Evaluation of Results from EPA's Schools Chemical Cleanout Campaign

An Examination of Approaches and Factors that Impacted the Results of Programs Funded by EPA's RCC Schools Chemical Cleanout Campaign in FY2004

January 2007

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EXECUTIVE SUMMARY

EPA's Schools Chemical Cleanout Campaign (SC3), a high visibility initiative operating as part of EPA's Resource Conservation Challenge (RCC), strives to remove accumulations of potentially dangerous chemicals from K-12 schools; prevent future accumulations through improved chemical management; and raise national awareness of the issue. In 2004, EPA provided $250,000 in funding to separate and distinct state/local SC3 programs in each of the 10 EPA Regions. Each state/local SC3 program addressed responsible chemical management, raising awareness, and chemical cleanout with various approaches and techniques.

In May 2005, EPA sponsored a "Formative Evaluation" of both EPA funded and non-EPA funded SC3 programs across the country to help EPA design and implement its own responsible chemical management efforts. The Formative Evaluation provided information to improve EPA's understanding of the processes, operations, functions, and structure that would best enable EPA and its partners to meet the goals for the program.

In a separate effort in September 2005, EPA initiated this "Results Evaluation" of the ten SC3 programs selected for EPA funding in 2004. This Results Evaluation focused on answering the following primary evaluation questions:

1. **Did the SC3 programs that received EPA funding achieve their goals?**
2. **What factors contributed the most to achieving or not achieving results?**
3. **How can the results these programs achieved be used to inform development or improvement of SC3 programs?**
4. **In the future, what can EPA do to improve achievement of intended results?**

Indtai developed a logic model of EPA's role in the SC3 program that presents a picture of how the Campaign is expected to work and identifies factors that can affect the ability of the SC3 program to achieve desired results. We used the logic model as a framework to guide collection of information about the results achieved by the ten SC3 programs. We primarily relied on review of documents from the ten SC3 programs and personal interviews with program implementers and EPA Regional personnel as data sources.

This report presents data and analysis as it relates to the above evaluation questions. While we do not compare or draw conclusions about the effectiveness of the ten programs relative to one another, we do provide data that allows for an improved understanding of the effectiveness of different SC3 approaches and techniques. We identify numerous best practices in SC3 areas such as chemical disposal, creating partnerships, funding, and training that the programs used to achieve results. A discussion of critical success factors, impediments, and costs provides insight into factors that impacted results and can be used to inform development or refinement of other SC3 programs.

The results illustrated that all of the ten SC3 programs showed progress in tackling chemical mismanagement: more schools are safer; more children are being protected from dangerous chemical risks; awareness about responsible chemical management and safety has increased; and additional mechanisms are in place to stimulate behavior change. Without the EPA funding, the majority of SC3 programs would probably have NOT been able to accomplish

the aforementioned results and taken steps to rid schools of outdated, excess, and dangerous chemicals. Below we present a high-level summary of results.

Summary Highlights of Results from the Programs Receiving 2004 SC3 Funding	
Schools Cleaned Out	About 500
Population/children affected	585,000+
Chemicals Removed	72,000 pounds +
Personnel Trained (e.g., teachers, administrators, facilities)	1,500 +
Funding in Addition to EPA SC3 (not including in-kind services)	$235,000+

Regarding *Evaluation Question #1: Did the SC3 programs that received EPA funding achieve their goals?* The SC3 programs achieved their broad goals and objectives of removing dangerous chemicals (approximately 95% of chemicals removed were hazardous), reducing risks, and promoting responsible chemical management. A variety of metrics were used to measure the results (e.g., quantity and types of chemicals removed, school population affected) as well as capture positive unintended results such as additional funding contributions that resulted from SC3 achievements.

Regarding *Evaluation Question #2: What factors contributed the most to achieving or not achieving results?* We identified numerous critical success factors and innovative techniques that impacted attaining results. The critical success factors may be useful to mitigate the various implementation impediments, such as not having an established baseline assessment of the chemical management problem or competing school priorities. We found that disposal costs greatly impacted achieving results and represent the greatest cost in SC3 program budgets, but there are also a variety of other costs, such as personnel time, to be aware of.

Regarding *Evaluation Question #3: How can the results these programs achieved be used to inform development or improvement of SC3 programs?* We found that not only the results, but also the unique approaches to program implementation and sustainability provide excellent real world examples and best practices for other SC3 programs to consider. While not all of the approaches are a good fit for every SC3 program, the report provides a myriad of methods to support the various programmatic elements of SC3 programs such as chemical inventorying and long-term responsible chemical management.

Regarding *Evaluation Question #4: In the future, what can EPA do to improve achievement of intended results?* Interviewees identified ways EPA could help, at the national level, with the development and refinement of state/tribal/local SC3 programs. Most agree that EPA should act as a resource, providing information or clarification on issues ranging from RCRA concerns (e.g., generator status) to "how to" guides to developing SC3 programs to facilitating partnerships with other federal and state agencies to support SC3 initiatives.

This document presents our detailed findings of the Results Evaluation, and focuses on identifying approaches and other factors that had the greatest impact on the results achieved. We conclude by presenting recommended next steps for EPA to consider as they develop a national schools chemical cleanout campaign.

I. INTRODUCTION

In 2004, EPA launched the Schools Chemical Cleanout Campaign (SC3), a high visibility initiative operating as part of EPA's Resource Conservation Challenge (RCC). The Campaign is a cooperative effort amongst EPA's Office of Solid Waste and Emergency Response (OSWER), Office of Children's Health Protection and Environmental Education (OCHPEE), Office of Prevention, Pesticides, and Toxic Substances (OPPTS), Office of Air and Radiation (OAR), and the Regions, and uses a variety of innovative approaches to achieve its goals:

(1) Remove accumulations of potentially dangerous chemicals from K-12 schools;
(2) Prevent future accumulations through improved chemical management; and
(3) Raise national awareness of the issue.

In 2004, the RCC funded separate and distinct SC3 programs in each of the 10 EPA Regions. Each program received approximately $25,000. These programs were designed and implemented to address each of the aforementioned goals. The programs each took unique approaches in achieving results. The 2004 funded programs are listed in Exhibit 1. (Please see Appendix 1 for detailed program summaries).

Exhibit 1
Programs Receiving SC3 Funding in 2004

EPA Region	SC3 Program
1	Rhode Island Chemical Safe Schools Committee
2	Rochester City School District (NY)
3	NW Tri-County Intermediate Unit's Safer Schools Initiative (PA)
4	Tennessee Department of Environment and Conservation's Safe SC3 Program
5	Osh Kosh/Green Bay School Chemical Collection Program (WI)
6	Ft. Worth Independent School District's Clean Out Your Chemicals Project (TX)
7	Rehab the Lab (IA)
8	Wyoming Department of Education's Safer Schools Initiative
9	Los Angeles Unified School District Pilot Program for Laboratory Chemicals (CA)
10	Idaho Chemical Roundup

Separate from this effort, in May 2005, EPA sponsored a "Formative Evaluation" of both EPA funded and non-EPA funded SC3 programs across the country to help EPA design a national SC3 program. The Formative Evaluation[1] provided information to improve EPA's understanding of the processes, operations, functions, and structure that would best enable EPA and its partners to facilitate the goals for the program.

In September 2005, EPA initiated this "Results Evaluation" of the ten SC3 programs selected for EPA funding in 2004. This document summarizes our findings of the Results Evaluation, and focuses on identifying approaches and other factors that had the greatest impact on the results achieved. Together with the Formative Evaluation, programmatic analyses, and other information, EPA plans to use the findings of this evaluation to develop a national SC3. This evaluation project also aims to improve future EPA SC3 funding competitions, heighten awareness of EPA's national and regional SC3 efforts, and provide model approaches and best practices for jurisdictions initiating their own chemical management programs.

This Results Evaluation focused on answering the following primary evaluation questions:

1. **Did the SC3 programs that received EPA funding achieve their goals?**
2. **What factors contributed the most to achieving or not achieving results?**
3. **How can the results these programs achieved be used to inform development or improvement of SC3 programs?**
4. **In the future, what can EPA do to improve achievement of intended results?**

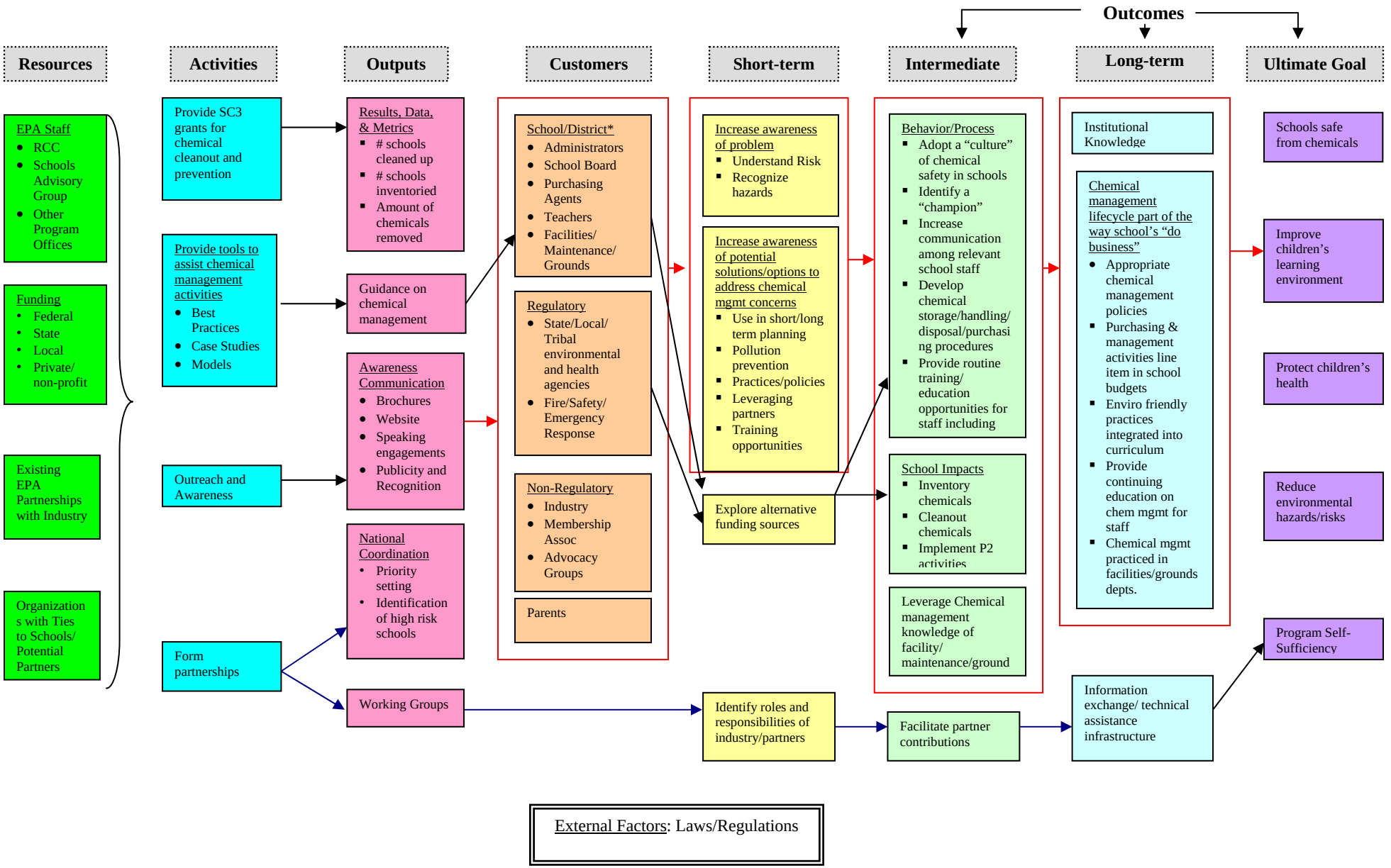
The remaining sections of the report present the evaluation methodology, results, and conclusions. The results section presents our findings, organized according to evaluation questions #1 and #2. The discussion/conclusion section serves dual purposes: it presents findings of evaluation questions #3 and #4, and addresses forward-looking aspects of the SC3 program as well as recommendations and next steps that EPA may consider as it continues to develop a national campaign.

II. METHODOLOGY

To frame the evaluation, Indtai[2] created a logic model that reflects EPA's current role in the SC3 program as well as potential role in a more robust national SC3 effort (see Exhibit 2). The logic model presents a picture of how the Campaign is expected to work and identifies factors that can affect the ability of the SC3 program to achieve desired results. The logic model links programmatic inputs, activities, and outputs to various stakeholder groups or customers. It also captures desired outcomes over time (e.g., increased awareness, changed behaviors). EPA can use this logic model as a tool to identify factors influencing program effectiveness. Indtai used the logic model to ensure we crafted evaluation questions and information objectives that best measured the impacts of the 10 SC3 programs that received EPA funding in 2004.

[1] Building Successful Programs to Address Chemical Risks in Schools: Recommendations from an Evaluation of Selected School Chemical Cleanout and Prevention Programs. For further information, see http://www.epa.gov/sc3.
[2] Indtai, Inc. was primarily responsible for conducting this evaluation under contract with Industrial Economics, Inc.

Exhibit 2: EPA Office of Solid Waste: Schools Chemical Cleanout Campaign



*Keeping in mind potential geographic (urban vs. rural) and socio-economic considerations

Indtai developed information objectives or "action items" corresponding to each of the four aforementioned evaluation questions. The action items corresponded to the type of data we anticipated collecting, both quantitative (e.g., number of schools cleaned out or number of teachers trained) and qualitative (e.g., critical success factors). For each of the action items, we presented our approach to information collection (e.g. see Exhibit 3 for information collection approaches used to answer Evaluation Question #1). We used three primary methods throughout the information collection process: document review, data mining/analysis, and personal interviews. To the greatest extent possible, Indtai leveraged quantitative and qualitative data we collected as part of the Formative Evaluation.[3]

Exhibit 3
Sample Action Items and Information Collection Approaches
Evaluation Question #1: Did the SC3 programs that received EPA funding achieve their goals?

Information Action Item	Information Collection Approach
Identify goals and/or targets (e.g., 20 teachers trained per year or X amount of chemicals removed)	Document Review, Interview
Collect demographic and geographic information of population served by program (e.g., rural v. urban, school size)	Data Collection, Document Review, Interview
Collect results that align with goals/targets (e.g., amount of chemicals, # training sessions)	Data Collection, Document Review, Interview
Collect unintended results (e.g., activities beyond program scope)	Data Collection (potentially), Interview
Identify performance measures/metrics	Document Review, Interview
Measure the impact of EPA funding on goal achievement	Interview

We used the SC3 logic model along with data and knowledge from previous SC3 program analyses to inform development of the interview guide and questions. The interview questions corresponded to the information action items[4]. Indtai used a dynamic approach to interviewing, allowing us to tailor questions according to the interviewee's background and expertise. For instance, if an EPA Regional SC3 lead was not familiar with the behavior change aspects of the program, we reserved those questions for the program leaders at the state/local level.

Indtai coordinated with EPA personnel to identify potential interviewees. We spoke with EPA Regional personnel that administered and oversaw the funding. We also spoke with state/local SC3 program personnel, which included program partners (hereafter referred to as "program implementers"), to gain different perspectives and insights[5]. Indtai had spoken with

[3] See Appendix 2 for complete methodology outlining action items for each evaluation question.
[4] See Appendix 3 for interview guide.
[5] See Appendix 4 for list of interviewees

many of the participants during the Formative Evaluation, so we had already established a rapport.

Indtai spoke or coordinated via email with EPA Regional personnel prior to contacting the SC3 program implementers. In all Regions, we contacted EPA personnel. There was one instance in which we were unable to get in touch with the primary program implementer, the Rhode Island Department of Health (RIDoH), but did talk to a partnering organization (for the Rhode Island Chemical Safe Schools Committee (SSC)). Indtai spoke with the RIDoH during the Formative Evaluation and used that information for this evaluation.

Indtai followed the established quality assurance plan while collecting information for this evaluation. Personal interviews included two Indtai personnel to ensure we captured information accurately. We asked for the most current versions of reports, data, and other documents from EPA personnel and the program implementers. We also sent each of the program contacts a follow-up email containing the data we captured as part of Exhibit 6 for their review and concurrence.

Once all of the data was collected, Indtai compiled, organized, and prepared the data for analysis according to evaluation question. We identified any data quality or completeness issues that may impact our analysis and presentation. For example, the data quality surrounding the quantities of chemicals removed from schools was highly variable among the programs. We worked with the program implementers to try and address those concerns. Wherever necessary throughout this report, we note any data quality or completeness issues that may have impacted the results.

We presented quantitative results data in summary tables to illustrate both the "rolled up" data on all of the ten programs combined (Exhibit 4) as well as a table that shows a breakdown for each program (Exhibit 6). Indtai identified common themes, practices, programmatic elements, and other information across the ten grant programs that answered the evaluation questions. We also noted unique examples of lessons learned and best practices in the findings.

We encountered some difficulties in interpretation and attribution of some of the data. For SC3 programs that were part of broader or existing efforts or supported simultaneously by multiple funding sources, it was often difficult to attribute the specific "results" data to the 2004 EPA SC3 funding. This was especially true in Iowa where prior efforts and the 2004-funded efforts blended together. There were also issues with data completeness and quality that stemmed from the types of data collected and methods used to track or measure. For additional information on data quality, please see the *Metrics* subsection of this report under Section III – Results.

Each SC3 program and approach is reflective of highly individualized and unique circumstances. While programs may share similar programmatic elements (e.g., chemical inventories), that does not equate to comparability. Therefore, Indtai did not attempt to make any determinations of the relative success of any of the programs reviewed. For example, it is not fair or accurate to compare the amount of chemicals removed by each program since there are multiple factors surrounding each program's approach to cleanout. This report does provide

quantitative and qualitative data to help improve understanding of effectiveness of particular SC3 approaches and techniques as well as identifies best practices.

III. RESULTS

This section presents the results of our data collection efforts to answer the evaluation questions. The findings are organized according to evaluation question. The information is primarily a result of insights from interviewees and represents common or recurring themes amongst the interviewees. Where appropriate, we provide specific, real-world examples from the ten SC3 programs.

The big picture question this evaluation sought to answer was "***Are Schools Safer?***" Consistently, according to the results, the answer is "***Yes***." The SC3 programs resulted in:

- Removal of dangerous chemicals;
- Decreased or mitigated risk of chemical accidents or incidents;
- Improved safety (e.g., better chemical storage, lab safety);
- Safer learning environments for children;
- Increased awareness of chemical management issues in schools and organizations impacting schools; and
- Development and implementation of responsible chemical management practices.

Specifically, Exhibit 4 presents a roll-up summary of the ten SC3 programs[6]. Please see Exhibit 6 for a breakout of results for each grant program.

Exhibit 4
Summary Highlights of Results from the Programs Receiving 2004 SC3 Funding

Schools Cleaned Out	About 500[7]
Population/children affected	585,000+
Chemicals Removed	72,000+[8]
Personnel Trained (e.g., teachers, administrators, facilities)	1,500 +
Funding in Addition to EPA SC3 (not including in-kind services)	$235,000+

[6] This data was compiled from 2004 funded program reports to EPA, websites, articles, and personal interviews. Indtai did not independently verify the validity of the data, but it was reviewed and approved by SC3 program implementers. In the methodology section we discussed data quality and completeness issues.

[7] Wyoming and Iowa data was only available by school district therefore we present an estimated range of number of schools.

[8] Due to the complexity of funding sources in Iowa's program, we had difficulty attributing the portion of Iowa's data to the 2004 EPA funds. Based on data verified by EPA Region 7, we include 20,000 pounds in this table. The amount could be as high as 120,000 pounds.

With all of these strides, also comes a word of caution from evaluation participants. Many are still concerned about "repeat offenders" (i.e., inappropriate chemical acquisition and storage after the baseline cleanout). Factors such as lack of compliance mechanisms, staff turnover, funding concerns, and inadequate institutionalization of responsible chemical management practices, could hinder long-term sustainability of these programs and *may* result in the need for future chemical cleanouts.

Creating safer schools requires awareness and knowledge of the unique set of circumstances surrounding individual schools. There is no "one size fits all" approach to SC3 programs. While there are common elements that are proven to achieve results, the implementation and program sustainability methods and approaches vary. Throughout this report and specifically in response to evaluation question #3 (see section IV.A), we present demonstrated approaches and practices for consideration by EPA and SC3 program implementers. Program implementers should be aware that before considering any of the approaches or techniques in this report, a thorough assessment of your individual situation and needs is critical (e.g., understanding what regulations are applicable in your state/locality).

III.A. Evaluation Question #1: Did the SC3 programs that received EPA funding achieve their goals?

The information below was obtained through interviews and represents the opinions and thoughts of EPA Regional personnel and SC3 program implementers. We begin with a discussion of common program goals and objectives prior to reporting the results. We then present the results from each of the 10 programs that received EPA funding in 2004 (Exhibit 6). To facilitate understanding of the results presented in Exhibit 6, we include a discussion on common SC3 program metrics—a critical component to documenting achievements. We also identify "unintended" results. Lastly, we discuss the role of funding in achieving results.

Common Program Goals, Objectives, and Targets

As a condition of the EPA SC3 funding, all programs had to address responsible chemical management, raising awareness, and chemical cleanout[9]. This, however, did not mean they all had the same goals or targets or use the same approaches to achieve goals[10]. Generally, the programs' goals and objectives were broad and focused on removing dangerous, outdated, or excess quantities of chemicals, risk reduction, and prevention. Most programs specified target areas such as chemical laboratories, but some did not. See the text box for sample goal and objective statements.

Sample SC3 Goals/Objectives

"To enhance processes and procedures for the disposal of chemicals, hazardous waste, and waste reduction, and management."—*Ft. Worth Independent School District Program*

"To reduce health hazards associated with hazardous chemicals in the laboratories, and to reduce release of hazardous chemicals from the storage area into the environment."—*Los Angeles Unified School District*

[9] Most chemical removal was accompanied by a chemical inventory either of the entire school or of the chemicals slated for removal and disposal.
[10] Please see Section IV for a discussion on approaches to achieving results.

A few programs set a target range of the number of schools they wanted to reach or at least estimated the number of schools that would be eligible to participate. In certain cases, programs specified geographic areas or economically disadvantaged areas as targets.

As for training and awareness, all felt it was necessary, but that did not necessarily equate to a target or goal. Some funding applications did note venues and opportunities they hoped to leverage to provide training or set goals for the number of sessions they hoped to complete during the project period. In the Tennessee Department of Environmental and Conservation (TDEC) proposal, forums such as teacher in-service workdays, workshops, Tennessee Science Teacher Association meetings, and EPA's Safe School Roundtable were highlighted as events and venues to target for training and awareness[11].

Results

Metrics

Developing metrics to measure the impact of SC3 programs is a critical step in determining the program's impact on the target populations. While all of the ten SC3 programs had some type of metrics[12], the absence of baseline chemical inventories or assessment of overall chemical management issues resulted in the inability to fully determine SC3 program impacts. Most programs did capture *approximate* amounts of chemicals removed and other measurable results that positively impacted the targeted school populations.

Below, we discuss SC3 metrics typically used by the ten programs receiving EPA SC3 funds in 2004. In certain instances, we also present common difficulties and issues that SC3 program implementers should be aware of as they develop and implement metrics. The data that was captured using these types of metrics, is presented in Exhibit 6 for each of the 10 SC3 programs that received EPA funding in 2004.

- *Number and Type of Schools/School Districts Served*: This captures the number and type (e.g., high schools, vocational) of individual schools or the number of districts that have participated in the SC3 program. This metric can be further delineated by capturing the number of schools that participated in aspects of the program (e.g., cleanout only, training). **For purposes of this evaluation, this metric primarily represents only those schools that conducted chemical cleanout.** Where possible, in Exhibit 6, we denoted where programs captured more specific data that went beyond the number of schools that conducted cleanout. For example, the Osh Kosh, Wisconsin SC3 program noted the number of schools that participated in on-site audits. In Idaho's Chemical Roundup, one school received a chemical storage cabinet in lieu of cleanout assistance.

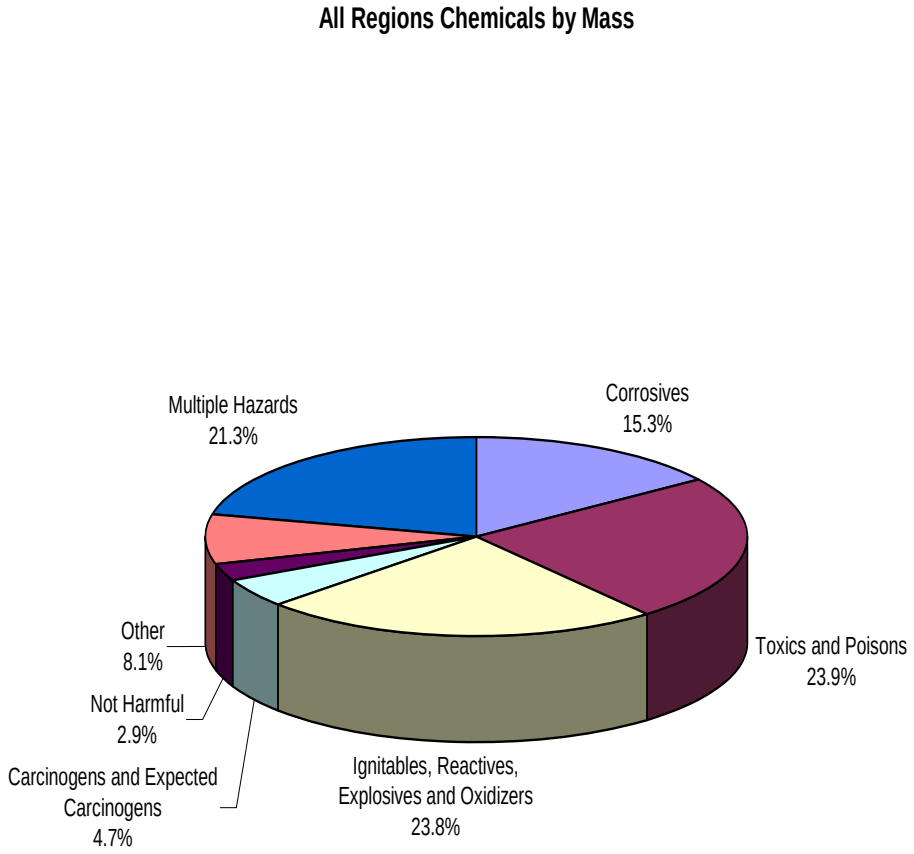
[11] SC3 EPA 2nd and 3rd Quarterly Report, October 1-2004-June 30, 2005.
[12] On July 8, 2004 OSW disseminated a memo to Regional SC3 leads that discussed metrics they should consider including in grants.

- *Quantity of Chemicals Removed:* This captures the amount, usually measured by volume or mass of chemicals removed from a school. Some programs reported this metric in terms of the number of containers of chemicals (e.g., two bottles of sulfuric acid) removed from schools. Programs encountered occasional difficulties in reporting the true amount of chemicals removed. The most common problem was difficulty converting various chemical volumes/weights in order to aggregate amount of chemicals removed (e.g., calculations requiring knowledge of chemical densities to convert to pounds). Some of the program implementers did not have a chemistry background, hindering their ability to summarize data (e.g., convert different measurement into a comparable format). Many sought assistance for this task from others in their organizations or partners. Also, some used the number of containers removed as a proxy for the true amount of each chemical removed, resulting in a less exact metric. In a few cases, improved storage or containment practices were also noted, such as purchase of a chemical storage cabinet. Please see Exhibit 6 for details on each program. The quantities of chemicals removed from each program were highly variable due to the unique circumstances and approach to each SC3 program.

  Programs collected this data from a variety of sources. The most common ways were chemical inventories, packing lists, and waste manifests. Others supplemented this information with written reports and personal conversations to obtain anecdotal information.

- *Type of Chemicals Removed:* This reports the classification of chemicals removed. Classifications used by programs widely varied. Some were very specific, breaking down each chemical by name (e.g., potassium chloride or ammonium nitrate). Others used broad classifications like hazard classes or categories such as hazardous, toxic, flammable, corrosive, explosive. Some SC3 program's list of chemicals contained substances that were not hazardous, but still removed (e.g., olive oil, chalk). Exhibit 5 presents a summary roll up of data on types of chemicals removed from the ten SC3 programs.

Exhibit 5: Summary of Types of Chemicals Removed from 10 SC3 Programs



*Data compiled by SAIC

- *Cost of Cleanout:* Expenditures related to chemical cleanout. These can be both financial and in terms of personnel/labor hours. Typically, programs captured the costs related to chemical inventorying, packaging, and disposal. Disposal represents the largest part of cost. Typically, we found most cleanouts range from $2,000-5,000 per school.[13] Some programs also tracked internal labor/personnel hours. These hours were not solely related to chemical cleanout, but also may have included logistics planning, technical assistance, outreach, and training.

- *Other Chemical Management Costs:* Some found it useful to track expenditures related to outreach, communications, technical assistance, and training. In addition to labor hours, typical costs included stipends or financial incentives (e.g., financial incentives for teachers to attend training sessions) and printing and publishing costs.

[13] Additional information on potential costs of cleanout can be found beginning on page 21 of this report.

- *Number of Training Sessions/Number of Personnel Trained*: This captures the number and type of training sessions provided as part of the SC3 program. It also reports the number and type of personnel trained (e.g., teachers, facilities, school administrators).

- *Other Funding Contributions*: This metric reflects the financial and in-kind contributions in addition to EPA's SC3 funds. Contributions made by program partners as well as by individual schools were sometimes reported as part of the total funding used to achieve results. For example, the Los Angeles Unified School District (LAUSD) broke down the portion of the program costs attributed to the EPA funds and monies contributed by LAUSD's Office of Environmental Health and Safety (OEHS).

One program had a metric that related to SC3 program sustainability at the individual school level. Tennessee Department of Environment and Conservation's (TDEC) program developed a metric, "establishment of a long-term program." Another aspect of sustainability is behavioral change. None of the ten programs had a formal metric to measure behavior change or awareness, but were able to provide anecdotal information (e.g., greater awareness among teachers about green chemistry, implementation of chemical hygiene plans). Most interviewees commented that it would be very useful to capture this information, but they feel it was too early to be tracking it.

A few programs took a slightly different approach and also incorporated evaluation questions to help assess their performance and results. The NW Tri-County Intermediate Unit (IU) used the following to assess results[14]:

- What worked, what didn't work?
- What improvements could make a more successful program?
- What are the lessons learned from this effort?
- What were the actual costs involved broken out by budget category?
- How can the program be conducted on a much larger scale?

In Exhibit 6 below, we present the results from each of the ten SC3 programs. The information was gathered from interviews, program reports, articles, and other SC3 program documents. As noted earlier in the methodology section, we encountered some issues with data completeness and quality. This table reflects the most current data we were able to get and was verified by the primary point of contact (and person we interviewed) for each program. The school populations affected was estimated using data from http://www.greatschools.net/.[15] If we had individual school names, we looked those up and used their enrollment numbers. If we did not have specific school names, we used averages of school size.

[14] From "Safer Schools Initiative-Summer 2004- The Northwest Tri-County Intermediate Unit and P3ERIE"

[15] Great Schools is an independent nonprofit organization founded by a former teacher, that provides information to help parents and others make informed decisions that supports their children's education and improves schools in their community. The site contains profiles of over 120,000 schools that contain enrollment data, test scores, and other information.

Exhibit 6: Breakout of Results from 10 SC3 Programs

	Region 1 - RI	Region 2 - NY	Region 3 - PA	Region 4 - TN	Region 5 – WI	Region 6 - TX	Region 7 - IA	Region 8 - WY	Region 9 – CA	Region 10 – ID
Program Implementer	RI Department of Health	Rochester City School District	NW Tri-County Intermediate Unit	Tennessee Dept of Environment and Conservation	EPA Region 5	Fort Worth Independent School District	EPA Region 7/Metro Waste Authority	Wyoming Department of Education	Los Angles Unified School District	Idaho Department of Environmental Quality
# of schools cleaned out	8 Schools	13 secondary schools	16 schools	69 schools	57 schools with 13 requesting on site audits	37 Schools; 15 High ; 22 Middle	182 of 366 schools reached	31 school districts (of 48 in state)	47 schools	22 Total: 11 SC3; 11 DEQ
Quantity of Chemicals Removed[16]	893 lbs	800 lbs solid 1,300 gallons liquid	267 lbs	23,000 lbs	1,982 lbs	15,000 lbs	20,000 lbs[17]	6,000 lbs	3,283 lbs	SC3: 763 lbs DEQ: 648 lbs Total: 1,411 lbs
School population/ children affected (# students)	4,686	~6,939	11,469	~50,000[18]	40,760	~21,645	269,345	53,599	116,802	SC3: 4,136 DEQ: 5,891 Total: 10,027
# of school personnel trained	Not Measured	50 science teachers	14 School Representatives	24 workshops	Teachers at onsite audited schools were trained onsite	Specific number not measured	Science educators: 89; Auto/Tech: 38	N/A	120 Chemical Safety Coord.; 1,100 plant managers	2 Training sessions scheduled for Fall 2006
Funding In Addition to EPA SC3 funds	RIDEM in kind services	Monroe County in kind staff time	EPA Region 3: $5K; PADEP in kind services	EPA OPPTS grant: $26K; TDEC: in kind staff time; school participation fees	EPA Region 5: $9K	FWISD: $55K; Schools paid portion of cost	IA DNR: $75K	OPPTS: $27K; In-kind staff time; schools paid portion	LAUSD matching/in kind: $19K	School Match: $34K IDEQ: $20K
Partners	Φ E	E	E	Φ	Φ	Φ E	E	Φ	E	
Existing Chemical Management Regulations	✔					✔	✔	✔	✔	✔

[16] Approximately **95%** of the chemicals removed from all of the 10 programs were considered to be **hazardous**

[17] Due to the complexity of funding sources in the Iowa program, it was difficult to accurately attribute the exact quantity of chemicals removed to the 2004 EPA funds. EPA Region 7 provided this data. It is possible that up to 120,000 pounds could be attributed to the Iowa chemical management program.

[18] This is an estimation based on the average number of students/school since we did not have the names of schools cleaned out

Key

Φ - State Education Agency - State/Local Environmental Agency - State/Local Public Health Agency

- Business/Industry E - Local School District - Other Community Partnership - US EPA

Unintended Results

Unintended results are those that were not expected as part of what the program is designed to do or achieve. These results can be both positive and negative and are important considerations when developing and implementing SC3 programs. Please see Section IV for recommendations on how to leverage unintended results.

We asked participants about the types of results they viewed as "unintended." Interviewees most frequently identified positive unintended results. These findings are presented below:

- *Increased awareness of school personnel not directly targeted.* Programs reported anecdotal examples of school staff that were not the primary audience of the program efforts, such as facilities and maintenance, inquiring about chemical disposal options and showing increased awareness of chemical management. For instance, at the Rochester City School District (RCSD) bus garage, awareness of the program led to maintenance personnel asking about how to properly dispose of excess or used garage chemicals. For the NW Tri-County IU, the SC3 program actually opened their eyes to how significant this problem is not only in labs, but also in other areas of the school. In the future, they anticipate involving others, such as maintenance/facilities personnel that also have a role in chemical management.

- *Created new partnerships.* The SC3 programs have provided opportunities for organizations that do not typically work together, but have relationships to schools, to join forces to address responsible chemical management. The RCSD sought the assistance of the Monroe County household hazardous waste facility in chemical disposal. The relationship grew into a more formalized partnership agreement and ultimately resulted in lower disposal fees for school chemicals.

- *Generated interest from additional areas/schools.* The success of SC3 programs and awareness of services (and funding) offered serve as a catalyst to attracting new program participants. In Idaho, the scope of the program was originally focused on the northern region of the state, but upon hearing about the program, enough interest was generated that the Idaho Department of Environmental Quality (IDEQ) expanded the program statewide. In Tennessee, the success of initial program efforts resulted in private schools inquiring about participation. Also, the TDEC SC3 program serves as a model that has generated interest from other states in EPA Region 4 to develop programs. In Wyoming, the SC3 program resulted in 3-4 additional schools to do chemical cleanout using their own funds.

- *Gained support of upper management.* SC3 program achievements have gained the attention and support of management with state agencies, school districts, and even raised awareness of state legislatures on the issue. In Idaho, the results of the efforts by the IDEQ Chemical Roundup project manager resulted in management support and a contribution of $20,000 in additional funds to expand the program statewide.

- *Improved lab safety among teachers.* Teachers became more diligent about overall lab safety, not just chemical management. There was increased awareness and concerted efforts to maintain equipment properly (e.g., eye wash stations, ventilation hoods) to create a safe lab environment for students. The Fort Worth Independent School District (FWISD) witnessed this behavior change by many of the teachers that experienced the lab chemical cleanout. While teachers in the FWISD did not directly assist with cleanout, they did receive education and training.

- *Sparked interest from local community.* In Iowa, the chemical removal and management efforts in schools have impacted the local community. Awareness of the program has been spread throughout communities by school children, parents, and others. As a result, the local business community has approached the Metro Waste Authority (MWA) to get information about chemical removal services for businesses. In Idaho, chemical disposal contractors that have been involved in SC3 efforts have begun their own chemical removal marketing efforts targeting schools.

- *Generated interest in waste minimizing and safer chemistry experiments.* While promotion of techniques and practices such as green or micro-scale chemistry that serve to reduce the amount of dangerous chemicals used in laboratories were not the primary objectives of the majority of the SC3 programs, interviewees noticed an increased awareness and interest in using these techniques for lab experiments. In some situations, newer teachers that are more aware of these techniques are helping to advocate these practices in conjunction with overall chemical management efforts. In addition, several of the SC3 programs incorporated information about green and micro-scale chemistry into training and information sessions, which has spurred additional interest in putting these techniques into practice in the classroom.

- *Resulted in development of chemical management training resources.* Many of the SC3 programs have developed training resources and tools for teachers, administrators, facilities, and others. These resources are frequently available online and are being shared by numerous SC3 programs. Several interviewees mentioned other program websites that they often go to for information on training and other resources. For example, IDEQ's Chemical Roundup website provides multiple fact sheets to assist with chemical management.

- *Increased use of existing chemical removal services.* School districts or state agencies may provide some type of chemical removal or technical assistance service to interested schools. Awareness of these services has increased in some areas due to SC3 program efforts. In Texas, the FWISD has seen an increase in the number of inquiries to assist with removal of chemicals, illustrating increased interest in getting rid of dangerous chemicals as well as awareness of existing removal options.

Impact of EPA Funding on Achieving Results

The majority of program implementers agreed that results would not have been achieved without financial support from EPA. Some programs were so dependent on the SC3 funding, that unless they receive future funding, they claim that they will no longer be able to assist with chemical cleanout. On the other hand, other programs were able to leverage the EPA funding to attract financial support from other organizations. The additional funding allowed programs to cleanout more schools, conduct more comprehensive cleanouts, and train additional staff on responsible chemical management. This project did not evaluate whether or not those leveraged funds will assist in long-term sustainability. More information on other funding sources can be found in section IV.A.

III.B. Evaluation Question #2: What factors contributed to achieving or not achieving results?

This section presents critical success factors as well as factors that contributed to program implementation difficulties. We also highlight innovative approaches that, according to interviewees, positively impacted program results. Lastly, we discuss how program costs can impact an SC3 program's ability to achieve results.

Critical Success Factors

Based on information gathered during interviews, we present the following factors that were most commonly mentioned as contributing to program success. This is not meant to be an exhaustive list, but represents the factors referred to most frequently by interviewees.

SC3 Program Critical Success Factors

- Have a program champion
- Ease of program participation
- Create partnerships
- EPA funding
- Leverage other funding sources
- Raise awareness of the problem and risks
- Identify qualified disposal contractors
- Build relationships with EPA Regional personnel

- *Have a program champion:* A program champion advocates, promotes, and educates others about the positive benefits of SC3 programs (as well as the consequences of not addressing school chemical problems). The champion often makes the cause a personal one and is dedicated to ensuring successful program implementation. Interviewees, representing six out of ten programs, mentioned that the results could not have been achieved without a program champion. For instance in Region 7, a staff person at the Metro Waste Authority provided a significant portion of her time to promoting the advantages of chemical management both in Iowa and to others around the country. Her knowledge and enthusiasm for the cause was motivational to individual schools and SC3 programs.

- *Ease of program participation:* Making it easy for schools to participate in SC3 programs is key to success. A simple program structure, minimal bureaucracy and paperwork, providing sufficient instruction, and emphasizing the importance of responsible chemical management were all noted as ways to make SC3 programs attractive to participants. The Wyoming

Department of Education (WDE) credited the simplicity of its approach as critical to achieving results.

- *Create partnerships:* The majority of the SC3 programs developed new or leveraged existing relationships to achieve results.[19] These partnerships created roles and responsibilities for the partners that aligned with their areas of expertise. For example, the TDEC SC3 program worked with a university to develop a green chemistry manual. In Rhode Island, the Department of Environmental Management (RIDEM) coordinated with the Department of Labor to utilize existing inspection programs to assess chemical management problems. Also in Rhode Island, the Safe School Committee (SSC) was formed to support SC3 efforts. The SSC was comprised of numerous partners, including state/local agencies and universities, each with defined roles and responsibilities. In many instances, partners provided in-kind services such as personnel time. The NW Tri-County IU in Pennsylvania partnered with the Department of Environmental Protection to review chemical inventories.

- *EPA funding:* As previously stated, interviewees mentioned that they could not have achieved success in the absence of EPA funding. In some cases, they also could not have leveraged other funding without that from EPA. For instance, FWISD said that the EPA funding was a "catalyst" for getting their school board to contribute $55,000.

- *Leverage other funding sources:* Many of the programs were able to use the SC3 program results to secure funding from other sources. Interviewees credited the ability to reach out to additional schools and expand the program scope to this additional funding. Programs used a variety of creative ways to leverage additional funding sources.[20] Idaho used the initial results and interest generated from their mini-grant approach to SC3. This approach offered schools a limited amount of funding as an incentive for the schools to cover the remaining cost of chemical management activities.

- *Raise awareness of the problem and risks:* Efforts to educate people about the risks of improper chemical management is integral to attaining results. A lack of awareness can hinder progress, especially, if responsible chemical management is not viewed as a priority. The SC3 programs took steps to raise awareness among stakeholders critical to their programs. These included teachers, science department chairs, facilities/grounds/maintenance, school administrators, state environmental, agriculture, health, and labor agencies, and membership organizations. Methods ranged from publishing articles about SC3 program success to participating in conferences and events to training sessions. For instance, the IDEQ advertised, sent letters to chemical schoolteachers and principals, developed press releases, and posted notices on listservs.

- *Identify qualified disposal contractors:* Identifying a knowledgeable contractor that the schools can trust is very important. Since schools are not typically in the business of chemical removal, they often need assistance in this area and rely on contractors to effectively and safely remove the chemicals for proper disposal. Many programs provided

[19] LAUSD and FWISD did not have partners aside from EPA.
[20] See section IV for more information on alternative funding sources.

schools with lists of disposal contractors in their areas, allowing the schools to personally contact and develop a relationship with the contractors. In Wyoming, this was cited as one of the critical success factors, not only because it helped to develop trust, but also gave the school ownership of their role in chemical removal.

- *Build relationships with EPA Regional personnel:* Having a relationship with EPA Regional personnel or being connected to networks that interact with EPA was helpful in raising awareness about funding opportunities. Program implementers in EPA Regions 2, 3, and 10 mentioned that routine interactions with EPA personnel and awareness of SC3 happenings at the Regional level were critical to awareness about funding opportunities. In Region 4, the relationship between the grantee and Region is also assisting other state and local SC3 programs. EPA Region 4 frequently touts the success of the TDEC SC3 program and refers other states, tribes, and localities to TDEC personnel for information.

Factors Contributing to Implementation Difficulties

Based on information gathered during interviews, we present various factors that hindered program implementation. This is not meant to be an exhaustive list, but represents the factors most commonly highlighted by interviewees and derived from analysis.

Factors Contributing to SC3 Implementation Difficulties

- No established baseline or scope of chemical management problem
- Incomplete or inaccurate chemical inventories
- Lack of awareness of school chemical management policies and regulations
- Inexperience of SC3 program implementers in developing requests for proposals for waste management contracts
- Lack of staff time and personnel to implement SC3 program
- Lack of qualified staff to conduct inventory and assist with chemical removal
- Difficulty identifying and disposing of certain chemicals
- "Non compliance" or resistance from teachers
- Competing school priorities
- Unwilling program participants
- Lack of enforcement mechanism and follow-up assistance

- *No established baseline or scope of chemical management problem:* Without a baseline, or sense of the extent of the problem, it is often difficult to develop and implement a program that is responsive to the individual school needs. It is also difficult to measure results without a baseline for comparison.[21] A baseline does not just refer to the type and quantity of chemicals, but also to location, accessibility, and storage of chemicals. This presents somewhat of a "chicken-and-egg" problem in that the effort to identify school risks is not a small undertaking, and involves time and money. A broader program challenge is to identify methods for cost-effectively identifying (and prioritizing) schools with the most urgent need, short of performing a complete inventory.

[21] Not establishing a baseline is also a problem on a larger scale, at the national level. Without quantifying the extent of problem, it is hard to determine the magnitude of the risk and to develop programs that adequately address those risks. Through the assistance of the 2004 EPA funds, these 10 SC3 programs have taken the first step toward establishing a baseline.

A few programs noted that additional locations with chemicals were found after cleanout. Accessibility to chemical storage areas was commonly mentioned as an impediment to assessing the baseline or extent of chemical management problems. The FWISD encountered a variety of accessibility issues such as nobody having the key to chemical storage areas, as did the NW Tri-County IU.

- *Incomplete or inaccurate chemical inventories:* Lacking a comprehensive and complete inventory can cause a variety of problems in the short and long-term for schools. Proper inventories are required to accurately gauge the extent of individual schools' chemical management problems as well as estimate disposal costs. An initial accurate inventory is also critical to effectively and efficiently managing future chemical and equipment purchases, storage considerations, and sustaining long-term chemical management practices.

- *Lack of awareness of school chemical management policies and regulations*: Interviewees found that (mainly newer) teachers were unaware or unfamiliar with school or school district policies and procedures. This is illustrative of a larger problem with institutionalizing responsible chemical management policies and procedures. Schools have to deal with teacher and administrative turnover and must find ways to mitigate the loss of institutional knowledge. To remedy this problem on the FWISD system, polices were re-emphasized at meetings with science and secondary education directors.

- *Inexperience of SC3 program implementers in developing requests for proposals for hazardous waste contractors:* The NW Tri-County IU in particular had difficulty with this aspect of their program. As they attempted to develop a request for proposal or "bid package" for hazardous waste disposal contractors, the School Board continually rejected it for being inadequate and not properly addressing issues such as liability. This resulted in development of multiple versions of the bid package before receiving Board approval. The NW Tri-County IU sought and received assistance from Regional EPA personnel on this issue. Even with that assistance, the revisions slowed down the process of contracting with a hazardous waste company significantly. In fact in a couple of instances, schools became "tired of waiting" and decided not to participate in the program. The NW Tri-County IU hopes EPA could provide additional assistance on this issue in the future.

- *Lack of staff time and personnel to implement SC3 program:* It is often the case that SC3 program implementers have many other responsibilities, of which managing or implementing SC3 programs is just one. It is rare to find a program with staff dedicated 100% to the program. In some cases, programs, such as Idaho, hired interns that were primarily working on SC3 efforts, but the time commitment fluctuates with other school responsibilities and there is often high turnover.

- *Lack of qualified staff to conduct inventory and assist with chemical removal:* The lack of qualified staff, both within the SC3 program implementing entity and at the school level, caused some difficulties and can ultimately impact disposal costs. Generally speaking, most teachers do not have lab safety or chemical management pre-service teacher training and are not qualified to conduct inventories or prepare chemicals for disposal without the assistance of a trained professional. Likewise, since some of the SC3 program implementers were not

entities that typically handle these issues (e.g., school districts or school service organizations), more of the inventorying, identifying chemicals for removal, and packing work had to be done by disposal contractors (which can increase cost). At FWISD, while the primary program manager had a background to conduct inventories and remove chemicals, his staff that was available to assist, did not. This resulted in one person having to do the majority of the work.

- *Difficulty identifying and disposing of certain chemicals:* Due to age and improper storage of chemicals, many programs were unable to accurately identify chemicals. Frequently, older chemicals were mislabeled, not in their original containers, or just not labeled at all. This not only presented a potential risk during chemical removal, but also resulted in additional resources to have chemicals tested and identified. Problems also arose when dealing with certain types of chemicals such as radioactive, pharmaceuticals, and human specimens. These substances require special handling procedures and can impact the cost of disposal. In Iowa, MWA experienced difficulty in disposing pharmaceuticals and human specimens. After research and searching for organizations to assist, they worked with the state Drug Enforcement Agency and funeral homes to help with disposal.

- *"Non compliance" or resistance from teachers:* SC3 programs encountered teachers that were unreceptive, resistant, or unwilling to dispose of all of the dangerous chemicals they were aware of. This behavior was most often found in "older" teachers that had been in their profession for a number of years. Several interviewees noted teachers that did not divulge all of their chemicals (in one instance, these chemicals appeared weeks after the cleanout and were removed) or claimed that they may need the chemicals for future experiments even though those chemicals had not been used in several years. On the other hand, newer teachers were generally, but not always, more aware and interested in ridding their classrooms of outdated, excess, and dangerous chemicals (this is especially true of they inherited chemicals from a previous teacher).

- *Competing school priorities:* With the primary mission of schools being to educate children, chemical management is not always viewed as a top priority, even though it impacts a safe learning environment. Schools also have various mandates they need to address such as No Child Left Behind, that often rank higher on the priority list. Especially in a time of budget constraints, schools often have difficulty justifying the cost (actual or presumed) of chemical cleanout and responsible chemical management.

- *Unwilling program participants:* There are schools that opt not to participate, which result in an incomplete "picture" of the extent of schools' chemical management problems and risks that are unknown and unable to be addressed. While some interviewees did not know why schools chose to not participate, others cited reasons such as: schools said they had already done their own cleanout, they did not have a chemical management problem, or were concerned about the cost. Interviewees acknowledged that they still seek ways to get to these schools, but it is often difficult. Many said they would tackle these "hard to reach" schools after they addressed the willing participants.

- *Lack of enforcement mechanism and follow-up assistance:* For a variety of reasons, including lack of resources (staff time and financial) and jurisdictional/authority issues, compliance with aspects of SC3 programs are difficult to verify or enforce. Most SC3 programs are voluntary. While many develop requirements for participation, those requirements do remain over the long-term. LAUSD mentioned that they have "no control" over what chemicals teachers purchase. Some programs have put infrastructure in place that can act as an enforcement mechanism. The FWISD is implementing a Material Safety Data Sheet (MSDS) inventory system that is district-wide to enforce smart chemical purchasing.

  Many SC3 programs are unable to follow up with schools to offer technical assistance or help implementing responsible chemical management and sustainability measures. Many interviewees expressed a desire for these components, especially as they attempt to assess changes in behavior as a result of their programs.

Innovative/Particular Approaches that Impacted Results

We asked interviewees if they felt that any particular approach or aspect of their SC3 program was more critical to achieving results than others. Not all interviewees had a response to this question. The approaches below were identified by interviewees and are not a result of analysis. Additional chemical management approaches and techniques are found in section IV.A. Here is what interviewees felt to be innovative:

- *Mini-grant approach to chemical cleanout:* In Idaho, the IDEQ used a mini-grant approach that provided $1,000 to schools toward chemical removal/disposal. The schools had to cover the costs over that amount. IDEQ felt that this was a great way to make a big impact with a small amount of funding. IDEQ estimates that the schools typically contributed about $4,000 of their own funds to cover the remaining costs.

- *"Joint ownership" of chemical management:* In Wyoming, the WDE advocated joint ownership of school chemical management issues. Their message was to let schools know they were not alone in handling these issues, while emphasizing the roles and responsibilities of the school versus those of WDE. They structured their program so that WDE and schools were partners in the effort and felt this approach created trust and autonomy to handle chemical management in the most appropriate way for their individual school. It should be noted that this was the only program that followed such a "hands off" approach regarding approach to local implementation.

- *School TV stations as training mechanism:* In Iowa, there is a statewide TV network that every school can access. The MWA used this medium to reach out to teachers to train them on responsible chemical management. Many programs encounter difficulties in attracting teachers to training sessions since training is often after hours, expenses for attending are not reimbursed, or the training does not equate to continuing education credits or certification. The MWA used an existing resource to their advantage and educated numerous teachers in the process.

- *Utilizing inspection reports or the authority of other agencies:* This technique was used by several grantees as a way to reach out to schools to help with chemical management concerns. The RIDEM routinely spoke with personnel in the state Labor agency who had the authority to inspect schools. RIDEM educated Labor on the SC3 program and issues so as a courtesy, Labor personnel would notify RIDEM of any potential chemical management issues they encountered so that RIDEM could follow-up with schools. Similarly, the NW Tri-County IU reviewed school inspection reports completed by the County Health Department to identify schools with violations that may need assistance with chemical management. LAUSD also has a comprehensive inspection program that covers 14 different areas (e.g., health, environment, indoor air quality) and results in scorecards for each school. They also have an inspection database[22].

Typical SC3 Program Costs

The following are typical costs associated with implementation of SC3 programs. It is possible for any one of these costs to impact the magnitude of results achieved or the ability of an in implementing organization to effectively and efficiently run their program. We did not attempt to analyze each program's costs relative the results achieved (e.g., cost-effectiveness). We should also note that the programs did not actually track some of these costs listed below, but mentioned them anecdotally. Below we present typical SC3 program costs, highlighting a few examples we have from interviewees:

- Personnel time/cost of implementing organization and/or funding organization (e.g., grant administration or EPA regional technical assistance);
- Administrative costs of implementing organization and/or funding organization (e.g., grant administration or EPA regional technical assistance);
- School staff time and incentives for school staff participation (depending on how SC3 program is structured this can include teachers, department chairs, administrators, purchasing officials, facilities/maintenance/grounds);
- Preparing chemicals for disposal;
- Removal/disposal;
- Training;
- Production of outreach and collateral materials (e.g., brochures, articles); and
- Prevention related (e.g., purchase of chemistry kits, new equipment).

[22] LAUSD's efforts served as the model for EPA's HealthySEAT tool to help school districts evaluate and manage their school facilities for key environmental, safety and health issues.

There was a wide variation in the way each SC3 program documented many of these costs. Additionally, many of the examples, such as personnel or administrative costs, were thought about "after the fact" and not formally tracked as part of the SC3 programs. Below we present a sampling of how SC3 programs captured personnel costs associated with program implementation:

- LAUSD estimated a "labor cost" of about $5,000 for staff time dedicated to the SC3 program which was covered by LAUSD in kind services;
- LAUSD also tracked how much time staff spent at each school related to cleanout: they cleaned out 47 schools and spent 294 hours;
- $5,000 of RCSD's budget covered staff time;
- EPA Region 5 staff dedicated about 5 weeks to the program;
- FWISD had 5 staff people assisting the SC3 efforts and of the EPA funding, about 30% of the budget covered personnel costs (including fringe benefits and travel);
- TDEC's two primary staff people for the SC3 program spent about one third of their time on the program; and
- EPA Region 7 staff spent "a couple of days a month".

Of the aforementioned costs, disposal is the most highly variable and has the greatest impact on the results achieved. Typical cleanouts ranged from $2,000-5,000. Depending on the situation, some schools may face substantially larger costs. In fact, RIDEM mentioned a school that incurred a $25,000 cleanout cost since the local fire department became involved and required the school to cleanout a large amount of chemicals. If a large portion of SC3 program budgets are needed for disposal costs, it can limit the number of schools that participate, number of school personnel trained, and the types of chemicals targeted for removal (e.g., certain chemicals may be cost prohibitive to remove or programs only want to focus on certain chemicals and provide schools a list of what the funding will and will not cover). There are ways programs can lower disposal costs and that is discussed in section IV.A.

In-kind services, such as personnel labor hours, are not always captured in SC3 program budgets. Many programs leverage the expertise of their staff (e.g., state environmental agency staff with chemistry backgrounds) as they implement aspects of their programs. The salaries of these personnel are often not covered by grant or other types of funding. Therefore, the use of personnel for SC3 program can be intermittent or on an "as available" basis since SC3 programs are not their primary responsibility. For example, the RCSD has one person, the Environmental, Health, and Safety Coordinator, who is responsible for SC3 program implementation as well as OSHA training and managing a range of environmental issues and contractors dealing with issues from asbestos to lead-based paint abatement. In Iowa, the person leading MWA's effort was spending so much time responding to inquiries from schools as well as other states interested in their program, that she has been reassigned to focus on chemical management for businesses, not schools.

Another cost which is hard to quantify, but can impact results, is what we refer to as intangibles. A good example is the level of expertise, knowledge, or experience that program implementers have about chemistry/science, chemical management and safety, and chemical

management activities. If there is a significant learning curve that staff must overcome, it can lead to implementation difficulties. This is both a time and financial cost to programs. The financial cost comes when a lack of knowledge may result in an accident or higher dependence on disposal contractors to conduct inventories and cleanouts. When SC3 program staff have chemistry knowledge and experience, they are often able to identify chemicals that can safely be disposed of, or package similar chemicals to reduce disposal costs.

IV. Discussion and Conclusions

This section serves to answer the remaining evaluation questions, which look ahead to how the findings of this evaluation can be used both by state and local chemical management programs and EPA to improve achievement of results. We answer the questions in the context of the goals of this evaluation as well as provide information to inform the ultimate goals (and ways of attaining those goals) of the current and future SC3 program, as outlined in the logic model (please refer back to Exhibit 2).

First, we answer evaluation question #3, by identifying various "best practices" that resulted in SC3 program or results achievement. Second, we answer the final evaluation question with a discussion of how EPA can use these results to improve achievement of results.

IV.A. Evaluation Question #3: How can the results these programs achieved be used to inform development or improvement of SC3 programs?

As mentioned in earlier sections of this report, individual school chemical management problems and needs are unique. Based on our assessment of each of the ten SC3 programs and the variations within each program, recommending any particular approach that will result in success in all instances could not be supported by the data at this time. It is important for each program or any area considering developing a program, to take a holistic assessment of the situation and create a SC3 program that best suits those needs.[23]

We also cannot generalize as to the characteristics that define the type of school that most likely will have chemical management problems. As these SC3 programs illustrate, there is more than one "model" of poor chemical management. Interviewees noted problems in all types of schools from elementary to high schools to more specialized schools (e.g., vocational). It is fair to say the majority of problems do occur in high schools, but elementary schools are also a concern, especially if the building was converted from a previous use (e.g., high schools that are converted to elementary or specialized schools). Common sense might say that older school buildings may have a bigger problem, but SC3 program implementers saw new buildings with issues as well. Location may dictate an approach to disposal (e.g., finding ways to lower the transportation costs associated with disposal if schools in rural areas are spread out), but similar chemical management issues are found in rural and urban; public and private; and, socio-economically advantaged and disadvantaged areas.

[23] EPA is currently developing a toolkit, including a model program document and checklists for those looking to create SC3 programs as well as those currently implementing programs.

With these points in mind, we do present a sampling of "best practices" from the ten SC3 programs. Interviewees identified these practices that were used in their programs. They represent common techniques and approaches that SC3 implementers use during the various stages of program implementation. SC3 implementers should note that not all of these best practices would work in every situation, it is important to assess individual program needs before implementing any of these practices.

The practices are organized into the following categories: Program Development, Awareness, and Implementation Approaches; Partnerships; Funding; Chemical Inventorying; Chemical Disposal; Training; Purchasing; and, Prevention and Program Sustainability. All of the best practices are aimed at creating safer schools and improving a child's learning environment, protecting the health of school children and staff by reducing risks associated with chemical mismanagement, instilling responsible chemical management practices, and protecting the environment—the ultimate goals of the SC3 program.

<u>Program Development, Awareness, and Implementation Approaches</u>

- *Research local "dynamics":* It is important for SC3 programs to be mindful of local/state politics, laws, and regulations governing chemical management and safety in schools, and authority (e.g., enforcement, inspection). All of these could potentially impact design, implementation, sustainability, and ultimate success of SC3 programs. For instance, in Texas, the FWISD personnel were not authorized overtime which hindered their ability to access schools at a time of day that was ideal to remove chemicals (i.e., it is preferred that students not be present during this process, but FWISD personnel had to enter schools during normal school hours).

- *Give schools ownership via a key role in responsible chemical management:* In Wyoming, the Department of Education credited a school's sense of ownership over the fate of chemical management and prevention in their schools as strongly contributing to program success.

- *Raise awareness about the program and problem*: Educating stakeholders about how SC3 programs address short and long-term chemical management concerns is key to achieving and sustaining success. There are a variety of techniques that can be used to raise awareness. For instance, the TDEC program used a highly visible press event to kick off their SC3 efforts. TDEC staged the press event at a school and involved EPA as well as SC3 program implementers. TDEC felt this "eye opening" approach helped to "show unity" and commitment to the SC3 cause. Other approaches can be as simple as running articles in relevant publications aimed at school personnel, including principals and superintendents or making presentations at conferences and events.

- *Develop SC3 pilot programs*: A number of the programs used the pilot program approach to "test the waters" as they developed their SC3 programs. IDEQ, TDEC, and LAUSD credited this approach with the success of their programs. The pilots especially helped to raise awareness, attract new participants, and increase program scope and reach.

- *Advocate a stepwise approach:* Many programs believed that any progress is better than none at all. Therefore, if schools are only capable of tackling one aspect of chemical management, such as completing an inventory or removing one chemical such as mercury from classrooms, then they should do so and deal with other programmatic aspects later. This approach tends not to overwhelm participants and allows them to participate and do additional activities as time and money permit. It also allows implementing organizations to allow for impacts of a "learning curve" or unanticipated hurdles in executing parts of their program. For instance, Rochester City School District (RCSD) is using a phased approach to incorporating an Environmental Management System to assist with responsible chemical management.[24] A stepwise approach is cost-effective when third-party chemical removal contractors are not involved, as mobilization (fixed) costs are higher when they visit a school many times instead of just one time (e.g., to do a mass inventory and removal effort).

Partnerships

There are numerous existing stakeholder groups that have natural interactions with schools. These range from state, tribal, and local agencies to membership organizations to school boards. Exhibit 7 provides a graphical illustration of typical stakeholders that could be leveraged as partners in SC3 programs. Below are a few examples of partnerships from the ten programs.

- *Colleges and Universities:* These higher education institutions are a great source of knowledge, expertise, and potential labor (e.g., internships) that is often readily available and accessible. Both the RCSD and IDEQ used graduate students to assist in implementation of their programs. The graduate students provided administrative and technical assistance to the SC3 programs while receiving valuable real world experience of an internship.

  TDEC partnered with Union University to develop a Green Chemistry Manual for teachers and students. The manual is also available online for others to access. Green chemistry training is also under development and professors from Union University have offered to participate.

  Colleges and universities are also a potential resource to assist with chemical inventorying and removal. In addition to providing technical assistance with inventories, college science departments may be able to use chemicals that schools no longer need for classroom activities.

- *State and Local Agencies/Organizations:* As previously mentioned, various state agencies have different roles that impact schools. Labor, health, and fire departments often have inspection authority and can provide a second set of "eyes and ears" in schools. In Rhode Island, the labor department provided this function to the RIDEM. While schools may not see a natural relationship to state environmental agencies, they do pay great attention to

[24] See program summaries in Appendix 1 for more information.

messages coming from state or local education agencies. Education agencies can potentially send powerful messages that command the attention (and response) of schools.[25]

- *School Staff*: There is a variety of school staff that are highly knowledgeable and "up to speed" on current chemical management issues and initiatives. Maintenance and facilities personnel are often aware of the various regulations and policies governing storage, use, and disposal of chemicals. SC3 programs should reach out to these personnel and open lines of communications and information sharing.

  Some schools have teachers that serve as Chemical Hygiene Officers (CHO) who are responsible for proper chemical management and often prevention in their schools. CHO's often are required to be trained in chemical management and have responsibilities that are spelled out in school policy.

  Science department chairs are also a great resource, especially since they often oversee multiple schools or departments and can coordinate initiatives across programs. Several SC3 programs specifically target these school staff. It is also a cost-effective way to get the program message out by educating one person who has daily interactions with multiple teachers and school administrators.

Funding

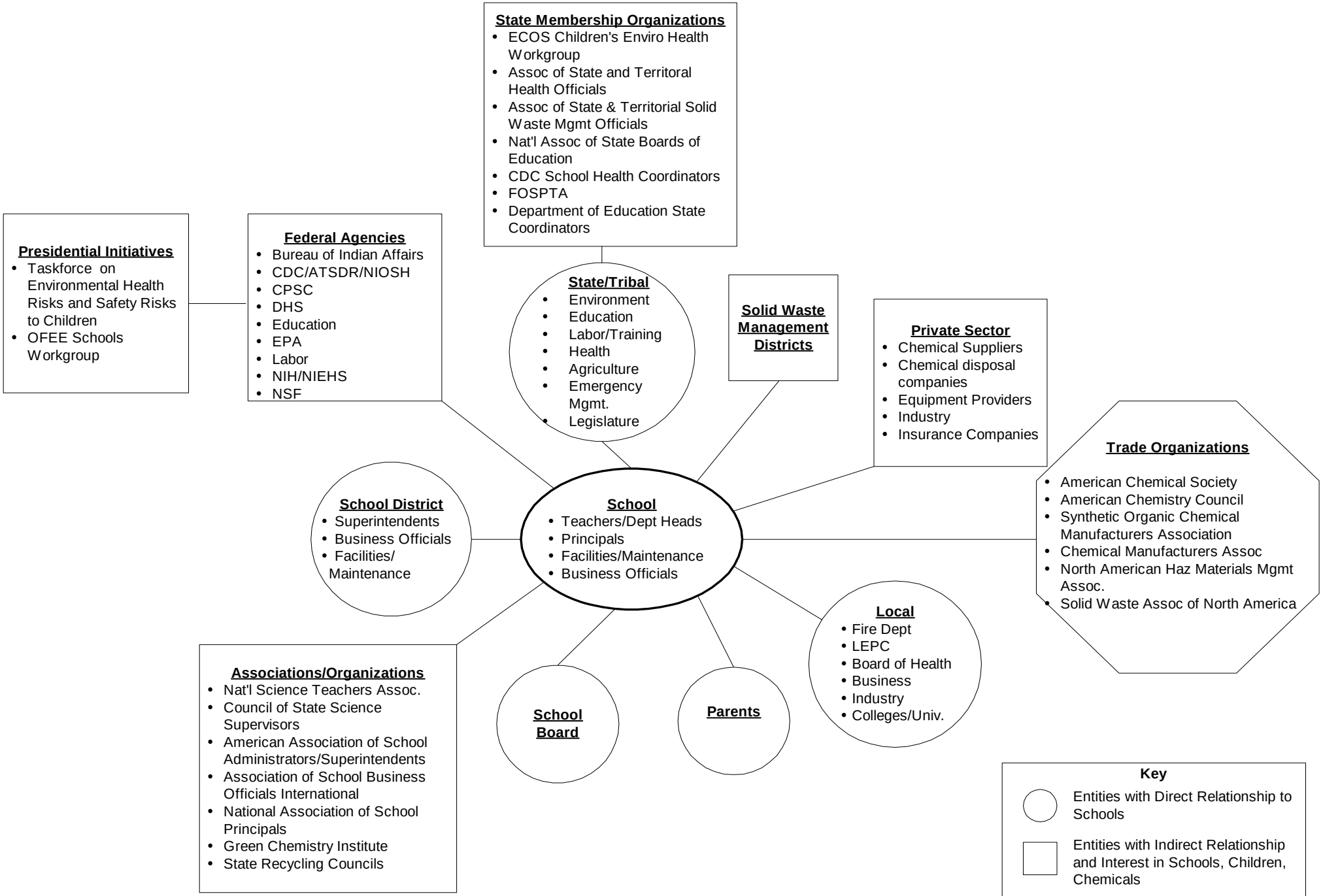
It is important for SC3 programs to explore a variety of funding options and, if possible, not solely depend on one source of funding. Diversity of funding can help increase the long-term viability of SC3 programs. Here we highlight a few examples of funding sources.[26] Also, please see Exhibit 7 for additional examples of stakeholders that may be able to provide funding. Funding approaches, such as the mini-grant approach, have also been highlighted throughout this report.

- *Federal Agencies:* Various EPA program offices and Regions have grant funding available for aspects of SC3 programs such as awareness and responsible chemical management. Offices including OSWER, Office of Children's Health Protection and Environmental Education, OAR, OPPTS and the Regions have provided funding related to SC3 efforts. TDEC was able to secure OPPTS funding and the NW Tri-County IU worked with EPA Region 3 for additional funds to support their efforts. Other federal agencies with relationships to schools, such as the Department of Education and Centers for Disease Control, should also be explored.

[25] Education agencies may not see chemical management and prevention as an issue that they have a role in. It is important for SC3 programs to educate these agencies on how they can help.

[26] For additional information on funding sources that were used by non-SC3 funded programs, please refer to the Formative Evaluation report: Building Successful Programs to Address Chemical Risks in Schools: Recommendations from an Evaluation of Selected School Chemical Cleanout and Prevention Programs.

Exhibit 7: Stakeholder Relationships in School Chemical Cleanout Programs*



*This graphic contains a representative sample of organizations and is not meant to be exhaustive

- *State/Local Agencies:* State and local environmental, education, labor, health and safety, and agriculture agencies may have funding available for SC3 programs. Many of the programs successfully leveraged federal funding to obtain state funding that resulted in additional schools receiving SC3 assistance. The IDEQ leveraged the EPA funding to receive DEQ financial support. In Iowa, the state Department of Natural Resources contributed $75,000 of grant funding to schools. SC3 programs should engage their management to explore funding availability and options. It is possible that there are grant programs, monies from taxes or fees, or other sources that are viable. Additionally, state or local agencies may also be available to provide in-kind services that can expand the reach and services of SC3 programs.

- *Schools and School Districts:* Some SC3 programs require that schools contribute to the costs of chemical removal, training, or other activities. Their financial contribution helps to ensure responsibility and emphasize the need for long-term responsible chemical management. In Wyoming, schools were required to cover 49% of the costs of cleanout. In Tennessee, schools paid a fee based on their socioeconomic status (e.g., schools in disadvantaged areas paid less than those in wealthier areas). Even though the majority of schools may not yet have a line item in their school budget for chemical disposal or management, some in fact do, and SC3 programs should assess the viability of this funding source.

- *Supplemental Environmental Projects (SEP):* A SEP is another funding avenue that could potentially be used by SC3 programs. Entities complete SEPs as a form of reparation for environmental violation(s). If the conditions of the SEP are applicable to aspects of SC3 programs, the program could greatly benefit. For example, in Rhode Island, the Safe Schools Committee partnered with Brown University (the subject of a SEP) to assist and provide technical assistance to their SC3 efforts. The Idaho SC3 program also benefited from a SEP with the University of Idaho that provided SC3 assistance to schools and raised awareness of SC3 issues.

Chemical Inventorying

- *Provide sample chemical lists as guidance:* Asking a teacher to complete an inventory without any guidance on the types of chemicals to remove and why those chemicals are hazardous can lead to incomplete inventories and risks that remain. Some programs provided lists of chemicals or websites with references and information to guide teachers through the inventorying process. In Rhode Island, they actually have a mandate that includes a banned chemical list[27]. In Tennessee, TDEC has a chemical inventory spreadsheet, available online, that describes the risks and hazards of various chemicals and allows teachers to input their quantities into the inventory.

- *Involving teachers in chemical management decision-making:* In Wyoming, WDE took a different approach, depending on teachers to help decide what chemicals to keep around and which to dispose of. Wyoming's approach is based on relationships, trust, and ownership. In

[27] According to RIDEM this was the "most difficult but most significant" aspect of their SC3 program. The banned chemical list is thought to relieve teachers from having to decide what chemicals to use, but at the same time, RIDEM and its partners have not seen a substantial increase in awareness of this list since implemented.

fact, they had a chemical list in their school chemical management regulations, but have decided to remove it as part of the current revisions.

- *Track and maintain inventories:* It is important to emphasize that chemical inventories are not only helpful to decide what to get rid of, but can be used as a planning and purchasing tool if properly maintained. In Texas, the FWISD has implemented a system where teachers must input the MSDS sheets into a district-wide system. This helps to prevent purchase of excessive quantities and promotes safe chemistry practices. They also implemented corresponding policy to limit the quantities purchased.

A FWISD policy states…
"Chemicals shall not be ordered by any teacher unless pre-approved by the science chair in writing. All quantities are to be 500 milliliters or less and must be justified (be able to be consumed during a normal school year's activity.)

- *Provide on-site assistance:* Providing on-site assistance to teachers or other staff to complete inventories not only ensures a more complete and accurate inventory, but also serves to train and educate them on various aspects of chemical management, such as safe storage practices. EPA Region 5 noticed that when they went out to schools to help, the quantities of chemicals slated for removal more than doubled over the amounts listed in pre-visit inventories. RIDEM also mentioned that schools appreciated the on-site assistance and personal attention they provided.
- *Seek assistance from experienced professionals*: Many programs sought assistance from those more experienced or with chemical backgrounds to ensure accuracy of inventories as well as identify substances that could be disposed of without having to involve a hazardous waste contractor. For example, the NW Tri-County IU coordinated with the PA Department of Environmental Protection to review inventories submitted by the schools.

<u>Chemical Disposal</u>

In this section we begin with general best practices and then offer techniques to lower disposal costs. It should be noted that SC3 program implementers should identify any federal, state, or local requirements that may apply to chemical storage, labeling, removal, transport, or disposal *before* implementing any of these best practices identified by program funding recipients.

- *Provide list of disposal contractors:* Schools often do not even know where to begin when it comes to finding a disposal contractor. While many SC3 implementing organizations, such as state agencies, cannot recommend specific contractors, providing a resource list gives schools a place to start. The Wyoming program found this technique helpful. It not only provided a starting point, but also allowed the schools to speak directly with the contractors to build rapport.

- *Disposal technical assistance:* Some programs provided schools with points of contact to answer any questions regarding chemical removal or to request assistance in chemical inventory, packing, and removal. SC3 programs in Texas, Rhode Island, and Wyoming used

this approach and found it resulted in schools calling up to ask for help with chemical management.

- *Coordinate with household hazardous waste removal events:* Piggybacking on existing opportunities is a great way to reduce costs, especially for disposal. In Tennessee, the TDEC combined their chemical cleanout with the household hazardous waste program, allowing for savings in disposal cost. In Wisconsin, household hazardous waste collection centers were also utilized.

- *Sort and consolidate chemicals prior to removal:* Having a qualified professional help to sort and combine like chemicals can result in substantial cost savings. This also allows for identification of chemicals or other substances that do not require disposal by a hazardous waste contractor and therefore do not need to be packed and removed with the other more dangerous (and expensive to remove) chemicals. Since some hazardous waste disposal companies charge per container, consolidating chemicals by a qualified professional is also an option. Similarly, if each school can safely store all chemicals in one temporary holding area for pick-up, it reduces the amount of time contractors need for removal. RIDEM went to schools to assist in sorting and categorizing chemicals for disposal. They estimate that at the schools they visited, each school's cleanout was less than $5,000.

- *Negotiate lower rates:* In comparison to individual schools, organizations (e.g., school districts) are often able to leverage existing contracts or relationships with hazardous waste disposal companies to negotiate lower disposal rates. Having completed chemical inventories (containing information on type, quantity, containers, and location) prior to removal are extremely helpful in estimating and negotiating disposal costs.

- *Create a "temporary" storage facility:* Creating a facility to temporarily house chemicals from across a school district or a geographic area can reduce the transportation costs associated with disposal. Also, if only small amounts of chemicals are removed from schools, those can be stored temporarily until it is more cost effective to have a contractor removal the chemicals. The FWISD credited such an approach to reducing disposal costs from an average cost of $455/drum to $145/drum. To accommodate the chemicals awaiting disposal, they retrofit an existing facility (in accordance with applicable regulations) so that chemicals were properly stored.

<u>Training</u>

- *Develop training strategy/design:* It is important to decide the content of training sessions upfront with an eye toward not overwhelming participants with too much information. Interviewees agreed that too much information dilutes the effectiveness of training, as does information that is not easily comprehensible. In Iowa, the MWA surveyed training participants to gauge effectiveness and many commented that the sessions presented too much information. The sessions have since been redesigned.

- *Specialized training sessions:* If programs are targeting various audiences within a school, such as facilities/maintenance, teachers, and administrators, it may be better to offer target-

specific, specialized training sessions. This allows training to offer the most relevant material to each specific role and responsibility related to proper chemical management. MWA as well as LAUSD used this approach. MWA had trainings for science educators and automotive/tech staff. LAUSD had separate trainings for plant managers and chemical safety coordinators.

- *Provide incentives to increase participation:* Teachers are often reluctant to attend training for a variety of reasons including cost and time away from their classrooms. The programs used a variety of approaches to provide incentives for teachers. Incentives included providing substitute teachers, reimbursing costs associated with time or travel to training session (NW Tri-County IU), and providing eligibility for continuing education credits (LAUSD).

- *Leverage existing venues:* A cost-effective approach to training is to research existing opportunities and venues, such as conferences, workshops, and teacher in-service days, to present training sessions or breakout sessions.

- *Offer training throughout chemical management lifecycle:* Having one comprehensive training session that covers every topic from "A to Z" is not as effective as spreading the training over time and possibly aligning topics of training sessions with the schools' stage in the SC3 program. For example, if schools are only beginning the inventorying phase, providing information on how to approach future chemical purchases, may not be as appropriate as information on how to properly store their chemicals.

- *Provide multiple opportunities for school staff to attend training:* Giving teachers and other school staff multiple opportunities to attend training will result in increased participation. The more limited the training schedule, the less likely the trainings will fit into schedules of school staff.

<u>Purchasing</u>

- *Promote centralized or district-level purchasing:* Having a centralized system or less people with the ability to directly purchase chemicals can help monitor the quantities and types of chemicals being purchased. If individual school staff members are allowed to buy whatever chemicals they feel they need for classroom activities, schools run the risk of additional chemical cleanouts in the future. The FWISD requires all chemical purchases to be approved, in writing, by the science director. Additionally, centralized purchasing allows for easier tracking and maintenance of accurate chemical inventories.

- *Develop purchasing guidelines:* SC3 programs should promote the development of purchasing guidelines that outline the types and quantities of chemicals allowed to be purchased. These guidelines should make every effort to restrict chemicals purchased to the amount necessary to complete near-term classroom activities. Also, guidelines should emphasize preventative measures such as micro-scale chemistry. To reinforce guidelines, SC3 programs can offer training or other forms of outreach. In California, LAUSD included a procurement aspect in their training sessions.

Responsible Chemical Management and Program Sustainability

We combined these two topics because they are intertwined. Properly executed chemical management practices will sustain strides made in managing chemicals and prevent the need for future cleanout. The other type of sustainability is to ensure that SC3 programs will be available if schools demonstrate a need for assistance.

- *Promote "greener" chemistry practices:* Green and micro-scale chemistry are approaches that generally use techniques that require lesser quantities and toxicity of chemicals, which is advantageous to creating safer learning environments and protecting the environment. Additionally, many programs promote the use of "lab kits" which include everything necessary to conduct an experiment in one package. This decreases the likelihood of purchasing bulk or excess quantities of chemicals. It should be noted that micro-scale chemistry can be expensive and does not necessarily always use "greener" chemicals. SC3 programs can also provide teachers with resources to access safer and greener chemistry experiments via the Internet. TDEC partnered with a university to develop a green chemistry lab manual for teachers that is available online.

- *Require and provide incentives for routine training:* Ensuring school staff members are up-to-date on responsible chemical management topics, techniques, and procedures will help to reinforce these practices in daily classroom activities. SC3 programs could explore innovative concepts with schools such as requiring training as part of staff performance evaluations, as a way to spur interest in continuing education. Also, SC3 programs can consider providing incentives, financial or otherwise, to staff that participate in training.

- *Reward success:* TDEC identifies and rewards schools for their achievements. Other SC3 programs can do the same to provide an incentive for schools to participate. Acknowledging accomplishments can also serve as a great outreach and awareness tool. In Idaho and Tennessee, the success of program participants attracted other schools to join the effort and raised awareness within state agencies.

- *Explore technical assistance and enforcement mechanisms to prevent future cleanouts:* SC3 programs should provide technical assistance or a point of contact at the appropriate agency or organization that schools can contact for information or assistance. Just knowing someone is out there to help, is often enough to ease the concerns of schools. Programs may also want to assess the various authorities of organizations within their state or locality to determine if any existing authority can be leveraged to help enforce SC3 program requirements or goals.

- *Institutionalize chemical management policies*: SC3 programs can educate schools on the importance of developing chemical management, purchasing, and prevention policies and procedures. This is critical in the face of staff turnover. It helps to ensure proper practices remain and to establish chemical management as priority to schools. SC3 programs can work with schools to develop approaches to raising and maintaining awareness about these policies, such as disseminating them at the beginning of each school year or having teachers sign a pledge that they have read and comply with policies.

- *Explore funding options:* SC3 programs can research alternative funding options as it is unlikely that one source of funding will sustain the program over the long-term. SC3 programs can leverage partner relationships to identify new funding sources or existing mechanisms available that provide low or no-cost services, such as utilizing a communications network to spread the word about upcoming training sessions. For example, TDEC used the statewide superintendents association to help with outreach.

- *Educate schools about creating chemical management line items in their annual budgets:* While most schools will not need annual chemical cleanouts, individual schools as well as school systems or districts should budget for responsible chemical management costs. These dollars could cover training and outreach, a chemical inventory tracking system, new storage systems, and other items. RCSD mentioned that most schools in their district have an existing budget line item, but it may not be sufficient to cover responsible chemical management costs.

IV.B. Evaluation Question #4: In the future, what can EPA do to improve achievement of intended results?

To answer this question, we present a discussion of recommendations and next steps that the national SC3 program can explore to better assist state, tribal, and local SC3 programs to achieve results and make schools safer. The recommendations will also provide ideas for EPA to consider, as they look at ways to make state, tribal, and local SC3 programs sustainable and self-sufficient. The first set of recommendations represents Indtai's opinions based upon the findings in this evaluation. The second set of recommendations represents the opinions of the interviewees on how EPA (at a national level) could assist SC3 programs.

- *Use the results of this evaluation to refine SC3 logic model:* EPA should consider reviewing this report with an eye toward assessing how future SC3 activities can assist in attaining short and long-term goals and objectives. In addition to actual results, the critical success factors, impediments, and best practices can inform potential SC3 inputs and activities and ensure the needs of the various target audiences are being met. The evaluation results can also identify potentially new areas where metrics would be useful in assessing progress toward program goals. Interviewees commented that metrics are critical, yet it is currently too early to assess progress toward goals, such as behavior change. EPA could use the logic model to help develop and implement metrics to measure behavior change in the future.

- *Support and promote activities in and across EPA Regions*: The EPA Regions are a valuable resource for EPA HQ and program implementers to use to learn about SC3 program innovations, successes, and challenges from the field. EPA's SC3 Regional leads are aware of what is happening in their states, but could also learn from what is happening in other Regions. EPA should look into creating an informal mechanism for sharing information and knowledge. For instance, EPA HQ could identify relevant conferences and events and present breakout sessions, roundtables, or keynote speakers that address SC3 initiatives in their Region. EPA should also consider sponsoring state/tribal/local SC3 program implementers to speak at these events. Also, EPA HQ could support and attend Regional events that promote SC3 efforts as a way to hear first-hand feedback and establish OSW's

desire to be aware of achievements at the state, tribal, and local levels. For instance, FWISD mentioned an EPA regional training event that they found very informative. This may be an example of an opportunity to get feedback from those in the field.

- *Create ongoing dialogue with state/tribal/local SC3 program leaders*: EPA may want to consider developing a mechanism that spurs dialogue among SC3 program leaders. This would benefit both EPA and state, tribal, and local SC3 programs. Potential mechanisms range from the ability to "chat" online about chemical management efforts to periodic Regional events that invite local leaders to discuss their programs and exchange information. We found an interest on the part of program administrators to hear about what is going on in other areas and learn from other programs. For example, the IDEQ was very interested in other programs that developed lists of banned or inappropriate chemicals for schools. EPA could use this feedback to inform the logic model and objectives and goals of the national SC3 program.

- *Establish a more robust effort to promote SC3 successes:* Promoting SC3 success stories is an activity that can help EPA's SC3 achieve its short and long-term goals, while simultaneously stimulating chemical management at the state, tribal, and local levels. Rewarding and promoting program achievements is not only a "pat on the back" for the specific program, but can also serve to spur competition among programs, raise visibility for SC3 programs, and increase participation. EPA should explore ways, such as annual SC3 "Achievement Awards" at the national and Regional levels. EPA may also want to participate or lend support to promoting existing awards programs. SC3 programs in both Iowa and Tennessee have already received awards for their efforts.

- *Provide guidance and resources on developing, implementing, and sustaining state/tribal/local SC3 programs:* EPA is in a position to be the single portal for information on creating, implementing, measuring results of, and sustaining SC3 programs. An EPA Regional representative stated, "EPA needs to be a SC3 resource." EPA can leverage existing relationships with other federal and state agencies to consolidate or develop new, user-friendly guidance, information, and other tools for SC3 program implementers and others interested in responsible chemical management efforts. Interviewees suggested that EPA may want to consider providing simple, "step-by-step" guidance to help develop and improve existing SC3 programs via EPA's SC3 website. Guidance could include real-world examples of how other programs have implemented approaches and techniques to chemical management. In addition, guidance could provide examples of common metrics used to measure results and improve program performance. We recommend EPA consider using the results of this evaluation to inform development of guidance materials and resources.

- *Explore ways to promote and transform positive "unintended results":* The earlier "unintended results" portion of this report provides EPA with some insights into how SC3 programs may transform the positive unintended results into typical intended results. For instance, identify ways to leverage SC3 program visibility to increase interest from other schools outside the target area, other types of schools such as private or vocational, or other areas within the school (e.g., the NW Tri-County IU's SC3 program raised awareness among the facilities/maintenance staff). Or, promote raising awareness about program success

within a state agency to gain management support and possibly secure funding. EPA may want to consider developing case studies that illustrate these unexpected, positive results.

- *Work with federal partners to develop solutions to specific chemical disposal issues:* A few of the programs we evaluated encountered difficulties in disposing of certain substances, such as human specimens in formaldehyde, pharmaceuticals (mentioned in Region 7), and radioactive materials. EPA could take the initiative to work with other federal agencies to identify potential solutions to these issues. Solutions could include guidance, best practices, state/local resources and contacts. EPA could also speak with state/tribal/local SC3 programs to gain insight into their relationships with federal or similar state partners on these issues. For instance, Idaho has worked with local military installations in the past to help with chemical disposal.

- *Clarify regulatory questions and concerns:* Often, questions arise that can hinder successful implementation of SC3 programs. EPA could solicit feedback from SC3 Regional leads and program implementers as to regulatory issues of concern. For example, interviewees brought up issues such as generator status, liability, and classification of certain wastes, about which they have sought clarification. An EPA position on these and other issues would help SC3 programs to determine the most appropriate course of action when in certain situations.

- *Identify resources of other federal and state agencies and state/local SC3 programs to bolster EPA's national campaign:* EPA should coordinate with its federal partners to identify resources, tools, and information that may already exist and are applicable to responsible chemical management. EPA may want to look beyond materials only targeted to schools, but also to materials aimed at other stakeholder groups with relationships or interest in schools. EPA could also look to state/local SC3 programs that may provide online resources or information about their programs. Interviewees mentioned that they often seek such information and like to model aspects of their efforts after other successful programs. For example, Iowa's Rehab the Lab program was modeled after King County, Washington's program.

<u>Recommendations Heard from Interviewees</u>

The following are a sampling of recommendations heard *directly from interviewees* and are suggestions for national level EPA-led efforts.

Partnerships

- Work with federal partners to address standardizing or improving consistency of science curriculum, particularly textbooks and lesson plans.

- Involve the US Army Corps of Engineers (e.g., for help with cleanout) and Nuclear Regulatory Commission (e.g., to educate on how to safely dispose of radioactive waste) as national SC3 program partners.

- Work with the Bureau of Indian Affairs to address chemical management in tribal schools.

- Work with chemical suppliers to allow for return of used quantities of chemicals; do this as part of the purchase agreement – strive for full lifecycle solutions with chemical providers.

Guidance/Information

- Provide information on aspects of SC3 programs such as funding opportunities, developing and implanting metrics, and securing partnerships.

- Develop "branding" program for chemicals to identify ones that are compliant with safe or environmentally friendly chemical management practices.

- When raising awareness of problems, do not "create the perception that every school is going to blow up" – don't be alarmist, but urge due care and diligence on the issue.

- Develop a tool to assist SC3 program implementers with calculating amounts of chemicals removed (e.g., tools that help convert volume measurements into a comparable format).

- Address liability issues that schools and SC3 program implementers face when purchasing, storing, using, and disposing of chemicals and hazardous materials.

- Develop a chemical clearinghouse that provides information on chemicals and the opportunity to exchange materials (e.g., if one school donates excess quantities of a chemical that another school may use).

- Develop lab safety guides.

***

As a result of the funding provided to state and local SC3 program in 2004, more schools are safer; more children are being protected from dangerous chemical risks; awareness about responsible chemical management and safety has increased; and additional mechanisms are in place to stimulate behavior change. Without the EPA funding, the majority of SC3 programs would probably have NOT been able to accomplish the aforementioned results and taken steps to rid schools of outdated, excess, and dangerous chemicals. The results these programs achieved provide best practices and real world examples that could be useful to other SC3 programs as well as EPA's national Schools Chemical Cleanout Campaign.

Acronyms List

-C-
CHO - Chemical Hygiene Officers

-F-
FWISD - Fort Worth Independent School District

-I-
IDEQ - Idaho Department of Environmental Quality

-L-
LAUSD - Los Angles Unified School District

-M-
MSDS – Materials Safety Data Sheet
MWA - Des Moines Metro Waste Authority

-N-
NW Tri-County IU: Northwest Tri-County Intermediate Unit

-O-
OAR – Office of Air and Radiation
OPPTS – Office of Prevention, Pesticides, and Toxic Substances
OSW – Office of Solid Waste
OSWER – Office of Solid Waste and Emergency Response
OEHS - Office of Environmental Health and Safety

-R-
RCC – Resource Conservation Challenge
RCSD – Rochester City School District
RIDEM - Rhode Island Department of Environmental Management
RIDoH – Rhode Island Department of Health

-S-
SC3 – Schools Chemical Cleanout Campaign
SEP - Supplemental Environmental Projects
SSC – Safe Schools Committee (RI)

-T-
TDEC – Tennessee Department of Environment and Conservation

-W -
WDE - Wyoming Department of Education

APPENDICES

Evaluation of Results from EPA's Schools Chemical Cleanout Campaign

An Examination of Approaches and Factors that Impacted the Results of Programs Funded by EPA's RCC Schools Chemical Cleanout Campaign in FY2004

Appendix 1: 2004 SC3-Funded Program Summaries

Region 1 - Rhode Island

The Safe Schools Committee (SSC) is a public-private partnership working to address chemical management issues in schools. The partnership members include the Rhode Island Departments of Health, Education, Environmental Management (RIDEM), and Labor and Training; Brown University; Community College of Rhode Island; Rhode Island Committee on Occupational Health and Safety; Rhode Island Fire Marshall's Office; and private business. Their goal is to support schools and districts in minimizing health risks from chemicals and they reach this goal through development of guidance materials, training and professional development opportunities and the use of regulatory authority.

In fact, the Committee successfully worked to incorporate a list of banned chemicals into the Rhode Island *Rules and Regulations for School Health Programs* in 2003.

The Rhode Island Department of Health, on behalf of the Committee, used EPA SC3 funds to assist public and charter high schools with chemical removal. Only schools that have developed a Chemical Hygiene Plan were eligible for assistance. The Chemical Hygiene Plan must address chemical purchase, storage, disposal, personal protective equipment and contain an inventory. Greater consideration is also given to school systems that have a greater community need (defined as a percentage of children receiving free or reduced cost lunches). As of 2006, 4,686 students were impacted by the chemical cleanouts in a total of eight schools.

Currently, the SSC still works to educate school personnel and others on chemical management issues. RIDEM also assists schools by providing technical expertise. RIDEM works with the Department of Labor, who has the authority to conduct school inspections, to share information on chemical management concerns at schools.

For more information, please contact Bob Vanderslice at the Department of Health at bobv@doh.state.ri.us or Jim Ball at Rhode Island Department of Environmental Management at 401-222-1360 or james.ball@dem.ri.gov.

Region 2 - New York

In the last few years, the Rochester City School District has instituted a number of practices to improve the management and proper disposal of hazardous materials. The current effort targets four program areas:

- Hazard Communication and safe chemical storage training for science teachers;
- Disposal of excess chemicals identified by teachers;
- Improved lab procedure to reduce amounts of chemicals ordered; and
- Restriction on accepting unnecessary donated chemicals

This program has been expanded using EPA SC3 funding. The Rochester City School District estimates that the SC3 funding allowed the removal of 800 lbs solid hazardous waste and 1,300 gallons of hazardous liquids from the District chemical storage facility. Thirteen secondary schools underwent chemical inventories to identify excess chemicals for removal and disposal. The District has also begun a phased approach to implement an Environmental Management System (EMS). An EMS is a set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency. The Rochester City School District developed a full EMS for the School District in order to educate the students on the

District's "greener schools" initiative, educate District employees on how an EMS will result in P2 and safer workplace. The EMS will be completed in 2007.The project also supports and showcases intergovernmental working relationships between the City of Rochester, Monroe County, and the Rochester Institute of Technology. In addition, the relationships developed by this effort resulted in lower chemical disposal costs for the District.

The District continues to support chemical management initiatives in schools. For more information, please contact Suzanne Wheatcraft at Suzanne.wheatcraft@rcsdk12.org or 585-262-8405.

Region 3 - Pennsylvania

In 2005-2006 The Northwest Tri-County Intermediate Unit, a school service organization, implemented the Safer Schools Initiative that focused on conducting chemical inventories, cleanout, training and policy development. They used existing information from the local health department to identify schools with violations to help determine the extent of the problem in schools. A representative from a local pollution prevention organization also educated the Intermediate Unit on the problems in schools.

They leveraged the expertise and resources of the Northwest Regional Office of the PA Department of Environmental Protection to assist with reviewing chemical inventories. This review also helped to mitigate disposal costs by identifying substances that may not require a hazardous waste disposal contractor. The program also included prevention activities such as the implementation of an in-service training program (teachers educated about chemical safety and green chemistry) and the establishment of stronger relationships between schools and businesses to ensure safe chemical management. The program successfully removed 175 containers of hazardous materials from 16 schools, affecting 11,469 students.

This program was highly dependent on EPA SC3 funding. Currently, most schools and the Intermediate Unit do not have budgets that include chemical disposal. The Intermediate Unit will continue to provide technical assistance and training as needed. For more information on this program, please contact Lacey Maze at 814-734-8460 or lacey_maze@iu5.org.

Region 4 - Tennessee

Beginning in the fall 2004, selected schools in Tennessee participated in the School Chemical Cleanout Campaign. The SC3 program was an expansion of a previous pilot program facilitated by the Tennessee Department of Environment and Conservation (TDEC)/ Division of Community Assistance's Green Schools Program. The Green Schools Programs stems from a partnership among TDEC, the Tennessee Science Teachers Association, the Tennessee Valley Association (TVA), Onyx Environmental and the Tennessee Department of Agriculture.

TDEC's SC3 programs seek to reduce waste, eliminate outdated, unknown and unusable chemicals from schools, encourage environmentally sound use of chemicals in classrooms, bring cost savings to schools through pollution prevention, and promote SC3 success state-wide. TDEC's programmatic components included lab chemical inventories, disposal, and teacher training. TDEC staff conducted numerous trainings and also partnered with a local university to develop a green chemistry handbook for teachers.

TDEC has been successful in reaching their goals and has even assisted school districts in other states with their SC3 programs. In total, 69 schools were cleaned out with 23,000 lbs of hazardous chemicals removed. TDEC leveraged various EPA grant-funding sources by requiring schools to contribute funds based on their socio-economic status.

Contact Ken Nafe at ken.nafe@state.tn.us or 615-532-0281. Also see the following site for more information: http://www.tennessee.gov/environment/sc3/

Region 5 – Wisconsin

The U.S. EPA in partnership with the Wisconsin Department of Public Instruction (DPI) targeted schools in the Green Bay/Oshkosh area to participate in the School Chemical Collection Program. The main focus of the program in Green Bay/Oshkosh was to reduce chemical waste, promote the safe management of chemicals, and promote environmentally preferable purchasing of laboratory chemicals. A total of 57 schools participated in the Chemical Collection Program out of an approximate 233 eligible schools.

The chemical collection took place at a location provided by the Winnebago County Solid Waste Coordinator. Chemicals were received from the 57 schools on the collection day. Representatives from the participating schools transported their chemicals to a drive-thru maintenance building where the chemicals were segregated and packaged by a waste management company for transportation to a U.S. EPA-approved off-site disposal facility. The School Chemical Collection Program resulted in the collection/disposal of approximately 1,982 lbs of various chemicals.

For more information on this effort, please contact Janet Haff of EPA Region 5 at haff.janet@epa.gov .

Region 6 - Texas

In 2004, EPA awarded the Fort Worth Independent School District (FWISD) a SC3 grant to enhance processes and procedures for the disposal of chemicals, hazardous waste, and waste reduction and management. FWISD met those objectives through four major strategies:

1. Inventory system;
2. Disposal of chemicals;
3. Prevention program; and
4. Evaluation design.

FWISD conducted cleanouts at 15 high schools and 22 middle schools, resulting in the removal of 15,000 lbs of hazardous chemicals. A portion of the chemicals may have been collected prior to the SC3 grant, however disposal funds were unavailable. District funds were made available to cover the cost of disposal for these chemicals and those removed during the grant period once the EPA grant was awarded.

FWISD also implemented a district-wide chemical inventorying system that tracks Material Safety Data Sheets on all chemicals purchased. This system will help prevent unnecessary purchases both in terms of quantities and types of chemicals.

The FWISD SC3 program also had a training component. The training was aimed at the Science Director in each school, who is responsible for chemical management. The training encourages chemical management and prevention practices such as use of lab kits to minimize risks and waste and limiting orders of high volumes of chemicals.

FWISD continues to support chemical management in schools. Schools can call the District at anytime if they have hazardous chemicals that need to be removed and disposed of.

For more information, please contact George Reid at 817-871-2637.

Region 7 - Iowa

The EPA Region 7 currently facilitates the Iowa school cleanout effort through onsite compliance visits and a partnership with Des Moines Metro Waste Authority (MWA). The MWA has been supporting SC3 efforts in Iowa since approximately 2000. As of 2006, 182 schools of 366 have been reached, with a total of 206,905 lbs of hazardous chemicals removed. The Iowa program not only focuses on the removal of excess laboratory chemicals, but also waste storage practices, pollution prevention, and education of teachers, administrators, and facilities personnel. It should be noted that due to its longer history and the complexity of funding sources in the IOWA program, it was difficult to accurately attribute the exact quantity of chemicals removed to the SC3 funds provided by EPA in 2004. EPA Region 7 estimated this amount at 20,000 pounds, but it is possible that a much larger amount could be attributed to the EPA funding.

The EPA SC3 funding has allowed MWA to reach out to more schools and develop a series of training sessions and videos to complement the efforts. MWA has been successful in partnering with EMC Insurance Company to expand the program throughout the state and ensure chemical management efforts are in place for years to come. EMC works with schools to implement chemical management and prevention activities as a requirement of their insurance packages. This also results in discounts for chemical disposal and ensures teachers and staff is adequately trained. The school staff completes extensive training that focuses on environmental compliance awareness, waste stream identification, alternatives, and a review process for on-site assessment.

Contact Becky Wehrman with MWA at 515-967-5512 to learn more about their efforts. Also Kent Candee of EMC Insurance can provide more information on EMC's efforts to address chemical management in Iowa schools. He can be reached at Kent.A.Candee@emcins.com

Region 8 - Wyoming

The Wyoming Department of Education (WDE), with funding from EPA, has implemented a program to assess, remove, dispose and prevent the future accumulation of dangerous chemicals in school laboratories. The initiative, which builds on existing WDE partnerships with school districts, is part of EPA's Schools Chemical Cleanout Campaign. WDE's program requires schools to cover 49% of the cost of chemical removal, while WDE covers the remaining costs. The cornerstone of WDE's approach advocates giving schools ownership over chemical

management, cleanout, and prevention. The program has been a success and even served as catalysts for other school districts that were not participating in the program. Over 6,000 pounds of hazardous material collected and properly disposed from 31 school districts.

Wyoming does have guidelines governing chemical management and prevention that are currently undergoing a revision and update. WDE has plans underway to coordinate with statewide emergency responders to increase awareness on chemical management in schools.

For more information, please contact Bruce Hayes at 307-777-6198 or bhayes1@educ.state.wy.us

Region 9 - California

In compliance with The California Code of Regulations, Section 5191 that requires school districts to reduce and control hazards within school laboratories, Los Angles Unified School District (LAUSD) has developed a Chemical Hygiene and Safety Plan (CHSP). EPA SC3 funds were combined with $19,000 from the LAUSD (including in kind staff time) to implement the CHSP. This effort is part of a larger program targeting school environmental issues.

The program focuses on disposing unused laboratory chemicals and ensuring stored chemicals are placed in proper containers and/or bottles. Several prevention measures, provided by the Office of Environmental Health and Safety (OEHS), were taken including offering training and guidance for chemical safety coordinators, science teachers and plant managers. Additionally, LAUSD used a tracking system that verifies both used and unused chemicals in schools. LAUSD has been able to reach 47 schools resulting in the removal of 3,283 lbs of hazardous chemicals, affecting 116,802 students. Although the program for laboratory chemicals ended in July 2005, OEHS will keep on implementing the above prevention measures at all school sites.

For more information, contact Soe Aung at soe.aung@lausd.net.

Region 10 - Idaho

A 2003-2004 Supplemental Environmental Project (SEP) conducted by the University of Idaho with assistance from the Idaho Department of Environmental Quality (DEQ) revealed that schools in Idaho have accumulated a significant amount of hazardous chemicals and many schools lack knowledge of the proper disposal procedures. The DEQ partnered with local waste handlers, universities, community leaders, and school officials to develop strategies for removing chemical stockpiles from schools. The initial effort focused on schools in the Boise area, but due to promotion of the program, the SC3 program was expanded statewide. This success resulted in DEQ providing additional funding to support the effort. The combined EPA and DEQ funds provided 22 schools with assistance in disposing chemicals as well as identifying and categorizing existing chemical stockpiles. DEQ used a “mini-grant” approach that offered schools $1,000 toward chemical removal. The Schools were required to provide the remaining funds to cover the cleanout. DEQ also leveraged a college-level intern to assist in developing educational materials and provide technical assistance to support the program. The program resulted in removal of 1,411 lbs of hazardous chemicals. In an effort to prevent future chemical management problems, two school personnel training sessions are scheduled to take place in Fall 2006. DEQ is looking into ways to fund additional cleanouts.

For more information, please contact Patti Best at 208-373-0146 or Patti.Best@deq.idaho.gov. Also visit http://www.deq.idaho.gov/waste/educ_tools/chemical_roundup.cfm

Appendix 2: Evaluation Methodology for the Evaluation of Results from EPA's School Chemical Cleanout Campaign

Final Draft

Submitted:
5 April 2006

Introduction

The primary purpose of this project is to evaluate the results achieved by each of the SC3 funded programs in the 10 EPA Regions. This "results evaluation" will provide insights into the types of activities undertaken by grantees and the corresponding impacts on:

1. Awareness of risks and proper mitigation steps;
2. Changes in behaviors that prevent or minimize the recurrence of chemical risks at schools;
3. School business practices related to chemical management;
4. The environment; and
5. Children's health and their learning environment.

The evaluation will attempt to identify grantee approaches and other factors that had the greatest impact on the results achieved. Together with other information and programmatic analyses, EPA plans to use the results of this evaluation to develop a national cleanout, prevention, and awareness program. This evaluation project also aims to improve future EPA grantee competitions, heighten awareness of EPA SC3 grant opportunities, and provide model approaches and best practices for jurisdictions considering their own programs. This program evaluation will serve to answer the following primary questions:

5. **Did the SC3 grantees achieve their goals?**
6. **What factors contributed the most to achieving or not achieving results?**
7. **How can the results of these grants be used to inform development or improvement of SC3 programs?**
8. **In the future, what can EPA do to improve achievement of intended results?**

Indtai, Inc. will have the primary responsibility of conducting this evaluation. The evaluation methodology described below derives from the programmatic logic model developed under Task 2-3. This results evaluation will involve the collection of both qualitative and quantitative data to identify contributing factors that impacted attainment of SC3 program goals and identify ways to improve future achievement of goals.

Overview of EPA's SC3 Grant Program

In 2004, EPA launched the School Chemical Cleanout Campaign (SC3), a high visibility initiative operating as part of EPA's Resource Conservation Challenge (RCC). The Campaign is a cooperative effort amongst OSWER, OPPTS, OAR and the Regions, and uses a variety of innovative approaches to achieve its three goals: (1) removal of outdated and dangerous chemicals from K-12 schools; (2) prevention of future stockpiles of chemicals and reduction of accidents by establishing prevention activities such as good purchasing and management practices; and, (3) raising national awareness of the problem.

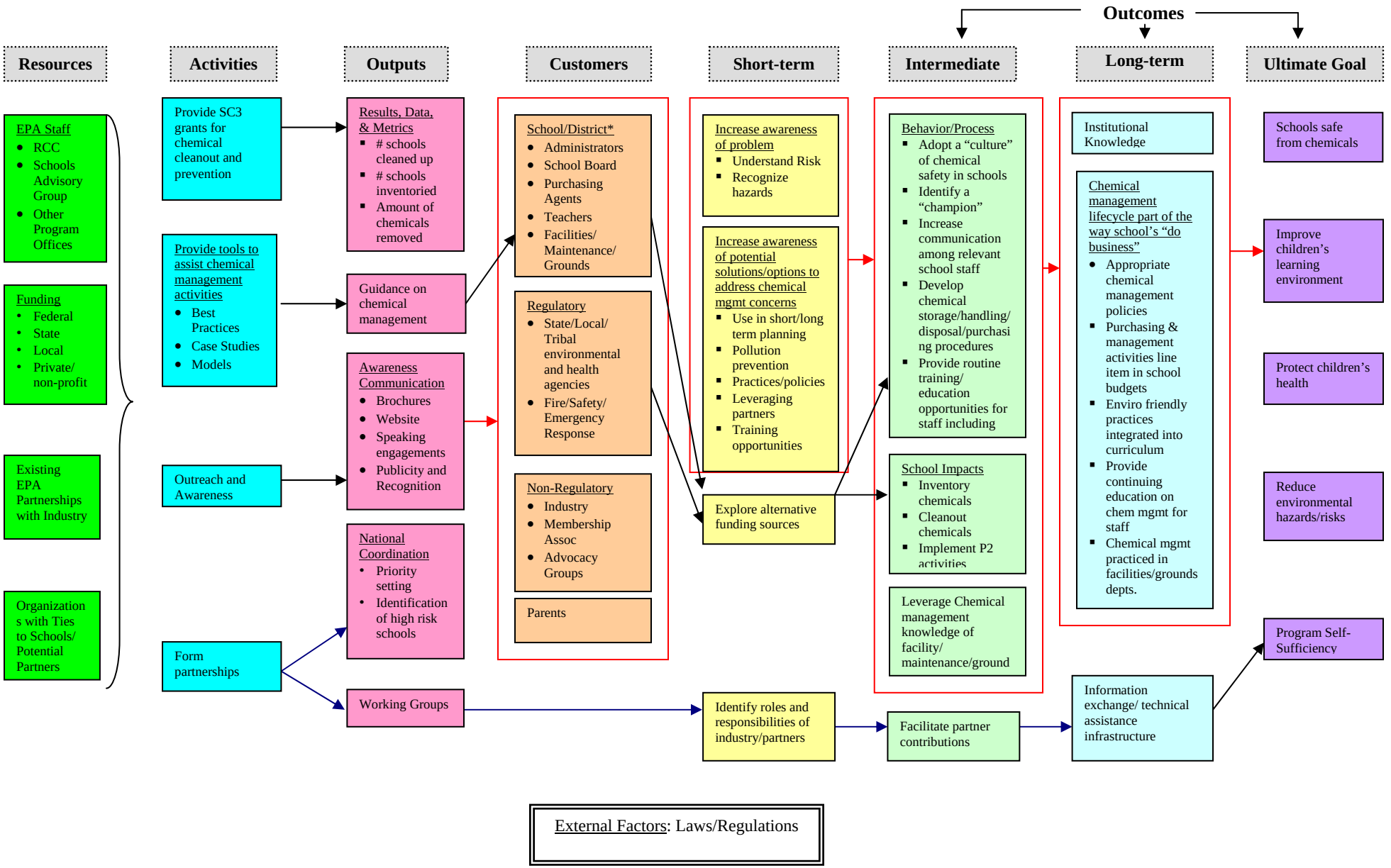
In 2004, the RCC funded separate and distinct SC3 programs in each of the 10 EPA Regions. These programs were designed and implemented to address each of the three stated goals. The programs each took unique approaches in achieving results.

In May 2005, EPA sponsored a "formative evaluation" of both EPA funded and non-EPA funded SC3 programs to help EPA design its own Schools Chemical Cleanout Campaign program. The evaluation is intended to provide information that improves EPA's understanding of what processes, operations, functions, and structure would best enable EPA and its partners to meet the goals for the program.

To illustrate the various components of the SC3 program, we have developed a draft logic model (i.e., a graphical representation of the relationships between program inputs, outputs, and intended outcomes), presented below.

The draft logic model is currently undergoing review by EPA. Indtai realizes the logic model is subject to revision pending comments from EPA. In the interim, we used the draft logic model to develop and refine the evaluation information objectives. In particular, we examined each element in the logic model to make sure that the data collection process addresses all relevant aspects of the SC3 program

EPA Office of Solid Waste: Schools Chemical Cleanout Campaign Logic



*Keeping in mind potential geographic (urban vs. rural) and socio-economic considerations

Evaluation Design

This evaluation will analyze the "results" of the 10 EPA SC3 grantees. To present a comprehensive analysis of the grants, both quantitative and qualitative data are necessary. In fact, the most value to EPA may result from insights gained during interviews that describe *how* and *why* results were or were not achieved. Where available, we will bolster findings with quantitative data (for more detail on data types see below).

Portions of this evaluation project will depend on accessing quantitative data that measure achievements and degrees of progress made by grantees. We assume that EPA SC3 staff will provide us with all grant reports that contain relevant information (e.g., applications and closeout reports). If EPA does not have such information, we will contact the state/local program administrators. There is also the possibility that we may encounter issues involving data completeness, quality, and comparability. We will work with EPA to resolve these issues. If any of the information requires an expert for interpretation, we will consult with IEc and EPA to address this issue or develop an alternative approach to interpreting and using the data.

In this section, we first identify the basic information collection components that are applicable to the overall evaluation design. Then, we define the information objectives for each evaluation questions and outline our approach to answering each question.

The basic evaluation design components are:

- **Collect data from reports (or other relevant sources) and conduct document review.** Indtai will review all materials provided by the WAM, regional SC3 personnel, and points of contact for the ten grantees. We will contact EPA's SC3 personnel to gather all relevant grant reports and information that may contain both quantitative and qualitative data on the results of the ten grants. Indtai will also review documents collected during its formative evaluation of a national SC3 program. We anticipate that it will be necessary to contact grantees directly to gather data or information that may have been collected, but not officially reported in any grant reports submitted to EPA. In addition, we will conduct a brief review of SC3 program websites to collect additional background information. Indtai will keep files on each of the ten grantees, both in hardcopy and electronically. A courtesy copy of any files received during the information collection process that did not originate from EPA will be transmitted to the WAM and appropriate EPA SC3 staff.

- **Interviews to collect quantitative and qualitative data**. Based on the document review, initial data collection, and information learned in the formative evaluation, Indtai will develop sets of comparable interview questions tailored to various audiences (e.g., Regional personnel versus local school district personnel). The questions will be both program-specific and general (applicable to a potential national program) in nature. Indtai will develop questions, in a dynamic interview format that strives to ask only relevant questions of each interviewee (e.g., questions about EPA program management would *not* be posed to a local program manager). Questions may also be revised over the course of the interview process based on feedback and insights we get. Indtai will seek

input from the EPA WAM on the interview questions and consider doing a "dry run" interview to refine questions as appropriate. Please see Attachment 1 for a proposed list of interview questions.

Indtai spoke with many of the potential interviewees during the formative evaluation (see below for list of proposed EPA Regional interviewees). We will leverage information and insights learned in those interviews wherever possible. Indtai will use personal interviews to solicit feedback from those involved with managing and implementing SC3 programs. This qualitative information will bolster interpretation of the quantitative results data and also provide important context and anecdotal information. We intend to speak with both EPA Regional SC3 personnel as well as state/local program administrators associated with the grantee. We will coordinate with SC3 staff to ensure we are speaking with the most appropriate regional personnel. In addition, we will contact the EPA Regional personnel prior to directly contacting anyone at the state/local level.

An email, sent from EPA SC3 staff, will be sent to each interviewee introducing Indtai, stating the purpose of the call and asking to arrange a convenient time to discuss the program (Please see Attachment 2 for a sample introductory email). We anticipate each call lasting 60-90 minutes. We will ask EPA personnel for recommendations on who else we should contact in order to ensure we are conducting a comprehensive evaluation of each program. It also may be the case where the EPA Regional contact does not feel they can adequately offer feedback on a specific program (due to not administering the program on a daily basis). In this scenario, we will ask for suggestions regarding alternate contacts.

Proposed EPA Regional Interviewees		
Region	**Name**	**SC3 Program**
1	Joan Jouzaitis	RI Chemical Safe Schools Committee
2	Joseph Bergstein	Rochester City School District
3	Wayne Naylor	P3 Erie
4	Delores Rodgers-Smith	TN Pollution Prevention Partnership
5	Maryann Suero	Wisconsin-Osh Kosh
6	Melissa Gaylon	Ft. Worth Independent School District
7	Edwin Buckner	Iowa Rehab the Lab
8	Matthew Langenfeld	Wyoming Dept. of Education
9	Bill Jones	CA LAUSD
10	Carmen Caldwell	Idaho DEQ

- **Mine data.** Indtai will mine relevant data from the grant reports and other sources provided by EPA and the state/local SC3 program administrators. Indtai realizes that data may not occur in a form that is readily usable or comparable to other data sets. We may need to refine the data and analyze for completeness and quality issues. As necessary, we will develop alternative approaches to data mining that mitigate any potential issues. For example, we may decide that summarizing the data into broad

categories according to chemical type (e.g., corrosive) is just as effective as reporting on specific chemical amounts. We will house all data we collect in a central location and have it available to electronically transmit to WAM or other SC3 personnel if necessary.

Quantitatively we will be looking to capture the following types of data (this list may not be exhaustive):

- Amount of chemicals removed from schools;
- Types of chemicals removed from schools;
- School characteristics (e.g., elementary/high school, school populations impacted, rural/urban);
- Number of training sessions/Number of people trained;
- Cost associated with SC3 program; and
- Number of staff dedicated to program implementation.

We will also review all of the interview notes to gather additional information to support the quantitative data and also provide insights on other aspects of the results achieved by the grantees. This information may have been tracked or measured by grantees or may be anecdotal. This may include, but is not limited to:

- Types of pollution prevention and "beyond compliance" activities implemented;
- Types of training sessions;
- Activities undertaken to increase awareness of program; and
- Behavior changes (e.g., new policies developed such as chemical purchasing).

- **Analyze data.** Indtai will analyze all data gathered during the information collection process to formulate draft findings that are responsive to the evaluation questions. During the analytical process, we will contact WAM, EPA SC3 staff, or interviewees on any issues warranting clarification. To the greatest extent possible, we will attempt to convey common or recurring themes across the ten grantees selected for evaluation. Indtai will brief WAM and other EPA personnel on these findings. We will consider presenting the draft findings to the Schools Advisory Group for input, if necessary. The complete analysis will be presented in the evaluation report.

Evaluation Questions and Information Objectives

As mentioned above, we outline the evaluation questions and associated information objectives. We also include which of the above information collection components will be used to answer each question. It is important to keep in mind that while some of these information objectives may seem broad, we will focus on more specific aspects during the data collection processes. Additionally, each question will include data mining and analysis, so those steps are not specifically listed under the information collection approach sections below.

1. Did the SC3 grantees achieve their goals?

Information Objective	Information Collection Approach
Identify grantee goals and/or targets (e.g., 20 teachers trained per year or X amount of chemicals removed)	Document Review, Interview
Collect demographic and geographic information of population served by program (e.g., rural v. urban, school size)	Data Collection, Document Review, Interview
Collect results that align with goals/targets (e.g., amount of chemicals, # training sessions)	Data Collection, Document Review, Interview
Collect unintended results (e.g., activities beyond program scope)	Data Collection (potentially), Interview
Identify performance measures/metrics	Document Review, Interview
Measure the impact of EPA funding on goal achievement	Interview

2. What factors contributed the most to achieving or not achieving results?

Information Objective	Information Collection Approach
Identify critical success factors	Interview
Identify the programmatic elements for which results were *easiest* to achieve (e.g., cleanout, inventorying, P2)	Interview
Identify the programmatic elements for which results were *hardest* to achieve (e.g., cleanout, inventorying, P2)	Interview
Identify innovative approaches, such as the use of an EMS, that impacted the results achieved	Document review, Interview
Identify the costs involved in implementing these programs (i.e., total program costs and those specific to grant related activities)?	Document review, Interview
Determine impact of cost on achieving results	Interview

3. How can the results of these grants be used to inform development or improvement of SC3 programs?

Information Objective	Information Collection Approach
Identify best practices that can contribute to achievement of goals	Interview
Determine if these practices are applicable to different sets of circumstances (e.g., a rural school, newly constructed schools)	Interview
Identify metrics that are appropriate for evaluating the results of various types of state and local SC3 programs	Document review, Interview
Determine which of those metrics (or others) can be used to compare the effectiveness of different programs	Interview

4. In the future, what can EPA do to improve achievement of intended results?

Information Objective	Information Collection Approach
Identify what is needed to reduce barriers to achievement of grant goals (by EPA, states, or others)	Interview
Identify what can be done to encourage or discourage unintended results (e.g., additional P2 efforts not included in original program scope)?	Interview

Evaluation Products

1. **Plan for compilation, presentation, and analysis**. Indtai will review all data collected and develop an approach for compiling, analyzing, and presenting the information to EPA WAM and SC3 staff. At this time, we will discuss various approaches to presenting the data and results that offers the most value to EPA. For instance, we may feel that presenting the amounts of types of chemicals (e.g., corrosive, ignitable) removed from schools is more valuable than a laundry list of amounts of specific chemicals removed. Or, we may choose to highlight how certain innovative approaches resulted in "x" amount of chemicals removed or new storage solutions implemented. Once we begin collecting the data, we will have a better sense of the most appropriate way to illustrate and summarize our findings. At this point, we will present our strategy for presenting the information we collected. To be most efficient, this may happen in conjunction with the draft report outline below.

2. **Evaluation report.** Indtai will draft an evaluation report summarizing our findings and outlining recommendations, as appropriate. Prior to writing the report, we will submit a detailed outline to the WAM for review and comment. Included in the report will be high-level graphical representations based on data from the ten grantees. As appropriate, we will include more detailed data and lists of sources as appendices to the report.

   The draft evaluation report will be submitted to WAM and other relevant EPA personnel for review. Indtai will then incorporate comments, as necessary, and transmit final report to WAM. The final report will be prepared and delivered in accordance with OPEI's Report Formatting and Presentation Guidelines of March 2005. The report will follow this basic structure:

   EXECUTIVE SUMMARY

   I. Introduction

   A. Background and History of the SC3 Grant Program
   B. Purpose/Objectives of the Evaluation
      C. Research Questions
      D. Structure of the Report

II. Methodology and Approach

A. Study Design
B. Quality Assurance Plan
C. Information Collection Assumptions
D. Data Collection
E. Data Analysis

III. Results

A. Overall Summary of Results Organized by Evaluation Questions and Sub-Questions
B. Summary of Results from Interviews (e.g., best practices, factors that contributed to achieving results)
C. Summary of Results from Mining of Quantitative Data (this may not require a separate section, it may be interwoven in other sections)

IV. Discussions and Conclusions

A. Suggestions for Improving the Effectiveness of the SC3 Grant Program
B. Recommendations for Creating a National SC3 Program (based on lessons learned from grant results)
C. Conclusion

APPENDICES

3. **Oral presentation.** Indtai will present the evaluation findings to the WAM and other relevant EPA personnel at a time and location to be determined. Indtai will develop all necessary presentation materials, such as PowerPoint slides or handouts, and distribute at presentation. All presentations materials will also be electronically transmitted to WAM.

Quality Assurance Plan

To maintain quality assurance throughout this evaluation project, Indtai will take the following steps. With regards to documentation analysis, we will coordinate with the EPA WAM and SC3 personnel to obtain final versions of key documents. We will craft interview questions that are tied to answering the information objectives and overall evaluation questions. We will work with WAM to vet all interview questions and potentially conduct a "dry-run" interview to improve the clarity and completeness of questions. Every interview will involve two contractor personnel, thereby ensuring that comprehensive notes are taken and all relevant questions and follow-up inquiries are made. We will send follow-up emails to certain interviewees to clarify statements and collect additional documents and information for review. Indtai will maintain regular communication with the EPA WAM to advise on the status of the evaluation process.

Evaluation Timeline

Below is a tentative deliverable schedule. More firm dates will be decided once this methodology is approved and the introductory email is sent. Indtai will make every effort to ensure the information collection process is efficient and effective. Since IEc's contract year ends during the middle of this project, we realize this may create potential delays or brief period of stop work while contract details are finalized.

Task	**Deliverable**	**Tentative Delivery Schedule as of April 4, 2006**
3	Begin Information Collection	April-May 2006
	Complete Information Collection	June-July 2006
	Draft Information Analysis Plan	June-July 2006
	Final Information Analysis Plan	July-August 2006
4	Detailed Outline of Draft Report	July-August 2006
	Draft Report	August 2006
	Prepare Presentation Materials	August-September 2006
	Oral Presentation	August-September 2006
	Final Report	August-September 2006

Attachment: Sample Introductory Email

This sample introductory email was used during the SC3 formative evaluation and was transmitted by Kristina Meson in OSW. For this evaluation, we will develop text to differentiate this "results" evaluation from the formative so that interviewees realize we want to gather a new set of information from them.

Hi SC3 Leads-

I wanted to alert you that you may be contacted by our contractor Indtai, Inc. seeking information on your SC3 projects. Shelley Rappaport is the lead contractor who may be contacting you. You may also hear from Rob Brotzman.

We have heard from many of you that it would be really helpful to do some analysis of SC3 programs, both those funded in 2004 and those run by states or other organizations, to see what the key factors are that lead to program success, or present obstacles to implementing an effective program. So, we listened, and are working with Indtai on a formative evaluation to do just that. The purpose of this evaluation is to help us design our own SC3 program, or help others better design theirs. The evaluation is intended to provide information to help EPA understand what processes, operations, functions, and structure would best enable EPA and its partners to meet the goals for the program.

We are in the process of looking at the breadth of SC3 type programs and are narrowing down those that we will look into further. We will likely focus on 4 2004 EPA projects and 6 or so non-EPA funded projects. We are trying to get a wide range of programs that vary on how the are run. Once selected, Shelley will contact the regional lead to discuss the project. If the regional lead and the contractor believes it might be useful to contact the grantee, the regional lead will make that decision and decide how best to make the contact.

We would like to move quickly on this project so that we will have a good analysis complete to feed into the development of a "how-to" guide and, of course, in time for the next funding cycle. I would appreciate your cooperation in making this happen. I don't expect that it will take too much of your time. If for some reason you do not want to participate, please let me know. And, of course, if you have questions, just give me a holler.

Thanks, as always, for the wonderful work you do in creating a safer learning environment for our children, - K

Kristina (Krysia) L. Meson
EPA/Office of Solid Waste
Hazardous Waste Identification Division and
EPA Peer Support and CISM Team
Tele: (703) 308-8488
Fax: (703) 308-0514
meson.kristina@epa.gov

Appendix 3: SC3 Results Evaluation Interview Guide

Submitted:
24 May 2006

SC3 Results Evaluation Interview Questions

{We will start by introducing ourselves and asking if a brief recap on the purpose of the call and the evaluation is necessary. If not, proceed directly to questions}

BACKGROUND/CONTEXT

{We will ask a few background/contextual questions gauge the level of familiarity each person has with the program in question as well as verify facts. These questions will also give us information so that we can tailor the remaining program specific questions accordingly}

- Describe your involvement in the program/describe your interaction with those leading the program
- How long have you been aware/involved with the program?
- What is the program's purpose? Is it part of a larger effort?
- Give us a sense of the scope of the program. For example:
    - How many schools are involved? What percentage of total? Elementary, middle (define), high school? How many kids impacted, faculty impacted?
- How many people were involved in the program and what was the total FTE required to implement the program? (e.g., 2 FTE of 10 teachers' time)

RESULTS SPECIFIC QUESTIONS

(We will start with questions that are specific to each of the programs of interest to the evaluation project and then transition to more generic questions. Throughout this interview, we will ask, as necessary, for any program documentation, such as results or information not available on the Internet, that may be helpful to our evaluation.)

Did the SC3 grantees achieve their goals?

- What were the goals of each of the 10 state and local programs funded by EPA grants? Were these goals unique to the grant funding or part of a larger program or strategy?
    - Do you feel the program has **made schools safer**? Please describe.
    - Do you feel the program has **reduced risks of releases / exposure** going forward?
    - Describe any **changes in policies, procedures, or behavior** (e.g., chemical purchasing or chemical management policies).
- Specifically, how were the EPA grants intended to help achieve goals? Without EPA funding, would each program have achieved goals? If so, how?
- Did you evaluate the progress toward meeting goals at any point throughout the process? Did you readjust your approach to reaching goals?
- Were the intended results of the 10 grants achieved? Explain.
- Were any goals not achieved? Explain.
- What metrics or measures did you use?
- Who was responsible for tracking results?
- Were there any unintended results that either benefited or detracted from the grantee's ability to achieve program goals?

What factors contributed the most to achieving or not achieving results?

- Which programmatic elements (e.g., cleanout, inventorying, P2) were the most difficult to achieve intended results? Which was the easiest? Why?
- Did particular approaches, such as the use of an EMS, have a greater impact on the results achieved? Explain.
- Which program implementer had the greatest impact on achieving or not achieving results?
- Please describe any **partnerships** formed or **stakeholder involvement** in the implementation of the program.
    - What was their role?
    - What impact did they have?
    - Do you feel they are an integral part of the program? Why or why not?
    - Do you feel it would be helpful to speak with any of the partners or stakeholders? If so, could you provide me with contact info.
    - Was a stakeholder group formed/used? Was it ad hoc, already established, did it become permanent?
- What costs were involved in implementing these programs? Did they have an impact on achieving results?

How can the results of these grants be used to inform development or improvement of SC3 programs?

- Are there best practices that can contribute to achievement of grant goals?
- Are these practices applicable to different sets of circumstances?
- If {insert name} program overcame any impediments to success, how could others learn from that experience?
- What metrics are appropriate for evaluating the results of various types of state and local SC3 programs? Can measures be identified that allow for comparison of the effectiveness of different programs? What system/process did you use to track data?
- What types of activities could EPA, other federal agencies, or states/local undertake to inform the development or improvement of SC3 programs?

In the future, what can EPA do to improve achievement of intended results?

- What can be done reduce barriers to achievement of grant goals?
- What can be done to encourage or discourage unintended results (e.g, additional P2 efforts not included in original program scope)?
- What can EPA do to help {insert program name} achieve sustainability and self-sufficiency?
- Are there any specific program element areas where EPA could be of assistance? Explain.

Appendix 4: SC3 Results Evaluation Interviewees

SC3 Results Evaluation Interviewees

EPA Regional Personnel		
Contact Person	*EPA Region*	*SC3 Program*
Joan Jouzaitis	1	Rhode Island Chemical Safe Schools Committee
Laura Livingston	2	Rochester City School District (NY)
Sharon Perez-Suarez	3	Northwest Tri-County Intermediate Unit's Safer School Initiative
Delores Rodgers-Smith	4	Tennessee Department of Environment and Conservation's Safe SC3 Program
Janet Haff	5	Osh Kosh/Green Bay School Chemical Collection Program (WI)
Donna Cooper	6	Fort Worth Independent School District's Clean Out Your Chemical's Project (TX)
Ed Buckner	7	Iowa Rehab the Lab
Matt Langenfeld	8	Wyoming Department of Education's Safer Schools Initiative
Bill Jones	9	Los Angeles Unified School District Pilot Program for Laboratory Chemicals
Carmen Caldwell	10	Idaho Chemical Roundup
State/Local SC3 Program Implementers		
Contact Person	*Affiliation*	*SC3 Program*
Jim Ball	RI Department of Environmental Management	Rhode Island Chemical Safe Schools Committee
Suzanne Wheatcraft	Rochester City School District	Rochester City School District (NY)
Lacey Maze	NW Tri- County Intermediate Unit	Northwest Tri-County Intermediate Unit's Safer School Initiative
Ken Nafe Cynthia Rohrbach	TN Dept of Environment and Conservation	Tennessee Department of Environment and Conservation's Safe SC3 Program
Janet Haff	US EPA, Region 5	Osh Kosh/Green Bay School Chemical Collection Program (WI)
George Reid	Fort Worth Independent School District	Fort Worth Independent School District's Clean Out Your Chemical's Project (TX)
Kent Candee	EMC Insurance	Iowa Rehab the Lab
Becky Wehrman	Metro Waste Authority	Iowa Rehab the Lab
Bruce Hayes	WY Department of Education	Wyoming Department of Education's Safer Schools Initiative
Soe Aung Yi Hwa Kim	Los Angeles Unified School District Office of Environmental Health and Safety	Los Angeles Unified School District Pilot Program for Laboratory Chemicals
Patti Best	ID Dept. Environmental Quality	Idaho Chemical Roundup