

Chapter 3

Remedial Progress

The Agency's progress during FY98 illustrated its continuing commitment to accelerating and completing cleanups at Superfund sites. The Agency started 100 remedial actions (RAs) and completed construction activities to place 87 sites in the construction completion category. To date under the Superfund program, the Agency has placed a total of 585 National Priorities List (NPL) sites in the construction completion category. This chapter describes the remedial progress during the fiscal year. Specifically, this chapter provides information on:

- Status on all remedial actions undertaken in FY98, as required by CERCLA Section 301(h)(1)(F);
- Remedies selected during FY98, as required by CERCLA Section 301(h)(1)(A);
- FY98 results of five-year reviews under CERCLA Section 121(c) at sites where contamination remained after the initiation of the RA, as required by CERCLA Section 301(h)(1)(E); and
- FY98 efforts to develop and use innovative treatment technologies, including an evaluation of newly developed and achievable permanent treatment technologies, as required by CERCLA Section 301(h)(1)(D).

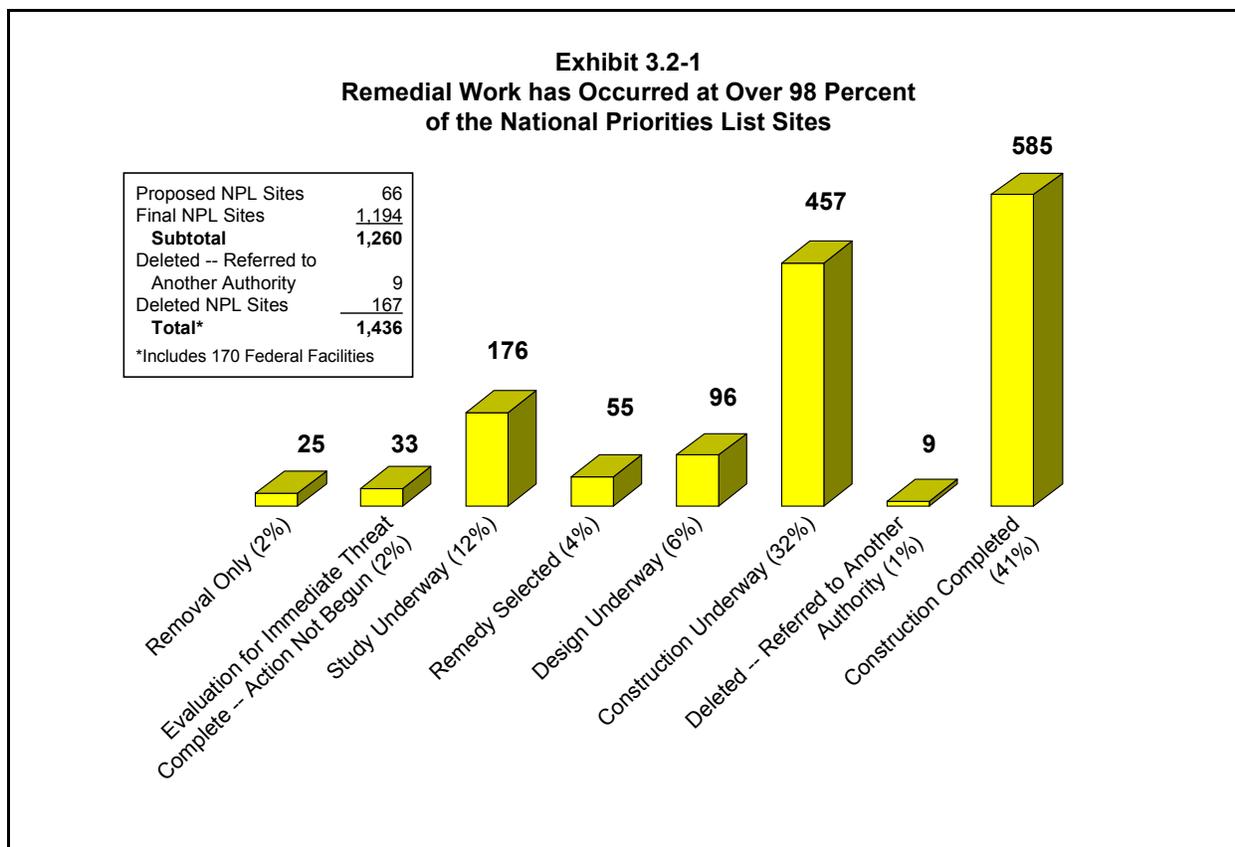
process is preceded by the site evaluation process, which consists of the discovery or identification of a potential site, the preliminary assessment of the site, and the site inspection (SI). During the SI, the site is evaluated for possible listing on the NPL. If a site is listed on the NPL after the SI, the Trust Fund can be used to finance cleanup activities at the site under the remedial authority of CERCLA.

The remedial process to clean up NPL sites is comprised of the following activities:

- The remedial investigation/feasibility study (RI/FS) to determine the type and extent of contamination and to evaluate and develop remedial clean-up alternatives;
- The record of decision (ROD) to identify the remedy selected, based on the results of the RI/FS and public comment on the clean-up alternatives;
- The remedial design (RD) to develop the plans and specifications required to construct the selected remedy;
- The remedial action to implement the selected remedy, from the start through the completion of construction of the remedy; and
- Operation and maintenance (O&M) to ensure the effectiveness and/or integrity of the remedy. O&M occurs after implementation of a response action.

3.1 Remedial Process

The remedial process complements the removal process (see Chapter 2) by addressing more complicated, long-term evaluation and response for hazardous waste sites on the NPL. The remedial



Source: CERCLIS (as of September 30, 1998).

A Remedial Project Manager (RPM) oversees all remedial activities and related enforcement activities. Regional coordinators at EPA Headquarters assist RPMs by reviewing remedial and enforcement activities and by answering technical and policy questions.

3.2 Fiscal Year 1998 Remedial Progress

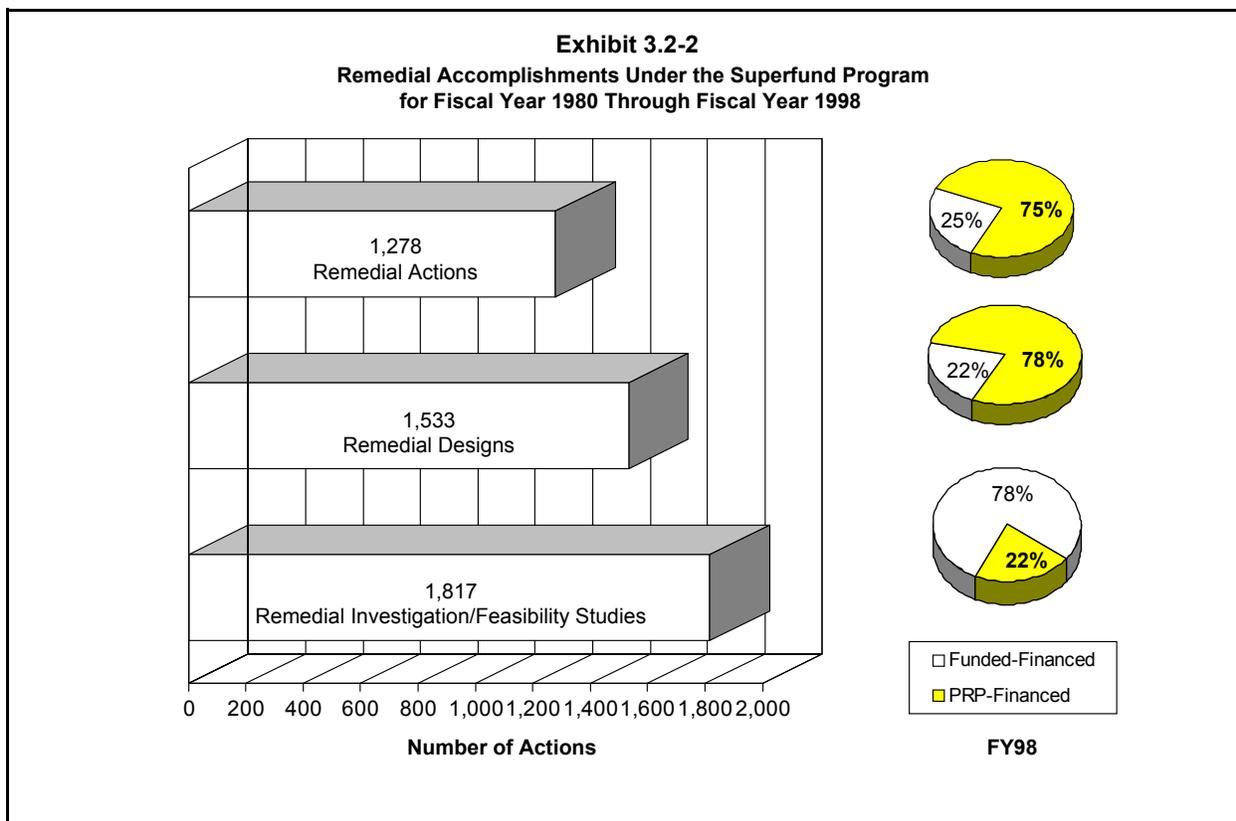
The Agency's progress during the fiscal year in initiating RAs and completing construction activities to classify sites as construction completions indicates its continuing commitment to accelerate the cleanup of NPL sites. By the end of FY98, remedial work had occurred at 98 percent of the 1,436 NPL sites. In addition, 176 sites were deleted from the NPL, including 9 sites referred to other authorities. Exhibit 3.2-1 illustrates the status of the work at NPL sites, showing sites by the most advanced stage of activity accomplished. The following sections of this chapter highlight progress made at the sites during FY98.

3.2.1 Construction Completions

Responding to the recommendations of the 1991 30-Day Study and the 1993 Superfund Administrative Improvements Task Force, the Agency has worked to accelerate and complete cleanup at NPL sites. The Agency completed construction activities at 87 sites during FY98, bringing the total number of sites in the construction completion category to 585. Forty percent of the construction completions have been achieved in the past three years.

3.2.2 New Remedial Activities

As shown in Exhibit 3.2-2, the Agency or potentially responsible parties (PRPs) had undertaken 1,817 RI/FSs, 1,533 RDs, and 1,278 RAs since the inception of the Superfund program through the end of the FY98. The remedial activities started during FY98 reflect the Agency's continued emphasis on accelerating the pace of cleanup and focusing resources on RAs. New



Source: CERCLIS (as of September 30, 1998).

remedial activities undertaken this fiscal year include:

RI/FS Starts: The Agency or PRPs started 40 RI/FSs during FY98, including 31 (78 percent) financed by EPA and 9 (22 percent) financed by PRPs. For comparison, in FY97 the Agency or PRPs started 41 RI/FSs, including 23 (56 percent) financed by EPA and 18 (44 percent) financed by PRPs.

RD Starts: The Agency or PRPs started 73 RDs during FY98, including 16 (22 percent) financed by EPA and 57 (78 percent) financed by PRPs. For comparison, in FY97 the Agency or PRPs started 72 RDs, including 22 (31 percent) financed by EPA and 50 (69 percent) financed by PRPs.

RA Starts: The Agency or PRPs started 100 RAs during FY98. EPA financed 25 (25 percent) and PRPs financed 75 (75 percent). For comparison, in FY97, the Agency or PRPs started approximately 102 RAs, including 32 (31 percent) financed by EPA and 70 (69 percent) financed by PRPs.

3.2.3 In Progress Remedial Activities

At the end of FY98, 1,935 RI/FS, RA, and RD projects were in progress at 836 sites. For comparison, at the end of FY97, 1,793 RI/FS, RA, and RD projects were in progress at 815 sites. Projects in progress at the end of FY98 included 1,588 RI/FS and RA projects and 347 RD projects. As required by CERCLA Sections 301(h)(1)(B),(C), and (F), a listing of the RI/FS and RA projects in progress at the end of FY98 is provided in Appendix A, along with a projected completion schedule for each project. A listing of all RDs in progress at the end of FY98 is provided in Appendix B.

Of the 1,588 RI/FS and RA projects in progress at the end of FY98, 62 percent were on schedule, ahead of schedule, started during the fiscal year, or had no previously published completion schedule, and 20 percent were behind schedule. These projects include 978 on schedule, 20 ahead of schedule, 238 started during the fiscal year, 26 that had no previously published completion schedule, and 321 that were behind schedule. Exhibit 3.2-3

compares the number of projects in progress at NPL sites at the end of FY98 with the number in progress at the end of FY97, by lead.

PRPs were conducting 466 of the RI/FS and RA projects in progress at the end of FY98, including 122 RI/FSs and 344 RAs. Of these 466 PRP-financed projects, 77 percent were on schedule, ahead of schedule, started during the fiscal year, or had no previously published completion schedule, and 23 percent were behind schedule. Projects include 268 on schedule, 1 ahead of schedule, 83 started during the fiscal year, 2 did not report a planned completion schedule, 7 had no previously published completion schedule, and 105 were behind schedule.

3.3 Remedial Selection

The Agency signed 173 RODs in FY98 as compared to the 168 RODs signed in FY97. The ROD documents the results of all studies performed on the site, identifies each remedial alternative that the Agency considered, and explains the basis for selecting the remedy. The ROD is signed after the RI/FS is completed and the public has had the opportunity to comment on the remedial alternatives that are being considered to clean up the site.

The Agency selected a variety of remedies in FY98 RODs, based on a careful analysis of characteristics unique to each site and the proximity of each site to people and sensitive environments (wetlands and endangered wildlife are examples of environmental resources that are taken into consideration when evaluating remedies). Congress,

**Exhibit 3.2-3
Projects in Progress at National Priorities List Sites
by Lead for Fiscal Year 1997 and Fiscal Year 1998**

	RI/FS		RDs		RAs	
	FY97	FY98	FY97	FY98	FY97	FY98
Fund-Financed-State-Lead	24	17	15	17	43	44
Fund-Financed-Federal-Lead ¹	138	165	80	81	137	149
Fund-Financed-EPA Performs Work at Site ²	8	7	0	0	3	1
PRP-Financed and PRP-Lead	126	122	144	164	295	344
Mixed Funding-Monies from Fund and PRPs	3	3	1	1	13	7
PRP-Financed-State Order and EPA Oversight ³	23	23	13	15	29	33
State Enforcement	2	0	0	0	0	0
Federal Facility	484	484	46	69	166	189
Total⁴	808	821	299	347	686	767

¹ Includes remedial program-lead projects and enforcement program-lead projects.
² Projects at which EPA employees, rather than contractors, perform the site cleanup work.
³ Projects where site cleanup work is financed and performed by the PRPs under state order, with EPA oversight.
⁴ Reflects numerical values in CERCLIS as of September 30, 1998 and may be adjusted after that date as new information appears in the database.

Sources: CERCLIS (as of September 30, 1998); *Progress Toward Implementing Superfund Fiscal Year 1997*.

with the enactment of SARA, indicated that EPA should give preference to treatment remedies, rather than containment or disposal.

To fulfill the statutory requirement of CERCLA Section 301(h)(1)(A) to provide an abstract of each feasibility study (i.e., ROD), the National Technology Information Service (NTIS) can provide requested RODs. Appendix C provides detailed information on how to make these ROD requests.

3.4 Facilities Subject to Review Under CERCLA Section 121(c)

Certain remedies, such as containment, allow hazardous substances, pollutants, or contaminants to remain on site if they do not pose a threat to human health or the environment. CERCLA Section 121(c), as amended by SARA, requires that a post-SARA remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site be reviewed no less often than every five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. These five-year reviews are referred to as "statutory" reviews. Section 121(c) requires the Agency to report to Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

As a matter of policy, EPA also conducts a five-year review for sites where hazardous substances, pollutants, and contaminants will not remain on site upon completion of the remedy, but where the remedy will take longer than five years. These policy reviews are conducted every five years until the remedial action is complete and achieves cleanup levels that allow for unlimited use and unrestricted exposure. Additionally, at least one policy review is conducted for pre-SARA sites where upon attainment of the ROD cleanup levels, the remedial action will not allow for unlimited use and unrestricted exposure.

Policy reviews were announced in Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-02, May 23, 1991, *Structure and Components of Five-Year Reviews*. Guidelines for

the conduct of five-year reviews were further articulated in two supplemental directives in 1994 and 1995. The determination of whether a site requires a statutory or policy five-year review generally is made based on information provided in the ROD.

FY98 was the eighth year in which sites were eligible for five-year review. Headquarters data indicated that a total of 137 sites required five-year reviews in FY98. A total of 113 five-year reviews were completed in FY98, as illustrated in Exhibit 3.4-1. Thirty-five of the 113 reviews were due in prior fiscal years. Twenty-three reviews were completed early and were due in later fiscal years. Reviews were done at three additional sites at the Regions' discretion.

Of the 113 sites that were reviewed during FY98, 76 had statutory reviews and 37 had policy reviews. For these reviews, EPA determined that the remedies continue to protect human health and the environment at 108 of the sites. Ongoing remedies are included among those considered protective. For the five remaining sites, the review reports either did not make a protectiveness determination or stated that remedies do not currently protect human health and the environment as follows:

1) The Chemical Control Corporation report (Region 2, statutory review) stated that "the levels of contaminant concentrations in well CW-3 indicate a possibility that the site may not be protective of human health and the environment. Among the possible causes of such high results could be improper sample location; improper sampling and/or analytical procedures; continuing migration of contamination from the solidified mass; or continuing contaminant migration from other sources."

2) The Chemical Insecticide Corporation report (Region 2, statutory review) stated that the remedy is not at this time protective of human health and the environment because of a fire that occurred at an adjoining property. Two components of the remedy, the cap and the fencing, were damaged by the fire. At the time of the report, steps were being taken to make the remedy protective.

Exhibit 3.4-1
Sites at Which Five-Year Reviews
were Conducted During Fiscal Year 1998

Region	State	Site Name	Review Date
Statutory Reviews			
1	CT	Beacon Heights Landfill (2 nd Review) ¹	9/4/98
1	MA	Iron Horse Park ³	9/29/98
1	CT	Laurel Park, Inc. ³	9/11/98
1	VT	Old Springfield Landfill ³	9/29/98
1	RI	Piccillo Farm (2 nd Review) ¹	5/22/98
1	MA	Re-Solve, Inc. (2 nd Review) ¹	9/29/98
1	CT	Yaworski Waste Lagoon ³	9/29/98
2	NJ	Chemical Control Corp. ¹	9/28/98
2	NJ	Chemical Insecticide Corp. ²	6/18/98
2	NY	Clothier Disposal ³	3/13/98
2	NY	Conklin Dumps ¹	1/30/98
2	NY	GE-Moreau (2 nd Review) ²	9/28/98
2	NY	Islip Municipal Sanitary Landfill ¹	4/8/98
2	NY	Marathon Battery Co. ¹	6/10/98
2	NJ	NL Industries ¹	4/9/98
2	NY	North Sea Municipal Landfill ¹	9/29/98
2	NY	Pollution Abatement Services ³	6/10/98
2	NJ	Scientific Chemical Processing, Inc. ³	9/30/98
2	NY	Sealand Restoration ³	8/12/98
2	PR	Upjohn Facility (2 nd Review) ²	9/9/98
2	NY	Vestal Water Supply 1-1 ³	9/30/98
3	VA	C&R Battery ¹	7/29/98
3	VA	Greenwood Chemical ²	1/23/98
3	DE	Harvey & Knott Drum (2 nd Review) ¹	9/30/98
3	PA	Henderson Road ³	9/28/98
3	MD	Mid-Atlantic Wood Preservers ¹	8/20/98
3	PA	Raymark ¹	9/30/98
4	FL	Alpha Chemical Corp. (2 nd Review) ²	9/4/98
4	SC	Carolawn Site ¹	8/27/98
4	FL	Dubose Oil Products Co. ¹	9/24/98
4	MS	Flowood Site ³	5/28/98
4	GA	Hercules 009 Landfill ³	9/21/98
4	TN	Mallory Capacitor Co. (2 nd Review) ²	7/1/98
4	GA	Powersville Landfill ³	1/16/98

Region	State	Site Name	Review Date
4	KY	Smith's Farm (Brooks) ¹	9/30/98
5	MI	Bofors Nobel, Inc. ³	9/30/98
5	IL	Byron Salvage Yard ³	9/30/98
5	WI	Eau Claire Municipal Well Field (2 nd Review) ²	9/25/98
5	WI	Fadowski Drum Disposal ¹	9/14/98
5	MN	Kummer Sanitary Landfill (2 nd Review) ³	10/7/97
5	MI	Liquid Disposal, Inc. ¹	2/23/98
5	MI	Mason County Landfill ³	11/13/97
5	WI	National Presto Industries ²	9/25/98
5	WI	Onalaska Municipal Landfill ¹	7/14/98
5	OH	Republic Steel Quarry ³	6/26/98
5	OH	Summit National Liquid Disposal Service ¹	9/23/98
5	MN	Twin Cities Air Force Base ³	4/2/98
5	IL	Velsicol Chemical Corp. (Illinois) ³	9/10/98
6	NM	AT & SF (Clovis) ³	9/30/98
6	LA	Bayou Sorrel (2 nd Review) ¹	9/22/98
6	TX	Brio Refinery ³	1/8/98
6	NM	Cimarron Mining Corp. ³	7/22/98
6	LA	Cleve Reber ²	9/30/98
6	TX	Dixie Oil Processors, Inc. ³	9/24/98
6	LA	Gulf Coast Vacuum Services ¹	9/30/98
6	NM	United Nuclear Corp. ²	9/24/98
7	IA	Fairfield Coal Gasification Plant ¹	10/3/97
7	IA	John Deere (Dubuque Works) (2 nd Review) ²	9/30/98
7	IA	John Deere (Ottumwa Works Landfill) ³	3/30/98
7	NE	Lindsay Manufacturing Co. ¹	7/1/98
8	UT	Hill Air Force Base ³	9/28/98
8	CO	Smuggler Mountain ³	11/7/97
8	UT	Wasatch Chemical Co. (Lot 6) ¹	10/24/97
9	CA	Koppers Co., Inc. (Oroville Plant) ¹	12/28/97
9	CA	Operating Industries Inc. Landfill #2 (2 nd Review) ²	12/30/97
9	CA	San Fernando Valley, North Hollywood OU (2 nd Review) ¹	8/17/98
10	WA	Commencement Bay-Near Shore/Tide Flats ³	9/29/98
10	WA	Commencement Bay-South Tacoma Channel (2 nd Review) ¹	7/16/98
10	AK	Eielson Air Force Base ¹	9/28/98
10	WA	FMC Corp (Yakima Plant) ⁴	9/29/98
10	OR	Joseph Forest Products ³	9/30/98
10	WA	Queen City Farms ²	9/28/98
10	WA	Seattle Municipal Landfill ³	9/28/98

Region	State	Site Name	Review Date
10	OR	Teledyne Wah Chang Albany (TWCA) ³	12/29/97
10	WA	US Navy Naval Air Station, Whidbey Island (Ault Field) ¹	9/25/98
10	ID	USDOE Idaho National Engineering Lab ¹	9/18/98
Policy Reviews			
1	NH	Kearsarge Metallurgical Corp. ¹	7/8/98
1	ME	McKin Co. (2 nd Review) ³	9/30/98
1	NH	Mottolo Pig Farm ¹	9/11/98
1	MA	Plymouth Harbor/Cannons Engineering Corp. (2 nd Review) ¹	7/29/98
1	NH	South Municipal Water Supply Well ²	6/2/98
1	RI	Western Sand & Gravel (2 nd Review) ¹	7/6/98
2	NJ	Friedman Property ²	8/12/98
2	NJ	Goose Farm ¹	9/25/98
2	NJ	Ringwood Mines/Landfill ¹	9/25/98
2	NY	Suffern Village Well Field ³	9/30/98
2	NJ	Tabernacle Drum Dump ¹	9/10/98
2	NJ	Vineland State School ³	9/29/98
3	PA	Eastern Diversified Metals ²	2/9/98
4	FL	Beulah Landfill ⁴	9/24/98
4	KY	Distler Brickyard ²	9/28/98
4	KY	Distler Farm (2 nd Review) ¹	9/23/98
4	KY	Lee's Lane Landfill (2 nd Review) ¹	7/1/98
4	AL	Mowbray Engineering Co. (2 nd Review) ¹	8/3/98
4	KY	Tri-City Industrial Disposal ²	4/3/98
5	MN	Burlington Northern (Brainard/Baxter) (2 nd Review) ¹	3/13/98
5	MI	Burrows Sanitation ¹	3/17/98
5	MN	Naval Industrial Reserve Ordnance Plant ²	9/29/98
5	OH	New Lyme Landfill ¹	2/24/98
5	MN	Nutting Truck and Caster Co. (2 nd Review) ²	3/31/98
5	MI	Southwest Ottawa County Landfill (2 nd Review) ²	10/27/97
5	MN	Whittaker Corp. (2 nd Review) ¹	12/31/97
6	TX	North Cavalcade Street ²	7/8/98
6	TX	Sikes Disposal Pits ²	4/8/98
7	IA	Aidex Corp. (2 nd Review) ¹	4/6/98
7	IA	Des Moines TCE (2 nd Review) ¹	12/29/97
7	KS	Hydro-Flex ⁴	9/17/98
9	CA	Beckman Instruments ¹	4/3/98
9	CA	Lawrence Livermore National Lab (USDOE) ²	12/2/97
9	CA	San Fernando Valley (Area 1) (2 nd Review) ¹	8/17/98
10	OR	Allied Plating, Inc. ¹	7/1/98

Region	State	Site Name	Review Date
10	OR	United Chrome Products, Inc. ³	3/24/98
10	WA	Western Processing Co., Inc. (2 nd Review) ¹	9/29/98

¹Due in FY98

²Early – due after FY98

³Late – due prior to FY98

⁴Review Not Previously Required

Source: Five-Year Review Program Implementation and Management System.

3) The McKin Company report (Region 2, policy review) stated that exposure to contaminated groundwater, as indicated in the ROD and the first five-year review, continues to be a potential threat to human health and, without adequate institutional controls, continued residential development in this area may create a non-protective situation.

4) The Southwest Ottawa County Landfill report (Region 5, policy review) concluded that the Groundwater Restoration Agreement, the agreement delineating the remedy and cleanup standards, continues to be protective. However, the report noted that significant questions are present concerning the effectiveness of the current purge and treatment system. Further, the Michigan Department of Environmental Quality has begun investigation into new information concerning inorganic contaminants at the site.

5) The North Cavalcade Street report (Region 6, policy review) did not make a clear statement on protectiveness. The report stated that when the system was designed, it was believed that groundwater cleanup would take only two years. After some removal efforts, it appeared that a large amount of dense non-aqueous phase liquid (DNAPL) was present and the original groundwater remediation design could not achieve clean up levels. Groundwater extraction efforts were then stopped, and a groundwater fate and transport study was begun. The purpose of this study was to locate remaining DNAPL in order to determine how to best remove it and determine what risk any remaining residual DNAPL may pose to human health and the environment. Furthermore, the soil remediation process had proven to be ineffective. After 18 months of treatment, the process had not remediated any soil to the remediation goals listed in the ROD.

A five-year review report is not considered completed until a signed copy is received by Headquarters. An additional 59 reports from previous fiscal years were not listed in previous SARCs as being completed, but have now been received by Headquarters. These reports are listed in Exhibit 3.4-2. Out of these 59 reports, 16 had statutory reviews and 43 had policy reviews. For these reviews, EPA determined that the remedies continue to protect human health and the environment at 56 of the sites. Ongoing remedies are included among those considered protective. For the three remaining sites, the review reports either did not make a protectiveness determination or stated that remedies do not currently protect human health and the environment. These three sites are addressed below:

1) The Middletown Road Dump report (Region 3, policy review) stated that no conclusion could be drawn at the time of the report because some detection limits used in a March 1993 sampling event are above acceptable health-based levels.

Further groundwater sampling was to take place and the results were to be reviewed by EPA. Also, the report noted that the site appears to be used as a dump with unrestricted access.

2) The Joslyn Manufacturing and Supply Company report (Region 5, policy review) stated that changes in ARARs and to be considered since the ROD should be used to reevaluate the system effectiveness in containing the contaminant plume and to reevaluate the impact of contaminants on surface waters. The report stated that if these evaluations indicated inadequate groundwater capture or surface water impact, the system will need to be modified to ensure the appropriate level of protectiveness.

Exhibit 3.4-2
Sites at Which Five-Year Reviews were Conducted
During Previous Fiscal Years, but Not Listed in the SARC

Region	State	Site Name	Review Date
Statutory Reviews			
1	CT	Beacon Heights Landfill ¹	12/14/92
3	PA	Heleva Landfill ³	5/26/94
3	PA	MW Manufacturing ²	10/6/95
4	NC	Celanese Shelby Fibers (OU1) ¹	9/8/94
4	FL	Hollingsworth Solderless Terminal Co. ²	1/22/96
4	SC	Independent Nail Co. ¹	9/13/93
6	LA	Bayou Sorrel ²	9/30/93
6	OK	Compass Industries ¹	6/1/95
6	NM	South Valley ²	9/30/95
8	CO	Chemical Sales Co. ²	7/28/92
8	CO	Rocky Mountain Arsenal (2 nd Review) ¹	9/29/97
8	CO	Uravan ⁴	9/6/94
9	CA	Iron Mountain Mine ¹	9/30/93
9	CA	Stringfellow ³	2/10/93
10	WA	Commencement Bay-Time Oil/Well 12A ^{3**}	4/19/93
10	WA	Tacoma Landfill ^{2**}	9/25/97
Policy Reviews			
1	CT	Kellogg-Deering Well Field ³	12/29/92
1	MA	Plymouth Harbor/Cannons Engineering Corp. ¹	12/4/92
1	NH	Sylvester ³	9/22/94
1	RI	Western Sand & Gravel ³	12/23/92
1	ME	Winthrop Landfill ³	10/9/92
3	PA	Bruin Lagoon ²	4/7/93
3	PA	Kimberton ²	9/22/94
3	MD	Middletown Road Dump ³	10/15/93
3	PA	Mill/Creek Dump ²	9/27/96
3	PA	Presque Isle ³	3/3/93
3	PA	Reeser's Landfill ⁴	6/7/93
3	PA	Route 940 Drum Dump ¹	9/30/97
3	PA	Taylor Borough ³	3/30/93
3	PA	Wade (ABM) ³	2/3/93
4	KY	A.L. Taylor ²	6/30/92
4	FL	Davie Landfill ¹	3/2/94
4	KY	Distler Farm ¹	9/28/93

Region	State	Site Name	Review Date
4	TN	Galloway Ponds ²	10/4/93
4	KY	Lee's Lane Landfill ¹	3/11/93
4	AL	Mowbray Engineering Co. ³	3/4/93
4	FL	Pepper Steel & Alloys ²	9/23/94
4	AL	Triana/Tennessee River ³	6/14/93
5	MN	Burlington Northern (Brainard/Baxter) ¹	1/27/93
5	MI	Cemetery Dump ³	7/8/94
5	MI	Charlevoix Municipal Well Field ²	9/14/94
5	MN	General Mills/Henkel Corp. ⁴	9/30/94
5	MN	Joslyn Manufacturing and Supply Co. ⁴	12/28/95
5	MN	Kurt Manufacturing ³	9/30/94
5	MN	Nutting Truck and Caster Co. ⁴	3/29/94
5	MN	Oakdale Dump ¹	3/31/93
5	MN	Whittaker Corp. ³	9/16/93
6	LA	Louisiana Army Ammunition Plant ⁴	2/8/94
6	OK	Tar Creek (Ottawa County) ³	4/30/94
6	TX	Triangle Chemical Co. ³	7/11/94
7	IA	Aidex Corp. ¹	6/25/93
7	IA	Des Moines TCE ³	12/30/92
7	IA	LaBounty Dump ¹	1/8/93
7	NE	Waverly Groundwater Contamination ²	9/27/93
9	CA	Celtor Chemical Works ¹	9/30/93
9	AZ	Mountain View Mobile Home Estates ²	9/9/91
9	GU	Ordot Landfill ⁴	9/30/93
9	CA	San Fernando Valley ²	7/8/93
10	WA	Western Processing Co., Inc. ³	1/4/93

¹ Completed during the FY in which the report was required

² Early – Completed earlier than the FY in which the report was required

³ Late – Completed later than the FY in which the report was required

⁴ Review Not Previously Required

**Two first five-year reviews have been completed for different operable units at the Commencement Bay - South Tacoma Channel site, one in FY93 and one in FY97.

Source: Five-Year Review Program Implementation and Management System.

3) The Kurt Manufacturing report (Region 5, policy review) stated that the levels of groundwater contamination at the site are considered by the Minnesota Pollution Control Agency to be unacceptable, and the remedial action in place at the time of the report was considered partially ineffective to remediate the groundwater contamination.

3.5 Fostering New Cleanup Technologies

EPA is committed to the development, demonstration, and deployment of innovative technologies to remediate Superfund sites cost-effectively. In addition to selecting remedies in RODs, several EPA-led programs facilitate remedy implementation and encourage the use of innovative

technologies at Superfund sites. FY98 marked the completion of the last 4 of 15 volumes developed under a seven-year project to create engineering monographs on site clean-up technologies. EPA funded the American Academy of Environmental Engineers in establishing expert task groups to author monographs on eight clean-up technologies (bioremediation, chemical treatment, soil washing/flushing, solvent/chemical extraction, stabilization/solidification, thermal desorption, thermal destruction, and vacuum vapor extraction) to assist site managers and permit writers in the selection and implementation of the technologies. The first eight monographs describe the state of practice for each technology. The second seven reports provide design and application guidance. (Solvent extraction and soil washing have been combined into a single manual in the second series.)

Also in FY98, EPA concluded its principal sponsorship of the Ground Water Remediation Technologies Analysis Center (GWRTAC). The Center was established under a three-year grant in FY95 as a clearinghouse for information on *in situ* groundwater cleanup technologies. It has become a definitive source of state-of-the-practice information on new development in over 12 cleanup techniques. This year, EPA and GWRTAC co-sponsored the second in a series of conferences to highlight recent advances *in situ* groundwater remediation.

3.5.1 Superfund Innovative Technology Evaluation (SITE) Program

The SITE program, which completed its 13th year in FY98, was established in direct response to a legislative mandate under the Superfund Amendments and Reauthorization Act (SARA). The program is considered the pioneer and model program for demonstrating and evaluating full-scale, viable, innovative treatment technologies at hazardous waste sites. In response to a comprehensive program review, in FY96 the SITE program shifted from a technology-driven focus to a more integrated approach driven by the needs of the waste remediation community. The new goals of the program are to interact with the user community, understand its needs, integrate those needs with EPA's research mission, and expeditiously address those needs.

The next generation of SITE can be defined by the following operating principles.

Matching the site needs with innovative technology solutions: Sites will be solicited and prioritized based on (1) the demonstration needs of the user, and (2) the research focus areas identified by EPA (such as groundwater treatment, *in situ* treatment, and metals in soil treatment).

Conducting technology field demonstrations: SITE will rapidly conduct field demonstrations of high technical quality to verify performance of remediation technologies. The resulting data and reports are intended for use by site owners and government decision-makers in selecting remediation options. The data reports add credibility to technology vendors for promoting their processes.

Information transfer: Information transfer activities ensure that valuable technical information is disseminated to increase awareness and promote products evaluated under the program for use at site cleanups. Information transfer activities consist of technical networking, publications, electronic distribution, Internet, and conference exhibits.

Program quality planning: Overall program direction and strategies will be evaluated each year based on responses from the user community. Information gathered through networking with the user community will be incorporated into the program planning process.

Exhibit 3.5-1 displays three of the four components of the program with the number of FY98 accomplishments. These components include the demonstration program, emerging technology program, and the characterization and monitoring program. The fourth component, technology transfer, involves publication and distribution of SITE program results.

Exhibit 3.5-1 Fiscal Year 1998 SITE Program Accomplishments	
	Cumulative Projects Through FY98
Demonstration Program	95
Emerging Technology Program	66
Characterization and Monitoring Program	37

Source: National Risk Reduction Engineering
Laboratory.

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