September 19, 2005

Amendment #3

INDEPENDENT MONITORING OF LEAD PAINT REMOVAL OPERATIONS AT VARIOUS LOCATIONS

CITYWIDE

CONTRACT NO. HBMPL4

PIN: 84105MBBR006

Refer to Page 5, Section IV of the Request for Proposals, Format and Content of the Proposal, (A) Proposal Format, Component 2B, Proposal Narrative

Delete: Page 5 in the Format and Content Section of this RFP.

Replace with: Revised Page 5 in this amendment.

Refer to Page 6, Section IV of the Request for Proposals, Format and Content of the Proposal, (A) Proposal Format, Component 2B, Proposal Narrative

Delete: Page 6 in the Format and Content Section of this RFP.

Replace with: Revised Page 6 in this amendment.

Refer to Section VII (E) of the Request for Proposals, Cost Proposal Forms Packet

Delete: Form 4T1 – Labor Cost Proposal (Monitors (IH) @ 43,000 hours) in this RFP.

Replace with: Form 4T1 – Labor Cost Proposal (Monitors (IH) @ 35,000 hours) in this amendment.

No Change Orders will be issued and the Firm will be obligated to perform the services with the number of man-hours indicated.

Refer to Section VII (A) of the Request for Proposals, Proposed Contractual Agreement

Insert: Statement of Findings: Final Environmental Impact Study behind GR-5 and in front of (B) General Provisions – (Appendix A).

The qualifications for the job titles listed on the Form 4T1 are on Page SR-2, paragraph 3. All personnel on the project must have current certifications in order to perform the scope of services in the contract. A review of qualified staff is part of the proposal review process. This contract does **not** require a Professional Engineer for the Monitors title.

The staffing of the Monitors (IH) to perform the monitoring services **may vary up to 4 Full-Time monitors** working five (5) days a week at various durations of this contract.

The successful Firm is an Independent Auditor who will be monitoring projects that include, but are not limited to, Construction, Resident Engineering Inspection, Total Design and Construction Support Services. The successful firm is prohibited from bidding on any affected contracts that involve Construction, Resident Engineering Inspection, Total Design and Construction Support Services during the duration of this contract.

All proposals submitted will be considered, but the firm is limited to the maximum anticipated contract cost of $2,750,000.

Proposal Due Date and Time and Location:

Date: September 29, 2005
Time: NO LATER THAN 2:00 PM
Location: NYCDOT, Contract Section
40 Worth Street, 8th Floor, Room 824A
New York, New York 10013

Proposals should be hand delivered to NYCDOT Contract Section located at 40 Worth Street, 8th Floor, Room 824A, New York, New York 10013 between the hours of 9 am and 2 pm only.

Proposers are advised that the Authorized Agency Contact Person for all matters concerning this Request for Proposals is:

Dr. Paul-Michael Kazas
Director, Capital Procurement
2 Rector Street, 8th Floor
New York, NY 10006
Telephone: (212) 442-7654
Fax: (212) 442-9885

SECTION IV: FORMAT AND CONTENT OF THE PROPOSAL

Instructions: Proposers should provide all the information requested in the format below.

The RFP package should consist of three (3) individually sealed components as listed below, each bound in a 8 1/2" x 11" plastic spiral binding. No pictures or drawings should be included, except for the cover. The cover should be hard cardboard or laminated plastic, the cover should feature the name of the responding firm(s) and the contract name and number. Responses should be typed using 12 point font. Responses on pre-printed forms should be no smaller than 8 point font, and then only when necessary. The response may include a one page bound transmittal letter, which summarizes the respondent's understanding of the project and its ability to successfully accomplish the job. Each section should be tabbed and labeled to correspond with each section listed (i.e. 1T, 2T, 3T, 4T, 5T, 6T, Form 4T1, Form 4T2 and 4T3.).

The proposal will be evaluated on the basis of its content, not length.

A. Proposal Format

Component 1: Procedural Forms

A Procedural Forms packet has been supplied with this Request for Proposal and should be fully completed and included in the proposal package as follows:

FORM 1P	**PROPOSAL COVER LETTER**
FORM 2P	**ACKNOWLEDGEMENT OF ADDENDA**
FORM 3P	**AFFIRMATION FORM**

The Original Procedural Forms Packet should include all completed Procedural forms, required procedural documents, signed certifications and Supplementary information.

Component 2A: Proposal Forms

A Proposal Forms Packet has been supplied with this Request for Proposal and should be fully completed and included in the proposal package as follows:

FORM 1T	**QUALITY & RELEVANCE OF PRIOR EXPERIENCE (FIRM IN GENERAL)**
FORM 2T	**PROPOSED STAFF (RESUMES)**
FORM 3T	**STAFF EXPERIENCE**
FORM 4T	**JOB TITLES & HOURS PROPOSED**
FORM 5T	**OVERALL APPROACH**
FORM 6T	**NYCDOT CURRENT WORKLOAD DISCLOSURE (2 PGS.)**

Component 2B: Proposal Narrative

The firm that will be awarded this contract shall not be eligible for award as a Prime Consultant or Sub-Consultant for NYCDOT contracts that include but are not limited to Construction, Resident Engineering Inspection, Total Design, and Construction Support Services, for the duration of this Independent Monitoring of Lead Paint Removal Operations at Various Locations, Citywide.

Where any proposed Prime Consultant or Sub-consultant, either substantially or incidentally performed any REI contracts, citywide during the life of this contract, attach a narrative addressing the following:

- Demonstrate that the proposer, and/or each proposed sub-consultant that substantially performed on the Construction, Resident Engineering Inspection, Total Design, and Construction Support Services contracts, if any, has no conflict of interest that would prevent them from performing properly on the related Independent Monitoring of Lead Paint Removal Operations at Various Locations, Citywide contract. In addition, submit a written affirmation from the proposer, and/or from each sub-contractor attesting to the same.

- Demonstrate that the work of each proposed sub-consultant that incidentally performed on the Construction, Resident Engineering Inspection, Total Design, and Construction Support Services contracts, if any, was, in fact, incidental and that each has no conflict of interest that would prevent them from performing properly on the related Independent Monitoring of Lead Paint Removal Operations at Various Locations, Citywide. In addition, submit a written affirmation from each such sub-contractor attesting the same.

Component 3: **Cost Proposal**

A Cost Proposal Forms Packet has been supplied with this Request for Proposals and should be fully completed and included in the proposal package as follows:

Cost Proposal

FORM 4T1	**LABOR COST PROPOSAL***
FORM 4T2	**COST PROPOSAL SUMMARY***
FORM 4T3	**PERFORMANCE OUTCOME MEASURES & FINANCIAL INCENTIVES AND/OR DISINCENTIVES**

NOTE:* FORM 4T1 (COLUMNS 3, 4 AND 5), AND FORM 4T2 ARE TO BE COMPLETED AND SUBMITTED AS PART OF YOUR COST PROPOSAL PACKET.

Performance Outcome Measures and Financial Incentives and/or Disincentives

Performance outcome measures and their related financial incentives and/or disincentives should be proposed in Form 4T3. List and describe desired performance outcomes or targets for the work to be performed by the proposer under the contract along with the related financial incentives and/or disincentives that could potentially be applied to the contract. While the proposer's proposed performance outcome measures and related financial incentives and/or disincentives will not be scored, they may be considered by the agency while awarding the contract and structuring its payments to the consultants.

All components should be individually sealed and labeled (i.e., Component 1, Component 2, Component 3) to indicate the contents of each package and placed in an outer envelope or wrapper. Address all component packages, outer envelopes or wrappers as follows:

Proposer's Name
Address

NYCDOT Contract Section
40 Worth Street
8th Floor, Room 824A
New York, New York 10013

PIN No. 84105MBBR006
CONTRACT NO. HBMPL4
INDEPENDENT MONITORING OF LEAD PAINT REMOVAL IN VARIOUS LOCATIONS, CITYWIDE
PROPOSAL SUBMISSION DEADLINE IS SEPTEMBER 29, 2005
NO LATER THAN 2:00 PM

The individually sealed proposals should be submitted at the time and place as indicated in Section I, Timetable.

(FOR MONITORING ONLY)

FORM 4T1 - LABOR COST PROPOSAL

PROJECT NAME: INDEPENDENT MONITORING OF LEAD PAINT REMOVAL OPERATIONS AT VARIOUS LOCATIONS, CITYWIDE

PIN: 84105MBBR006

CONTRACT NO.: HBMPL4

PRIME CONSULTANT: _____

CONSULTANT ON THIS FORM: _____

(COLUMN 1) JOB TITLE	(COLUMN 2) TOTAL HOURS	(COLUMN 3) HOURS THIS FIRM	(COLUMN 4) AVERAGE HOURLY RATE	(COLUMN 5) LABOR COST (COL 3 X COL 4)
1. Certified Industrial Hygienist	1,500 Hrs.			
2. Monitors (IH)	35,000 Hrs.			
3. Project Manager	8,760 Hrs.			
TOTALS	45,260 Hrs.			(T)

MULTIPLIER FOR OVERHEAD _____(A) (A)

MULTIPLIER FOR PROFIT _____(B) (B)

TOTAL MULIPLIER _____**(1 + A) X (1 + B)** (M

TOTAL LABOR COST (Line T X Line M) (C)

TOTAL LABOR ESCALATED TO PROJECT MIDPOINT ((C) X PROPOSED ESCALATION FACTOR IN SHADED AREA)

PROPOSED ESCALATION FACTOR _____ (D)

(MAXIMUM ESCALATION FACTOR = 1.08)

INSTRUCTIONS:

Each consultant of the project team is to submit a separate "Labor Cost Proposal Form". For each job title, the hours proposed by each firm of the project team in column (3) **MUST SUM** to the total hours provided in column (2).

For column (4), use actual average salary rates for each firm for each job title at regional offices. Attach a listing of current average rates for all titles/grades/levels as approved by NYCDOT (if available) or NYSDOT for regional offices. A regional office is defined as one located within a 75 mile radius of Columbus Circle (NYC).

The labor costs to be included in column (5) are obtained by multiplying the hours in column (3) by the average hourly rate in column (4).

The proposed escalation factor used to calculate "D" should not exceed the maximum escalation factor indicated in the shaded area. Greater consideration will be given to proposers that propose more competitive prices.

New York City
Department of Transportation
Wilbur L. Chapman, Commissioner

Division of Bridges
Two Rector Street, 8th Floor
New York, New York 10006
Tel: 212/788-2100 Fax 212/788-9015

STATEMENT OF FINDINGS: PAINT REMOVAL OPERATIONS ON NEW YORK CITY DEPARTMENT OF TRANSPORTATION BRIDGES CEQR NO. 96-DOT-005Y ISSUANCE DATE: NOVEMBER 12, 1998

A. INTRODUCTION

This Statement of Findings has been prepared in accordance with the environmental review requirements pursuant to Article 8 of the New York State Environmental Conservation Law, the State Environmental Quality Review Act (SEQRA) as set forth in Section 617.9 of its implementing regulations and the City Environmental Quality Review (CEQR) process as set forth in Executive Order 91 and its amendments. This Statement of Findings has been prepared to demonstrate that 1) the procedural requirements have been met; 2) the proposed paint removal procedures were selected from among reasonable alternatives; and 3) the potential for adverse environmental effects as disclosed in the environmental impact statement and during the review process will be avoided or minimized to the extent practicable by the incorporation of mitigation measures and other project commitments.

Under CEQR, the New York City Department of Transportation (NYCDOT) is the lead agency responsible for conducting the environmental review that determines whether the proposed action would have significant impacts on public health and the environment. The New York City Department of Environmental Protection (NYCDEP) and the New York City Department of Health (NYCDOH) are the primary interested agencies.

In accordance with a Stipulation of Settlement, an Environmental Impact Statement (EIS) was prepared. NYCDOT issued a Draft Scope of Work on May 22, 1997 that set forth the analyses and methodologies proposed for the EIS. The public, interested agencies, community boards, and elected officials were invited to comment on the draft scope either in writing or at the public scoping meetings held on June 24, June 25, and June 26, 1997. The comment period on the Draft Scope of Work remained open until August 1, 1997. These comments were incorporated into the Final Scope of Work, which was issued in March 1998.

The Draft Environmental Impact Statement (DEIS) was certified as being complete on June 23, 1998 and was published and distributed for public review. The certification of the DEIS was followed by a public hearing, which was held on July 14, 1998. Notices of the DEIS availability as well as the date and location of the public hearing were advertised in eight local newspapers, the City Record and Environmental News Bulletin, and were mailed to the local community boards and elected officials. Comments on the DEIS were received at a public hearing or were submitted in writing to the NYCDOT through August 24, 1998, the close of the public comment period.

A Final Environmental Impact Statement (FEIS) was prepared, which addresses all substantive comments made on the DEIS. The FEIS was certified as being complete and a Notice of Completion was issued on October 7, 1998.

After considering the FEIS for no less than 10 days after issuance of the Notice of Completion, NYCDOT has adopted this Statement of Findings.

B. PROPOSED ACTION AND REQUIRED APPROVALS

NYCDOT proposes to establish technical procedures and related specifications for the maintenance of its steel bridges, including lead-paint and rust removal techniques, guidelines for containment systems, and requirements for inspection and monitoring. The specifications will cover the full range of situations that may arise in considering the most appropriate methods for this maintenance. These procedures would permit NYCDOT to fulfill its responsibilities for protecting the structural integrity of its bridges, while also protecting the health of bridge workers and of residents or visitors in surrounding communities, and minimizing environmental impacts resulting from paint removal procedures.

NYCDOT proposes surface preparation techniques that are appropriate for a range of circumstances. Any method found to be technically and environmentally feasible would be considered for inclusion in the technical specifications for a given bridge painting project, along with appropriate containment, monitoring, and other provisions associated with its operation. The proposed removal techniques include:

- Dry Abrasive Blasting
- Vacuum Blasting
- Wet Abrasive Blasting
- Water Jetting
- Power Tool Cleaning
- Hand Tool Cleaning
- Chemical Stripping

NYCDOT will develop technical specifications appropriate for the selected paint removal methods, which will be followed by NYCDOT's in-house painting crews and contractors during bridge repair and painting activities on its bridges. The proposed specifications will cover the following areas:

- Containment
- Certification and Training
- Compliance and Monitoring Procedures
- Oversight
- Cleanup
- Disposal and Transport
- Worker Protection
- Community Notification

There are no other regulatory approvals required to adopt the technical specifications. However, NYCDOT will require its in-house staff and contractors to comply with all applicable Federal, State, and City laws.

C. FINDINGS AND CONCLUSIONS

The New York City Department of Transportation has carefully considered the human health, environmental, economic, and other essential concerns related to its development of technical specifications for safe lead paint removal operations from its bridges. NYCDOT concurs with the

facts and conclusions disclosed in the FEIS and the SEQRA/CEQR administrative record for the project. Further, NYCDOT has adopted the mitigation measures and project commitments detailed in the FEIS and specified in this Statement of Findings. Subject to these mitigation and project commitments, the framework for the technical procedures will be based on the selection of preferred options from among reasonable alternatives that best avoids or minimizes, to the extent practicable, potential adverse human health and environmental effects.

PROBABLE EFFECTS OF THE PROPOSED ACTION

LAND USE AND COMMUNITY FACILITIES

The proposed paint removal procedures, which essentially represent maintenance activities of a temporary nature, would not directly affect future land use patterns or trends, which would occur independently of NYCDOT's proposed action. The proposed action would not result in any significant adverse effects on current and future populations, community facilities, and/or other land uses in the areas surrounding NYCDOT's bridges. Additionally, once the lead-containing paint is removed, the potential for adverse impacts from lead deposition due to natural delamination would be eliminated.

TRANSPORTATION

Lead paint removal operations on NYCDOT bridges may entail short-term lane closures on NYCDOT bridges and possible local traffic diversions, thereby requiring the development of a Maintenance and Protection of Traffic (MPT) plan. However, any adverse transportation effects would be temporary in nature.

HISTORIC RESOURCES

NYCDOT has in its inventory seven bridges that are designated New York City Landmarks (NYCL), four of which are listed on the State and National Registers of Historic Places and one of which is listed as a National Historic Landmark. To avoid adverse impacts to bridges that are listed on or determined to be eligible for the Registers or are designated an NYCL or are pending such a designation, NYCDOT will follow these procedures:

For all the applicable bridges, NYCDOT will select removal techniques that will not compromise the historic nature of the structure, and will also include development of measures to avoid harm to the historic materials of the bridge, including selection of paint in historic or existing colors, carrying out replacement or restoration, and avoidance of impacts on any historic structures or districts below or adjacent to the bridge.

Paint removal and repainting procedures employed would ensure adequate protection of other materials and historic districts or structures below or adjacent to the bridges.

VISUAL RESOURCES

The proposed action to remove lead paint and repaint NYCDOT bridges will result in unavoidable, albeit temporary, adverse visual effects due to the presence of containment structures and paint removal equipment. Once work is completed, no structural changes will have been made, but the bridges would be improved in their appearance, and any temporary adverse visual effects would

no longer exist.

NOISE

Noise generated by the proposed paint removal operations would be impractical to effectively mitigate; however, this unavoidable impact would be temporary in nature and would not result in any long-term adverse effects. All paint removal operations will be conducted in compliance with all applicable noise code requirements.

CONTAMINATED MATERIALS

While lead-paint wastes are not specifically listed by the US Environmental Protection Agency (U.S. EPA) as being hazardous, the waste may or may not meet the regulatory criteria of a hazardous waste; this depends upon the toxicity characteristics of the waste for lead and seven other metals (arsenic, barium, cadmium, chromium, mercury, selenium, and silver). Wastes that do not exceed these thresholds are considered non-hazardous solid wastes, which have less stringent regulatory frameworks for management and disposal. However, it is NYCDOT's policy to treat all lead-paint wastes and spent abrasives from lead-paint removal projects as if they were hazardous, even if testing indicates that these hazardous thresholds are not exceeded.

If an incident were to occur, such as a failure of a portion of or the entire containment structure, an Emergency Response Plan would be initiated, which would include notification of the appropriate local, state, and federal agencies. Notification of the public and subsequent cleanup (as well as any other necessary activities) would then be undertaken in coordination between NYCDOT and the relevant local, state, and federal agencies.

AIR QUALITY

The air quality analysis considered the potential air impacts from both criteria pollutants and non-criteria pollutants as the result of maintenance, repair, cleaning, or paint removal activities. The criteria airborne pollutants associated with the proposed project include lead, Total Suspended Particulate matter (TSP), and respirable particulate matter (PM_{10} and $PM_{2.5}$). The non-criteria pollutants (for which New York State guideline values have been developed but no regulatory standards have been established) associated with paint removal activities include the trace metals, such as copper, zinc, chromium, cadmium, arsenic, barium, mercury, selenium, and silver, which may be found both within the paint being removed, and within the abrasive materials used to remove the paint. The potential for the proposed paint removal action, if not properly contained, to significantly increase the concentration of each criteria pollutant was assessed and compared with the appropriate National Ambient Air Quality Standards (NAAQS) and New York State Standards.

The results of the criteria pollutant analyses indicated that except for the work site areas (approximately 20 feet from the paint removal spot, site or location), which are not places of public access, there would be no predicted exceedances of the NAAQS, although at locations near some of the bridges selected for detailed analysis there were predicted exceedances of the New York State TSP (Total Suspended Matter) 24-hour average standard. The predicted 24-hour TSP exceedances are a result of combining the highest predicted 24-hour air concentration due to adverse meteorological conditions with worst-case background concentration. The assumption that

the highest predicted maximum worst-case event would occur on the same day as the worst meteorological conditions with the highest background conditions is extremely conservative. If the 24-hour potential release rate calculations were to consider the occurrence of only the highest reasonable worst case event, which is a more plausible assumption, the 24-hour TSP standard would not be exceeded. Mitigation measures would eliminate these worst-case predicted exceedances of the 24-hour TSP standard.

Exceedances of the Annual Guideline Concentrations (AGCs) for arsenic and cadmium could occur at each receptor location, due to existing monitored levels of these metals throughout the region. However, the largest increment, or contribution of the proposed action to the maximum predicted concentrations at any receptor location, would be insignificant. The maximum predicted concentrations for all other non-criteria metals were within the recommended AGCs at all receptor locations.

In terms of the Short-term Guideline Concentrations (SGCs), exceedances were only predicted for arsenic at publicly accessible places adjacent to the bridges. This short-term exceedance of SGC could only occur under the unlikely confluence of a maximum worst case release event on a day with worst case meteorological conditions (i.e., low wind speeds directing the spill toward the place of public access).

For the alternatives to dry abrasive blasting, the magnitude of the maximum potential airborne releases for wet abrasive blasting, water jetting, power tool cleaning, hand tool cleaning and chemical stripping would be considerably less than those predicted for abrasive blasting operations.

PUBLIC HEALTH: LEAD

The analysis considers blood lead levels under three scenarios: (1) baseline conditions among children and adults potentially affected by bridge maintenance activities, (2) future conditions assuming that bridge maintenance activities involving lead paint removal are carried out, and (3) future conditions assuming that no action is taken to maintain the bridges, resulting in the gradual delamination of the paint, and dispersion of lead-bearing matter into the environment. Increments to the baseline blood lead levels are calculated for the second and third scenarios.

Three blood lead models are used in the evaluations: U.S. EPA's IEUBK Model for steady state blood lead levels in children, the Bowers *et. al.* adult model, as adopted by U.S. EPA for steady state blood lead levels in adults, and the O'Flaherty Model, for short-term blood lead levels in both children and adults. The models are used with EPA-recommended exposure parameters, which, in conjunction with the air quality modeling assumptions, considerably overestimate the actual risk to the population.

Baseline blood lead levels for children were assessed from New York City Department of Health (NYCDOH) Comprehensive Surveillance Database[1]. Blood lead levels were compiled for heath districts in closest proximity to each representative bridge and for one year age increments in children up to age 7 years. Baseline blood lead information for adults were based on the third

[1] Since 1993, all 1- and 2-year-old children, and children between 6 months and 6 years who are at risk for high-dose lead exposure, must be tested.

annual National Health and Examination Survey (NHANES), which took place between 1988 and 1994.

Exposure was evaluated for residential settings in proximity to all six representative bridges chosen for detailed analysis. Additionally, paved and unpaved parks were evaluated as well as commercial and industrial settings.

The analysis indicated that most of the community would be exposed to much less lead than assumed in the modeled scenarios and would not exhibit any measurable increase in blood lead level.

The maximum blood lead levels resulting from both the bridge maintenance and delamination scenarios were calculated as increments, which were added to the baseline blood lead levels. These increases are only predicted to occur in the absence of the proposed project's mitigation and could only occur at the location of maximum deposition from any accidental releases. The lower end of the range is related to exposure to reasonable worst-case releases, while the upper end of the range could be a result of exposure to a maximum worst-case release. With the proposed mitigation measures, even under a maximum worst-case release scenario annual average blood lead increments would not be measurable. Blood lead increments predicted to occur from exposure to lead in paved and unpaved parks were less than those calculated for residential settings or for adults in the commercial and industrial exposure scenarios.

Using the containment measures specified in this EIS, the probability of significant releases of lead-containing debris during paint removal operations is very low. In the unlikely event that such releases occur, the mitigation procedures specify that clean up would occur immediately. With immediate clean up, the predicted impact on blood lead levels would be negligible, if any. It should be noted that the predicted impacts are based on a theoretical risk analysis using conservative models to determine appropriate mitigation measures. Therefore, even the predicted negligible impacts will most likely never occur.

PUBLIC HEALTH: RESPIRATORY DISORDERS

NYCDOT's proposed paint removal methods vary in the amounts of fine particulates generated, from virtually none if using hand tool or water jetting to significant amounts if using dry abrasive blasting. Laboratory analysis of particle-size distributions from dry abrasive operations indicates that very small quantities of respirable particulates would be generated from blasting activities. Under normal working conditions, fine particulates from both the paint and abrasive blasting debris, as well as from bird droppings, would be confined to the containment vacuum filter system and, therefore, no increase in respiratory public health effects, including asthma, is expected to result from the particulates generated by the paint removal activities.

In the event of an accidental release, modeling results-using conservative assumptions-indicate that ambient increases of PM_{10} levels would be well below the NAAQS. To the extent possible, care would be taken to minimize levels of ambient particulate, especially short-term releases, such that particulate levels generated from bridge paint removal operations do not exceed NAAQS.

Droppings from pigeons and other birds are commonly found on bridge surfaces. Human inhalation of infected bird droppings can cause a variety of pulmonary infections. However, the exposure

levels required to cause these diseases have not been well-defined. Nonetheless, bridge maintenance workers should avoid excess exposure to any bird droppings present on bridge surfaces. The EIS recommends procedures to minimize the risk of potential accidental releases of particulate matter, as well as to reduce exposure to bird droppings during bridge paint removal activities.

WATER QUALITY

Under typical conditions, NYCDOT's proposed paint removal operations with their containment and oversight procedures, would not release any significant amount of fugitive materials into the surrounding environment; thus, water quality would not be affected. In the event of an accidental breach in containment, malfunction of equipment, or error in work practices, the potential exists to release lead paint chips and blasting debris into the water. The impact of such releases is dependent on the paint removal method used, extent of the release, the size of the area affected, and the existing conditions of that area. The majority of the debris released would sink to the bottom and become incorporated into sediments; a small proportion could dissolve. However, the predicted lead levels released during the project duration would not result in significant increases of dissolved lead in the receiving water body.

Methods of paint removal other than dry abrasive blasting would produce lower emissions of lead into the environment, with the exception of wet abrasive blasting, which would produce approximately the same spills directly into the water. The impacts from these alternatives would be expected to be less severe than the abrasive blasting option.

NATURAL RESOURCES

Under typical conditions, NYCDOT's proposed paint removal operations with their containment and oversight procedures, would not release any significant amount of fugitive materials into the surrounding environment; thus, no impacts on natural resources would occur. The proposed paint removal operations could affect sensitive ecological areas due to the toxicity of lead and other metals released into the environment. In addition, disturbing the site with construction personnel and machinery may cause damage to the natural environment.

The highest predicted concentration of lead deposited over the duration of the project would be 22.3 ppm in soil and would not be significant. Only in the event of a maximum worst case spill would concentrations exceed 50 ppm in the soil. An increase of this magnitude in the terrestrial environment may cause a biological response, but is unlikely to alter the ecosystem structure and function.

Other types of paint removal systems have been considered, including vacuum blasting, wet abrasive blasting, water jetting, power tool cleaning, hand tool cleaning, and chemical stripping. None of these alternatives are expected to produce greater impacts than that disclosed for the abrasive blasting method.

However, habitat loss due to disturbance from workers and machinery could have a significant impact on the terrestrial environment. A site-specific work plan for each NYCDOT bridge located in a sensitive ecological area will be prepared to protect and minimize damage to habitats.

OPEN SPACE

Lead paint removal, when properly contained, will not result in any significant impacts on open space resources or to their users. However, open spaces beneath or immediately abutting the work area may be temporarily closed during paint removal operations. These potential closures would be necessary for construction safety, as well as a precaution against potential public exposure to lead dust from an accidental release during paint removal. After the completion of the paint removal project, NYCDOT will implement procedures to ensure proper cleanup of the affected public open space area. Once the lead-containing paint is removed, a new non-lead-containing coating will be applied; therefore, the potential for impacts on open spaces and their users from lead deposition due to natural shedding would be eliminated.

WATERFRONT REVITALIZATION PROGRAM

Only 10 percent of the bridges in NYCDOT's inventory span water bodies or are near waterfront or shoreline locations; most provide vehicular or pedestrian access over railway cuts or highway overpasses and underpasses. Moreover, since lead paint removal is essentially a maintenance activity limited to the existing bridge structure, it would be temporary in nature and would neither encourage nor discourage the maintenance or development of waterfront-related uses.

ENERGY AND INFRASTRUCTURE

The proposed paint removal actions would not result in any on long-term demands for or significant impacts on the City's energy or infrastructure system. Wastewater would be collected, filtered, tested, and treated if necessary, prior to disposal into the sewer system or transported off-site for appropriate disposal.

ECONOMICS

Paint Removal Costs

The EIS examined costs for various paint removal methods. Estimates range between $3.00 and $6.50 per square foot for total paint removal and between $1.05 and $7.00 per square foot of removal area for spot repair/overcoat. These estimates are consistent with SSPC's estimates based on 1992 and 1993 data for the same categories and did not include costs related to traffic control, paint material, worker protection, environmental monitoring, and engineering.

For full-time on-site environmental oversight (daily), the cost could range between $1.00 and $1.50 per square foot. For oversight on an auditing basis, cost on a per-project basis is estimated to be approximately $0.10 per square foot. The cost associated with the initial daily oversights followed by audits would be a combination of the two estimates, depending on the scope of the bridge project.

The costs associated with NYCDOT's recommendation of worker's blood lead testing once a month would represent a minor increase in cost over OSHA's mandated testing every 6 months.

It is NYCDOT's policy to store and dispose of all paint wastes and used abrasives as if they were hazardous wastes. The estimated cost of disposal of hazardous materials is approximately $400 per ton of waste, or $200 per 55-gallon waste drum, a significantly greater cost than for disposal

of non-hazardous materials (about $40-50 per ton). For projects removing large areas of lead-containing paint, the use of recyclable instead of expendable abrasives, where practicable, would result in much lower cost because of the reduced volume of waste requiring disposal as a hazardous material.

The initial cost to the contractor for SSPC QP-1 and QP-2 audit and certification could range from $5,000 to $7,000. The C3 training course in the hazards of lead exposure and controlling such exposure pathways is a 32-hour (4-day) curriculum that would cost approximately $775 to $860 per person. As a supplement to the SSPC C3 training, a separate course would be provided to familiarize all site supervisory personnel with the specifics of NYCDOT technical procedures and documentation for lead-paint removal projects. Cost for this ½ to 1 day course to review NYCDOT procedures, documentation, and monitoring protocols would be staff time spent attending the ½ to 1 day supervisor course.

Medical Costs

Those children who reside in the areas surrounding the bridges would have no measurable increase in blood lead levels due to the proposed paint removal activities. However, costs associated with increased blood lead levels have been estimated on a per child basis for those children living in the areas of maximum impact from bridge maintenance activities. These costs have been developed for the hypothetical child who resides in the building exposed to a maximum worst case release. In the absence of environmental mitigation, the cost of treating blood lead level exceeding each of these thresholds is estimated to be approximately $61 per child. With mitigation, this cost would be reduced to approximately $2 per child under the same maximum residential exposure.

ALTERNATIVES

No Action

This alternative would not be selected by NYCDOT because it would result in much greater releases of lead into the surrounding environment than any of the proposed lead paint removal alternatives. Through weathering, the lead paint is being removed from the bridges in an uncontrolled manner, as compared with the highly controlled environment proposed for the removal alternatives. The greater lead releases would result in much greater adverse impacts than the paint removal alternatives at bridge locations.

Overcoating

The decision to overcoat is part of an overall maintenance strategy that defers total paint removal until some future date. Because overcoating requires some form of surface preparation prior to application of the additional coating, the health risk and environmental effects are already addressed in the evaluation of the proposed action. However, a bridge that has been overcoated a number of times will eventually require complete paint removal down to bare steel surface. This will require use of the same methods discussed as part of NYCDOT's proposed actions.

Advanced Technologies: Laser or Robotic Removal

These methods have not yet been proven to be practical in bridge painting projects. Because of the multiple steps and additional re-work that is needed, associated cost could be much higher than traditional removal methods. Additionally, at this stage of development, there are no distinct advantages in using these methods versus human operators who can immediately adjust to varying conditions inside the containment.

Steel Replacement

Steel replacement is not always cost-effective nor practical for the painting and lead paint removal conditions NYCDOT faces. A primary consideration in this type of reconstruction is the maintenance and protection of traffic. Because the City's bridges provide transportation access throughout the five boroughs, traffic capacity must be maintained to the extent practicable during the reconstruction process. The need to maintain this capacity, especially during peak travel periods, has resulted in the use of staged construction for many of the City's reconstruction projects. This type of construction adds significant cost to a project, not only from the inefficiency of the construction process but also the added expense of the Maintenance and Protection of Traffic (MPT) Plan. In addition, the environmental impacts from the loss in travel lanes on traffic congestion, noise, air quality, and community disruption can be severe. The advantage of this staged construction sequence is that some level of traffic is maintained across the bridge at all times.

Reconstruction of heavily traveled bridges, with their attendant high MPT expenses, typically costs NYCDOT approximately $400 per square foot of deck area. For less heavily traveled bridges, the reconstruction cost would be at a minimum $250 per square foot of deck area and do not include the engineering time or expense required for the redesign of the new steel members.

Basic costs for the various paint removal options typically could range between $3 and $7 per square foot of paint removal area. Even adding the cost of the environmental monitoring, medical surveillance, and MPT planning associated with the paint removal methods, this cost per square foot would not approach that of steel replacement. However, in some instances steel replacement can play an important role in NYCDOT's overall maintenance strategy. For bridge structures requiring either full or partial rehabilitation that is also scheduled for paint removal strategies, replacement may prove to be a practical and cost-effective solution.

MITIGATION MEASURES AND PROJECT COMMITMENTS

Potential impacts typically associated with lead paint removal could occur with the failure of the primary mitigation measure (containment and ancillary equipment) or poor work practices. Many of these potential impacts would be precluded by the provision of full containment as part of the proposed action. Containment requirements for removal methods are based on SSPC guidance as shown in Table 1. Therefore, the following mitigation measures have been developed to eliminate or minimize any of the remaining potential impacts. Since these potential impacts are related to accidental releases of waste material, the mitigation focuses on preventative measures to minimize the number or severity of any release of the spent material off the work site.

Table 1
SSPC Containment Class

Class	Description			
1	Highest level of emissions control.			
	Class 1A: Abrasive Blast Rigid or flexible containment material; air impenetrable; rigid or flexible support structure; full seal on all joints; resealable entryway or airlock. Ventilation uses baffles, louvers, flap seals, filters, and ducts on air supply points to avoid escape of abrasive and debris, negative air pressure, specified minimum air movement inside structure, and filtration of exhaust dust. Visual or instrument verification of negative air pressure.	*Class 1W: Water Blast* Rigid or flexible containment material; air impenetrable and water impermeable; rigid or flexible support structure; full seal on all joints; resealable entryway. Input air flow can be forced or natural; visual verification of negative air pressure; minimum air movement inside structure and filtration of exhaust dust.	*Class 1C: Chemical Strip* Rigid or flexible containment material; air impenetrable and chemical resistant; rigid or flexible support structure; full seal on all joints; overlap at entryway. Input air flow can be forced or natural; filtration of exhaust dust. Negative air pressure or minimum air movement not specified.	*Class 1P: Power Tools* Rigid or flexible containment material; can be air penetrable; rigid or flexible support structure; full seal on all joints; resealable entryway. Ventilation with controlled air flow, negative air pressure, minimum air movement inside structure, and filtration of exhaust dust. Visual verification of negative air pressure.
2	High level of emissions control.			
	Class 2A: Abrasive Blast Same as Class 1A, except: airlock at entryway and instrument monitoring of negative pressure are not required options and open air intake (without baffles, etc.) can be used.	*Class 2W: Water Blast* Same as Class 1W, except: air impenetrable materials, resealable entryway, negative air pressure, minimum air movement and filtration not required. Overlap at entry required.	*Class 2C: Chemical Strip* Same as Class 1C, except: air impenetrable materials, forced ventilation, and exhaust dust filtration not required.	*Class 2P: Power Tools* Same as Class 1P, except: resealable entryway, negative air pressure, and minimum air movement not required, and open seam or overlap at entryway and open air intake (without baffles, etc.) can be used.
3	Moderate level of emissions control.			
	Class 3A: Abrasive Blast Same as Class 2A, except: air penetrable materials, partial seal at joints and open seam at entry are permitted, negative air pressure verification not required and minimum air movement in structure not specified.	*Class 3W: Water Blast* Same as Class 2W, except: minimal support structure, partial seal of joints, and open seam at entry permitted.	*Class 3C: Chemical Strip* Same as Class 2C, except minimal support structure, partial seal of joints, and open seam at entry permitted.	*Class 3P: Power Tools* Same as Class 2P, except minimal support structure and partial seal of joints permitted.
4	Minimal level of emissions control.			
	Class 4A: Abrasive Blast Same as Class 3A, except: minimal support structure, and only partial seal of joints and open seam at entry required. Filtration of exhaust air not needed.	NA	NA	NA

Note: When vacuum shrouding is employed for abrasive blast, water blast, or power tools, ground covers of free hanging tarpaulins may provide controls equivalent to Class 1 containment.

Source: SSPC Publication No. 96-07, *Guides on Environmental Protection*, SSPC-Guide 6, 1995.

The mitigation program consists of eight program elements:

1. Containment
2. Oversight
3. Certification and Workers' Awareness Training
4. Monitoring and compliance
5. Cleanup procedures
6. Disposal and transport
7. Emergency response
8. Worker protection

Each of these elements is discussed in detail below. Also included is a discussion of community notification procedures.

CONTAINMENT

The proposed containment classes for each removal method are shown in Table 2.

Protective Measures for Lead Containing Paint Removal Techniques — Table 2

Removal Techniques									
Abrasive Blasting			Other Blasting		Power Tools		Hand Tool	Chemical Strip	
Expendable	Recyclable	Vacuum	Wet Abrasive	Water	Without HEPA	With HEPA		Hand Removal	Wet Removal
1A	1A	4A	1W	2W	1P	3P	3P	3C	2C

Source: SSPC Publication No. 95-07, Guidelines on Environmental Protection, SSPC Guide 6, 1995.

OVERSIGHT

Recognizing the importance of oversight as part of the mitigation program, NYCDOT will mandate this on all of its non-emergency lead paint removal projects. The environmental oversight mandate would be to ensure that lead paint removal projects are conducted in a safe, environmentally protective manner, and in accordance with the technical specifications.

The oversight program will consist of two separate levels. At the project level, there will be an environmental overseer who will monitor the paint removal projects on either a full- or part-time basis, depending on the removal method employed. The second part of the oversight program will be an overall quality control monitoring of all paint removal projects by NYCDOT quality assurance personnel.

Environmental Overseer

For maintenance paint removal projects (including in-house painting), the environmental overseer will be employed by or under direct contract to NYCDOT. For bridge rehabilitation or reconstruction projects, which include a paint removal component, the environmental consultant would be under contract to the consultant performing resident engineering services. In either case, the environmental consultant would have the authority to stop lead paint removal work if it is not conducted in a safe and protective manner. Specific criteria, whereupon work will be stopped, are discussed below under "Monitoring and Compliance."

To ensure that sufficient resources are available for any of their painting needs, NYCDOT would retain the services of one or more environmental consultants on an as-needed term basis. To maintain maximum flexibility, NYCDOT could also retain a project-specific consultant for a very large (or long) project so that the on-call consultant would be available for other painting projects.

The responsibilities of the environmental overseer would include:

- Ambient air monitoring (where applicable)
- Visual emission assessment
- Containment monitoring
- On-site guidance
- Site inspection
- Record keeping and release reporting

Three activity levels of oversight are proposed:

- Daily
- Daily/Audit
- Audit

Under daily activity, which applies to dry open abrasive blasting, the environmental overseer would be on-site a portion of or all day every day that paint removal work is being undertaken. Under the daily/audit activity level, which applies to wet abrasive blasting, the environmental overseer would be on the project site every day for the first week of lead paint removal and make periodic visits thereafter. The audit level of activity assumes the environmental overseer will be on-site for the first day and then make periodic visits to the work site, but no less than twice a month. This audit applies to planned paint removal activities using all other techniques. In addition, for "Red," "Yellow," and "Safety" flag repairs, where possible, there will be oversight on an audit basis; however, because of the urgent and often short-term nature of such repairs, it may not always be possible to have an environmental overseer present on-site for the first day.

For the three levels of activity, the environmental oversight role would consist of the following:

Daily

- Review contractor records of current worker blood-lead level results;
- Check operating change areas adjacent to containment entrance and operating wash facilities with one-way entry and exitways;
- Check for lead warning signs in compliance with the U.S. Occupational Safety and Health Administration (OSHA) Standard;
- Conduct initial containment inspection for integrity and to verify air flow;
- Ensure contractor compliance with OSHA (i.e., respirators, protective gear, personal hygiene) in work area;
- Conduct visual emissions monitoring and visual containment integrity checks;
- Document work site activity and relevant data (e.g., weather information) in written daily log;
- Conduct real-time air monitoring with hand held monitoring devices;
- Conduct high volume ambient air sampling for TSP-lead;
- Conduct visual integrity inspections of negative air ducts (e.g., between dust collector and containment);

- Conduct visual emission monitoring of work site equipment (e.g., dust collector, truck mounted vacuum unit, etc.);
- Notify NYCDOT representative of contractor work site environmental violations and ensure correction;
- Conduct visual inspection (e.g., daily, final, and prior to containment dismantling or relocation);
- Monitor waste handling, storage, transport, and disposal compliance with RCRA standard;
- Function as emergency response standby at all times throughout the work.

Daily/Audit

- Review contractor records of current worker blood-lead level results;
- Check for lead warning signs in compliance with the OSHA Standard;
- Conduct initial containment inspection for integrity;
- Ensure contractor compliance with OSHA (i.e., respirators, protective gear, personal hygiene) in work area;
- Conduct visual emissions monitoring and visual containment integrity checks;
- Document work site activity and relevant data (e.g., weather information) in written daily/ audit log;
- Notify NYCDOT representative of contractor work site environmental violations and ensure correction;
- Conduct visual inspection (e.g., daily, final, and prior to containment dismantling or relocation); and
- Monitor waste handling, storage, transport, and disposal compliance with RCRA standard.

Audit

- Review contractor records of current worker blood-lead level results;
- Check for lead warning signs in compliance with the OSHA Standard;
- Conduct initial containment inspection for integrity;
- Ensure contractor compliance with OSHA (i.e., respirators, protective gear, personal hygiene) in work area;
- Conduct visual emissions monitoring and visual containment integrity checks;
- Document work site activity and relevant data (e.g., weather information) in written audit log;
- Notify NYCDOT representative of contractor work site environmental violations and ensure correction;
- Conduct visual inspection (e.g., daily, final, and prior to containment dismantling or relocation); and
- Monitor waste handling, storage, transport, and disposal compliance with RCRA standard.

The initial approval of the containment system at a site will be made by the individual NYCDOT Project Manager, the Director of Painting, or the Senior Engineer in consultation with the environmental overseer. After this initial approval, continued operation in compliance with the technical specifications will be monitored by the on-site NYCDOT Inspector (contracts) or the on-site Supervisor (in-house jobs). These individuals have the authority to decide that blasting

should not proceed if there is any condition, such as high wind (gusts or sustained winds in excess of 30 mph) or other meteorological developments, that in his/her judgment would prevent containment and collection of dust and debris. The Inspector/Supervisor will have been trained in visual evaluation of fugitive dust emissions, as discussed below.

For bridge projects undergoing oversight on an auditing basis when no environmental overseer is at the work site, NYCDOT supervisory personnel would assume the role. NYCDOT assigns on-site inspectors to each contractor repainting project. Normally, an inspector will be on the site at all times. For in-house projects, there is a NYCDOT supervisor on the job and a District Supervisor visits each site periodically.

NYCDOT Quality Assurance Oversight

Additionally, NYCDOT has created a Lead Protection and Hazardous Waste Division, a group independent of NYCDOT's Painting and Construction Divisions, whose staff will include appropriately trained and certified personnel to supervise all environmental consultants retained by NYCDOT, as well as in-house NYCDOT personnel performing environmental oversight functions. The purpose of the quality assurance aspect of the oversight program is to provide NYCDOT with an additional level of supervision on paint removal projects. Personnel from the Lead Protection and Hazardous Waste Division will make periodic, unscheduled visits to the work site to ensure the environmental overseer and the painting contractor are following the procedures outlined in each project specification. In addition, their duties will include inspecting records of the environmental overseer, including work logs, monitoring data, release reporting, etc.

CERTIFICATION AND WORKERS' AWARENESS TRAINING

Contractor Qualifications

A qualified and experienced contractor can more effectively control emissions from the work site than an inexperienced or careless contractor. Thus, controlling contractor quality would be an effective means of controlling work site emissions.

SSPC-the Society for Protective Coatings—formerly known as the Steel Structures Painting Council—developed the Painting Contractor Certification Program to verify the capabilities of contractors performing industrial surface preparation and coating application in the field. The program's objective is to determine if a painting contractor has the personnel, organization, qualifications, procedures, knowledge, and capability to produce quality surface preparation and coating application for complex industrial structures. The program is divided into two primary certifications: QP-1 and QP-2.

The QP-1 certification encompasses the field application of coatings to complex structures. Contractors applying for the QP-1 certification must demonstrate a minimal history of compliance with the SSPC's quality and safety requirements. The applicant must demonstrate that necessary components of its quality program have been in-place company-wide for at least 6 consecutive production months.

QP-2 certification assesses the capabilities of contractors to protect worker health and safety and the environment while successfully completing industrial hazardous paint removal projects. The

contractor must have QP-1 certification before applying for QP-2 certification, unless the two certifications are being applied for at the same time. As with the QP-1 certification, the Contractor must submit written documentation of an in-place management structure, technical capabilities, personnel qualifications, and training, and the existence of safety and environmental compliance programs.

As owner of 770 bridges, NYCDOT would like to have a large pool of painting resources available for its bridge projects. Where the NYCDOT engineer's estimate of the value of the surface preparation of the paint application and of related work is $5 million or greater, the painting contractor or subcontractor will be required to possess QP-1 and QP-2 certification upon time of bid opening.

For painting projects with a value of greater than $500,000 but less than $5 million, if the painting contractor or subcontractor is not already SSPC QP-1 and QP-2 certified, application for certification must be made within 6 months and certification must be achieved within 12 months from the start of paint-related work. Exceptions will be granted, at the City's sole discretion, for those firms who have applied for certification and demonstrated that a good faith effort has been made. In the event the painting contractor or subcontractor is not QP-1 and QP-2 certified at the start of the paint-related work, an additional 5 percent retainage over and above that specified in the painting contract will be held from all partial payments until such time as certification is achieved.

As NYCDOT wishes to encourage the participation of small and emerging painting firms, NYCDOT will not require painting contractors to be QP-1 or QP-2 certified for contracts with a value of less than $500,000. These small contracts usually comprise minor work components of small bridge reconstruction and rehabilitation projects (e.g., paint removal of steel cut lines). QP-1 and QP-2 certification requires a minimum of field experience; a $500,000 contract would help achieve the preliminary experience for future certification.

Supervisor Training

As the controlling factor at the work site, the contractor's representative, the environmental consultant, and NYCDOT inspectors and supervisors must be adequately trained in the hazards of lead exposure (to workers, the public, and the environment) and the means for controlling those hazards. Supervisors will be required to undergo the C3 training course or an appropriate refresher course within 12 months from the start of the painting work. The SSPC C3 training course, also known by its formal name, "Supervisor/Competent Person Training for Deleading of Industrial Structures," is a 32-hour (4-day) curriculum divided into the following seven units:

1. Introduction to Lead Hazards provides detailed information on the general history of lead uses, sources of lead contamination, health effects of exposure, insurance considerations, and general regulatory information.
2. Lead Exposure-Producing Operations and Controls is the program unit that provides the most information regarding paint removal methods.
3. Closed Containment Systems continues the discussion of how to collect and contain debris and the basic elements of the closed containment system.

4. Worker Protection for Lead introduces participants to the OSHA Lead in Construction Standard and describes the requirements for exposure assessments, medical surveillance, personal protective equipment, training, record keeping, respiratory protection, and enforcement.
5. Chemical Exposures and Other Health and Safety Issues continues the safety discussion started in the previous unit and broadens the scope to include the Hazard Communication Standard, the use of Material Safety Data Sheets (MSDS), and other safety hazards a crew may encounter on a typical job site.
6. Compliance with Air, Soil and Water Regulations discusses the background of each regulation governing air, soil, and water contamination and describes the procedures for monitoring for contaminants.
7. Compliance with Solid and Hazardous Waste Regulations continues the discussion of current regulations, focusing on the disposal of solid versus hazardous waste.

The federal EPA has yet to promulgate any regulation specifically governing painting on steel structures; therefore, no model curriculum is available for individual states to base their approvals. The individual states must decide upon course content, length, workshop to lecture ratio, instructor qualifications and numerous other criteria. Only a handful of states have chosen to do so. The criteria listed above are, however, all addressed in the SSPC administered program. This program is the product of a peer review process among the numerous professionals in industry and government who comprise the SSPC. The course is known to focus on the issues of concern to the City for work on its bridges. Since New York State does not have a certification program for supervisor training for work on steel structures, this SSPC program would offer the most appropriate means to accomplish the goals of the EIS.

Similar reasoning was applied in the decision not to allow equivalent programs to the SSPC QP1 / QP2 contractor certification program. Even though the QP2 standard allows for the use of a qualifying agency other than SSPC, there is no industry recognized alternative to SSPC, especially one that draws upon the peer review process to keep its standards and criteria current and one with the full range of quality control systems in place to properly administer and enforce the program.

NYCDOT Supervisor Course

Although the C3 training provides an excellent background, the program's curriculum does not cover many requirements unique to NYCDOT. A NYCDOT training course for all site supervisory personnel (including NYCDOT inspectors and supervisors, contractors, environmental consultants, and auditors) would familiarize these individuals with the specific requirements of the revised NYCDOT procedures and documentation. The length of the course would be ½ to 1 day. This is dependent on a variety of conditions, including the amount of change in existing procedures.

The suggested curriculum, which would be revised as needed, is as follows:

1. Review of the new NYCDOT procedures.
2. Standardized documentation required by new NYCDOT procedures.

3. Visual, ambient, and real time aerosol monitoring procedures.

The advantages to this training are numerous, including the ability to formally standardize reporting formats, and the opportunity for an open discussion on the new procedures. This would give all supervisory personnel working on a particular project a chance to voice any concerns they have prior to the beginning of the project, and ensure that everyone understands the necessary documentation. This training would be mandatory for all supervisory personnel involved with the project, and could be conducted by an outside firm. However, if it is conducted by an outside firm, a NYCDOT representative knowledgeable in the procedures should be available for questions.

COMPLIANCE AND MONITORING PROCEDURES

NYCDOT, or its environmental consultant, will be conducting various monitoring procedures, including ambient air monitoring as appropriate, for each painting project. The results will be shared with the contractor, who will be held responsible for the immediate correction of the cause of unacceptable emissions (e.g. repair of containment flaws) if they are encountered.

Typically, the environmental overseer would perform all ambient air monitoring. Depending on the activity level of the environmental oversight, NYCDOT and/or its environmental consultant would share responsibilities for monitoring of visual emissions and containment integrity.

The only monitoring that would typically not be conducted by NYCDOT or its environmental consultant is "Establishing Regulated Areas". This monitoring is used to assure that unprotected personnel near a painting project do not enter into contaminated areas adjacent to the containment or equipment. The contractor will be required to undertake this monitoring as part of the worker protection program. However, if NYCDOT wishes to further confirm the adequacy of the regulated area for the protection of its own personnel, it may conduct such monitoring in addition to that provided by the contractor.

Contractor Monitoring

NYCDOT will perform (either with in-house personnel or through an environmental consulting firm) all environmental monitoring work. To help avoid project delays related to the scheduling and setup of environmental monitoring equipment, NYCDOT will specify that the contractor will be responsible for providing all ambient air monitoring and support equipment (e.g., generators, power cords, fuel, etc.). The contractors will also be responsible for the security, overnight storage, and prompt maintenance of the equipment. The contractor will site all equipment needed to operate the monitors, at locations identified by NYCDOT, in accordance with criteria described later in this section.

The environmental overseer will be responsible for equipment calibration and operation of the ambient air monitors, collection, analysis and interpretation of all sample results, and all required documentation in accordance with the criteria described later in this section.

Air Quality Monitoring

Air quality monitoring determines whether the health, safety, and welfare of the public or surrounding bridge workers are being endangered in the event that lead is discharged. Such monitoring is also useful in determining whether the specified level of containment of work activities

is being achieved.

Four methods of air quality monitoring may be involved on a given project. They include a method for real time monitoring through observation of visible emissions, and quantitative monitoring with sampling equipment to measure the amount of lead being released into the ambient air. The methods outlined in *Project Design: Industrial Lead Paint Removal Handbook, Volume II, SSPC 95-06* (PD/Lead) are :

- Ambient Air Monitoring: PD/Lead Method A1-Instrument Monitoring for Total Suspended Particulate (TSP-Lead)
- Worker Protection: PD/Lead Method A3-Establishing Regulated Areas
- Visual Emissions: PD/Lead Method A4-Visible Emissions Assessment
- Containment Integrity: real-time aerosol monitoring

Ambient air monitoring method A1 is used when there is a significant potential for the public to be exposed to airborne lead and subsequently deposited lead. The methods are based on the National Ambient Air Quality Standards (NAAQS). While verifying compliance with regional air quality (NAAQS) regulations may be the purpose behind monitoring in some instances, it is more often conducted as a means to assure that the health and welfare of the public is not at risk from the operations. As such, the NAAQS are used as the basis for the acceptance criteria. If the public is not present within the dispersion zone of lead particulates that might escape from the work area, then such monitoring will be of little benefit. Based on the FEIS analysis results, it was determined that ambient air monitoring for TSP-lead would offer better indications of site-specific source concentrations than PM_{10}; thus, PM_{10} monitoring will not be required as part of paint removal projects.

Worker Protection, Method A3, is used to establish a zone or zones around project activities and equipment that might emit lead or other toxic metals. The purpose is to assure that unprotected project personnel are not inadvertently exposed to unacceptable levels of lead or other toxic metals. This monitoring is typically conducted as a part of the contractor's worker protection requirements.

Visual Emissions Assessment, Method A4, provides immediate feedback on the escape of emissions that are visible. It will be used as an indication of the adequacy of controls provided by containment. This method is based on visible emissions criteria established by SSPC in Guide 6.

Real-time aerosol monitors can provide a semi-quantitative estimate of its dust concentrations. Since the instrument operates on a light-scattering technique, its response is, therefore, dependent on the size of the particles being measured. To have a truly quantitative result, the instrument would have to be calibrated against a dust having a known particle size distribution that is identical to the dust being measured. Since this is not feasible, real-time aerosol monitors would be used only in evaluating the integrity of containment (seals, entryways, etc.) for relative increases in dust concentration over background.

Baseline Ambient Air Monitoring And Assessments. It has been historic practice in New York City and other areas of the country to conduct background monitoring prior to the start of a project, or to establish remote monitoring stations during the project in order to account for fluctuations in existing (background) concentrations of lead. These background concentrations were then used to make adjustments to the maximum permitted concentrations measured at the project site, resulting in the establishment of acceptance criteria that varied from day to day, and project to project; based on the measured background concentration. NYCDOT will use a single background concentration, and therefore a single acceptance criteria, based on the last several years of TSP-Lead monitoring data collected at New York State Department of Environmental Conservation (NYSDEC) ambient air monitoring stations.

Ambient Air Monitoring. The environmental overseer would provide air quality monitoring services to evaluate the effectiveness of project specifications and engineering controls in minimizing the release of airborne dust and lead during abrasive blasting operations. The environmental overseer would utilize high volume air samplers to collect TSP-lead samples at four fixed locations surrounding work site operations. The locations of sampling stations would be selected based on the configuration of the containment structure and the areas of highest potential community exposure and expected wind direction.

Air sampling results would be available within four work days of monitoring and would be submitted in the form of a report identifying results as a time-weighted average (TWA), in units of micrograms per cubic meter of air (ug/m3) and would include the volume of air sampled and the sampling duration.

All work, including QA/QC procedures, monitoring preparation, installation operations, inspection, analysis, and the reporting of results, would comply with all Federal, State, and local regulations related to air monitoring and analysis, and would adhere to national standards (including the Code of Federal Regulations for instrument monitoring procedures, 40 CFR 50, Appendices B, G, and J). The laboratory providing the analytical services would be a New York State Department of Health certified laboratory and would meet EPA-certified laboratory protocol for the particular type of analysis.

The environmental overseer will review the results upon receipt from the laboratory. Because the ambient air monitoring samples require laboratory analysis, results will not be available immediately. Thus, the results can be used only to verify the effectiveness of the on-site inspections and oversight procedures. If any of the criteria for TSP-lead, listed in Table 3 below, are exceeded, corrective action will be ordered within 24 hours of receipt of results. The NYCDOT on-site Inspector/Supervisor will be responsible for implementing the corrective action and for documenting the exceedance, the corrective action, and its effectiveness, within 1 week of receipt of 2 days air monitoring data subsequent to the corrective action.

Table 3
Ambient Air Acceptance Criteria

Criterion	Corrective Action
TSP-Lead > 4.5 - 2CB* on 1 day of blasting	Assess all field data for that day and take appropriate corrective action.
TSP-Lead > 4.5 - 2CB at the same location on 2 days of blasting	Suspend blasting pending full assessment and corrective action.
Note: * Where CB is the background concentration and is equal to 0.1μg/m3.	

The lead criteria are derived from the National Ambient Air Quality (NAAQS) Standard for lead, which is 1.5 micrograms per cubic meter averaged over 90 days. The criterion of 4.5 micrograms per cubic meter minus twice background for TSP-lead is the mathematical expression of achieving 1.5 micrograms per cubic meter as a 24-hour average based on an 8-hour work site sample.

Worker Protection

In establishing Regulated Areas, emissions are monitored with area or personal pumps to establish a zone around emissions-producing operations to assure that unprotected personnel are not exposed. These tests will be performed by the contractor in accordance with PD/Lead Method A3.

Regulated Areas should be established at locations where the airborne lead emissions exceed the OSHA Action Level of 30 ug/m3 as an 8-hour time weighted average.

If the results of testing show that the outer boundaries of the regulated area are located where the airborne concentration is greater than 30 ug/m3, the zone should be moved further away from the activity and the monitoring repeated, or the work activities resulting in the emissions modified or corrected and the monitoring repeated in the same location.

Containment Integrity

After the containment system is installed, the environmental overseer would conduct a site inspection to verify that the containment system has been properly installed and rendered operational. The environmental overseer would also be required to monitor containment performance for the duration of the project. The procedure for verification of containment integrity would include the following elements:

- Visually inspect the containment system for leaks.
- Verify that the necessary airflow is achieved throughout the containment system with a minimum of "dead spots."
- Use instrument monitoring (e.g., hand-held velometers or thermal anonometers) or visual observations to verify that dust collection equipment is drawing an adequate volume of air.
- When applicable, negative air pressure will be verified through the concave appearance of the containment wall tarps or the use of smoke bombs (by observing the path of smoke) to verify the flow of air into the containment. When instrument monitoring of negative air pressure is employed, a minimum of 0.03 inches of water column relative to ambient conditions would be maintained.

- Verify containment integrity through exterior ambient air monitoring and visible emission assessments as described herein.
- Perform real time monitoring with a hand-held, direct reading particle counter (e.g., DataRam unit). The particle counter would be used throughout the project duration to evaluate the integrity of containment (seals, entryways, etc.) for relative increases in dust concentration over background.

Visual Emissions

Level 1 emissions control criteria from SSPC Guide 6 will be invoked on all NYCDOT projects. It is defined as follows:

- *Level 1 Emissions* Random emissions of a cumulative duration of no more than 1 percent of the work day. This amounts to a duration of 5 minutes in an 8-hour work day. This may be adjusted to an hourly rate such as no more than 36 seconds per hour, or 9 seconds during any 15-minute observation cycle.

Another method for assessing visible emissions is based on the opacity of the emissions as defined in Method 9 of 40 CFR 60, Appendix A. This method is designed for use in assessing emissions from point sources such as stacks. Observers must be EPA-certified and are required to pass practical tests every 6 months to retain the certification. Although emissions from paint removal projects have been assessed by this method, experience suggests it is of questionable value on bridge painting projects. Therefore, NYCDOT will rely on restrictions of total visible emissions without regard to opacity. PD/Lead Method A4 is based on total emissions, (i.e., Method 22 of 40 CFR 50, Appendix A) independent of opacity. However, NYCDOT will still require that the visible emission assessor be certified (in accordance with EPA Method 9) to improve the quality of visible emissions assessments but would not require the 6-month re-certification.

Selection of Project-specific Monitoring

Duration of Ambient Air Monitoring. The duration of ambient air monitoring will be based on the potential health risk to the public and the surrounding workers. Three options are available. Criteria for establishing the minimum monitoring frequency are discussed below.

- *Daily Monitoring* Monitoring throughout the duration of non-emergency dry open abrasive blasting operations.
- *Start-Up Monitoring* Monitoring at project start-up is used to establish the adequacy of the controls over emissions. Once it is determined that the results are acceptable, the monitoring is discontinued. Monitoring may be resumed again if excessive emissions are suspected, or if the methods of removal or containment are changed.
- *No Monitoring* For flag repairs or projects utilizing non-dry abrasive blasting methods or bridge projects located over railcuts with no steel structures above street level, instrument monitoring of ambient air emissions may not be necessary. Assessment of visible emissions will suffice.

The selection of ambient air monitoring requirements is similar to that discussed under the environmental overseer's supervisory role. As shown in Table 4, daily ambient air monitoring would be conducted for non-emergency dry abrasive blasting projects. Start-up monitoring would be

performed for the first week for all wet abrasive projects. No ambient air monitoring would be required for vacuum blasting, power/hand tool methods, or chemical stripping in any environment setting. In addition, no ambient air monitoring would be performed where work is conducted over a railroad cut.

For "Red," "Yellow," and "safety" flag conditions, no ambient air monitoring will be performed. Because of the urgent and often short-term nature of these repairs, it may not be possible to have in place the necessary monitoring equipment and certified environmental overseers, as well as the time to develop the site-specific citing requirements. Since ambient monitoring serves to validate the effectiveness of the containment and control specifications, monitoring will not offer meaningful data on flag repairs that generally are small scale and of short durations.

Table 4
Ambient Air Monitoring

	Dry Abrasive Blasting	Wet Abrasive Blasting	All Other Methods
Bridges over Railcuts*	None	None	None
All other bridges	Daily TSP-Pb	Daily TSP-Pb for first week only	None
Notes: *Applies to bridges over a railcut with no structural steel above street grade.			

Historical Data on Soil Lead Concentrations. In order to determine if historical soil lead data from past paint removal projects could assist in determining the potential for impacts from future projects, available soil sampling data associated with paint removal projects was examined. Historical data from soils in the vicinity of five bridges were available for review (Williamsburg, Bronx-Pelham Parkway, Queensboro, Leggett Avenue, and East 174th Street Bridges).

Of the 64 common Manhattan locations, 20 showed an increase and 44 a decrease in lead concentration. Both data sets were well represented by lognormal distributions. Statistical analysis of the differences between the during/after and before data values indicates not only that there was no significant increase in average soil lead concentrations, but on average there was apparently a decrease in concentration, presumably due to the inherent random variation in soil concentrations. The lack of an increase in lead concentration indicates that further soil measurements are unlikely to provide useful information on the impact of paint removal projects.

CLEANUP PROCEDURES

The lead paint removal specifications would be designed to prevent releases of toxic metal containing dust and debris associated with abrasive blasting and power tool cleaning operations. The specifications would control work site releases by requiring the contractor to submit (for NYCDOT approval) detailed written procedures for environmental protection, as well as procedures for cleanup and inspection in the event of a release. These submittals, along with project specification requirements for periodic cleaning, final cleaning, and clearance inspections, would form the basis for rigorous contractor controls and continuous o supervision by the environmental overseer.

It should be noted that the results of the environmental analyses assumed no formal cleaning or oversight procedures. While accidents could still occur, it should be recognized that a vigorous oversight program would minimize the rate of occurrence, and formal cleaning procedures would minimize the amount of material released during an event.

Submittals

Prior to the start of the work, the contractor would be required to provide written submittals for review and approval. Such written submittals would include the following elements:

- Spill response plan with contractor procedures that would be followed in case of a spill. Such a plan would include reporting methods, corrective actions, cleaning procedures, and clearance criteria.
- Contact list with contractor's chain of command and 24-hour work site responsibility.
- Containment inspection procedures that would be followed (following containment installation and periodically) to certify containment integrity.
- Cleaning program that would include procedures for decontamination of containment structures, equipment, and reusable items during construction and prior to removal from the work site. Such a cleaning program would include procedures for proper testing and disposal of consumable (i.e., non-reusable) materials.

Daily Cleaning

Containment. To reduce the potential for adverse impacts on public health and the environment from an accidental breach in containment, NYCDOT will mandate that the contractor is required to remove bulk abrasive/paint debris from the containment floor while it is being generated. Acceptable methods include automatic waste conveyance systems or the use of manually operated vacuums. If such ongoing methods of removal are not employed to minimize the excessive buildup of waste, the contractor will be required to conduct bulk removal of the waste from the containment approximately every 2 hours to minimize large accumulations of waste.

Work Site. Work site cleaning would be conducted at least once per work shift. Such work site cleaning would include wet washing or vacuuming (using wet- or dry-powered vacuum units equipped with high-efficiency particulate air [HEPA] filters) dust, debris, solvents, paint, construction materials or other debris from all surfaces at the work area.

Cleaning Specifications

Containment. Procedures for containment cleaning would include the following:

- Prior to removal from containment, clean all durable equipment (e.g., scaffolds, staging, blast hoses, and hardware). Clean with compressed air (while the containment ventilation system is in operation) or by thoroughly vacuuming (using wet- or dry-powered vacuum units equipped with HEPA filters), followed by wet misting and washing if necessary.
- Place disposable supplies, such as rags or brushes in sealed containers (e.g., double 6-mil plastic bags or fiber drums). HEPA vacuum the sealed containers and thoroughly wet wipe prior to removal from the containment.

- Prior to relocation of containment, clean using HEPA vacuum to remove loose material that could be dislodged by wind or handling.
- Prior to final containment dismantling for removal off-site clean the containment materials with compressed air and/or HEPA vacuum to remove dust and debris. Follow with wet wash if necessary.
- A clearance inspection would be required to verify that the specified level of cleanliness has been achieved.

Durable Equipment and Adjacent Facility Structures. The project specifications would include procedures for cleaning durable project equipment (e.g., blast pots, abrasive reclaimers, dust collection equipment, powered hand tools) staged at the work site (i.e., outside containment) as well as fixed facility structures in areas surrounding the work site. Such procedures would include removing all accumulation of loosely held dust or debris by thoroughly vacuuming (using wet- or dry-powered vacuum units equipped with HEPA filters), followed by wet washing as necessary.

Reusable Supplies and Materials. The project specifications would include procedures for cleaning supplies that would be transported off site for reuse (e.g., tarping, flexile ductwork, air handling unit filters, etc.) Such procedures would include the following:

- Flexible Ductwork—Remove all accumulation of loosely held dust or debris from ductwork exterior by thoroughly vacuuming (using wet- or dry-powered vacuum units equipped with HEPA filters), followed by wet washing as necessary. The interior surface of ductwork would be cleaned using a low-pressure wash or air in conjunction with a system designed to capture the dust washings. After all visible, loose dust has been removed from inside the ductwork, the ends of each segment of duct would be sealed using a minimum of double-wrapped, 6-mil polyethylene sheeting. Prior to transporting off site, the ductwork would be labeled "LEAD CONTAMINATED."

- Equipment Filters—Remove all loosely held dust from accessible surfaces by thoroughly vacuuming (using wet- or dry-powered vacuum units equipped with HEPA filters). Contractor would be required to reinstall each filter or wrap each filter in two layers of 6-mil polyethylene sheeting. Prior to transporting off site, the wrapped filters would be labeled "LEAD CONTAMINATED."

Hard Surfaces. The project specifications would include procedures for cleaning hard (e.g., concrete, stone, glass, steel, wood, or asphalt) surfaces in public areas surrounding the work site. Such procedures would include removing all accumulation of loosely held dust or debris by thoroughly vacuuming (using wet- or dry-powered vacuum units equipped with HEPA filters), followed by wet misting or cleaning utilizing a low-pressure sprayer in conjunction with a system designed to capture the washings.

Final Project Cleanup

The specifications would include criteria for final cleaning and evaluation of each work site (e.g., containment, surrounding area and adjacent structures) and of durable equipment (e.g., dust collector, abrasive reclaimer, blast pot), and for cleaning or disposing of consumable supplies prior to leaving the work site. Successful completion of the project would be demonstrated when any

future health hazard has been eliminated. To ensure that residual contamination would be removed prior to containment dismantling and work site demobilization, the project specifications would require the following:

- Cleaning and clearance inspection of the containment and equipment prior to containment relocation along a bridge structure.
- Cleaning and clearance inspection of the containment and equipment prior to containment dismantling and removal from the work site.
- Final cleaning and clearance inspection of work site equipment. This would include examination of all surfaces within and around the containment for the presence of dust or debris, especially flat surfaces and overhead areas (e.g., top of piping or flanges of structural members within containment.) Wipe a cloth across the surfaces and inspect the cloth for evidence of dust.
- Final cleaning and clearance testing or disposal of reusable supplies.
- Final cleaning and/or proper disposal of consumable supplies.
- Final cleaning and clearance inspection of hard surfaces (e.g., concrete, stone, glass, steel, wood, or asphalt) in public areas up to 100 feet from the work site.
- Final cleaning of non-paved (i.e., vegetation or soil covered) surfaces in public areas that would include playgrounds, parks, and paths or beside streets under the work site. The surface layer of bare soil beneath the bridges and up to 100 feet from either side of the structure will be tested for total lead concentrations. If the concentration of total lead exceeds 400 ppm, the top 2 inches (not including vegetation) of topsoil would be removed and replaced with clean soil and/or sod.

Clearance inspections would be conducted by the environmental overseer. Contractor would be required to reclean the area and request an additional clearance inspection if dust is found.

Spill Cleanup

The project specifications would require the contractor to comply with the following in the event of a release—with the exception of complete failure of the containment structures—where the contractor's Spill Response Plan (described below) would be initiated.

- Contain breach;
- Notify the NYCDOT Engineer immediately;
- Contain and remove all spilled material by wet misting or vacuuming (using wet- or dry-powered vacuum units equipped with HEPA filters);
- Conduct a visual inspection that would include examining all affected surfaces for the presence of dust or debris. If surface dust or contamination is found, remove all spilled material by wet washing or vacuuming (using wet- or dry-powered vacuum units equipped with HEPA filters), and then repeat the visual inspection; and
- Change work practices, modify the containment, and take any and all corrective action to eliminate the possibility of a recurrence.

DISPOSAL AND TRANSPORT

The proposed action of lead paint removal and subsequent repainting involves both the use and generation of contaminated or hazardous materials. Although the wastes associated with lead paint removal may or may not meet the regulatory definition of hazardous waste under the Resource Conservation and Recovery Act (RCRA), it is NYCDOT's policy to treat all lead paint wastes and spent abrasives from lead paint removal projects as hazardous waste, even if they do not exceed the regulatory thresholds.

Based on RCRA requirements, the co-generators (NYCDOT and its contractor) would develop and implement a written safety and health program to identify, evaluate, and control safety and health hazards. This plan would be made available to all contractor and subcontractors, to OSHA personnel, and to personnel of other Federal, State, or City agencies with regulatory authority over the site. The workplan would address potential cleanup activities, as well as normal operating procedure.

Drums and containers would meet the appropriate regulations (approved leak-proof containers) for the wastes that they contain and be regularly inspected, especially prior to being moved. Site operations would be organized to minimize the amount of drum or container movement. A spill containment program would be implemented to address the potential for releases, especially while the drums are being transferred. Drums and containers would be identified and classified prior to packaging for shipment, and a manifest would be prepared describing the waste and designating the approved disposal/treatment facility. The wastes would be stored in a fenced, secured area on-site until pickup for disposal or recycling. A licensed contractor would then transport the wastes to the disposal/treatment facility. NYCDOT would maintain detailed records of manifests, test results, and any spills or releases.

EMERGENCY RESPONSE PLAN

Based on OSHA and RCRA requirements, an Emergency Response Plan would be developed and implemented in the event of a major release equivalent to that described under the Maximum Worst Case Scenario 1. The Emergency Response Plan for safe and effective responses to emergencies would be developed based on bridge-specific conditions, such as type of scheduled activity and adjacent sensitive uses. Elements of an emergency response plan include: pre-emergency planning; personnel roles, lines of authority, and communication; emergency recognition and prevention; site security and control; evacuation routes and procedures; emergency medical treatment and first aid; emergency alerting and response procedures; and procedures for reporting incidents to local, State, and Federal governmental agencies. The emergency response plan would be developed and managed under the auspices of the Mayor's Office of Emergency Management (OEM), compatible and integrated with the disaster, fire, and/or emergency response plans of local, State, and Federal agencies. Upon completion of any emergency response, a determination would be made in consultation with appropriate local, State, and Federal agencies as to whether it was necessary to undertake further activities to remove hazardous substances and materials contaminated with them (such as contaminated soil).

Were a significant release (e.g., maximum worst case scenario 1) to occur, the Emergency Response Plan would be initiated. OEM will be the on-scene Inter-Agency Coordinator. OEM will ensure that the needed resources are brought to bear during the incident, and will facilitate a smooth interaction among all of the participating agencies. The New York City Fire Department (FDNY) will act as the on-site Incident Commander and will have the responsibility for planning and implementing rescue, containment, mitigation of releases, and treatment of affected persons. These efforts will be coordinated with other relevant agencies, including the New York City Police Department (NYPD), New York City Department of Environmental Protection (NYCDEP), and New York City Department of Health (NYCDOH). Among the responsibilities of the NYPD will be to notify, as necessary, the surrounding community to minimize the public's exposure to the released contaminant. NYCDEP will identify the materials involved and assist in determining strategies for material containment, cleanup, and decontamination. NYCDEP will be the technical advisor in determining the appropriate sampling techniques, the areas to be surveyed, and the necessary actions for site remediation. NYCDOH will liaison with OEM to determine the potential health effects and make recommendations for treatment, including the provision of blood lead testing.

Any of the other non-routine releases would involve much smaller quantities of material and would be handled under the contractor's spill cleanup procedures, described above.

WORKER PROTECTION

The contractor, or NYCDOT for its in-house painting operations, is responsible for development and implementation of a worker protection program in accordance with the Occupational Safety and Health Administration Standard for Lead Exposure in Construction, 29 CFR 1926.62 (hereafter the "Standard.") The Standard is designed to minimize worker risk of lead exposure by, among other means, limiting worker exposures to 50 micrograms of lead per cubic meter of air averaged over an 8-hour workday. At a minimum, the following elements would be included in the contractor's worker protection program for employees exposed to lead:

- Hazard determination, including exposure assessment;
- Engineering and work practice controls;
- Respiratory protection;
- Protective clothing and equipment;
- Housekeeping;
- Hygiene facilities and practices;
- Medical surveillance and provisions for medical removal;
- Training;
- Signs; and
- Recordkeeping.

The Standard requires that engineering controls and good work practices be used to minimize employee exposure to lead. At a minimum, exposures must not exceed the OSHA interim final PEL of 50 micrograms per cubic meter of air (50 ug/m3) averaged over an 8-hour-period. When feasible engineering controls and work practice controls cannot reduce worker exposure to lead to at or below 50 ug/m3, respirators must be used to supplement the use of engineering and work practice

controls.

Competent Person

To implement the worker protection program, the contractor, or NYCDOT for its in-house painting operations, is required to designate a competent person (i.e., one who is capable of identifying existing and predictable hazards or working conditions which are hazardous or dangerous to employees, in accordance with the general safety and health provisions of OSHA's Standards). The competent person must have the authorization to take prompt corrective measures to eliminate such problems. Qualified medical personnel must be available to advise the contractor and employees on the health effects of employee lead exposure and supervise the medical surveillance program.

The competent person would review all site operations and stipulate the specific engineering controls and work practices designed to reduce worker exposure to lead. Engineering measures include local and general exhaust ventilation, process and equipment modification, material substitution, component replacement, and isolation or automation.

Worker Training

The OSHA Standard (the Standard) requires the contractor to communicate information concerning lead hazards, including but not limited to, the requirements concerning warning signs and labels, material safety data sheets (MSDS), and employee information and training. The contractor must provide appropriate worker training to ensure that workers understand the safety, health, and other hazards present, understand the necessary work practices to minimize the risks from hazards, and are able to respond to emergencies. In addition, contractors must comply with the following requirements:

- For all workers who are subject to exposure to lead at or above the action level on any day or who are subject to exposure to lead compounds which may cause skin or eye irritation (e.g. lead arsenate, lead azide), the contractor must provide a training program and assure worker participation.
- The contractor must provide the training program as initial training prior to the time of job assignment.
- The contractor must provide the training program at least annually for each employee who is subject to lead exposure at or above the action level on any day.

Training Program. The contractor must assure that each worker is trained in the following:

- The content of the Standard and its appendices;
- The specific nature of the operations which could result in exposure to lead above the action level;
- The purpose, proper selection, fitting, use, and limitations of respirators;
- The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females, hazards to the fetus, and additional precautions for workers who are

pregnant);

- The engineering controls and work practices associated with the employee's job assignment, including training of workers to follow relevant good work practices;
- The contents of any compliance plan in effect;
- Instructions to workers that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and
- The employee's right of access to records under 29 CFR 1910.20.

Personal Hygiene Practices

The contractor must provide and ensure that workers use washing facilities. Clean change areas and separate non-contaminated eating areas must also be provided. Parking areas would be established where cars would not be contaminated with lead.

Workers who are exposed to lead would follow these procedures upon finishing work for the day:

- Place disposable coveralls and shoe covers with the lead waste in closed containers;
- Place lead-contaminated clothes, including work shoes and personal protective equipment, in a closed container for laundering/cleaning (by the contractor);
- Use wash facilities to remove fugitive lead-containing debris from exposed areas. If workers are exposed to lead above the PEL, shower facilities must be provided and workers must shower and wash hair; and
- Change into street clothes.

Protective Clothing

At no cost to employees, contractors must provide clean, dry protective work clothing and equipment to workers who are exposed to lead above the PEL and for whom the possibility of skin contamination or skin or eye irritation exist. Appropriate changing facilities must also be provided. Appropriate protective work clothing and equipment used on construction sites would include the following:

- Coveralls or other full-body work clothing;
- Gloves;
- Vented goggles or face shields with protective spectacles or goggles; and
- Welding or blasting helmets, when required.

Disposable coveralls and separate shoe covers may be used, if appropriate, to avoid the need for laundering. Non-disposable coveralls would be replaced daily. If an employee leaves the work area wearing protective clothing, the clothing would be cleaned with high-efficiency particulate air (HEPA) filter vacuum equipment to remove loose particle contamination or, as an alternative, the coveralls would be removed. Before respirators are removed, HEPA vacuuming or some other suitable method, such as damp wiping, would be used to remove loose particle contamination on the respirator and at the face-mask seal.

At no time would workers be allowed to leave the work site wearing lead contaminated clothing or equipment, e.g., shoes, coveralls, or head gear. All contaminated clothing and equipment would be prevented from reaching the worker's home or vehicle.

Respiratory Protection

Although engineering and work practice controls are the primary means of protecting workers, airborne lead concentrations may be high or may vary widely, and source control at construction sites is often not sufficient to control exposure. During abrasive blasting operations, respirators must often be used to supplement engineering controls and work practices whenever these controls are technologically incapable of reducing worker exposures to lead to or below 50 ug/m3.

To provide adequate respiratory protection, respirators must be donned before entering the work area and must not be removed until the worker has left the area, or as part of a decontamination procedure. Respirators must be supplied by the contractor at no cost to employees. The contractor must assure that the respirator issued to the employee is properly selected and properly fitted so that it exhibits minimum facepiece leakage by performing either qualitative or quantitative fit tests for each employee wearing negative pressure respirators. Fit testing is to be performed at the time of the initial fitting and at least semiannually thereafter.

Respirator Program. When respirators are provided, the contractor must establish a respiratory protection program in accordance with the revised OSHA standard on respirator protection, 29 CFR 1910.134.

Minimum requirements for an acceptable respirator program for lead must include the following elements:

- Written standard operating procedures governing the selection and use of respirators;
- Selection of respirators on the basis of hazards to which the worker is exposed;
- Instruction and training in the proper use of respirators and their limitations;
- Regular inspection and cleaning, maintenance, and disinfection;
- Replacement of worn or deteriorated parts, including replacement of the filter element in an air-purifying respirator whenever an increase in breathing resistance is detected.
- Storage in a convenient, clean, and sanitary location, and protection against sunlight and physical damage;
- Maintenance of appropriate surveillance of work area conditions and degree of worker exposure or stress (physiological or psychological);
- Evaluation to determine the continued effectiveness of the program;
- Physician's determination that the employee is physically able to perform the work and wear a respirator while performing the work (respirator user's medical capacity to wear and work with a respirator would be reviewed annually);
- Use of Mine Safety and Health Administration/National Institute for Occupational Safety and Health (MSHA/NIOSH) certified respirators;
- Fit testing of negative-pressure respirators;
- Deterioration of ability of breathing air used for supplied-air respirators to meet the

requirements prescribed in 1910.134(d)(1); and
- Standing permission for employees to leave the work area to wash their faces and respirator face pieces whenever necessary to prevent skin irritation associated with respirator use.

Respirator Selection. Lead concentrations may vary substantially throughout a work shift as well as from day-to-day. The highest anticipated work concentration is to be used in the initial selection of an appropriate respirator.

NIOSH type CE respirators are required for use by abrasive blasting operators. Currently, NIOSH certifies both continuous flow and positive pressure respirators for abrasive blasting operations. Continuous-flow respirators are recommended by NIOSH only for airborne concentrations less than or equal to 25 times the OSHA PEL of 50 ug/m3. Positive pressure respirators are recommended by NIOSH for airborne concentrations less than 2,000 times the OSHA PEL (50 ug/m3). Furthermore, manufacturer's instructions regarding quality of air, air pressure, and inside diameter and length of hoses must be strictly followed. Use of longer hoses or smaller inside diameter hoses than the manufacture's specifications, or hoses with bends or kinks, may restrict the flow of air to a respirator.

Pigeon Waste. When working in areas where pigeons have nested, paint contractors are to use special precautions, which are based on the NYSDOT Safety Bulletin SB-94-4. This nesting results in a substantial build-up of pigeon droppings, a condition that can be harmful to humans if the material is disturbed and made airborne.

Histoplasmosis is a fungal infection resulting from exposure to pigeon droppings. Pigeons do not carry the organism that causes histoplasmosis. Histoplasmosis is caused by a soil organism that requires the moist, nutrient-rich environment that large masses of droppings offer. Areas with small amounts of dried droppings pose a minimal hazard.

Prior to work in any area where pigeons nest, a thorough inspection should be made to determine if and to what extent there is a build-up of material. Inspection itself requires minimum precautions such as the use of personal protective equipment, which may include gloves, rubber boots, rain-suit components, goggles, and a dust/nuisance respirator.

If substantial waste material is found in the immediate work area, cleaning must be performed. Employees engaged in cleaning activity shall wear all of the personal protective equipment specified above. A high-powered water hose is an effective means of removing such material. If the material is to be scraped away, it must be kept wet during the entire process. Application of a cleaning agent (e.g., bleach), before removal may help dissolve the material, and may be applied as a disinfectant upon the affected surfaces after the droppings have been removed. Compressed air shall not be used to remove pigeon droppings because it increases the potential for inhalation and ingestion of airborne particles and the area of potential exposure.

When cleaning has been successfully completed, the personal protective equipment specified above is no longer required. All other personal protective equipment appropriate for the task and/or location shall be used, such as full protection, hard hat, etc.

Employees engaged in cleaning, or any other activity that involves exposure to pigeon droppings, should observe a high degree of personal hygiene, even if the exposure is casual. Special care

must be taken to wash hands thoroughly before eating or smoking.

Medical Surveillance

When a worker is occupationally exposed to lead at or above the action level of 30 ug/m3 on any one day in a calendar year, the employee must be provided initial medical surveillance consisting of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin (ZPP) levels. Blood lead levels are currently the best indicator of personal lead exposure. Workers potentially exposed to lead at or above the action level must be monitored for the presence of lead in the blood and the effects of lead on the blood-forming system. Full medical surveillance is to be provided to employees exposed to lead at or above the action level for more than 30 days per year. All medical examinations and consultations would be performed by or under the direct supervision of a qualified physician and would be provided to employees at no cost, without loss of pay, and at a reasonable time and place. A qualified physician is a doctor of medicine (M.D.) or osteopathy (D.O.) familiar with the objectives and requirements of a medical surveillance program for lead exposure.

The following conditions necessitate an immediate medical consultation including, as determined by the qualified physician, a physical examination and a blood sample for lead analysis (biological monitoring):

- Whenever a worker develops signs or symptoms associated with lead toxicity; and
- Before a worker restarts work following medical removal.

Biological Monitoring. The purpose of biological monitoring is to identify workers with elevated blood lead levels. The data from biological monitoring is objective evidence of a worker's body burden from lead exposure and this data can be used to follow changes in worker exposure.

Blood lead and zinc protoporphyrin (ZPP) or free erythrocyte protoporphyrin (FEP) would be monitored for those workers exposed to lead. In general, workers in high-risk occupations would be monitored as often as needed to prevent adverse health effects.

NYCDOT is proposing to implement a program that would include biological monitoring at a frequency that goes beyond the requirements of the Standard. NYCDOT will require that the contractor be responsible for the following worker protection measures:

- Monthly blood lead and ZPP testing;
- Intervention when two or more workers register blood lead levels greater than 25 ug/dL; and
- Review and summary report of testing results by contractor's Industrial Hygienist (IH).

The rationale is that the evaluation of blood lead test results on a more frequent basis allows for early recognition of exposure problems and timely intervention to protect exposed workers.

Medical Removal. NYCDOT will use the OSHA Standard of 50 ug/dL as a medical removal trigger.

Recordkeeping. The contractor must maintain any employee exposure and medical records to document ongoing employee exposure, medical monitoring, and medical removal of workers. This

data provides a base to properly evaluate the employee's health.

Contractors must properly record cases when a worker:

- Has a blood lead level that exceeds 50 ug/dL;
- Has symptoms of lead poisoning, such as colic, nerve damage, renal damage, anemia, or gum problems, or receives medical treatment to lower blood lead levels or for lead poisoning.

COMMUNITY NOTIFICATION

NYCDOT will develop brochures containing general information on lead and its effects; various sources of lead; deleading operations specific to bridge projects; precautions to eliminate or minimize exposure undertaken by both NYCDOT and the community; and in case of a large release, steps that NYCDOT will implement to minimize community exposure (emergency response plan). The contractor will be responsible for providing project-specific flyers noting information (multi-language versions, if necessary) on the nature of the removal work, the time period of the work and its duration, and contact names and telephone numbers. The contractor will be responsible for posting the information around the perimeter of the job site.

The affected community will be notified of planned abrasive blasting activities as well as other removal activities requiring MPT plans (lane closures/diversions) at least 30 days in advance. Brochures and project-specific information flyers will be made available to the affected community through mailings to the community boards, council members, borough president, and members of the New York State Legislature.

OUTLINE OF THE ENVIRONMENTAL TECHNICAL SPECIFICATIONS

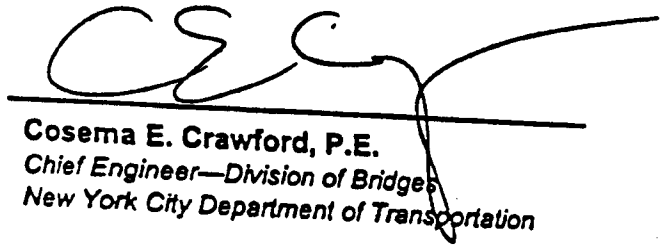
As a result of the various technical analysis, the FEIS has recommended mitigative measures and inspection/oversight procedures to avoid or minimize the potential for spills and releases of lead during the paint removal operations. In developing technical specifications for lead paint removal, it will be necessary for NYCDOT to first determine the existing coating characteristics unique to a particular bridge. NYCDOT can then determine the appropriate maintenance approach (i.e., spot repair, overcoating, partial or full removal). Accounting for the bridge's structural type and its setting as well as the requirements of the new coating system, a removal method will be selected as part of an overall painting strategy. The mitigation and commitments provided above will be utilized in preparing a technical paint specification that will be followed by NYCDOT's in-house staff and/or by an outside contractor. Figure 1 presents a decision chart illustrating the outline that NYCDOT's specification evaluators will follow in determining the environmental and public health issues associated with lead paint removal on a bridge-specific basis.

D. CERTIFICATION OF FINDINGS

After having considered the Draft and Final EIS, and having considered the preceding written facts and conclusions relied upon to meet the requirements of 6 NYCRR 617.9, this Statement of Findings certifies that:

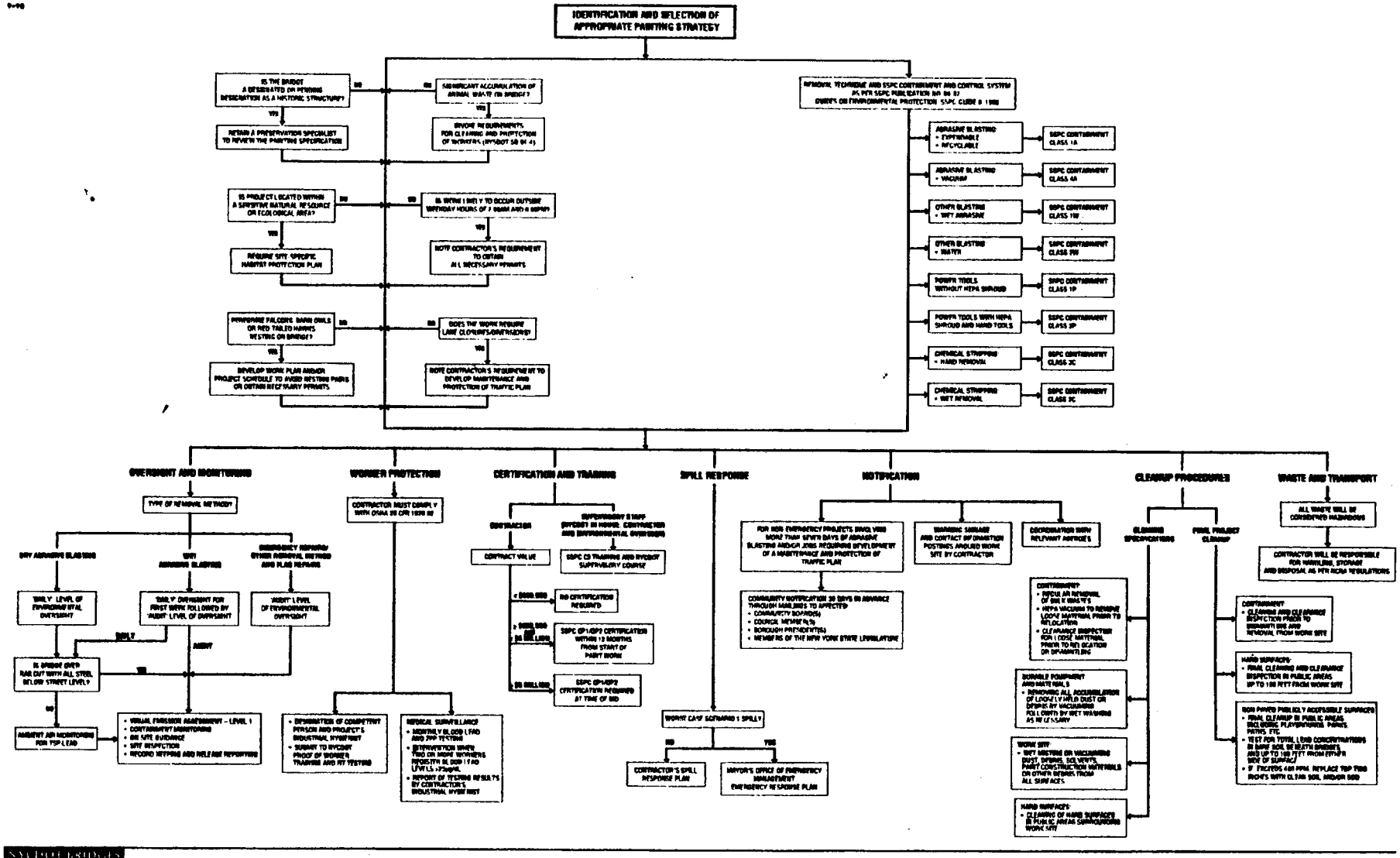
The requirements of 6 NYCRR Part 617 have been met;

- Consistent with the social, environmental and public health, economic, and other essential considerations from among the reasonable alternatives thereto, the proposed project and its preferred procedure is one that eliminates or minimizes potential for adverse effects to the maximum extent practicable, including the effects disclosed in the Draft EIS and Final EIS;
- Consistent with the social, environmental and public health, economic, and other essential considerations, to the extent practicable, adverse effects revealed in the EIS process will be eliminated or minimized by incorporating as conditions to the decision those mitigative measures or project commitments that were identified as practicable; and
- The Findings contain the facts and conclusions in the FEIS, which have been relied upon to support its decisions and indicate the social, environmental and public health, economic, and other factors and standards that formed the basis of this decision.



Cosema E. Crawford, P.E.
Chief Engineer—Division of Bridges
New York City Department of Transportation

11/12/98
Date



Technical Specification Outline

Figure 17-1