

**FINAL DECISION AND RESPONSE TO COMMENTS  
SELECTION OF REMEDIAL ALTERNATIVE  
FOR  
LAUFEN INTERNATIONAL, INC.  
EAST SPARTA, OHIO  
OHD 077 752 566**

**Introduction**

The U.S. Environmental Protection Agency, Region 5 presents this Final Decision and Response to Comments (FDRC) for the Laufen International, Inc. facility (Laufen) located in East Sparta, Ohio. This FDRC includes the April 2009, Statement of Basis (Attachment I). The Statement of Basis provides the facility background, summary of facility risks, scope of corrective action potential remedy alternatives, and the proposed remedy made available for public review and comment from April 21 to June 1, 2009. This FDRC selects the final remedy to be implemented at the Laufen facility based on the Administrative Record and public comments. EPA's Response to Comments addresses the public comments received on the Statement of Basis during the 42 day public comment period.

**Assessment of the Facility**

The response action documented in this FDRC is necessary to protect human health and the environment.

**Selected Remedy**

EPA selects the following remedial components as the remedy to address contaminated soil, surface water, sediment, and groundwater at the Laufen facility. The selected remedy addresses public comments by: 1) updating the volume of soil to be potentially excavated from the Interim Measures (IM) Area and allowing for additional sampling to better delineate the excavation area within the IM Area; 2) providing flexibility for managing the west pond at Areas of Interest (AOI) 5-4, determining the type of plants to revegetate the AOI and IM Area, and managing contaminated sediment near AOI 5-10; and 3) considering the use of on-site ponds to construct compensatory wetlands to replace those destroyed by implementation of the selected remedy.

***Corrective Measures for Areas of Interest (AOI). These Include AOI 5-4, 5-5, 5-6, 5-7, 5-9, 5-10, and a Non-Designated Area Northwest of AOI 5-10.***

The remedial alternatives considered for AOI were source removal with off-site disposal and pathway elimination using a soil cover and geotextile. A soil cover varying in depth from 6" to 18" and geotextile layer adequately protects human health and the environment. A thicker soil cover is necessary at those AOI with higher levels of lead and zinc that exceed cleanup goals

(CG) in soil and perched groundwater, and where seepage is present. Surface water drainage needs to be modified at some AOI where it comes into contact with tile waste and may cause migration of contaminants. Releases of lead and zinc to adjacent surface soils and sediment need to be remediated. The contaminated soil and sediment exceeding CG will be excavated and consolidated on the AOI prior to placing a soil cover.

Laufen shall submit a Corrective Measures Implementation (CMI) Work Plan, Final Design, Draft Operation and Maintenance (O&M) Plan, and Draft Construction Quality Assurance (CQA) Objectives to EPA for review and approval within 90 days of this FDRC. Laufen shall implement corrective measures at the AOI, incorporating EPA comments on the plans, design, and objectives. The corrective measures at the AOI must address the following requirements.

- Re-route surface drainage around the perimeter of AOI 5-4 to isolate surface water from the waste material and leachate, and eliminate the east pond. Excavate contaminated soil at the perimeter of AOI 5-4 and sediment from the east pond, and consolidate the material onto the eastern portion of AOI 5-4. As provided below, excavated materials from AOI 5-10 will be consolidated into AOI 5-4, and materials from northwest of AOI 5-10 may be consolidated into AOI 5-4. Once all consolidation is complete, place a nonwoven geotextile and a minimum 6" (western portion) to 12" (eastern portion) clean soil cover over the fill area at AOI 5-4, as necessary. Since it is likely that AOI 5-4 will be significantly reconfigured and waste consolidated, the area and depth of a nonwoven geotextile and clean soil cover may be re-evaluated and modified based on the approved final design. The approximate size of the area to be remediated is 4 acres.
- Excavate and consolidate contaminated soil and sediment at the perimeter of AOI 5-5 onto the fill area. Re-route surface drainage around the perimeter of AOI 5-5, and eliminate the west pond and north seep. Place a minimum 18" of clean soil cover over the entire fill area at AOI 5-5. The approximate size of the area to be remediated is 1.7 acres.
- Place a nonwoven geotextile and a minimum 6" clean soil cover over the flatter fill areas at AOI 5-6. The cover will be constructed to merge with the reclaimed mine spoils at the southern boundary, and the steep slopes surrounding the western portion of the fill area. The steeper slope areas in grids 2 and 5 do not require a cover. The approximate size of the area to be remediated is 1.8 acres.
- Excavate and consolidate contaminated soil and sediment at the perimeter of AOI 5-7 on to the fill area. Place a nonwoven geotextile and a minimum 12" clean soil cover over the entire fill areas at AOI 5-7 and AOI 5-9. The approximate size of the areas to be remediated is 2.5 acres. In the alternative, placement of a nonwoven geotextile and a minimum 6" clean soil cover may be appropriate, provided surface and under drainage at the AOIs is properly engineered and controlled to eliminate runoff to wetlands, and eliminate and/or collect seeps.

- Excavate the entire fill area at AOI 5-10 and associated contaminated soil and sediment, and place the material onto the eastern portion of AOI 5-4.
- For the uncharacterized fill area northwest of AOI 5-10, sample, analyze, and characterize the extent and nature of surficial soil contamination to determine whether CG established to protect human health and the environment are exceeded for lead, zinc, barium, and cobalt. If the CG are not exceeded, excavate and consolidate the contaminated sediment northwest of AOI 5-10 onto the eastern portion of AOI 5-4. If any CG are exceeded, EPA will identify the appropriate final remedy for the fill area and adjacent contaminated sediment consistent with the management of AOI with similar contaminant levels at this facility. The final remedy for this uncharacterized fill area may include consolidation of soil and sediment onto AOI 5-4, or off-site disposal, or consolidation of contaminated sediment onto the fill area and placement of a nonwoven geotextile and minimum soil cover which is at least as protective as provided for at AOI with similar contaminant levels.

Remedy construction for the AOI must be completed and a Construction Completion (CC) Report and Final O&M Plan submitted to EPA for review and approval within 18 months of this FDRC. In the CC Report, a registered professional engineer and the Laufen Project Manager shall certify that the remedy at the AOI has been conducted in accordance with the EPA-approved final design and specifications, to the best of their knowledge, and that CG have been attained. The report shall include as-built drawings signed and stamped by a registered professional engineer. Laufen shall implement the approved final O&M Plan, incorporating EPA comments.

***Corrective Measures for the IM Area. This Area Includes AOI 5-1 and the Former Surface Impoundment and Former Waste Pile in the Lowland Along Sandyville Road.***

Potential risks to human health are addressed by source removal and off-site disposal of soil having lead concentrations greater than 1,075 mg/kg which can be associated with unacceptable human blood-levels. A minimum 18" soil cover will be placed in the IM Area after source removal to eliminate the direct contact pathway for human and ecological receptors. An 18" soil cover was also determined to optimally minimize surface water infiltration and prevent leaching of lead and zinc to the unnamed tributary to Nimishillen Creek (UTNC). Laufen's proposal to reshape the UTNC channel, construct side berms, and place a polypropylene liner effectively reduces the transport of residual contaminants in the IM Area to the UTNC.

Laufen shall submit a CMI Work Plan, Prefinal Design, Draft O&M Plan, and Draft CQA Objectives to EPA for review and approval within 150 days of this FDRC. Laufen shall implement corrective measures at the IM Area, incorporating EPA comments on the plans, design, and objectives. The corrective measures at the IM Area must address the following requirements to protect human health and the environment.

- Excavate and consolidate contaminated soil and sediment at the perimeter of AOI 5-1

onto the fill area. Fill and grade the southern and eastern drainage areas at the perimeter of AOI 5-1 to eliminate ponding and expedite surface flow to the UTNC. Place 18" of clean soil cover over the entire fill area at AOI 5-1. The approximate size of the area to be remediated is 3 acres.

- Excavate and dispose off-site, residual tile waste sludge and soil contaminated with high levels of lead and zinc at the former surface impoundment and former waste pile in the IM Area. The areas to be excavated have lead levels exceeding the CG of 1,075 mg/kg to protect workers, and encompass sample locations GP-16 and GP-17; GP-21; GP-22; GP-25; GP-53; GP-30 and GP-31; GP-28, GP-29, GP-5, GP-4, GP-3, GP-2 and GP-1; and GP-52. Fill and grade excavated areas with clean soil. Place a minimum 18" of clean soil cover over approximately 4.8 acres of the IM Area where lead or zinc in soil exceeds the soil CG protective of ecological receptors (123 mg/kg lead and 162 mg/kg zinc).
- Excavate and dispose off-site, soft sediment contaminated with high lead and zinc levels in the UTNC in the IM Area. All sediment exceeding the sediment CG protective of ecological receptors (83 mg/kg lead and 290 mg/kg zinc) shall be removed from the UTNC. The area of sediment to be excavated has average lead levels of 2,400 mg/kg and zinc levels of 5,800 mg/kg, and is estimated to be 1,500 feet long, 6.5 feet wide, and 2 feet deep.
- After removal of contaminated sediment at the UTNC exceeding sediment CG protective of ecological receptors, excavate soil adjacent to and under the UTNC, as necessary, to accommodate the construction of a new channel designed for a 25-year, 24-hour storm event, and place the excavated soil beneath the 18" clean soil cover in the IM Area (provided that lead levels in the excavated soil do not exceed 1,075 mg/kg). Install a Pyramat® high performance turf reinforcement mat in the new UTNC channel to control erosion and establish riparian vegetation. Approximately 1,500 feet of the UTNC will be remediated. All work will be performed in compliance with a federal Section 404 permit under the Clean Water Act and state Section 401 water quality certification requirements.

Remedy construction for the IM Area must be completed within 30 months of this FDRC and a CC Report and Final O&M Plan submitted to EPA for review and approval at that time. In the CC Report, a registered professional engineer and the Laufen Project Manager shall certify that the remedy at the IM Area has been conducted in accordance with the EPA-approved final design and specifications, to the best of their knowledge, and that CG have been attained. The report shall include as-built drawings signed and stamped by a registered professional engineer. Laufen shall implement the approved final O&M Plan, incorporating EPA comments.

### ***Corrective Measures for the 3-Acre Hazardous Waste Landfill.***

An interim measure was implemented by Laufen to properly close the 3-acre hazardous waste landfill located at the north end of the IM Area. The landfill design was upgraded by improving the surface water drainage system, leachate storage system, landfill cap, and flood protection levee. These landfill enhancement projects were completed on October 17, 2007.

Groundwater monitoring and O&M programs are necessary to ensure the long-term integrity of the landfill.

Laufen shall submit an O&M plan for the 3-acre hazardous waste landfill to EPA for review and approval within 60 days of the FDRC. The O&M Plan shall include at a minimum, a long-term inspection and maintenance program to ensure the integrity and effectiveness of the cap, an operation and maintenance program for the leachate collection and removal system, and an inspection and maintenance program for site access controls. Laufen shall implement the approved final O&M Plan, incorporating EPA comments.

Laufen shall submit a plan for a groundwater compliance monitoring program for the 3-acre hazardous waste landfill to EPA for review and approval within 60 days of the FDRC. The program must be capable of demonstrating that the 3-acre hazardous waste landfill is in compliance with groundwater protection standards provided in EPA's Response to Comment 23 (page 18 of this FDRC) and provide for contingent actions if the standards are exceeded. Groundwater protection standards shall be met at the point of compliance located at the hydraulically downgradient limit of the hazardous waste management area. Laufen shall implement the approved groundwater compliance monitoring program, incorporating EPA comments.

***Other Corrective Measures, Certification, Monitoring, Institutional Controls, Financial Assurance, and Reporting Requirements.***

A CG of 1,075 mg/kg for lead is appropriate for the long-term protection of human health. Laufen shall excavate all soil contaminated with lead levels greater than 1,075 mg/kg beneath and in the vicinity of sump #2 at AOI 6, dispose of the excavated soil off-site in accordance with RCRA requirements, and submit a CC Report to EPA for review and approval within one year of this FDRC. The report shall include as-built drawings signed and stamped by a registered professional engineer. In the report, the Laufen Project Manager shall certify that the soil CG of 1,075 mg/kg has been attained at sump #2 at AOI 6.

Laufen may consider the use of on-site ponds to construct compensatory wetlands to replace those destroyed by implementation of the selected remedy.

Laufen shall provide certification by a responsible corporate officer or duly authorized representative of all documents submitted pursuant to this FDRC as required in Section 14 of the U.S. District Court Consent Decree (CD), Civil Action No. 5:04CV 2394.

Laufen shall submit a surface water and sediment performance monitoring program to EPA for review and approval as part of the Final O&M Plan to be submitted with the CC Reports for the AOIs and IM Area. The performance monitoring program must be capable of evaluating the effectiveness of the remedy in achieving and maintaining CGs provided in EPA's Response to Comments 2 and 5 (pages 8 and 11 of this FDRC) at the UTNC and AOI 5-1 drainage in the IM Area, and in the perimeter drainage areas at AOIs, as necessary. Laufen shall implement the

approved surface water and sediment performance monitoring programs for the AOIs and IM Area, incorporating EPA comments.

Laufen shall implement institutional controls for the land, soil, waste, and groundwater portions of the Laufen Facility that are subject to this FDRC. The goals of the institutional controls are to ensure that the Laufen property use remains industrial; the soil, waste, and groundwater at the facility are not disturbed in a manner that poses a risk to workers or the environment, or interferes with the implementation of the selected remedy; and groundwater compliance monitoring wells are maintained until the wells are approved for abandonment by EPA.

Laufen shall record an environmental covenant pursuant to Ohio Revised Code (ORC) §§ 5301.80 to 5301.92 memorializing the institutional controls required above. A draft environmental covenant must be submitted to EPA for review and approval within 90 days of this FDRC. The EPA-approved environmental covenant must be recorded on all facility deeds in accordance with ORC § 317.08 within 180 days of this FDRC and record documentation provided to EPA.

Laufen shall obtain financial assurance for completion of the selected remedy, including O&M, within 30 days of this FDRC. The current estimated cost for completing the selected remedy is \$6,749,000 over the expected lifetime of 30 years. Laufen shall provide financial assurance of \$6,749,000, in one of the forms permitted under 40 C.F.R. § 264.145 (modified to replace the terms “post-closure” and “closure” with “corrective action” and referencing the Consent Decree, as approved by EPA). Upon EPA approval of the final design for the remedies at the AOI, IM Area, and 3-Acre Hazardous Waste landfill, Laufen shall provide an updated cost estimate for completing the remedy, and annually thereafter. Upon EPA approval of the updated cost estimate, Laufen may modify the financial assurance if the updated cost estimate is less than the initial financial assurance that was provided within 30 days of this FDRC. Laufen must modify and obtain the required financial assurance within 30 days of EPA approval of the updated cost estimate if the updated cost estimate is greater than the initial financial assurance that was provided within 30 days of this FDRC.

Laufen shall submit CMI monthly progress reports to EPA during the design and construction phases detailing work performed to date, data collected, problems encountered, project schedule, and project percent completed. Progress reports are due by the 10<sup>th</sup> day of each month following this FDRC. Laufen shall submit CMI progress reports semiannually for O&M activities upon approval of the CC Reports for the AOI and IM Area.

The selected remedy selected by EPA for the Laufen facility meets the threshold criteria that reflect the performance standards that must be achieved, including:

- Protect Human Health and the Environment
- Attain Media Cleanup Standards Set by EPA
- Control the Sources of Releases

- Comply with Any Applicable Standards for Management of Wastes

The selected remedy also considers balancing criteria that represent a combination of technical measures and management controls that helped identify the best remedy, including:

- Long-term Reliability and Effectiveness
- Short-term Effectiveness
- Reduction in the Toxicity, Mobility, or Volume of Wastes
- Implementability
- Cost

### Public Participation Activities

A 42 day public comment period was held from April 21 to June 1, 2009. Written comments were submitted by only one party, Laufen. EPA extracted a total of 25 substantive comments from Laufen's submittal.

### Public Comments and EPA's Response to Comments

Comments received on the proposed remedy from Laufen were considered and addressed in the selected remedy. The proposed remedy was modified by EPA to: 1) provide a better estimate of the volume of soil to be excavated from the IM Area; 2) allow for step-out sampling to more accurately delineate the extent of contaminated soil in the IM Area required to be excavated; 3) not explicitly require the elimination of the west pond at AOI 5-4 but consider alternatives such as isolation and restoration of the west pond for mitigation of wetland impacts associated with the selected remedy; 4) allow for Laufen to propose the type of plants used to revegetate the AOIs and IM Area in the CMI Workplan and Final Design; 5) require Laufen to characterize the fill area northwest of AOI 5-10; 6) allow Laufen flexibility to manage contaminated sediment near AOI 5-10; and 7) include the use of onsite ponds for constructing compensatory wetlands to replace those destroyed by implementation of the selected remedy.

The following narrative summarizes Laufen's written comments on the proposed remedy and EPA's response to each comment. Each of Laufen's comments are numbered and presented in italics.

**Comment 1** - *The ecological cleanup goals proposed by EPA for lead and zinc are overly protective and will require remedial actions and funds that are unnecessary to protect potential ecological and human receptors. The cleanup goals proposed by Laufen in the revised CMS are based on realistic assumptions and site-specific data. The cleanup goals calculated by EPA compound high estimates for a number of parameters and use data bounded by NOAEL (No-Observed Adverse Effect Level) and LOAEL (Lowest-Observed Adverse Effect Level).*

**Response** - The CG for soil to protect ecological receptors were calculated by EPA to be 123

mg/kg for lead and 162 mg/kg for zinc (reported as 160 mg/kg in the Statement of Basis) and discussed with Laufen prior to submittal of the revised CMS on December 24, 2008 (Laufen Administrative Record document numbers 112 and 113, hereafter referred to as Laufen - 112 and Laufen - 113). The EPA-derived CG for zinc is the facility background concentration of 162 mg/kg derived by Laufen, since the calculated CG of 46 mg/kg is less than the facility background concentration (Laufen - 074). In the CMS (Laufen - 110), Laufen proposed CG of 470 mg/kg for lead and 500 mg/kg for zinc. Calculations to derive the CG were performed differently by EPA and Laufen. The differences include:

- EPA used only studies bounded by NOAEL and LOAEL to derive the CG.
- Laufen used an uncertainty factor of 2.0 for lead and 1.5 for zinc to increase the concentrations of the CG.
- EPA used the short-tailed shrew as the representative receptor to drive the risk-based cleanup for lead while Laufen used the American robin.

The methodology for deriving the CG using Eco-SSL documentation was provided by EPA to Laufen in its September 18, 2008 disapproval of the CMS (Laufen -101). The methodology ultimately used by Laufen to propose CG is not appropriate, inconsistent with EPA methodology, and results in the derivation of CG not protective of ecological receptors. The EPA-derived CG for soil to protect ecological receptors are incorporated into the selected remedy and provided in the table below:

### **Cleanup Goals for Soil to Protect Ecological Receptors**

<b>Constituent of Potential Interest (COPI)</b>	<b>Cleanup Goal in mg/kg (ppm)</b>
Barium	2,000
Cobalt	43
Lead	123
Zinc	162

**Comment 2** - *Cleanup goals are established by EPA in areas previously authorized by an NPDES Permit to allow for the discharge of 118 to 173 pounds per year of zinc to the UTNC. These authorized discharges are now part of the required remediation.*

**Response** - An authorized discharge to the UTNC through a NPDES permit is noted but not relevant to the investigations and required corrective measures. The average concentrations of lead and zinc in sediment in the UTNC are 2,400 and 5,800 mg/kg, respectively, approximately 20 to 30 times greater than the calculated CG for the selected remedy (see table below). These concentrations in sediment are consistent with high lead and zinc concentrations in soil in the IM Area (in the 1,000's to 10,000's mg/kg range) where closure was not properly implemented. The IM Area is believed to be the source of contaminated sediment. In addition, residual tile waste sludge was noted at boring locations GP-16, GP-21, and GP-22. It is highly unlikely that the

permitted discharge could result in average zinc concentrations of 5,800 mg/kg in sediment. In addition, the permitted discharge can not account for average lead concentrations of 2,400 mg/kg in sediment.

### **Cleanup Goals for Sediment to Protect Ecological Receptors**

<b>COPI</b>	<b>Cleanup Goal in mg/kg (ppm)</b>
Lead	83
Zinc	290

**Comment 3** - *Implementation of a remedy in composite sample areas CS-1, CS-2, CS-3, CS-4, CS-6, and CS-12 at AOI 5-4 would not be necessary to protect ecological receptors since the average exposure point concentrations are below the cleanup goals.*

**Response** - The average concentrations of lead and zinc in surface soil for all 15 composite samples taken at AOI 5-4 and presented in the Statement of Basis are 152 and 470 mg/kg, respectively. These lead and zinc levels exceed CG protective of ecological receptors provided in EPA's Response to Comment 1 above, and therefore demonstrate the need to implement the remedy for AOI 5-4. The comment poses the question of defining subareas of AOI 5-4 around specific composite samples that would not require implementation of a remedy. As described in the selected remedy, AOI 5-4 is likely to be substantially reconfigured for proper slopes. Consequently, the presence of contaminated subsurface soil at depth also needs to be considered as the area is re-contoured and deeper contaminants may be exposed closer to the surface.

Data from test pit and surface soil release grab samples taken at or in the vicinity of CS-1, CS-3, CS-4 and CS-6 indicate an exceedance of the CG for lead or zinc necessary to protect ecological receptors. At CS-2, no composite or test pit sampling results exceeded CG for lead or zinc. No test pit sampling was performed at CS-3 or CS-12.

Subsurface soil grab samples taken from test pits exceed CG for lead and zinc at CS-1 and CS-4. At CS-6, subsurface soil grab samples taken at depth from two test pits have zinc concentrations exceeding their CG. Downslope of AOI 5-4 at the base of CS-3, two surface soil release samples had zinc levels exceeding their CG and one surface soil sample had lead levels exceeding its CG.

**Comment 4** - *Laufen disagrees with EPA's "arbitrary" requirement for source removal based on the proposed cleanup goal of 1,075 mg/kg, based on a preliminary remediation goal (PRG) established by the EPA Technical Review Group for Lead, Adult Lead Committee for the Midwest Region. If source removal and off-site disposal is required, Laufen requests that the volume be limited to that estimated by EPA.*

**Response** - The human health risk assessment in the revised CMS (Laufen - 110) calculated an exposure point concentration for lead of 1,728 mg/kg for the construction worker. Laufen

concluded that at this concentration, the estimated blood lead levels for the construction worker and commercial/industrial worker in the IM Area would exceed the blood-lead level of concern of 10 µg/dL using the EPA Adult Lead Model.

The use of a lead PRG of 1,075 mg/kg was discussed by Laufen in the draft CMS (Laufen - 098). In EPA's disapproval of the draft CMS (Laufen - 101), EPA states that at a minimum, any location exceeding the PRG of 1,075 mg/kg for lead calculated by the U.S. EPA Technical Review Workgroup for Lead in soil should be considered for removal as part of the corrective measures evaluation process. In the draft CMS, Laufen proposed a lead PRG of 870 mg/kg based on ecological receptors and stated that:

“The use of the lead PRG of 870 mg/kg for soils will also be protective of human health risks based upon the Region 9 PRG value of 800 mg/kg for direct contact with industrial soils. These values are also less than the PRG (1,075 mg/kg) calculated by the USEPA Technical Review Workgroup for Lead, Adult Lead Committee, dated May 19, 2005; the calculated PRG for the Midwest Region, all races.”

The EPA human health CG for the excavation and removal of lead-contaminated soil in the IM Area is based on EPA Guidance cited by Laufen in the CMS. A CG of 1,075 mg/kg in the IM Area is appropriate for the long-term protection of human health and also contributes to the long-term protection of ecological receptors by significantly reducing lead concentrations in soil, combined with a protective soil cover.

The final volume of soil removed and sent offsite for disposal is dependent on confirmatory sampling demonstrating that the CG of 1,075 mg/kg has been achieved throughout the source area. The objective of the investigation was not to identify the specific volume of soil to be removed but to provide a rough estimate with which to consider appropriate remedy alternatives and financial assurance. The actual removal volume may be more or less. EPA currently estimates the volume of soil potentially excavated and disposed of off-site to be (from north to south, excluding the UTNC sediment remediation and re-channelization area):

*GP-16 (2-4') and GP-17 (0-8') = 40'x80'x5' = 592 cubic yards* (the final volume to be determined in the field; all waste material present from 3-4' at GP-16 must be removed; at GP-17, the boring log shows refusal because of shale at 6' but lead and zinc are reported to be present at 5,000 and 18,000 mg/kg at 6-8').  
*GP-22 (0-2' and 3.75' +) = 40'x40'x4' = 237 cubic yards* (the final volume to be determined in the field; all waste material present at 3.5-4'+ must be removed).  
*GP-53 (2-4') = 40'x40'x2' = 118 cubic yards.*  
*GP-30 (0-2') and GP-31 (0-4') = 80'x200'x3' = 1,777 cubic yards.*  
*GP-28 (2-4'), GP-29 (0-4'), GP-5 (0-4'), GP-4 (0-4'), GP-2 (0-2'), GP-1 (2-4') = 500'x40'x3' = 2,222 cubic yards.*  
*GP-52 (2-4') = 20'x20'x2' = 29 cubic yards.*

A conservative estimate of the total volume of soil to be potentially removed from the IM Area is 4,975 cubic yards. This current estimate is greater than the 3,200 cubic yards presented in the Statement of Basis and provided to Laufen (Laufen - 114) due to: 1) the inclusion of excavation at GP-1; 2) the extension of excavation at GP-16 and GP-17 as one removal area; 3) the addition of excavation of waste material at GP-22; and 4) the use of larger areas to be more representative of highly contaminated soil exceeding CGs based on a conservative interpretation of the data at sample locations GP-1 through GP-38, and GP-52 and GP-53. See EPA's Response to Comment 11 for a more specific discussion on the IM Area data and resulting reductions in average concentrations of lead and zinc associated with excavation. The extent of the IM Area requiring remediation and the estimated excavation of contaminated soil are depicted in attached Figure 6.3 from the CMS (Attachment II).

**Comment 5 -** *Laufen will modify the drainage ways at AOI 5-1 and 5-4 to reduce ponding in the upland areas. The ponds at other AOI will not be removed based on field observations and risk analysis. Laufen requests clarification that no other ponds require removal.*

**Response -** Investigations identified certain locations at AOI 5-5, 5-7, 5-9, and 5-10 that exceeded the CG for the selected remedy. The sediment CG provided in EPA's Response to Comment 2 above and/or surface water CG protective of ecological receptors provided in the table below were exceeded. Consistent with the Statement of Basis, the selected remedy requires the re-routing of surface drainage around the perimeter of AOI 5-5 and elimination of the west pond and north seep; consolidation of contaminated sediment onto the fill areas of AOI 5-7; and excavation of the entire fill area and associated contaminated sediment at AOI 5-10. Because of the apparent value of the established wetland at AOI 5-9, and only slight exceedances of CG, consolidation of contaminated sediment onto the fill area and removal of the pond at AOI 5-9 is not required in the selected remedy.

### Cleanup Goals for Surface Water to Protect Aquatic Life

COPI	Cleanup Goal in µg/l (ppb) *
Arsenic	150
Cadmium	2.2
Chromium	74
Copper	9.0
Lead	5.1
Mercury	0.77
Nickel	52
Selenium	4.6
Zinc	120

\* Hardness Dependent; the value here corresponds to a hardness of 100 mg/l.

**Comment 6** - *EPA proposes monitoring of sediment after the remedy construction is complete. Sediment monitoring is unnecessary since remedial actions will include documentation of the removal of impacted sediment.*

**Response** - EPA agrees that remedial actions by Laufen will include documentation of the removal of sediment exceeding CG provided in EPA's Response to Comment 2 above. After that, sediment monitoring for a certain period is important to evaluate the performance of the remedial actions. Following sediment removal, it will be necessary to conduct monitoring to ensure that CG are maintained and that the excavated area is not re-contaminated by additional sources or by disturbance of any residuals that remain above cleanup levels. This would be especially important in the IM Area where significant concentrations of lead and zinc will remain in adjacent soil and where runoff from upland source areas (i.e., AOI) could continue to contribute contaminants to surface water. The selected remedy requires surface water and sediment performance monitoring for the IM Area, and for those AOI where potential releases to perimeter drainage are possible after remedy construction. For further discussion of this issue, see the guidance at <http://www.epa.gov/superfund/health/conmedia/sediment/guidance.htm>.

**Comment 7** - *The average concentrations of lead and zinc in surface soil in the IM Area calculated by EPA are greater than the averages calculated by Laufen. Laufen requests the calculations and data EPA used to derive the average concentrations.*

**Response** - The applicable sample locations used by EPA to determine the average lead and zinc concentrations in surface soil (0 to 6") for the IM Area are GP-1 through GP-38, and GP-52 and GP-53. These sample locations are representative of the IM Area where the former surface impoundment and former waste pile were located and subject to closure. Sample locations GP-39 through GP-51 were not used in EPA's calculation since they are more representative of clean fill material placed during the construction of the 3-acre hazardous waste landfill. For duplicate samples taken at locations GP-14, GP-16, and GP-30, EPA averaged the two samples and used the resulting value in the calculation. EPA re-confirms that using this approach, the average lead and zinc concentrations in the IM Area are 1,365 and 2,735 mg/kg, respectively.

**Comment 8** - *The risk to workers from perched groundwater within the fill areas at AOI 5-5 and 5-7 is overstated in the Statement of Basis. Risk would only occur if there is excavation activity and the proposed remedy does not consider any excavation.*

**Response** - EPA's discussion of the potential risk to construction workers presented in the summary of facility risks in the Statement of Basis is derived from the CMS (Laufen - 110). Section 2.4.4 of the CMS states that the total lead at AOI 5-5 was found at a concentration of 0.028 mg/l, which exceeds the human health target decision level (TDL). At AOI 5-7, total lead was found at 0.016 mg/l and total barium was at 3.1 mg/l, which exceed the human health TDL. As stated in the Statement of Basis, these concentrations in perched groundwater pose a potential risk to construction workers. The likelihood of workers being exposed to contaminants in these areas would depend on whether future redevelopment activities are conducted at the site. EPA agrees that there is an unacceptable risk if there is excavation activity at the AOI. For both AOI,

there are seeps present at the surface, probably related to the presence of perched groundwater, and metals found in perched groundwater may be indicative of what human and ecological receptors may come into contact with at the surface. The selected remedy requires Laufen to address the perched groundwater and seeps by re-routing the surface drainage at AOI 5-5, and provide a 12" to 18" soil cap and vegetative cover at AOI 5-5 and 5-7.

**Comment 9** - *EPA's basis for "hot spot" removal of lead and zinc at the IM Area appears arbitrary. Laufen believes that risk reduction will occur by implementing a soil cover over the IM Area.*

**Response** - EPA described its expectations for final remedies at corrective action facilities in the Federal Register (See, 61FR 19432, May 1, 1996):

1) EPA expects to use engineering controls, such as containment, for wastes and contaminated media which can be reliably contained, pose relatively low long-term threats, or for which treatment is impracticable; 2) EPA expects to use a combination of methods (e.g., treatment, engineering and institutional controls), as appropriate, to achieve protection of human health and the environment; 3) EPA expects to use institutional controls such as water and land use restrictions primarily to supplement engineering controls as appropriate for short and long term management to prevent or limit exposure to hazardous wastes and constituents. EPA does not expect that institutional controls will often be the sole remedial action; and 4) EPA expects to remediate contaminated soils, as necessary, to prevent or limit direct exposure of human and environmental receptors and prevent the transfer of unacceptable concentrations of contaminants (e.g., via leaching, runoff, or air borne emissions) from soils, including subsurface soils, to other media.

These expectations were used in the development of a layered-approach in the selected remedy to address contaminated soil in the IM Area and reduce risk at the Laufen facility. Potential risks to human health are first addressed in the remedy by the selective excavation of soil contaminated with lead exceeding 1,075 mg/kg, which can be associated with unacceptable human blood-lead levels. Excavation and removal of this soil lowers the average levels of lead and zinc remaining in an ecologically-viable area but not to levels that are protective of ecological receptors. Therefore, an 18" soil cover will be placed to isolate residual lead and zinc contamination to limit direct exposure to environmental receptors and which will also aid in the prevention of contaminant transfer to the UTNC. Finally, institutional controls will be used to supplement the engineering controls appropriate for long-term management.

**Comment 10** - *The terms "plants" or "native plants" for stabilizing soil cover is not defined by EPA. Laufen proposes Kentucky bluegrass and red fescue for erosion protection. EPA needs to define "plants" and "native plants" so Laufen can estimate costs.*

**Response** - The type of plants used to revegetate the AOI and IM Area may be determined by Laufen and proposed in the CMI Workplan and Final Design. For the AOI, EPA noted during a site visit that a good grass cover was established on upland mine spoils just south of AOI 5-6.

This type of grass cover would be acceptable for AOI reclamation. Regarding the lowland IM Area which is wet and subject to ponding when the floodgate is closed at the discharge of the UTNC to Nimishillen Creek, Laufen should consider developing a vegetative cover consistent with a wetland. Laufen should consult with Ohio EPA and the Corps of Engineers during the federal Section 404 permit and state Section 401 certification requirements to evaluate acceptable vegetation for this wetland and for any compensatory wetlands required to replace those destroyed by implementation of the selected remedy.

**Comment 11** - *Laufen calculates that the remaining average lead and zinc concentrations in surface soil after hot spot removal in the IM Area is much less than that calculated by EPA. Laufen requests that EPA provide the data and calculations used to derive its results.*

**Response** - Please refer to EPA's Response to Comment 7 for supplemental information. EPA calculations remove certain sample locations (and depths) from the determination of average lead and zinc concentrations in soil remaining in the IM Area after hot spot removal. These locations have lead in soil that exceeds 1,075 mg/kg which pose a potential risk to workers. The locations are GP-2 (0-2'), GP-4 (0-4'), GP-5 (0-4'), GP-16 (2-4'), GP-17 (0-8'), GP-22 (0-2'), GP-28 (2-4'), GP-29 (0-4'), GP-30 (0-2'), GP-31 (0-4'), GP-52 (2-4'), and GP-53 (2-4'). In some instances EPA did include, in its calculations, soil at locations where lead did exceed 1,075 mg/kg. These exceedances occurred at depth (2-4'), were only slightly greater than 1,075 mg/kg of lead (except for GP-1), and did not have corresponding relatively high zinc levels. These locations are GP-1, GP-6 GP-13, GP-19, GP-20, GP-24, and GP-27.

Sample locations GP-3 (0-4'), GP-21 (2-4'), and GP-25 (2-4') are not included in EPA's calculations since they are within the footprint of the UTNC sediment and re-channelization remedial component of the selected remedy. Their volume is included in the calculations for sediment excavation and off-site disposal. Sample locations GP-7, GP-8, GP-9, GP-10, GP-12, GP-15, GP-32, and GP-33 are also not included in the IM Area calculations since they generally meet lead and zinc CG for the selected remedy, and are outside the area requiring remediation.

For sample locations and depths where soil will be excavated and disposed off-site (n = 18), the lead and zinc values are replaced with 40 and 162 mg/kg, respectively, which are the values calculated by Laufen representative of background concentrations for mine spoil fill. The sample size for all soil in the IM Area (n = 59) is divided into cumulative lead and zinc concentrations of 30,392 and 93,313 mg/kg, respectively, which results in average lead and zinc levels of 515 mg/kg and 1,582 mg/kg, which are greater than the 477 mg/kg and 1,456 mg/kg previously calculated. These higher lead and zinc concentrations should have been placed in the first paragraph of page 11 of the Statement of Basis. Also, EPA erroneously did not include the removal of soil at 2' to 4' at sample location GP-1 which significantly exceeds the lead value of 1,075 mg/kg and is adjacent to the GP-28, GP-29, GP-5, GP-4, and GP-2 removal area. Excavation of contaminated soil at 2' to 4' at GP-1 would further modify the remaining average soil concentrations in the IM Area cleanup area to 428 mg/kg for lead and 1,488 mg/kg for zinc. Excavating GP-1 would result in additional soil removal from the IM Area and is hereby incorporated into the selected remedy.

**Comment 12** – *Laufen believes that the method for determining the final quantity of contaminated soil for disposal should be based on testing of stockpiles from the excavation.*

**Response** - EPA does not agree with Laufen's proposed approach which would involve the collection of one sample (from four aliquots) per each 250 cubic yard of excavated soil. For 3,000 cubic yards, 12 samples would be obtained. If the lead concentration in a sample was less than 1,075 mg/kg, the soil would remain on-site; greater than 1,075 mg/kg, the 250 cubic yard volume of soil would be characterized and sent off-site. Laufen's proposed approach could result in large quantities of soil remaining onsite that originally exceeded 1,075 mg/kg of lead but were diluted by soil with lesser concentrations. This approach could also leave high average concentrations onsite approaching 1,075 mg/kg. Since lead concentrations have already been determined at specific locations with the IM Area, it is unnecessary to conduct further sampling. However, it may be appropriate to conduct step-out sampling at the locations described above in EPA's Response to Comment 4 to more accurately delineate the full horizontal and vertical extent of lead contamination in soil exceeding 1,075 mg/kg (and residual waste), and the soil volume subject to removal.

**Comment 13** - *The Statement of Basis does not support the placement of a 6" soil cover and geotextile at AOI 5-3.*

**Response** - The selected remedy does not require a 6" soil cover and geotextile at AOI 5-3. As stated further in Laufen's comments on the proposed remedy, Laufen agrees with the basis and recommendation of EPA for no action at AOI 5-3.

**Comment 14** - *The volume of sediment removal by excavation should be no more than that estimated by EPA and the methods for determining the final quantity for disposal should be based on testing of stockpiles from excavation.*

**Response** - EPA's estimate of 800 cubic yards of sediment to be excavated and disposed of is based on the following assumptions; the actual volume may be more or less.

*UTNC = 1500' long x 6.5' wide x 2' deep or 772 cubic yards*

*GP-3 (0-4') = 10'x10'x4' = 15 cubic yards*

*GP-21 and GP-25 (2-4') = 10'x20'x2' = 15 cubic yards*

The average concentration for the eight samples from the UTNC is 2,400 mg/kg of lead and 5,900 mg/kg of zinc. Sediment sampling shows that very high concentrations of lead and zinc are present in soft sediment throughout the UTNC. There is no evidence that lesser concentrations of lead and zinc are present in the UTNC. Similar to the discussion above in EPA's Response to Comment 12, it is unnecessary to conduct further sampling. All soft sediment and the three soil locations in the footprint of the UTNC shall be removed, dewatered, and characterized for off-site disposal. It may be appropriate to conduct step-out sampling at locations GP-3, GP-21, and GP-25 to more accurately delineate the full horizontal and vertical

extent of lead contamination in soil exceeding 1,075 mg/kg (and residual waste), and the soil volume subject to removal. The actual volume of sediment removal by excavation will be determined during implementation of the selected remedy.

**Comment 15** - *Groundwater exceedances in perched zones within AOI 5-5 and 5-7 are based on unfiltered samples collected from temporary wells that barely exceeded MCLs. These concentrations do not pose a threat to human health through a direct contact exposure pathway.*

**Response** - See EPA's Response to Comment 8.

**Comment 16** - *Laufen proposes to conduct surface water monitoring consistent with an Ohio general permit for industrial stormwater at the AOI and IM Area.*

**Response** - Monitoring surface water under a general permit for industrial stormwater is acceptable provided that it is capable of demonstrating that the selected remedy has achieved and continues to meet CG for surface water to protect aquatic life as provided in EPA's Response to Comment 5 above. The selected remedy limits the requirement of surface water monitoring to the UTNC and AOI 5-1 drainages in the IM Area, and to perimeter drainage areas at AOIs, as necessary. Surface water monitoring of upland AOI will be determined based on the final design of each AOI. Surface water monitoring is most important during the first few years of the remedy and would likely be phased out with time, provided that CG are consistently achieved.

**Comment 17** - *An increased soil cover thickness is not justified by the cost benefit of varying soil cap thickness and effects on surface water infiltration using the HELP Model. Laufen believes a 6" to 12" soil cover provides appropriate levels of protection.*

**Response** - Surface water infiltration calculations dated March 11, 2009, were previously provided by Laufen and considered by EPA in the Statement of Basis (see Laufen - 115). Surface water infiltration calculations using the HELP Model assume a 24" silt loam over sandy waste over a moderately compacted silt loam. Laufen's HELP Model calculated surface water infiltration using a 6" cap and geotextile, a 12" cap and geotextile, an 18" cap, an 18" pozzolonic cap, and a 24" RCRA Subtitle D cap. Respective surface water infiltration rates in inches per acre were 7.71, 6.16, 5.44, 5.90, and 5.45, respectively. An 18" cap is estimated to result in a 30% reduction in infiltration rates compared to a 6" cap, and a 12% reduction in infiltration rates compared to a 12" cap. Laufen does not believe the cost of this reduced infiltration is justified since an 18" cap results in cost increases of 72% and 22%, compared to a 6" and 12" cap.

Cost considerations for a remedy are used as a balancing criteria and are most important when considering remedies that are equally protective of human health and the environment (threshold criteria). The remedy must first be protective of human health and the environment before considering cost as a balancing criteria. In the Statement of Basis, EPA described a soil cap remedy that ranged from a 6" soil cover and geotextile layer, to an 18" soil cover. More contaminated areas would require a thicker 18" soil cover to be protective of human health and the environment. The main purpose of the soil cover is to isolate contaminated surface soil from

ecological receptors, and reduce erosion and leaching by establishing a vegetative cover on areas that are relatively barren. In some areas, such as the IM Area, and AOI 5-1 and 5-5, an 18" soil cover was proposed in the Statement of Basis to protect human health and the environment by minimizing exposure of high levels of metals in soil to plants and animals, and also to minimize water infiltration that could solubilize metals and allow their transport to adjacent surface drainages that could result in exceedances of ecological CG. As demonstrated in Laufen's calculations, an 18" cap will reduce infiltration by 12% compared to a 12" cap, at an increased cost of 22%. In these areas, a 6" or 12" cap would not be protective of human health and the environment, and would not isolate contaminated surface soil from ecological receptors. The selected remedy is consistent with the Statement of Basis by requiring an 18" soil cover at the IM Area, and AOI 5-1 and 5-5, which is necessary to adequately protect human health and the environment, attain media cleanup standards, and control the sources of releases.

**Comment 18** - *Laufen disagrees with EPA's proposal to eliminate the west pond at AOI 5-4. Neither sediment or surface water poses a risk and the poor biological quality appears to be related to low pH associated with acid mine drainage. Laufen may consider the pond as a candidate for mitigation of wetland impacts.*

**Response** - CG for lead and zinc in sediment were not exceeded at five sample locations within the west pond. As noted by Laufen, one surface water sample location in the west pond did exceed levels protective of the aquatic environment, mainly due to the very low hardness levels. Laufen believes that the poor biological quality of the west pond may be related to acid mine drainage inflow from upstream.

EPA's main concern is that the west pond and associated acid mine drainage may be causing increases in the solubility of lead and zinc from fill material at AOI 5-4, as evident in sediment and surface water data for the east pond. Elimination or isolation of the west pond and its flow from AOI 5-4 is essential in eliminating future releases of lead and zinc to surface water and sediment to the drainage area that eventually feeds the UTNC. This can be performed in many ways and the final design should detail the proposed method, including consideration of restoration of the west pond for mitigation of wetland impacts associated with the selected remedy. The goal of the remedy at AOI 5-4 is to ensure that the final construction results in no exceedances of CG in surface water and sediment immediately downstream from the AOI. The selected remedy addresses Laufen's comment by not specifically requiring the elimination of the west pond.

**Comment 19** - *The fill area northwest of the AOI 5-10 was not identified as an AOI during the RFI process and was not characterized. Any excavation of sediment near this fill area should be relocated to AOI 5-4.*

**Response** - The fill area northwest of AOI 5-10 was observed by EPA during a site visit. The fill area (exposed tile) is adjacent to a sediment sample location where contaminants were found to be in excess of CG. Based on this sediment sample result in the drainage area located northwest of AOI 5-10, the proposed remedy detailed excavation and consolidation of

contaminated sediment northwest of AOI 5-10 on to the adjacent fill area to the west and placement of a nonwoven geotextile and 6" clean soil cover over the entire fill area. In the alternative, sampling and analysis of surficial soil for lead, zinc, barium, and cobalt could be performed to determine whether CG established to protect human health and the environment are exceeded. A cover is not required if CG are not exceeded. In that case, excavated contaminated sediment northwest of AOI 5-10 would be consolidated onto the eastern portion of AOI 5-4 to be covered with a nonwoven geotextile and a minimum of 12" clean soil cover.

In consideration of Laufen's comment, the selected remedy allows for disposal of contaminated sediment exceeding CG at AOI 5-4. The selected remedy also requires Laufen to characterize the fill area northwest of AOI 5-10. Based on its close proximity to the sediment cleanup area, Laufen may want to consider disposal of the sediment at the fill area northwest of AOI 5-10 if CG in surface soil are found to be exceeded and remedial action is necessary.

**Comment 20** - *The potential for spills and threats to the local community from the removal of soil is not minimized by rail transport.*

**Response** - In the discussion of short-term effectiveness for the proposed remedy, the Statement of Basis describes that the use of rail transport would minimize potential threats to the local community from excessive truck traffic and spills. Because of the presence of an active rail spur adjacent to the IM Area, EPA believes that hauling large quantities of soil in rail cars would eliminate excessive truck traffic associated with the transport of up to 5,875 cubic yards of contaminated soil and sediment on two-lane roads through communities, and further, minimize the threat of spills associated with hundreds of loads of truck traffic on public roadways.

**Comment 21** - *The area for a protective soil cover in the IM Area is 3.55 acres, not the 4.8 acres specified by EPA in the Statement of Basis.*

**Response** - EPA's assessment of the area of the IM Area (roughly calculated to be approximately 4.8 acres) to be remediated with a protective soil cover is depicted in attached Figure 6.3 from the CMS (Attachment II).

**Comment 22** - *Laufen will consider the appropriate vegetative plants that will provide an appropriate cover for AOI to reduce the potential for erosion as part of the CMI design and implementation.*

**Response** - See EPA's Response to Comment 10.

**Comment 23** - *The long-term groundwater monitoring program proposed in the CMS is appropriate.*

**Response** - The groundwater monitoring program proposed in the CMS (Laufen - 110) may be appropriate but lacks the specificity required for EPA's review and approval. A general characterization of the groundwater monitoring program is provided in Section 6.3.1 of the CMS

and Appendix F as part of the post-closure cost estimate. This general characterization should be expanded and submitted as a plan capable of adequately assessing groundwater conditions for at least 30 years at the landfill. The groundwater monitoring well network must be specific to the 3-acre hazardous waste landfill and ensure that the following groundwater protection standards are met.

### Groundwater Protection Standards

COPI	Maximum Contaminant Level in $\mu\text{g/l}$ (ppb)
Antimony	6
Arsenic	10
Barium	2,000
Beryllium	4
Cadmium	5
Chromium	100
Copper	1,300*
Lead	15*
Mercury	2
Selenium	50
Silver	100**
Thallium	2
Zinc	5,000**

\* Action Level      \*\* Secondary Standard

**Comment 24** - *The long-term O&M program proposed in the CMS is appropriate.*

**Response** - The O&M program proposed in the CMS (Laufen - 110) may be appropriate but lacks the specificity required for EPA's review and approval. A general characterization of the O&M Plan is provided in Section 6.3.1 of the CMS and Appendix F as part of the post-closure cost estimate. This general characterization should be expanded and submitted as a plan that provides the details required in Section II.C of Attachment IV of the Consent Decree. The O&M Plan must have components specific to the AOIs, IM Area, and 3-acre hazardous waste landfill, and include an inspection checklist for each area.

**Comment 25** - *Laufen will consider the use of ponds on the site as appropriate to construct compensatory wetlands to replace those destroyed by implementation of the remedy.*

**Response** - EPA agrees that if Laufen is required to construct compensatory wetlands to replace those destroyed by implementation of the selected remedy, the use of onsite ponds (e.g., the west pond at AOI 5-4) should be considered.

## Corrective Action Complete Determination

Once Laufen believes it has met its corrective measures obligations, it may send a request to EPA, Region 5 for consideration of a corrective action complete determination (CACD). This request should include a written explanation justifying how Laufen has satisfied the criteria for the CACD, based on information outlined in the February 23, 2005, EPA guidance on CACD.

## Administrative Record

The Administrative Record for the selected remedy is available at the Stark County District Library, 9754 Cleveland Avenue SE, Magnolia, Ohio 44643 and the 7<sup>th</sup> Floor Records Center at EPA Region 5, 77 W. Jackson Blvd., Chicago, Illinois 60604.

## Future Actions

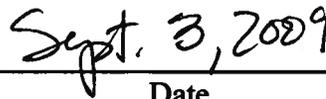
The U.S. District Court Consent Decree (CD), Civil Action No. 5:04CV 2394 requires Laufen to implement the selected remedy in a manner consistent with the Scope of Work for Corrective Measures Implementation, Attachment IV to the CD.

## Declaration

Based on the Administrative Record compiled for this corrective action, EPA has determined that the selected remedy for the Laufen facility is appropriate and protective of human health and the environment.



\_\_\_\_\_  
Margaret M. Guerriero  
Director  
Land and Chemicals Division



\_\_\_\_\_  
Date

Attachments (2)

IN THE MATTER OF:

***Laufen International, Inc.***  
***East Sparta, Ohio***  
***EPA I.D. No. OHD 077 752 566***