2B on the next page. At the gas pipeline, ISS and permeation grouting (PG) technology will be used to construct subsurface barrier walls, shown as walls 1A and 1B on the next page. PG technology is a form of jet grouting, whereby liquid grout is injected into the subsurface to fill the natural porosity and form a barrier to groundwater flow and contaminant migration.

At all three utility corridors, capping technology will be used to minimize infiltration of rainwater into the subsurface. At the gas pipeline and high-voltage power structures, ISS will be used to construct a cap, while a cement fabric will be used at the railroad tracks. Contaminants under these capped areas will be restricted from migrating laterally; however, their downward migration will be limited only by the tight soil stringers upon which they currently reside. Any downward migration of contaminants in the future will be monitored and remediated, as necessary.

This work will require closure of the railroad tracks for approximately 6-10 days, with completion of the work expected in approximately 10-14 weeks. Costs are estimated at $1,623,300.


GAS LINE
PERMEATION GROUTING SECTION OF WALL #1B
ISS SECTION OF WALL #1B
WALL #2B (ISS WALL)
ISS AREA 2
WESTERN CONTAINMENT AREA
WALL #2A (ISS WALL)
ISS AREA 1
ISS SECTION OF WALL #1A
GPC STRUCTURE #22
PERMEATION GROUTING SECTION OF WALL #1A
ISS AREA 3
CONTRACTOR EQUIPMENT STAGING AREA
CSX TRACKS
TEMPORARY CONSTRUCTION ACCESS ROAD
SUB AREA 1
SUB AREA 2
SUB AREA 3
SUB AREA 4
SUB AREA 5
SUB AREA 6
SUB AREA 7
LIMITS OF CLEARING
WOODED AREA
TMW28A
TMW28C
TMW28B
MW-28C
BURNETT CREEK
25' OFFSET FROM RAIL
CSX 25' R.O.W.
GATE
LEGEND
ISS WALL
PERMEATION GROUTING WALL
MONITORING WELL LOCATION
INJECTION WELL LOCATION
BRUNSWICK WOOD PRESERVING SITE
BRUNSWICK, GEORGIA
ALTERNATIVE A11
ISS AND COMBINATION WALL
CAPPING OF
UTILITY CORRIDORS -
CONCEPTUAL LAYOUT
FIGURE
8

EXPLANATION OF SIGNIFICANT DIFFERENCE

The remedial action described above for the creosote in the shallow A-zone remaining outside the western containment area (WCA) represents a significant design adjustment affecting the scope of the OU1 Remedial Action. This remedial work will contain additional creosote source areas found outside the WCA, for which treatment by in-situ chemical oxidation (ISCO) is technically challenging and cost-prohibitive. The source containment strategy of the remedy will remain the same; in addition, the total cost of the OU1 RA will remain within the range of the estimate in the June 2002 Record of Decision.

The technologies used for this remedial work in the shallow A-zone will have the same objective as those previously used at the site: to prevent contaminant migration via groundwater in the subsurface. The in-situ solidification (ISS) component will use cement and slag to bind contaminants in subsurface soils, while capping technology will prevent infiltration of rain water. In the utility corridors where creosote will remain untreated, ISS and permeation grouting will be used to construct subsurface barrier walls that will have the same containment objective as the primary and secondary subsurface walls previously constructed at the site. This significant change does not fundamentally alter the Site remedy selected in the June 2002 ROD. The objectives of the OU1 remedy remain unchanged, with the same level of protection.

Table 1 summarizes this significant difference.

REVIEW AND STATUTORY DETERMINATIONS

The Georgia Environmental Protection Division (GAEPD) has reviewed this ESD and was given an opportunity to provide comments. GAEPD did not provide comments on this ESD. GAEPD concurs with the selected remedy for the Site and is supporting the Remedial Action through its State Superfund Contract with EPA. The modified remedy for the Site has been reviewed for consistency with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, more commonly known as Superfund) and fully satisfies the requirements of CERCLA § 121. Copies of this ESD have been sent to the mailing list that EPA maintains for this Site.

This ESD has also been made part of the Administrative Record (AR) for the Site, pursuant to the National Contingency Plan (NCP) §300.825(a)(2); the AR is available for public review at the Information Repository for the Site (see page 1

for the Information Repository location), and also at EPA's Region 4 office located at 61 Forsyth St., SW, Atlanta, Georgia, 30303. A public notice informing the public of this ESD was published in the Brunswick News on November 28, 2015. EPA has met the public participation requirements set forth in CERCLA Section 117(c) and in the National Contingency Plan (NCP) § 300.435(c)(2)(i).

Table 1. Summary of Significant Difference

	Original, June 2002 Record of Decision	**Revised**	**Difference**
	Two Subsurface Barrier Walls/Caps	Two Subsurface Barrier Walls/Caps; and, Remedial Action in Shallow A-Zone Outside of Western Containment Area ("ISS and Combination Walls/Capping in Utility Corridors")	Remedial Action in Shallow A-Zone Outside of Western Containment Area ("ISS and Combination Walls/Capping in Utility Corridors")
Cost	$11,589,220[1]	$13,212,520[2]	+$1,623,300[3]

1) See Record of Decision dated June 2002, Table 14, page 65. Includes capital costs for two barrier walls, subcaps, and caps (does not include contractor or contingency fees).
2) Does not include secondary subsurface barrier wall discussed in the June 2011 Explanation of Significant Difference.
3) See "DNAPL Remedial Technology Evaluation Report Addendum Revision 0, March 2015.