



Scope of Services

Remediation and Site Clean-up

Introduction

The most significant stage of any environmental project is the remediation phase. Essentially, this phase is the *remedy* or the *cure*. Remediation represents the attempt to repair the damage to the environment caused by the release of contaminants into soil, groundwater, or surface waters.

Remediation strategies are as varied and complex as the variety of contaminated sites and may employ the use of one or many technologies that have been shown to be effective for a particular type of contamination in a specific setting. Often, several of the available technologies are applied in combination or in a sequential manner. A term used to indicate the use of multiple technologies is “treatment train.” In such cases, a technology may be used to transform the contaminant to a form that can be transformed by yet another technology until the contaminant is no longer a threat to human health and the environment. At complex sites, several technologies may be applied simultaneously, resulting in a “treatment train.” As outlined below, remediation technologies are generally classified into three categories.

Remediation Technologies

Destructive Technologies

Through the application of destructive technologies, the contaminants are actually destroyed. Generally, biological, physical or chemical processes result in the *transformation* of the contaminant into harmless chemicals that can reenter the carbon chain of life. Examples of destructive technologies include bioremediation, incineration, photolysis, or hydrolysis. Contaminants that generally respond well to destructive technology are organic molecules.

Transfer Technologies

The transfer technologies are used when it is not practical, cost effective, or feasible to apply destructive technologies. Transfer technologies includes the *relocation* of the contamination from an environmentally sensitive site to another location which is specifically designed to either store contaminants for long periods of time without risk to the environment or treat the contaminants to reduce the risk to the environment and provide for safe, long term storage. Examples of transfer technologies include the use of landfills or hazardous waste treatment and storage

REMEDATION (Continued)

facilities where contaminants may be stored indefinitely. Phytoremediation is an example of an innovative transfer technology in which plants are used to assimilate the contaminant, thus facilitating the transfer process.

Sequestration Technologies

The contaminant is encapsulated or stabilized in such a manner as to render it harmless to its environment. Sequestration technologies may be applied directly at the site or at special treatment facilities. In either case, an attempt is made to render the contaminant harmless by eliminating or reducing the exposure of the contaminant to humans and to the environment. Sequestration technologies are generally applied to contaminants which do not respond favorably to destructive technologies, when the contaminants are too dangerous to transfer to a treatment facility, or when other technologies are simply too costly. Dangerous concentrations of toxic metals or recalcitrant organics are examples of the types of contaminants that are candidates for sequestration. Examples of the technology include chemical stabilization and encapsulation of contaminants in place, such as the placement of a protective clay layer (engineered barriers) over a contaminated area. Abandoned lagoons and waste dumps are often candidates for encapsulation.

Heavy metals contaminated soils that fail the TCLP test is a classic example of the advantage of the application of sequestration. Upon excavation and removal from the site the soil would become hazardous waste. By chemically reacting the contaminated soil with stabilization materials, the characteristics of the waste can be changed so that the contamination can either be safely left on site or disposed off site at a significant cost savings because the waste is no longer hazardous. In other cases, the contaminated medium can be incorporated into a mixture that not only favorably changes its TCLP characteristic but also limits the bioavailability of the contaminant. Both approaches are recognized as sensible and cost effective remedial solutions to sites that would otherwise be difficult and expensive to restore.

Innovative Technologies

Hallen Environmental recognizes that nature often provides safe and effective solutions to the elimination of contaminants from the environment. Many of these mechanisms have been enhanced in recent years by the development of ways to focus, control and accelerate natural processes. The use of microbes, and more recently plants, are being introduced in today's most advanced treatment technologies. Hallen Environmental has experience with such innovative technologies in remedial designs and will continue to remain cognizant of scientific studies in an effort to propose the use of natural processes as efficient and cost effective alternative solutions to site remediation and rehabilitation as appropriate.

REMEDIATION (Continued)

Hallen Environmental's staff are continually seeking and evaluating new technologies that may benefit our Clients. Our personnel attend scientific meetings and trade shows and stay abreast of industry developments through review of professional journals and trade publications. Faced with a task, Hallen Environmental personnel are continually encouraged to look past the traditional paradigm and advance original alternatives to *accomplish the desired result faster and at less expense.*

Experience – The Key to Successful Remedial Action

Hallen Environmental personnel have successfully implemented each of the three basic technological remediation approaches on behalf of our Clients. Hallen Environmental personnel carefully analyze the site and the data concerning the character of the contamination. Hallen Environmental also takes into account the economics, the time frame and the risk involved when implementing remediation technologies. Some technologies may carry minimal risk but be costly to implement. Some of the newer technologies may carry a relatively high level of risk but offer significant potential cost savings. Some approaches may be short term while others may require years to complete.

Hallen Environmental considers each of these important factors in the selection and recommendation process and routinely develops reasonable and feasible options to propose for Client review and evaluation if applicable. The advantages and disadvantages of each approach are presented. These factors are used to determine remediation clean-up goals based upon new risk based cleanup models. Ultimately, both the Client and the regulatory agency may benefit from Hallen Environmental's analysis and recommended alternate approach to traditional methods in a process that considers both feasibility and cost.

The final measure of success is the implementation of the technologies and the remediation of the contaminated site. Hallen Environmental personnel have successfully remediated numerous contaminated sites for our Clients. With many of our Clients, multiple sites have been involved. In each case, Hallen Environmental personnel have successfully brought the site to closure and have obtained the closure letter from the regulatory agency. Unlike many environmental firms, Hallen Environmental's approach is direct and complete. We address the problem, develop the solution, propose it to the Client for review, evaluation and acceptance, implement the remedy and complete the process. All of this occurs within Hallen Environmental: a fully integrated, single-source company with the capability to approach an environmentally compromised site and provide all of the requirements for the remedy from inception to completion.

Hallen Environmental is comprised of a team of environmental professionals that includes, but is not limited to field technicians, field engineers, superintendents, cost

REMEDIATION (Continued)

/ schedule engineers and project managers who collectively strive to provide our customer clientele with superior service. Our technical capabilities allow us to provide comprehensive environmental analysis management and proactive solutions that are both time and cost sensitive; thus the ability to maintain original construction schedules without compromising the project or causing project delays.

Remediation and Site Clean-up Services

Philosophy

Remediation and site clean up is the business Hallen Environmental is in. As such, unless required by contract, we look to self perform to the maximum extent as many of the activities associated with completing a Clients project.

This philosophy, garnered from experience, allows Hallen Environmental the maximum control to ensure the project is done right the first time, limits liability to HES and the Client and keeps costs down by avoiding mark-ups on subcontractors who already have overhead and profit built into their prices.

With the significant numbers in trained, experienced multi-trade personnel and large owned inventory of equipment, Hallen Environmental has at its disposal through its affiliate Hallen the necessary resources to do the job. There are very few activities on most remediation and site clean-up Projects that Hallen Environmental cannot self perform to meet the quality and cost objectives of our Clients.

ENVIRONMENTAL AND SAFETY WORK PLAN PREPARATION

To avoid delays and successfully execute construction projects on contaminated sites, contractors must have established methods and procedures in place that will promote the timely and accurate implementation of construction activities. Hallen Environmental employees are experienced in preparing various work plans to support construction projects. The following is a sample of representative plans and documents that we have developed as well as implemented activities against:

- Contaminated Material Management Plans
- Health and Safety Plans
- Quality Assurance Project Plans

SITE PROTECTION

Hallen Environmental personnel have completed over 160 field projects that in almost every case required some form of site protection activities be performed. These include protection for personnel, equipment, site security, water run-on/run-

REMEDIATION (Continued)

off, soil erosion and sediment controls, traffic safety both on and off site, pedestrian and local population safety, utility clearance, protection of above grade and below grade utilities, buildings and structures, wetlands, drainage ways and catch basins etc.

Federal, State and most often local ordinances as well as project specific needs regulate the types of protection required. Subject to Client requirements, Hallen Environmental has used expeditors as well as self performed the preparation, negotiations and procurement of Project related permits and is fastidious in ensuring compliance with the protection requirements throughout the completion of the project.

WORK ZONE DELINEATION AND SEQUENCING

In almost every project involving the handling of hazardous waste, critical components to the success of the project are a) Clearly defining the support, contamination reduction and exclusion zones, and b) logically planning and executing the work in sequence to minimize risks for cross contamination, re-contamination, traffic routing / access and to expedite the project completion.

Defining the support (clean) zone for workers, support staff, authorized site visitors, material and equipment deliveries / pick-ups and support facilities (office trailers etc.), the contamination reduction zone (buffer) for egress to the work area and equipment and personnel decontamination, and exclusion zone (work) where the physical activities to complete the project occur, may be completed in a single occurrence or more often based on the type and order of magnitude of the project.

Hallen Environmental project managers and superintendents work with the site plans, specifications, Client, engineer and assigned Health & Safety representative to establish the proper types and extent of the site delineation controls required that are then rigorously enforced during the execution of the project.

Many factors may influence the sequencing in the way a project is completed that include but are not limited to the following:

- Access to the work area,
- Physical constraints, i.e. equipment removal before building dismantlement,
- Traffic and local road conditions,
- On-site traffic constraints,
- Property access agreements,
- Active facility operations,
- Client or other agency requirements,
- Local community issues,
- Utility relocations / shutdowns,

REMIEDIATION (Continued)

- Weather,
- Site and waste characterization results, and;
- Project financial concerns.

Using industry accepted cost estimating and scheduling software where the sequencing and schedule for a project is not already defined, Hallen Environmental project managers and superintendents work with the site plans, specifications, Client, engineer and assigned Health & Safety representative to establish and implement a logical work sequence that often incorporates the work of others to execute the best approach to safely and cost effectively meet the project and Client goals.

FACILITY DECONTAMINATION AND DEMOLITION

Hallen Environmental has the proven capability to support facility decontamination and demolition projects. HES personnel have orchestrated and served as environmental project managers on sites that have involved asbestos and lead paint abatement, structure demolition, and Brownfield redevelopment. Our ability to effectively self perform, as well as integrate various specialty subcontractor personnel, ensures that projects are successfully executed.

SITE CLEARANCE EXCAVATION

Our employees have managed and self performed an array of activities in support of preparing sites for construction or remediation. These activities have included oversight, management of material excavation, grading, utility clearance, as well as surveying and pre-construction environmental sampling and contamination delineation.

Hallen Environmental personnel have worked expertly with general contractors and leading construction firms during pre-construction activities including the siting and permitting phases of the process. We have worked to blend knowledge of regulatory policies, reporting procedures and permitting requirements to capably serve Clients through multiple phases of a construction or remediation project life cycle and meet aggressive project schedules.

REMEDIAL CONSTRUCTION AND SITE CLEAN UP

Hallen Environmental personnel have managed and worked on projects involving almost every technology used in the environmental field to complete projects in accordance with the Client's wishes.

From pressure washing a concrete loading dock to constructing and operating a contaminated water treatment system, from excavating a single drum containing

unknown hazardous wastes to constructing and operating a bio-pile installed to reduce petroleum hydrocarbons in contaminated soils. The breadth and depth of our personnel's experience is expansive. However, the core competencies of Hallen Environmental are in the following areas:

1. Local Permitting,
2. Site Clearing and Grubbing / Soil Erosion and Sediment Control,
3. Road/Paving removal, Dismantling & Demolition,
4. Excavation, staging, load-out,
5. UST/AST cleaning, cutting, sizing and removals,
6. Screening / Sizing / Crushing / Recycling,
7. Backfill, Compaction, paving, road repairs and site restoration,
8. Transportation and Disposal of Haz, Non-Haz, Recyclables, Beneficial re-use materials,
9. System construction, repair and start-up,
10. Process system set-up and operations,
11. Horizontal/directional drilling,
12. Dewatering and water treatment, and;
13. Sub-surface utility installation, cut & cap, relocation, rehabilitation.

With the exception of the physical transportation and disposal of hazardous waste, Hallen Environmental stands as a rare contractor in the Tri-State area able to self perform all of the listed core competencies above.

HAZARDOUS WASTE MANAGEMENT

Background

Hallen Environmental offers critical and necessary professional and technical support services associated with industrial and remedial waste management. Whether hazardous or non-hazardous wastes, Hallen Environmental can provide the Client with professional quality, cost-effective disposal alternatives. Following is a discussion of the technical and support services offered.

Waste Characterization

Unless completed by others, Hallen Environmental will utilize trained personnel to visit your site and collect a representative sample, or samples, of waste that require(s) disposal. The sample(s) will be submitted to a certified laboratory for the purpose of analytical waste characterization. The data received will then form the basis for the selection of disposal alternatives.

Waste Disposal Consultation

The trained waste Transportation & Disposal (T&D) coordinator at Hallen Environmental will evaluate the data related to a specific waste stream and will provide the Client with the most cost effective method of disposal subject to Client specific requirements. Treatment, recycling, thermal desorption, incineration or land disposal are among the options considered. Through the process of evaluation, Hallen Environmental will work with the Client and/or engineer to insure that the material is properly qualified and documentation is completed for the chosen disposal method. Compliance with regulatory requirements for record keeping, transportation and certification are primary goals and responsibilities of the management of all waste materials.

TRANSPORTATION AND DISPOSAL

Hallen Environmental is able to provide transportation, disposal, recycling and container services for impacted soil, sludge, ash, water, railroad ties, asphalt, concrete, scrap steel, demolition debris and much more.

Since our company is not limited to one transportation company and/or disposal facility, we are able to provide our Clients with qualified options through our “one stop shopping” process where all environmental and Client specific needs are considered.

Each of Hallen Environmental's disposal outlets are pre-qualified against our standard “risk screening” method, periodically audited, and re-qualified to provide

HAZARDOUS WASTE MANAGEMENT (CONTINUED)

our Clients with an established and maintained degree of confidence. Our network of disposal outlets includes, but are not limited to, the following receiving facilities:

- Subtitle "C" Landfills
- Subtitle "D" Landfills
 - Beneficial Reuse
 - Non-Hazardous Material
 - Daily Cover/Contour Material
- Thermal Treatment/Recycling
- Incineration

Hallen Environmental personnel schedule and coordinate the transport and disposal of materials as contractually required. Our personnel meticulously document that all applicable regulatory requirements have been followed. We can provide our Clients with the following transportation equipment and container services:

Transportation Equipment

Roll-Off Containers
Dump Trailers
Water Tankers
Vacuum Trucks
Intermodal/Rail
Gondola/Rail
Marine/Barge
Walking Floor Trailers
Van Trailers

Container Services

Pails
Drums
Cubic Yard Boxes (T-Packs)
Gondola Containers
Dewatering Containers
Fractionation Tanks
Mud Boxes
Polyethylene Tanks
Steel Tanks
Vac-tainers

EMERGENCY / RAPID RESPONSE

Background

Although not an Emergency Response Contractor at our core, Hallen Environmental has the experience, local facilities, equipment and overall capabilities to respond to Emergency (usually considered to mean within 2-4 hours) and Rapid (usually considered to mean within 1-2 days) responses. When either situation occurs, Hallen Environmental provides qualified, trained professionals who are equipped to respond quickly. The accidental release of a hazardous substance requires decisive and knowledgeable action designed to quickly control the spread of the contaminant and limit the impact to property. Health risks to populations in the surrounding environment must be evaluated and minimized. Potential legal and perceptual consequences must be moderated through strict and immediate regulatory compliance and reasoned, factual communication with the public and the media.

Services

Hallen Environmental's professional staff provides these services that focus immediately upon stabilizing the situation, but extend to minimization of the financial, legal and environmental issues that may soon follow. In each response situation, several critical issues must be dealt with quickly and decisively. Decision-making must be based upon experience, knowledge and management skills.

Among the potential issues which may arise in a response situation are:

- Health risk considerations,
- Risk to the environment,
- Damage to property,
- Containment of the problem,
- Cost minimization, and;
- Legal and political consequences.

Hallen Environmental fully understands the critical nature of each of these important components in a response situation and is prepared to address each with a decisive, timely and effective response.

Our professional staff is dedicated to providing response services that include, initially, stabilization of the event, but follows with expert assistance in dealing with the media, law enforcement, and regulatory authorities. Our experience in mitigating contaminated sites provides us with a solid background in the implementation of techniques and products to quickly stabilize the response situation.

EMERGENCY / RAPID RESPONSE (Continued)

The critical initial response is followed by professional consultation and recommendations regarding follow-up measures that may be necessary for property and site restoration. From initial reaction to site restoration, Hallen Environmental offers emergency and rapid response services based upon the application of sound scientific and engineering principles tempered with keen business judgment and common sense.

Though not typical, Hallen rapidly responded with over 100 personnel and a significant fleet of backhoes and support equipment to facilitate the rapid and critical shut down, rerouting and restoration of Gas and Electrical services for Con Edison in Manhattan after the September 11th, 2001 World Trade Center terrorist attack. Working around the clock for 10 days Hallen successfully completed all of the service work with workers, often donning Level C protection, facing numerous, at that time, un-quantified contaminants from the ground zero collapse of the two towers and collateral damage to other buildings and facilities.

HEALTH AND SAFETY SERVICES

HEALTH AND SAFETY SERVICES

Hallen Environmental is committed to providing a safe environment for our employees, Clients and the public. We have an excellent safety record and all our employees receive an initial 40-hour HAZWOPER training, as well as annual refresher courses. More than 50% of our employees are CPR, First Aid and Trenching / Excavation competent person certified. Employees also receive specialized training in hazards unique to their specific environmental project. Although traditionally provided just to our employees, at Client request, Hallen Environmental can offer our Clients the following health and safety training programs in compliance with OSHA and other applicable regulations:

- 40 Hour Health & Safety Training of Hazardous Waste Site Activities; 29 CFS 1910.120-HAZWOPER
- 8 Hour Advanced Annual Refresher Training; 29 CFR 1910.120-HAZWOPER
- 24 Hour Emergency Response Training; 29 CFR 1910.120
- 8 Hour “Emergency First Responder” Operations Level OSHA; 29 CFR 1910.120
- Confined Space Entry Safety/Rescue Training; 29 CFR 1910.146
- First Aid/Cardiopulmonary Resuscitation (CPR)
- General Industry and Construction Safety Compliance Training
- HAZCOM (Employee Right to Know)
- In-Plant Spill Response
- Personnel Protective Equipment Consultation
- Specialized Training: Blood borne Pathogen, Lockout/Tag out, Emergency Coordinator

Hallen Environmental can also offer guidance with Emergency / Rapid Response situations including, but not limited to:

- Emergency Response Site Assessment,
- On-Site Identification of Materials and Handling Procedures,
- Short Term Ground Water Recovery and Treatment System Design, Permitting, Installation and Maintenance,
- Accelerated Chemical Characterization of Contaminated Media, and;
- Waste Management Consultation Services.

Our Health and Safety officers customize safety-training sessions for general and/or specific work-related activities and can provide training services on-site, at our Client’s office, and/or at our corporate office. For example, Hallen Environmental uses customized training CD-ROM for employees throughout the company who are trained via their own computer. This method of training allows employees to receive standardized work-related safety training at the convenience of their own scheduling.

HEALTH AND SAFETY SERVICES (CONTINUED)

CONSTRUCTION SAFETY TRAINING AND SITE SAFETY MANAGEMENT

Hallen Environmental Services routinely provides initial and refresher training to construction staff that may be involved with activities at contaminated work sites. We also provide auditing services that allow companies to “benchmark” the overall quality, effectiveness and responsiveness of their safety programs.

Hallen Environmental can provide Certified Industrial Hygienists, Certified Safety Professionals, and/or experienced safety staff to perform site safety management. These individuals can be assigned on a variable, as needed basis, or on a long-term basis to support multi-year durational projects.

The following section provides summary project abstracts to demonstrate some of the experience Hallen has gained from the completion of environmental remediation and site clean up projects since 1996.