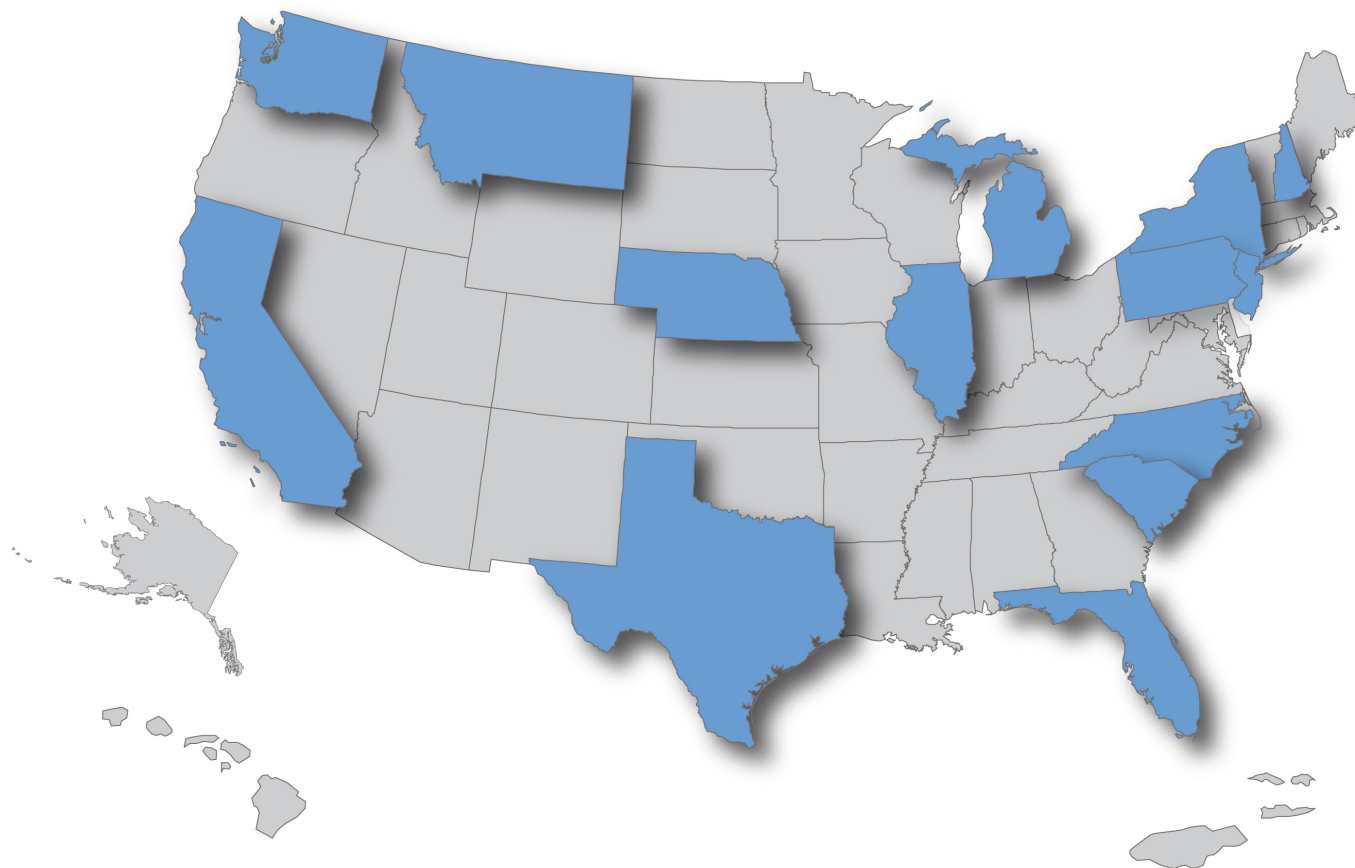


The National LUST Cleanup Backlog: A Study of Opportunities





THE NATIONAL LUST CLEANUP BACKLOG: A STUDY OF OPPORTUNITIES

STATE SUMMARY CHAPTER: NEW JERSEY

LIST OF ACRONYMS

BDA	Brownfields Development Area
BRMINCA	Bureau of Risk Management, Initial Notice, and Case Assignment
BSCM	Bureau of Southern Case Management
CEA	Classification Exception Area
EPA	United States Environmental Protection Agency
ESA	Expedited Site Assessment
FR	Financial Responsibility
FY	Fiscal Year
LSRP	Licensed Site Remediation Professional
LUST	Leaking Underground Storage Tank
MNA	Monitored Natural Attenuation
NA	Not Applicable
NFA	No Further Action
NJDEP	New Jersey Department of Environmental Protection
NJEMS	New Jersey Environmental Management System
RP	Responsible Party
SRRA	Site Remediation Reform Act
UST	Underground Storage Tank
UST Fund	Petroleum Underground Storage Tank Remediation, Upgrade, and Closure Fund

EXECUTIVE SUMMARY

Leaks from underground storage tanks (USTs) threaten America's groundwater and land resources. Even a small amount of petroleum released from a leaking underground storage tank (LUST) can contaminate groundwater, the drinking water source for nearly half of all Americans. In surveys of state water programs, 39 states and territories identified USTs as a major source of groundwater contamination.² As the reliance on our resources increases due to the rise in population and use, there is a correspondingly greater need to protect our finite natural resources.

From the beginning of the UST program to September 2009, more than 488,000 releases were confirmed from federally-regulated USTs nationwide. Of these confirmed releases needing cleanup, over 100,000 remained in the national LUST backlog. These releases are in every state, and many are old and affect groundwater. To help address this backlog of releases, the United States Environmental Protection Agency (EPA) invited 14 states to participate in a national backlog characterization study.

ANALYSIS OF NEW JERSEY DATA

New Jersey's Department of Environmental Protection (NJDEP) has made significant progress toward reducing its LUST cleanup backlog. As of March 2009, NJDEP had completed 6,523 LUST cleanups, which is 60 percent of all known releases in the state. At the time of data collection, there were 4,268 releases remaining in its backlog.³ To most effectively reduce the national cleanup backlog, EPA believes that states and EPA must develop backlog reduction strategies that can be effective in states with the largest backlogs. EPA invited New Jersey to participate in its national backlog study because New Jersey has one of the ten largest backlogs in the United States.

In this chapter, EPA characterized New Jersey's releases that have not been cleaned up, analyzed these releases based on categories of interest, and developed potential opportunities for NJDEP and EPA to explore that might improve the state's cleanup progress and reduce its backlog. Building on the potential cleanup opportunities identified in the study, EPA will continue to work with NJDEP to develop backlog reduction strategies.

In New Jersey, as in every state, many factors affect the pace of cleaning up releases such as the availability and mechanisms of funding, statutory requirements, and program structure. The recent economic downturn has also had an impact on the ability of many states to make progress on cleanups.

EPA included potential cleanup opportunities in this report even though current circumstances in New Jersey might make pursuing certain opportunities challenging or unlikely. Also, in some cases, NJDEP is already using similar strategies as part of its ongoing program. The findings from the analysis of NJDEP's data and the potential cleanup opportunities are summarized

- 1 Data were provided in March 2009 by NJDEP staff and are not identical to the UST performance measures found on EPA's website, available at: www.epa.gov/oust/cat/camarchv.htm.
- 2 EPA, *National Water Quality Inventory: 2000 Report*, pp. 50-52. www.epa.gov/305b/2000report/chp6.pdf.
- 3 EPA tracks individual releases rather than sites in its performance measures. Therefore, the analyses in this report account for numbers of releases, not sites.
- 4 Unknown media releases include those releases where the media is unknown as well as those releases where, based on available data, it was not possible to identify the media contaminated.

New Jersey LUST Data By the Numbers¹

National Backlog Contribution	4.0%
Cumulative Historical Releases	10,791
Closed Releases	6,523/60%
Open Releases	4,268/40%
Stage of Cleanup	
Confirmed Release	33/1%
Site Assessment	2,895/68%
Remediation	1,340/31%
Media Contaminated	
Groundwater	3,489/82%
Soil	740/17%
Unknown ⁴	39/1%
Median Age of Open Releases	12.2 years

below in six study areas: stage of cleanup, media contaminated, responsible party (RP) recalcitrance, release priority, number of releases per RP, and geographic clusters.

Stage of Cleanup *(see page NJ-10 for more details)*

New Jersey Finding	Potential Opportunity	Releases
34 percent of releases are either: <ul style="list-style-type: none"> • 5 years old or older and site assessment has not started; or • 10 years old or older and in site assessment. 	<ul style="list-style-type: none"> • Encourage RPs to expedite site assessments at old releases. • Implement enforcement actions at stalled releases. • Encourage RPs and stakeholders to examine public and private funding options. 	1,472
28 percent of releases are: <ul style="list-style-type: none"> • 10 years old or older; and • in remediation. 	Continue to use a systematic process to explore opportunities to accelerate cleanups and reach closure, such as: <ul style="list-style-type: none"> • continuing to periodically review release-specific treatment technologies; • reviewing site-specific cleanup standards; • continuing to implement institutional or engineering controls; and • pursuing alternative funding mechanisms or enforcement actions for old releases that are stalled. 	1,199

NJDEP's data show many old releases in the early stages of cleanup. However, the data might understate the level of remedial activity that has taken place at releases. For many releases in the Site Assessment stage, preliminary remediation efforts to remove contamination occur concurrently with groundwater and soil delineation efforts. Although these releases have started remedial action/early excavation to address contamination, the releases might not warrant nor necessarily have been granted final remedial action work plan approval and so the releases are not classified in this report as being in the Remediation stage. For those old releases where no remedial activities have begun, enforcement actions could be appropriate to move releases toward remediation and closure. EPA believes it is important for NJDEP to explore opportunities to accelerate cleanups at older releases and to make progress toward bringing all releases to closure.

Media Contaminated *(see page NJ-12 for more details)*

New Jersey Finding	Potential Opportunity	Releases
28 percent of releases: <ul style="list-style-type: none"> • contaminate groundwater; • are in remediation; and • are 10 years old or older. 	Systematically evaluate cleanup progress at old releases with groundwater impacts and encourage alternative cleanup technologies or other strategies to reduce time to closure.	1,190
16 percent of releases: <ul style="list-style-type: none"> • contaminate only soil; and • are not classified in the Remediation stage. 	Explore opportunities to move releases to remediation and closure, including: <ul style="list-style-type: none"> • encouraging RPs to move forward with cleanup under licensed site remediation professionals; • initiating enforcement actions at stalled releases; • continuing to target easy to close releases and moving them to closure; and • encouraging RPs to use expedited site assessment to move releases more quickly into remediation. 	669

Releases contaminating groundwater have always been the largest part of the national backlog and 82 percent of open releases in New Jersey are documented as contaminating groundwater. In general, groundwater contamination is more technically complex to remediate and takes longer to clean up than soil contamination. For old, complex cleanups where long-term remediation is underway, EPA believes it is important to have a system in place for periodic reevaluation of cleanup progress and to reconsider whether the cleanup technology being used is still optimal.

Soil contamination is typically easier to remediate than groundwater contamination. NJDEP's data show that many of New Jersey's releases with soil-only impacts are in the early stages of cleanup. As discussed above in the Stage of Cleanup section, NJDEP conducts some preliminary remedial activities simultaneously with site assessment activities. In this study, releases are considered to be in the Remediation stage when a final remedial action work plan is approved. Therefore, the status might not accurately reflect the ongoing remediation activities at releases. In addition, for releases that contaminate both groundwater and soil only, a portion of the releases never have a formal remedial action work plan. NJDEP estimates that of the groundwater releases, 25 to 35 percent will not have a formal remedial action work plan and the percentage for the soil only releases is much greater at 65 to 75 percent. These releases go from assessment/excavation to monitoring and closure. EPA believes NJDEP should

continue to make progress toward closure for all of its LUST releases. In cases where action is not proceeding NJDEP should consider enforcement.

RP Recalcitrance *(see page NJ-14 for more details)*

New Jersey Finding	Potential Opportunity	Releases
38 percent of releases are associated with recalcitrant RPs.	Consider enforcement actions to address releases with recalcitrant RPs.	1,612

RPs are listed as recalcitrant in NJDEP's database if required reports are overdue. Releases with recalcitrant RPs are less likely to have begun remediation and are therefore slowing the progress of cleanups in New Jersey. Increased use of enforcement actions by NJDEP, especially applied to RPs for soil cleanups, could yield more closures as well as influence other recalcitrant RPs to resume and complete cleanup activities.

Release Priority *(see page NJ-15 for more details)*

New Jersey Finding	Potential Opportunity	Releases
1 percent of releases: <ul style="list-style-type: none"> • are high priority; and • are not classified in the Remediation stage. 	Explore options for moving high priority releases toward closure such as: <ul style="list-style-type: none"> • using enforcement actions to initiate the cleanup of stalled releases; • expediting site assessments of all releases to ensure that all releases are appropriately ranked; • continuing to ensure that releases with immediate risk are actively being worked on; and • moving all releases toward closure. 	42
3 percent of releases (not including releases that contaminate soil only): <ul style="list-style-type: none"> • are not classified in the Remediation stage; and • have unknown or incomplete priority rankings. 	Consider options to move unranked releases toward remediation and closure such as: <ul style="list-style-type: none"> • assign and track priority for these releases to identify releases that: <ul style="list-style-type: none"> ○ require expedited cleanups; or ○ can be closed with minimal effort; and • examine public and private funding options such as petroleum brownfields grants for low priority releases. 	353

NJDEP uses a priority ranking system based on wellhead protection, receptor pathways, and source identification. NJDEP follows its priority rankings as a matter of policy. However, it makes exceptions on a case-by-case basis, allowing some releases to be worked on for economic development reasons. NJDEP stated it typically does not prioritize lower risk releases that contaminate soil only. However, excluding these releases, New Jersey has releases with unknown, incomplete, or high priority rankings that remain in early stages of cleanup. EPA will work with NJDEP to develop strategies to move all releases toward closure. NJDEP has stated that all high priority releases have had initial remedial action to address impacts to receptors and, as discussed in the Stage of Cleanup section above, many have had additional remedial activities but do not have final remedial action work plan approval.

Number of Releases per RP *(see page NJ-16 for more details)*

New Jersey Finding	Potential Opportunity	Releases
34 percent of releases are associated with 17 RPs each with 10 or more releases.	Explore possibilities for multi-site agreements (MSAs) or enforcement actions with parties associated with multiple open releases.	1,430

EPA analyzed the number of releases per RP to identify the RPs that are the largest potential contributors to the state's cleanup backlog. EPA was able to identify 17 RPs that are each responsible for 10 or more releases and account for 34 percent of the New Jersey backlog. NJDEP and EPA could use these data to identify potential participants for multi-site strategies to clean up groups of releases.

Geographic Clusters *(see page NJ-17 for more details)*

New Jersey Finding	Potential Opportunity	Releases
64 percent of releases are clustered within a one-mile radius of five or more releases.	Target releases within close proximity for resource consolidation opportunities.	Targeted number of releases ⁵

Another multi-site approach that NJDEP uses is targeting cleanup actions at geographically-clustered releases. This approach offers opportunities for new community-based reuse efforts, using economies of scale, and addressing commingled contamination. New Jersey has created Brownfields Development Areas (BDAs) to enhance revitalization for areas and communities affected by the presence of brownfields. EPA would like to work with NJDEP to explore opportunities to promote and enhance the understanding and use of BDAs to address LUST releases. EPA also intends to work with the states to conduct further geospatial analyses on clusters of open releases in relation to RPs, highway corridors, local geologic and hydrogeologic settings, groundwater resources, and/or communities with environmental justice concerns. These analyses might reveal additional opportunities for backlog reduction.

CONCLUSION

This chapter contains EPA's data analysis of New Jersey's LUST cleanup backlog and identifies potential opportunities to reduce the backlog in New Jersey. EPA discusses the findings and opportunities for New Jersey, along with those of 13 additional states, in the national chapter of this report. EPA will work with states to develop potential approaches and detailed strategies for reducing the backlog. Development of strategies could involve targeted data collection, reviewing particular case files, analyzing problem areas, and sharing best practices. Final strategies could involve EPA actions such as using additional program metrics to show cleanup progress, targeting resources for specific cleanup actions, clarifying and developing guidance, and revising policies. EPA, in partnership with states, is committed to reducing the backlog of confirmed UST releases and to protecting the nation's groundwater, land, and communities affected by these releases.

⁵ Opportunities marked as "targeted number of releases" relate to geographic opportunities that will address a limited number of releases within select designated geographic areas.

PROGRAM SUMMARY

State LUST Program Organization and Administration

Several bureaus within the New Jersey Department of Environmental Protection (NJDEP) are responsible for oversight of leaking underground storage tank (LUST) cleanups.⁶ Bureau of Risk Management, Initial Notice, and Case Assignment (BRMINCA) (formerly the Bureau of Case Assignment and Initial Notice) staff oversee initial report submittals and, where possible, issue letters of No Further Action (NFA) for cases that can be closed based on an initial report showing that cleanup standards have been met and no further remediation is needed to close the release. Bureau of Underground Storage Tanks staff administer technical oversight of active remediation for cases that cannot be closed by BRMINCA. Bureau of Southern Case Management (BSCM) (formerly the Bureau of Operation, Maintenance, and Monitoring) staff provide oversight of most cleanups following remedial action work plan approval. Bureau of Enforcement and Investigation staff are responsible for enforcement activities.

New Jersey's Site Remediation Reform Act (SRRA), signed into law on May 7, 2009, enlists the resources of licensed site remediation professionals (LSRPs) and establishes mandatory timeframes related to release investigation and remedial activities. LSRPs work independently and without department pre-approval, and are responsible for conducting release investigation and remediation and issuing response action outcomes. They answer to a licensing board and their work is audited by NJDEP staff. SRRA is expected to accelerate cleanups and allow NJDEP to adjust its resources to a robust auditing and enforcement program. The LSRPs address a broader universe of sites than just federally-regulated LUST sites; approximately 19,000 sites are covered under SRRA.

Cleanup Financing

Established in 1997, the Petroleum Underground Storage Tank Remediation, Upgrade, and Closure Fund (UST Fund) is funded by a state corporate business tax. The UST Fund is managed within the New Jersey Economic Development Authority and is administered jointly by NJDEP. The UST Fund does not function as a method of meeting financial responsibility (FR) requirements and most RPs use private insurance to fund cleanups. If the remediation is not covered by the insurance carrier, RPs must use private funds or state or commercial financing as their FR mechanism. Grants and loans from the UST Fund can be applied to the closure, upgrade, and remediation of state-regulated petroleum underground storage tanks (USTs) where applicable.¹⁰ To be eligible, the owner/operator must own fewer than 10 USTs in New Jersey, have a net worth of less than \$3 million, and be unable to obtain a commercial loan. The UST Fund has provided grants and loans to eligible owners and operators at 113 closed releases and 275 open releases (6 percent of the backlog).¹¹ As of June 30, 2010, the UST Fund is no longer accepting new applications for USTs that are subject to New Jersey's UST regulations (N.J.A.C. 7:14B) with the following exceptions: 1) supplemental applications can be submitted for cases with existing applications submitted prior to

New Jersey LUST Program At a Glance

Cleanup Rate

In fiscal year (FY) 2009, NJDEP confirmed 165 releases and completed 150 cleanups.⁷

Cleanup Financing

Responsible parties (RPs) must have insurance to cover cleanups.

Cleanup Standards

Risk-based decision making standards based on site-specific conditions are used.

Priority System

NJDEP uses a nine-tier priority system based on risk and source identification.

Releases per Project Manager

Each project manager is, on average, responsible for 93 open releases.⁸ Under SRRA, project manager responsibilities will shift to auditing and enforcement as LSRPs assume responsibility for site investigation and remedial activities.

Administrative Funding (FY 2007)

\$5.3 million⁹

⁶ For more information, see www.state.nj.us/dep/srp/bust/contact.htm.

⁷ Based on FY 2009 *UST Performance Measures End of Year Activity Report*.

⁸ Estimate provided by NJDEP staff.

⁹ This is the total of UST-related administrative expenditures, as reported to EPA.

¹⁰ For more information, see: www.nj.gov/dep/srp/finance/ustfund/.

¹¹ These data were obtained from the New Jersey Environmental Management System (NJEMS).

June 30, 2010, and 2) new applications can be submitted for newly discovered USTs that are not in operation and for which the application is submitted within 18 months of discovery.

Release Prioritization

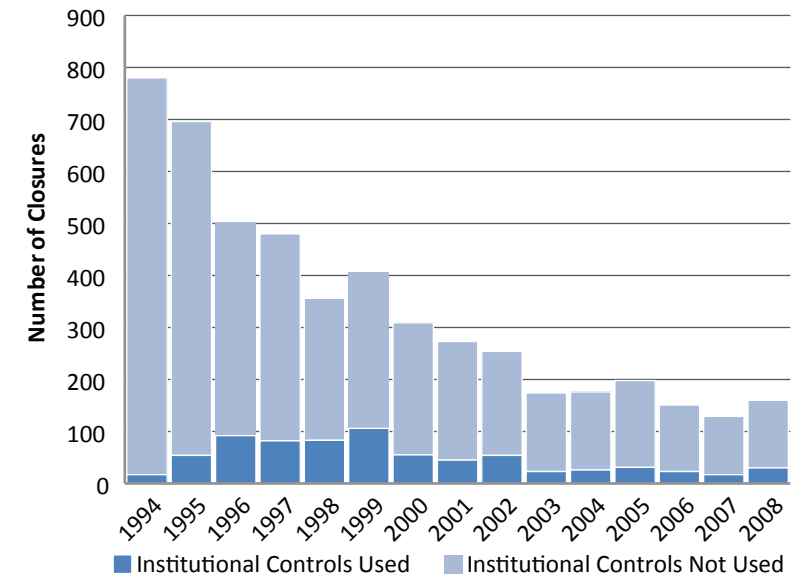
NJDEP uses a priority ranking system based on wellhead protection, receptor pathways, and source identification. Releases are categorized from 1 to 9, with Priority 1 being the highest priority. According to NJDEP staff, it is standard practice to not rank releases with soil impacts due to their inherently low risk. Cleanup rankings change whenever new information is received related to site risks. In some cases, once risks have been addressed through remedial activities, a high priority release will be reclassified as lower priority. NJDEP follows its prioritization system as a matter of policy and can address releases for economic development reasons as well as risk priority.

Cleanup Standards

NJDEP uses risk-based decision making for all LUST cases. NJDEP's risk-based decision making approach integrates risk assessment practices and traditional components of the corrective action process to ensure that appropriate and cost-effective remedies are selected and that limited resources are properly allocated. A risk-based cleanup could include institutional controls such as a groundwater Classification Exception Area (CEA) or a Declaration of Environmental Restriction, and/or an alternate direct contact soil cleanup standard.

Once source material has been removed, the case must demonstrate a decreasing trend in contaminants and then a release may enter monitored natural attenuation (MNA), typically for two years. Data collected under the MNA process are used to predict how long the contaminants will remain on site. Once institutional controls (e.g., the establishment of a CEA) are in place, the release is given an NFA determination. The RP must resample the site after a designated time period to validate the attenuation predictions. If contaminants remain, a new attenuation model is developed, the institutional control is extended, and the site retains its NFA status. The number of releases closed with institutional controls increased in the late 1990s and have accounted for between 10 and 18 percent of annual closures between 1996 and 2008 (Figure 1, above right).

Figure 1. Use of Institutional Controls over Time



State Backlog Reduction Efforts

NJDEP has pursued several backlog reduction efforts. Its largest effort involved increasing staffing and holding overtime sessions between 1992 and 1996. In a separate effort, NJDEP initiated its Cooperative Venture program in 1995 to work with UST owners and operators in developing prioritized and mutually agreed-on cleanup schedules. Review of this program began in 2003 and findings show limited success with this program. Also, in addition to regular reviews during which case managers focus efforts to process cases that are near to closing or can be closed, NJDEP has pursued specific actions to identify candidate releases for no remediation or no further action needed prior to closure. This process included establishment of an initial notice group, and New Jersey's BSCM is working with a contractor and EPA Region 2 to conduct file reviews. The most recent and notable backlog reduction effort is the passage of SRRA, which designates LSRPs to perform investigations and remedial actions to help streamline and accelerate the remediation of releases in New Jersey.

ANALYSIS AND OPPORTUNITIES

In this study, EPA analyzed New Jersey's federally-regulated releases that have not been cleaned up (open releases). EPA conducted a multivariate analysis on all of NJDEP's data.¹² This technique provided an objective analysis of multiple release characteristics and allowed EPA to highlight the traits most commonly associated with older releases. Next, EPA divided the open releases into groups that might warrant further attention. EPA used descriptive statistics to examine the distribution of releases by age of release and stage of cleanup and highlighted findings based on NJDEP's data.¹⁴ EPA then identified potential opportunities for addressing particular groups of releases in the backlog. Many releases are included in more than one opportunity. These opportunities describe actions that EPA and NJDEP might use as a starting point for collaborative efforts to address the backlog. Although EPA's analysis covered all releases in New Jersey, there are 340 releases that are not included in any of the subsets identified in the findings or opportunities due to the way EPA structured the analysis. These releases might also benefit from some of the suggested opportunities and strategies.

EPA's analyses revealed six areas of New Jersey's backlog with potential opportunities for its further reduction:

- Stage of cleanup
- Media contaminated
- RP recalcitrance
- Release priority
- Number of releases per RP
- Geographic clusters

LUST Data Source

Electronic data for LUST releases occurring between October 1979 and February 2009 were compiled with NJDEP staff in 2008 and 2009.¹³ Data were obtained from NJDEP's NJEMS and selected based on quality and the ability to address areas of interest in this analysis.

¹² For a detailed description of the analytic tree method, see Appendix A.

¹³ For a detailed description of the New Jersey data used in this analysis, see the Chapter Notes section.

¹⁴ For a detailed description of release stages, see the Chapter Notes section (Stage of Cleanup Reference Table).

STAGE OF CLEANUP

As of March 9, 2009, the New Jersey backlog consisted of 4,268 open releases. EPA analyzed the age of LUST releases and their distribution among the stages of cleanup. To facilitate analysis, EPA classified New Jersey’s open releases into three stages of cleanup: the Confirmed Release stage (releases where assessments have not begun), the Site Assessment stage (releases where assessments have begun), and the Remediation stage (releases where final remedial action work plans have been approved).¹⁵ While EPA grouped the releases into linear stages for this analysis, EPA recognizes that cleanups do not always proceed in a linear fashion. Cleanup can be an iterative process where releases go through successive rounds of site assessment and remediation. However, in the long run, this approach might be both longer and more costly. Acquiring good site characterization up front can accelerate the pace of cleanup and avoid the extra cost of repeated site assessment.

Since New Jersey’s LUST program began, NJDEP has closed 6,523 releases, half of which were closed in fewer than 2.0 years (Figure 2 below). The young median age of closed LUST releases might be attributable to the closure of relatively easy to remediate releases. BRMINCA, within NJDEP, reviews initial reports and identifies and closes releases where the initial report shows that cleanup standards have been met and no further remediation is needed to close the release. Also, national program policy allows states to report confirmed releases that require no further action at time of confirmation as “cleanup completed.” Therefore, some releases are reported as confirmed and cleaned up simultaneously.

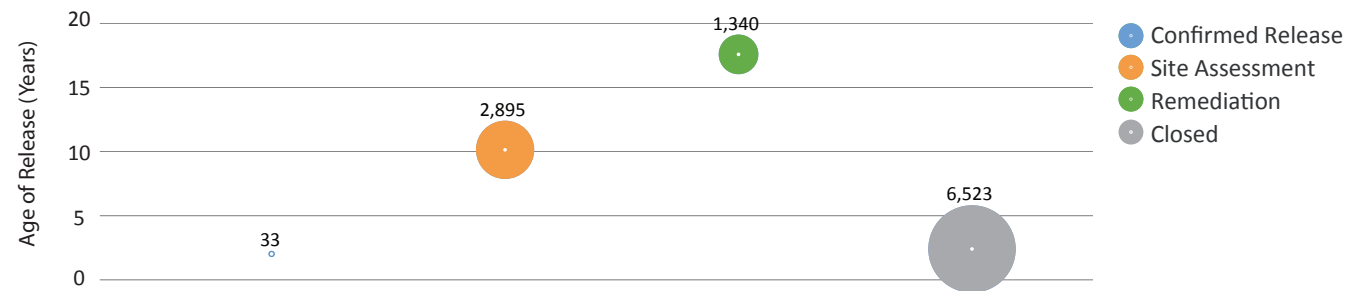
New Jersey Finding

34 percent of releases are either:

- 5 years old or older and site assessment has not started; or
- 10 years old or older and in site assessment.

Potential Opportunity	Releases
<ul style="list-style-type: none"> • Encourage RPs to expedite site assessments at old releases. • Implement enforcement actions at stalled releases. • Encourage RPs and stakeholders to examine public and private funding options. 	1,472
Releases 5 years old or older in the Confirmed Release stage	7
Releases 10 years old or older in the Site Assessment stage	1,465

Figure 2. Age of Releases among Stages of Cleanup



The white dot at the center of each circle represents the median age of releases. Each circle is labeled with, and scaled to, the number of releases within that stage. Included in the release counts and size of circles are 74 closed releases and 24 open releases for which age is unknown. These releases are not part of the median age calculation.

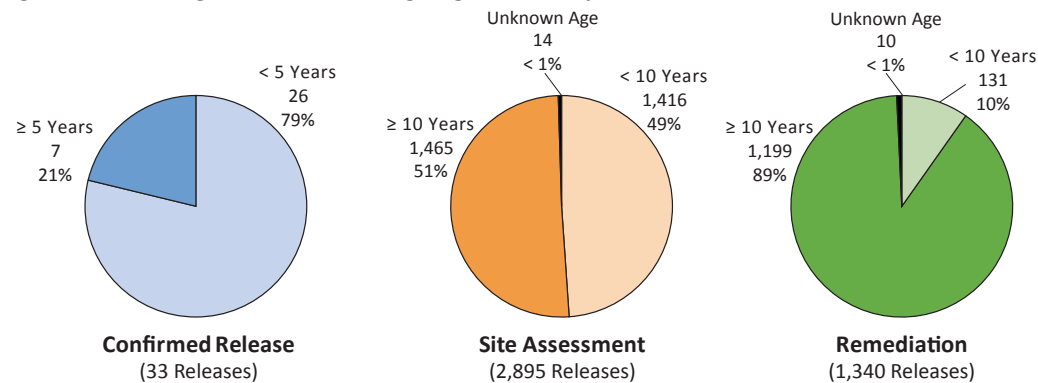
NJDEP has undertaken several efforts to identify candidate releases where no remediation or no further action is needed prior to closure and, as described above, has a program dedicated to identifying easy to close releases early in the cleanup process. Opportunities for closure with minimal effort are most likely found at lower priority releases where little or no remedial work is required to reach closure standards or at releases that have met closure standards but have not finished closure review.

New Jersey has many old LUST releases not in remediation. Figure 3 on page 11 shows the backlog of open releases by age and stage of cleanup. Figure 3 breaks out the 1,465 older releases in the Site Assessment stage (34 percent of the backlog) that have not entered the Remediation stage 10 years or more after the releases were confirmed. NJDEP’s data indicate that these

¹⁵ Releases were classified into stages based on available data and discussion with NJDEP staff. For more information, see the Chapter Notes section.

releases have not moved into remediation quickly. There is considerable overlap of activities among stages of cleanup, so this number might underestimate the amount of remedial activity underway at releases in the Site Assessment stage. For example, initial response actions, such as excavation of contaminated source material and free product removal, might be taken at the time of release confirmation. For many cases in the Site Assessment stage, efforts to remove contamination through excavation, vacuum extraction technologies, or chemical injection occur concurrently with groundwater and soil delineation efforts. Often, these releases have undergone some remedial action or early excavation to address contamination, but have not been granted full remedial action work plan approval and so are not classified in this report as Remediation stage. For those old releases where no remedial activities have begun, implementing enforcement actions might be appropriate to move releases toward remediation and closure. NJDEP should encourage RPs and communities to look at other funding options such as other public and private funding sources to facilitate assessment, cleanup, and reuse. For example, the state can encourage petroleum brownfields grants for low priority releases with no viable RP.

Figure 3. Release Age Distribution among Stages of Cleanup



NJDEP can also encourage RPs to use expedited site assessments to help rapidly characterize site conditions and move releases into remediation and to closure sooner. One of the tools available to both regulators and RPs is EPA's *Expedited Site Assessment (ESA)* guide.¹⁶ The guide explains the overall ESA process as well as specific site assessment tools and methods. Having RPs conduct their site assessments efficiently and quickly can help reduce the backlog.

New Jersey has many old releases in the Remediation stage. Twenty-eight percent of New Jersey's releases (1,199 releases) are in remediation and are 10 years old or older (Figure 3). This older group of releases represents 89 percent of the releases in remediation (Figure 3). Because EPA only has the date that a release was confirmed but not when it moved from one stage to the next (e.g., from assessment to remediation), EPA can calculate the overall age of the release but not the actual time spent in the Remediation stage. It is possible that some of these releases might have only recently begun remediation. NJDEP uses a systematic process to evaluate existing releases in remediation, focusing on MNA. NJDEP might also consider expanding that evaluation to include optimizing cleanup approaches. A systematic review of treatment technologies and cleanup standards in place at releases might identify opportunities to accelerate cleanups toward closure. New Jersey's new cleanup law is set up to move releases through the cleanup process more quickly as well. SRRAs requires RPs with releases

New Jersey Finding

28 percent of releases are:

- 10 years old or older; and
- in remediation.

Potential Opportunity

Releases

Continue to use a systematic process to explore opportunities to accelerate cleanups and reach closure, such as:

- continuing to periodically review release-specific treatment technologies;
- reviewing site-specific cleanup standards;
- continuing to implement institutional or engineering controls; and
- pursuing alternative funding mechanisms or enforcement actions for old releases that are stalled.

¹⁶ EPA's 1997 guidance document, *Expedited Site Assessment Tools For Underground Storage Tank Sites: A Guide For Regulators* (EPA 510-B-97-001), is available online at: www.epa.gov/OUST/pubs/sam.htm.

in the Site Assessment stage for more than 10 years to complete remedial investigations by May 2014. By May 2012, all remediation must be conducted by an LSRP.¹⁷ According to state staff, the combination of these activities should accelerate remedial progress at both old and new releases.

MEDIA CONTAMINATED

Groundwater is an important natural resource that is at risk from petroleum contamination. Old releases impacting groundwater make up the majority of New Jersey’s backlog. In general, groundwater contamination takes longer and is more expensive to clean up than soil contamination. In this study, EPA examined media as a factor contributing to the backlog. The following analysis classified media contamination into three categories: groundwater (3,489 open releases), soil (740 open releases), and “unknown” media, which includes releases with no media specified (39 open releases).¹⁸ NJDEP consistently tracks the type of media contaminated in its database and has very few releases with unknown media contamination.

In New Jersey, 82 percent of open releases (3,489 releases) involve groundwater contamination and have a median age of 14.5 years (Figure 4 below). In contrast, only 27 percent of closed releases (1,760 releases) involved groundwater contamination. These closed releases have a significantly younger mean age of 5.5 years compared to the median age of open releases. Of the 1,265 Remediation stage releases that impact groundwater, 94 percent (1,190 releases) are 10 years old or older (Figure 5 below to the left). This subset of older releases contaminating groundwater makes up 28 percent of New Jersey’s total backlog.

New Jersey Finding

28 percent of releases:

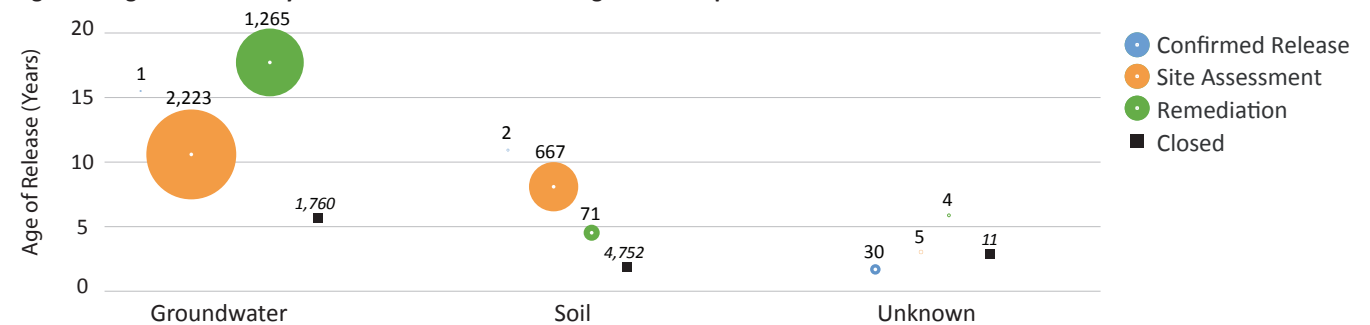
- contaminate groundwater;
- are in remediation; and
- are 10 years old or older.

Potential Opportunity

Releases

Systematically evaluate cleanup progress at old releases with groundwater impacts and encourage alternative cleanup technologies or other strategies to reduce time to closure.

Figure 4. Age of Releases by Media Contaminated and Stage of Cleanup



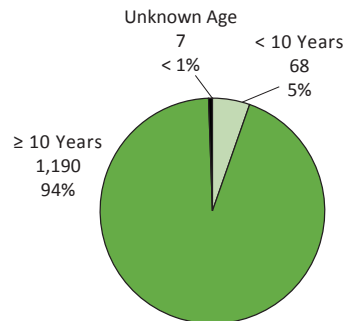
Squares indicating closed releases are not scaled to the number of releases in that stage.

Groundwater contamination is typically more complex and difficult to remediate. However, if NJDEP could identify opportunities to improve cleanup efficiencies, it might be able to accelerate the pace of cleanups. For example, encouraging RPs to reevaluate the cleanup progress, current contaminant levels, and treatment technologies might move releases through remediation faster. The use of institutional or engineering controls can also reduce the time to closure by eliminating exposure pathways and allowing for less stringent cleanup standards where protective and appropriate. NJDEP uses institutional controls as part of its systematic process of moving releases into MNA and closure. NJDEP data indicate that institutional controls are used at 10 to 18 percent of annual closures.

17 More information on SRRA, including additional cleanup milestones, is available at: www.state.nj.us/dep/srp/srra/.

18 For a detailed description of media contamination classifications, see the Chapter Notes section.

Figure 5. Age of Remediation Stage Releases with Groundwater Impacts



Releases that contaminate soil only are of concern because they represent a potential threat to groundwater resources and contaminate properties in neighborhoods and communities. Although contaminated soil can typically be cleaned up faster than contaminated groundwater, New Jersey has 740 releases contaminating soil only. Of soil-only cleanups, 90 percent (667 cleanups, 16 percent of the total backlog) remain in the Site Assessment stage and have a median age of 8.0 years (Figure 4). This categorization might not accurately reflect any remedial activities that have taken place at these releases because, according to NJDEP, releases with soil contamination typically have multiple rounds of soil removal and sampling prior to implementation of a final remedial action work plan. In addition, state staff indicated that only 25 to 35 percent of releases with soil-only impacts are ever formally classified as being in the Remediation stage because the RP chooses to conduct site assessment in concert with an excavation followed by post-remedial samples. Usually, once the sampling is complete, the release can be closed. The state encourages this practice when appropriate.

Soil contamination is typically easier to remediate than groundwater contamination. Encouraging RPs of pre-remediation soil cleanups to hire LSRPs for cleanup oversight might help expedite the cleanup of these releases.¹⁹ Other strategies for moving these releases forward include using enforcement actions and expediting site assessment to move releases quickly into remediation and continuing to target easy to close releases.

New Jersey Finding

16 percent of releases:

- contaminate only soil; and
- are not classified in the Remediation stage.

Potential Opportunity

Releases

Explore opportunities to move releases to remediation and closure, including:

669

- encouraging RPs to move forward with cleanup under LSRPs;
- initiating enforcement actions at stalled releases;
- continuing to target easy to close releases and moving them to closure; and
- encouraging RPs to use expedited site assessment to move releases more quickly into remediation.

¹⁹ Pre-remediation refers to releases in the Confirmed Release or Site Assessment stages.

RP RECALCITRANCE

New Jersey Finding

38 percent of releases are associated with recalcitrant RPs.

Potential Opportunity

Releases

Consider enforcement actions to address releases with recalcitrant RPs. 1,612

The NJDEP database tracks RPs as recalcitrant if required reports are overdue. Releases with recalcitrant RPs are less likely to have begun remediation and are therefore slowing the progress of cleanups in New Jersey. Releases with recalcitrant RPs account for 38 percent of the current backlog (1,612 releases), and 76 percent of these releases (1,231 releases) have not completed site assessment (Figure 6 below).

Figure 6. Age of Releases by Recalcitrance and Stage of Cleanup

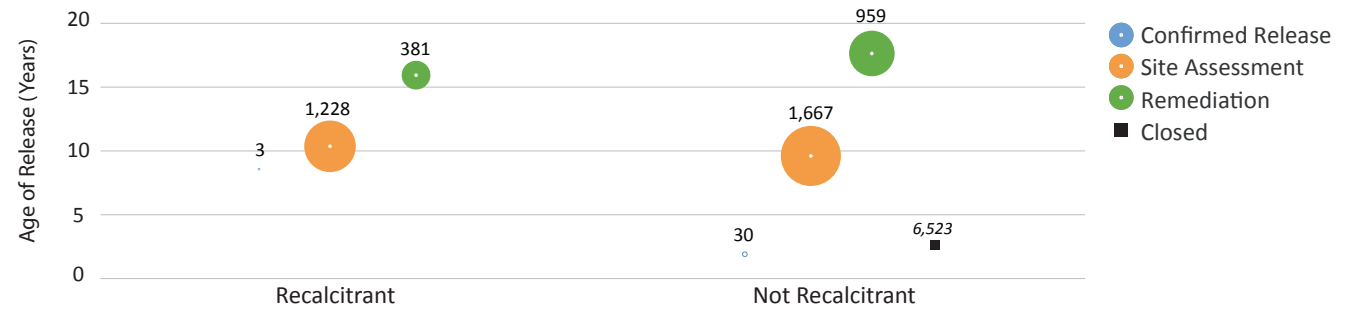
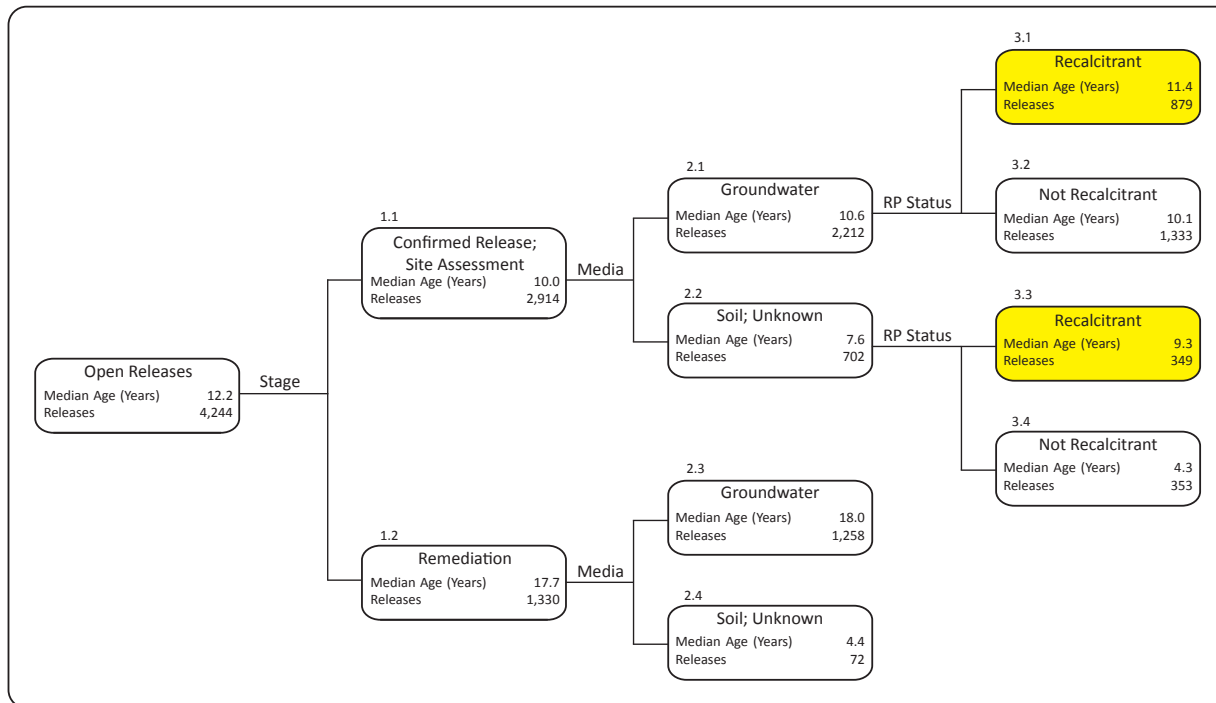


Figure 7. Tree Analysis of Open Release Age



Although Figure 6 suggests that the median ages of release for recalcitrant RPs are similar to those of releases with active RPs, further analysis of subsets of releases revealed more pronounced effects of recalcitrance. Figure 7 to the left illustrates that releases in the Confirmed Release or Site Assessment stage (Node 1.1) that impact groundwater (Node 2.1) and have recalcitrant RPs (Node 3.1) are older than releases with active RPs (Node 3.2). This age difference is even more significant for releases in the Confirmed Release or Site Assessment stage (Node 1.1) that impact soil or unknown media (Node 2.2) and have recalcitrant RPs (Node 3.3).

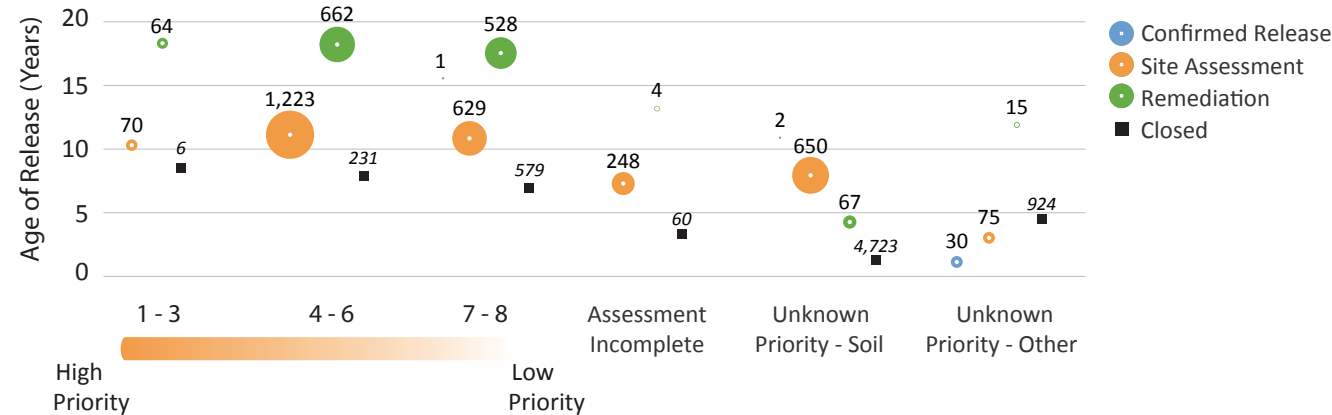
Efforts to prevent RP recalcitrance through increased use of enforcement actions, especially if applied to RPs with releases contaminating soil, could yield more closures, as well as spur other recalcitrant RPs to resume cleanup activities. According to NJDEP staff, once the LSRP program is fully functioning, the majority of staff resources will shift to enforcement.

RELEASE PRIORITY

Many state programs employ prioritization systems to decide how to best allocate state resources for state-funded assessments and cleanups and oversight of privately-financed cleanups. States approach cleanup prioritization differently; there might be opportunities within New Jersey's prioritization system to increase the number of closures. NJDEP follows its priority rankings as a matter of policy, but can make exceptions on a case-by-case basis.

The New Jersey backlog includes old releases of all priority ranks. NJDEP staff indicated that high priority cases (Priority 1, 2, and 3 cases) where receptors are impacted are to be investigated or remediated on an expedited timeframe. The data collected showed that 35 of the 70 high priority releases in the Site Assessment stage were confirmed 10 years ago or longer, and the 64 high priority releases (1 percent of the backlog) in the Remediation stage have a median age of 17.9 years (Figure 8 below).²⁰ In addition, NJDEP stated that initial remediation steps have been taken at all high priority sites to address risks to receptors. Although other interim remediation steps have occurred at some of these releases, they have not had final remedial action work plan approval. Since assessment and remediation often occur in tandem in New Jersey, NJDEP should explore opportunities to expedite site assessments and evaluate cleanup progress of high priority releases to ensure that all releases are appropriately ranked and moving toward remediation and closure. In cases where releases are stalled, NJDEP might want to consider enforcement actions, especially for high priority releases. EPA will work with NJDEP to develop strategies to move all releases toward closure and to continue to ensure that there are no immediate risks to human health and the environment from the high priority releases that have not been addressed.

Figure 8. Age of Releases by Release Priority and Stage of Cleanup



There are 353 releases not yet in remediation that have an unknown or blank priority ranking and that contaminate groundwater or unknown media.²¹ Of these releases, 105 releases (2 percent of the backlog) might have unknown priority

²⁰ Following data collection for this report, NJDEP staff indicated that 28 of the 70 high priority releases remaining in the Site Assessment stage should have been ranked lower. NJDEP staff addressed this data management issue by reclassifying these releases. There are 42 releases in the Site Assessment stage that remain ranked as high priority. NJDEP staff also indicated that although some releases remain high priority classifications, any direct risks at these releases have been mitigated.

²¹ According to NJDEP staff, it is standard practice to not rank releases that contaminate soil only due to their inherently low risk.

New Jersey Finding

1 percent of releases:

- are high priority; and
- are not classified in the Remediation stage.

Potential Opportunity

Releases

Explore options for moving high priority releases toward closure such as:

- using enforcement actions to initiate the cleanup of stalled releases;
- expediting site assessments of all releases to ensure that all releases are appropriately ranked;
- continuing to ensure that releases with immediate risk are actively being worked on; and
- moving all releases toward closure.

New Jersey Finding

3 percent of releases (not including releases that contaminate soil only):

- are not classified in the Remediation stage; and
- have unknown or incomplete priority rankings.

Potential Opportunity	Releases
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Consider options to move unranked releases toward remediation and closure such as:	353
<ul style="list-style-type: none"> • assign and track priority for these releases to identify releases that: <ul style="list-style-type: none"> ○ require expedited cleanups; or ○ can be closed with minimal effort; and • examine public and private funding options such as petroleum brownfields grants for low priority releases. 	

New Jersey Finding

34 percent of releases are associated with 17 RPs each with 10 or more releases.

Potential Opportunity	Releases
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Explore possibilities for multi-site agreements (MSAs) or enforcement actions with parties associated with multiple open releases.	1,430
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due to incomplete data entry. An additional 248 releases (6 percent of the backlog) have not completed risk characterization and, therefore, do not have enough data to assign a priority. Efforts to assign and track priority at these releases could identify high priority releases to be expedited or low priority releases to be closed with minimal effort or moved toward remediation. If some of the releases are not moving forward because the RP is no longer viable, NJDEP could consider petroleum brownfields grants for those releases that are lower priority.

NUMBER OF RELEASES PER RP

EPA analyzed the number of releases per RP to identify RPs that are the largest potential contributors to the state's cleanup backlog.²² Four RPs account for 24 percent of the New Jersey backlog (1,032 releases) (Table 1 to the right). Including these four RPs, 17 RPs are each responsible for 10 or more releases and account for 34 percent of the New Jersey backlog (1,430 releases).²³ NJDEP and EPA can use this information to identify potential participants for multi-site strategies to address these groups of releases. Focused efforts engaging these 17 RPs in collaboration or enforcement might expedite closure of many of these releases.

Table 1. RPs with 10 or More Releases

Type of RP	Number of Releases
1 Gasoline - Retail/Distribution/Refining	482
2 Gasoline - Retail/Distribution/Refining	299
3 Gasoline - Retail/Distribution/Refining	142
4 Gasoline - Retail/Distribution/Refining	109
5 Gasoline - Retail/Distribution/Refining	95
6 Gasoline - Retail/Distribution/Refining	73
7 Gasoline - Retail/Distribution/Refining	60
8 Other	26
9 Gasoline - Retail/Distribution/Refining	25
10 Government - State	20
11 Gasoline - Retail/Distribution/Refining	20
12 Government - State	17
13 Gasoline - Retail/Distribution/Refining	16
14 Gasoline - Retail/Distribution/Refining	13
15 Gasoline - Retail/Distribution/Refining	12
16 Gasoline - Retail/Distribution/Refining	11
17 Gasoline - Retail/Distribution/Refining	10
Total	1,430

²² NJDEP provided data on names of legally-responsible parties.

²³ No federal government entities were identified as having 10 or more releases in New Jersey.

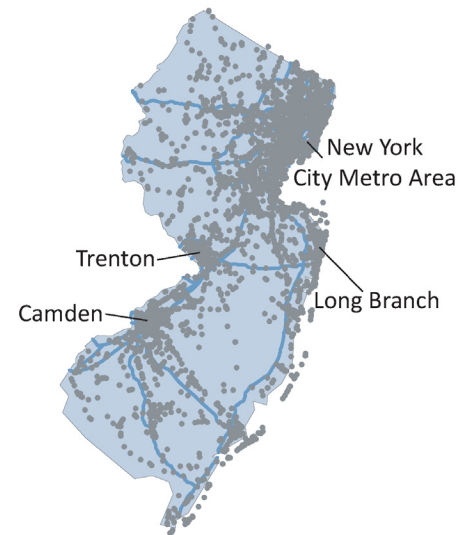
GEOGRAPHIC CLUSTERS

EPA performed a geospatial analysis to look for alternative ways to address the backlog. While releases in geographic clusters might not have the same RP, they tend to be located in densely populated areas and might present opportunities to consolidate resources and coordinate efforts. Geographic proximity can call attention to releases in areas of interest such as redevelopment, environmental justice, and ecological sensitivity.

EPA's analysis identified 2,745 releases (64 percent of releases) located within a one-mile radius of five or more releases (Figure 9 to the right). Of these releases, 1,655 (39 percent of releases) are located within a one-mile radius of 10 or more releases. Approaching the assessment and cleanup needs of an area impacted by LUSTs can be more effective than focusing on individual sites in isolation from the adjacent or surrounding area. Considering geographically-clustered releases might pave the way for new community-based revitalization efforts, utilize economies of scale to yield benefits such as reduced equipment costs, and present opportunities to develop multi-site cleanup strategies, especially at locations with commingled contamination.

State and local governments can also utilize geographic clusters for area-wide planning efforts. In fact, New Jersey has created Brownfields Development Areas (BDA) to enhance revitalization for areas and communities affected by the presence of brownfields. EPA would like to work with NJDEP to explore opportunities to promote and enhance the understanding and use of BDAs to address LUST releases. EPA encourages states to look for opportunities for resource consolidation and area-wide planning like New Jersey's BDAs but also recognizes that this approach is best geared to address targeted groups of releases as opposed to a state-wide opportunity for every cluster of releases. EPA intends to conduct further geospatial analyses on clusters of open releases in relation to RPs, highway corridors, local geologic and hydrogeologic settings, groundwater resources, and/or communities with environmental justice concerns. These analyses might reveal additional opportunities for backlog reduction.

Figure 9. Map of All Open Releases



New Jersey Finding

64 percent of releases are clustered within a one-mile radius of five or more releases.

Potential Opportunity

Target releases within close proximity for resource consolidation opportunities.

Releases

Targeted number of releases²⁴

²⁴ Opportunities marked as "targeted number of releases" relate to geographic opportunities that will address a limited number of releases within select designated geographic areas.

CONCLUSION

New Jersey LUST Program Contact Information

New Jersey Department of Environmental
Protection

Site Remediation Program

Bureau of Risk Management, Initial Notice,
and Case Assignment

P.O. Box 433

Trenton, New Jersey 08625

Phone: 609-633-0708

Bureau of Underground Storage Tanks

P.O. Box 413

Trenton, New Jersey 08625

Phone: 609-292-8761

www.state.nj.us/dep/srp/bust/contact.htm

In this state chapter, EPA presented the analysis of LUST data submitted by NJDEP and highlighted information on New Jersey's LUST program. Based on the analytic results, EPA identified potential opportunities that could be used to address specific backlog issues in New Jersey. Over the course of the entire study, EPA also analyzed data from 13 other states. Findings and opportunities that apply to all 14 states are discussed in the national chapter of the report. Each opportunity represents one potential approach among many to address the backlog. Discussion of the opportunities as a whole is intended as a starting point for further conversations among EPA, New Jersey, and the other states on strategies to reduce the backlog. EPA will work with the states to develop detailed strategies for reducing the backlog. Development of the strategies might include targeted data collection, reviewing particular case files, analyzing problem areas, and sharing best practices. The strategies could involve actions from EPA such as using additional program metrics, targeting resources for specific cleanup actions, clarifying and developing guidance, and revising policies. EPA, in partnership with the states, is committed to reducing the backlog of confirmed UST releases and to protecting the nation's groundwater, land, and the communities affected by these releases.

CHAPTER NOTES

NEW JERSEY DATA BY ATTRIBUTE

The following table provides details on the data elements of interest in this analysis. Data were provided by NJDEP staff in 2008 and 2009 for use in this analysis. Several data elements of interest could not be addressed with the information available. All available data elements were analyzed and only those data elements that revealed informative patterns of interest are included in the report.

Data Element	New Jersey Data	Use in Analysis
Administrative Cost	Data were obtained from the "History 5yr_1.xls" file.	Included in the "Program Summary" section and in the national chapter.
Age	Age was calculated for closed releases by subtracting the confirmed release date from the closure date and dividing by 365. Age was calculated for open releases by subtracting the confirmed release date from the data date and dividing by 365. Any values less than -.1 were left blank. Values between -.1 and 0 were counted as 0. All dates were rounded to one decimal point. Ages of releases with insufficient or invalid data were left blank.	Variable in all analyses.
Cleanup Cost	Data were obtained from the "EPA UST Resources to Cleanup 3 09" file. A single aggregated total is provided for 2,630 releases. This number is the total amount spent by contractors and includes both private and public spending. As these amounts could not be adjusted for inflation, these data were not analyzed in this report.	No informative patterns were identified.
Cleanup Standards	No site-specific data available.	State-wide standards examined in the national chapter.
Closure Date	Data for closed releases were obtained from the "Start Date (Gen: Case)" field in the "z EPA UST Age 3 09" file.	Included in the calculation of release age.
Confirmed Release Date	Data were obtained from the "Reported_Date" field in the "EPA UST Age 3 09" file.	Included in the calculation of release age.
Data Date	March 9, 2009, is used for all records. This is the date the data were obtained.	Included in the calculation of release age.
Federally-Regulated LUST Releases	Data were obtained from the "Federal Release Confirmed (Case UST)" field in the "EPA UST Age 3 09" file. Only federally-regulated releases were included in the files provided.	Identified the appropriate universe of releases for analysis.
Free Product	No data available.	Not applicable (NA)
Institutional Controls	Data were obtained from the "Subject Item Category Description" field in the "EPA UST Policy Toward Closure 3 09" file and from the "Case Status (Gen: Case)" field in the "z EPA UST 3 09" file.	Examined in the "Cleanup Standards" section and in the national chapter.
Latitude and Longitude	Data were obtained from the "X Coord Number (Master File)" and "Y Coord Number (Master File)" fields in the "EPA UST Site Location 3 09" file. Where possible, coordinates for releases without existing latitude and longitude values were obtained by EPA staff by geocoding address and street locations. The NJ State Plane coordinate system is used.	Used in geospatial analysis calculating the number of open releases within a one-mile radius of other open releases.
Media	Data were obtained from the "Rem Level (Gen: Case)" field in the "EPA UST Media Contaminated v1 3 09" file (see Media Reference Table).	Examined in the "Media Contaminated" section.
Methyl Tertiary Butyl Ether (MTBE)	No data available.	NA
Monitored Natural Attenuation (MNA)	No data available.	NA

Data Element	New Jersey Data	Use in Analysis
Number of Releases per RP	Calculated as the total number of open releases associated with a unique RP name.	Examined in the “Number of Releases per RP” section.
Orphan	No data available.	NA
Private Funding Mechanism	Data were obtained from the “FA: RFS Type (Case)” field in the “EPA UST Mech for Fin Resp 3 09” file.	Informative patterns were not identified.
Proximity	Geospatial analysis performed by EPA revealed the number of open releases located within a one-mile radius of each open release.	Examined in the “Geographic Clusters” section.
Region	Data not tracked by administrative regions.	NA
Release Priority	Data were obtained from “Case Category (Case Category)” field in the “EPA UST Cleanup Priority 3 09” file (see Release Priority Reference Table).	Examined in the “Release Priority” section.
RP	Data were obtained from the “RP Type (Case Attr)” field in the “EPA UST Ownership 3 09” file.	Used to calculate the number of releases associated with each unique RP.
RP Recalcitrance	Data were obtained from the “EPA UST Recalcitrant report due 3 09” file. This file is a list of overdue reports. The presence of a release’s ID number in this list indicates that the RP is currently recalcitrant.	Examined in the “RP Recalcitrance” section.
Staff Workload	Estimate provided by NJDEP staff.	Examined in the “Program Summary” section and in the national chapter.
Stage of Cleanup	Data were obtained from the “Activity Type Description” field in the “EPA UST Type of Remediation 3 09” file (see Stage of Cleanup Reference Table).	Variable in all analyses.
State Funded	Data were obtained from the “Grant Loan Type (Case)” field in the “EPA UST Mech for Fin Resp 3 09” file.	No informative patterns were identified.
Status	Data were obtained from the “Case Status (Gen: Case)” field in the “z EPA UST Age 3 09” file.	Identified the appropriate universe of releases for tree analysis.
Voluntary Cleanup Program	Data were obtained from the “Is MOA Case (Y/N)” field in the “EPA UST Policies for Prop Trans 3 09” file.	No informative patterns were identified.

Media Reference Table

Each release is assigned a remedial level in NJEMS. These data were used to identify the media contaminated by each release for analysis to identify patterns in release age related to media contaminated.

Remedial Level	Media
B: Single Phase Remedial Action - Single Contamination Affecting Only Soils	Soil
C1: No Formal Design - Source Known or Identified-Potential Groundwater Contamination	Soil
C2: Formal Design - Known Source or Release with Groundwater Contamination	Groundwater
C3: Multi-Phased Remedial Action - Unknown or Uncontrolled Discharge to Soil or Groundwater	Groundwater
D: Multi-Phased Remedial Action - Multiple Source/Release to Multi-Media Including Groundwater	Groundwater
L: Link Case	Unknown
No known remedial level	Unknown
U: Not Yet Determined	Unknown

Release Priority Reference Table

Each release is assigned a priority in NJEMS. These data were used to analyze patterns in the age of releases relative to their priority. Category 1 releases present the highest risk to receptors and are the highest priority releases.

Category	Description
1	Receptors impacted Source not identified Immediate response required of RP
2	Receptors impacted Source identified but not mitigated Immediate response required of RP
3	Receptors impacted Source identified and mitigated Immediate response required of RP
4	Receptors proximal, impact to the receptors not yet evaluated (sampled or data collected to evaluate receptor risk) Source not identified Source identified but not mitigated Source identified and mitigated 30-90 day initial response required of the RP
5	Receptors proximal, impact to the receptors evaluated (sampled or data collected to evaluate receptor risk), no impact demonstrated Source not identified Source identified but not mitigated Source identified and mitigated 30-90 day initial response required of the RP

Category	Description
6	No receptors proximal Source not identified 30-90 day initial response required of the RP
7	No receptors proximal or receptor evaluated and no risk identified Source identified and not mitigated Initial response by RP 120 days+
8	No receptors proximal or receptor evaluated and no risk identified Source identified and mitigated Initial response by RP 120 days+
9	No receptor search completed 30-day response required of RP

Stage of Cleanup Reference Table

Each release was assigned to a stage of cleanup based on the NJDEP Activity Type Description.

Remedial Level	Media
B: Single Phase Remedial Action - Single Contamination Affecting Only Soils	Soil
C1: No Formal Design - Source Known or Identified-Potential Groundwater Contamination	Soil
C2: Formal Design - Known Source or Release with Groundwater Contamination	Groundwater
C3: Multi-Phased Remedial Action - Unknown or Uncontrolled Discharge to Soil or Groundwater	Groundwater
D: Multi-Phased Remedial Action - Multiple Source/Release to Multi-Media Including Groundwater	Groundwater
L: Link Case	Unknown
No known remedial level	Unknown
U: Not Yet Determined	Unknown