

SSPC: The Society for Protective Coatings

TECHNOLOGY GUIDE NO. 18

Specifier's Guide for Determining Containment Class and Environmental Monitoring Strategies for Lead-Paint Removal Projects

1. Scope

1.1 This guide describes a six-step process to assist in determining the type of containment system and the level of environmental monitoring that should be specified on a project-specific basis when removing coatings that contain lead. The selection of the containment and monitoring strategies is based on an assessment of the type of paint removal method that will be used and the potential impact of the operations on the public, other workers in the area, and the environment. Note that local and state codes and regulations must be reviewed and take precedence to any guidance provided in this document.

The guidance provided in this document also applies to coatings containing other hazardous metals such as cadmium and chromium; however, the recommended analytical monitoring is often based on an analysis for lead. Paint chip sampling and testing for lead and other hazardous metals should be undertaken to properly characterize the paint being removed.

1.2 This guide does not cover the selection of paint removal methods, or design of containment/ventilation systems.

2. Description

This guide is intended to assist those who specify, design, construct, or monitor the effectiveness of containments and environmental monitoring procedures on projects where lead-containing coatings are being disturbed. It provides users with a series of steps for gathering and organizing information about a specific lead paint removal operation in order to select the type of containment and the environmental monitoring strategy that will result in the least risk to the public and the environment.

3 Information Resources

Much of the information contained in the guide has been extracted from *Project Design*,¹ which also provides additional details on the design process for lead-paint removal projects. Additional sources of information that the reader should consult for the proper use of this guide are SSPC-Guide 6, Guide for Containing Debris Generated During Paint Removal Operations², and SSPC-TU 7, Conducting Ambient Air, Soil, and Water Sampling During Surface Preparation and Paint Disturbance Activities.³

4. Steps for Gathering and Ordering Information

Step 1 – Identify the Emissions Potential of the Selected Paint Removal Method(s)

The various methods of paint removal will create differing amounts of emissions. The particle size distribution (PSD) of emissions may range from a few large paint chips and little airborne dust in the case of hand scraping, to large amounts of smaller particles, debris, and airborne dust in the case of abrasive blast cleaning. The small particle sizes will be carried further by the wind, placing the removal method into a higher "Paint Removal Emissions Category." For the purpose of this guide, four "Paint Removal Emissions Categories" are defined based on the general amount of emissions created, whether the emissions are wet or dry.

NOTE: No relationship is being implied between the emission category and the amount of lead that may be present in the emission. For example, open power tool cleaning is classified "moderate emissions potential," whereas water jetting is classified as "high emissions potential." However, the actual amount of lead in the dust surrounding the power tool operation may be greater than the amount of lead in the mist of water surrounding the water jetting operation.

Paint Removal Emissions Categories:

Category 1 - Very High Emissions Potential: The paint removal methods in this category include open abrasive blast cleaning with expendable or recyclable abrasives.

Category 2 - High Emissions Potential: The paint removal methods in this category involve the use of water and include high and ultra-high pressure water jetting, low and high pressure water cleaning, and wet abrasive blast cleaning.

Category 3 - Moderate Emissions Potential: The paint removal methods in this category include sponge jetting, chemical stripping (removal of stripping residue by means other than hand scraping), vacuum blast cleaning, wet abrasive blasting and waterjet cleaning with vacuum attachments, portable centrifugal wheel blast cleaning, and power tool cleaning. Note that when used with proper operating techniques on flat surfaces, wet or dry abrasive blast cleaning

with vacuum attachments and waterjetting with vacuum attachments can meet Category 4 requirements.

Category 4 - Low Emissions Potential: The methods in this category include hand tool cleaning and chemical stripping when removed by hand scraping only.

Record the paint removal methods and the associated Emissions Potential Category on the attached Form A.

Step 2 – Collecting Site-Specific Project Data and Potential Risk Indicators

Before the degree of containment and environmental monitoring strategies can be selected, site-specific data should first be collected. Data includes the proximity of the public, other workers, and soils/water to the paint removal operations. Each is discussed below.

Determine Relative Risk to the Public: The impact that project emissions might have on the public is significantly influenced by the relative proximity of the public to the paint removal operations, and the frequency of their presence. “Public” is defined as anyone who is not employed at the jobsite, whether by the contractor or the owner of the facility for which the work is being performed (as a direct facility employee or by another firm contracted to work at the facility).

Use Chart 1 to determine the relative risk to public health based on their proximity to the project and the frequency of their presence. Proximity is based on distances and is self-explanatory. Frequency is defined as follows:

- Never:* Public has no access near the site, such as work in the middle of an industrial facility.
- Rare:* Public has limited access near the work site, or may be present for a very limited duration such as driving on a roadway near a bridge project. A tank located in a remote rural area away from routine public access is included in this category.
- Occasional:* Public may be near the work site on a periodic basis. Examples include nearby parks or recreational areas.
- Always:* Public maintains a relatively full-time status near the work site, such as housing, schools, and commercial businesses.

Other Considerations: The designer should also review other factors that might affect potential public exposures:

- Time of Year – parks, ball fields and other open spaces may have higher usage at certain times of the year.
- Recreational Activities – such as fishing and boating, or outdoor festivals, fairs, carnivals.
- Wind Velocity – wind velocity can effect the distribution and concentration of the emissions, and may alter the general citing criteria presented in this Guide.

Wind Direction – Note that sensitive receptors that are proximate to (near) the work site may warrant a monitoring location, even when located upwind.

Other Sources of Emissions – the location of support operations in relation to the public should also be considered. Support operations include blast media transfer systems, blast media cleaning systems, exhaust air filtration, waste conveyance, etc.

Record the raw data and the relative public health risk on the attached Form A.

Determine Relative Risk to Adjacent Workers (to other site workers who are not involved in the paint removal project, but who are proximate enough to the work to potentially be exposed, as defined below).

The impact that project emissions might have on adjacent workers is significantly influenced by the relative proximity of the workers to the paint removal operations, and the frequency of their presence.

Use Chart 2 to determine the relative risk to adjacent workers based their proximity to the project and the frequency of their presence. Proximity is based on distances and is self-explanatory. Frequency is defined as follows:

- Rare* Adjacent workers have no routinely scheduled activities near the work area. This would apply to workers that may be needed to perform random maintenance or repair of facility equipment located within the work area.
- Occasional* Adjacent workers have routine, scheduled periodic stays of 2 hours or less per shift near the work area.
- Always* Adjacent workers have routine, scheduled stays of greater than 2 hours per shift near the work area.

Record the raw data and the relative risk to adjacent workers on the attached Form A.

Determine Potential Impact to the Environment (Adjacent Soil/ Water): The impact that project emissions might have on the environment (defined as adjacent soil and water) is significantly influenced by the relative proximity of soil and water to the paint removal operations.

Use Chart 3 to determine the potential impact to the environment by plotting the proximity to both soil and water. Note that proximity to soil or water is independent of use. Lawns are treated the same as farmland. Ponds and lakes are treated the same as rivers. However, certain land and water uses (e.g., water intakes, fisheries, vegetable gardens, etc.) may require special considerations and highest levels of protection. Proximity is based on distances and is self-explanatory.

Record the raw data and the potential environmental impact on the attached Form A.

CHART 1
DETERMINATION OF RELATIVE RISK TO PUBLIC HEALTH

Proximity	Frequency			
	Never	Rare	Occasionally	Always
Close (<100 ft) ¹	Nil	Moderate	High	High
Moderate (100-1000 ft) ²	Nil	Low	Moderate	High
Far (1000-2500 ft) ³	Nil	Low	Low	Moderate
N/A ⁴	Nil	Nil	Nil	Nil

¹ or within 2X the height of the structure relative to the receptor whichever is greater.

² or within 5X the height of the structure relative to the receptor, whichever is greater.

³ or 5X the height of the structure relative to the receptor, whichever is greater, but less than 2,500 ft.

⁴ or greater than 2,500 ft.

CHART 2
DETERMINATION OF RELATIVE RISK TO ADJACENT WORKERS

PROXIMITY TO WORKERS	FREQUENCY		
	Rare (no scheduled presence)	Occasionally (<2 hrs/shift)	Always (>2 hrs/shift)
Close (<50 ft)	Low	Moderate	High
Moderate (50-500 ft)	Nil	Low	Low
Far (>500 ft)	Nil	Nil	Nil

CHART 3
DETERMINATION OF POTENTIAL ENVIRONMENTAL IMPACT

PROXIMITY TO SOIL		PROXIMITY TO WATER	
		Distant (>200 ft) ²	Near (<200 ft) ¹
	Near (<200 ft) ¹	High	High
	Distant (>200 ft) ²	Low	High

¹ or within 5X the height of the structure, whichever is greater.

² or more than 5X the height of the structure, whichever is greater.

Step 3 – Determining Degree of Emissions Control Required

The risk indicators from Step 2 are combined in Chart 4 to determine the degree of emissions control required for the specific project.

Two “Emission Control Levels” are established as defined below:

Emission Control Level A – This category requires a very high level of control over emissions. The intent is to prevent essentially all emissions from escaping the work area.

Emission Control Level B – This category requires a high level of control over emissions, with the recognition that periodic, but infrequent, emissions are allowed.

Record the Emissions Control Level on the attached Form A.

Step 4 – Matching the Containment Requirements with the Paint Removal Method(s) and Degree of Emissions Control Required

Classes of containment are defined in SSPC Guide 6 for dry abrasive blast cleaning, wet methods of removal

(e.g., wet abrasive blast cleaning or water jetting), hand/power tool cleaning, and chemical stripping.

The containment classes are identified as 1 through 3 for hand/power tool cleaning and chemical stripping. Classes for dry abrasive blast cleaning and wet methods of removal are 1 through 4. The lower the number, the greater is the degree of control over emissions (and correspondingly the more elaborate the containment system).

The containment classes also contain a letter that corresponds to the method of removal:

A – Abrasive Blast Cleaning (Classes 1A through 4A)
W – Wet Methods (Classes 1W through 4W)
P – Hand/Power Tool Cleaning (Classes 1P through 3P)
C – Chemical Stripping (Classes 1C through 3C)

Select the recommended class of containment from Chart 5 based on Emissions Potential of the paint removal method from Step 1 and the Emissions Control Level from Step 3.

Record the SSPC class of containment on the attached Form A.

CHART 4
SELECTION OF PROJECT-SPECIFIC EMISSION CONTROL LEVEL

		RISK TO ADJACENT WORKERS					
		Nil	Low	High	Nil	Low	High
PUBLIC HEALTH RISK	High	A	A	A	A	A	A
	Moderate	A-B	A-B	A	A	A	A
	Low/Moderate	B	B	A	A-B	A-B	A
	Nil	B	B	A	A-B	A-B	A
		Low			High		
		ENVIRONMENTAL IMPACT					

CHART 5
SELECTION OF CONTAINMENT CLASS BASED ON EMISSIONS POTENTIAL OF PAINT REMOVAL METHOD AND EMISSIONS CONTROL LEVEL REQUIRED

PAINT REMOVAL EMISSIONS POTENTIAL	EMISSIONS CONTROL LEVEL REQUIRED	SSPC GUIDE 6 CONTAINMENT CLASS
Very High	A	1A
	B	2A
High	A	1W
	B	3W
Moderate	A	1P/1C
	B	2P/3C
Low	A	3P
	B	Ground tarps

