Yeh, Alice

From: Alicia Clark Alcorn <aalcorn@tpmlaw.com>
Sent: Monday, August 18, 2014 3:14 PM
To: Region2 PassaicLower8MileComments
Cc: 'Senator Robert Torricelli'; Michael.Daneker@APORTER.COM; 'Jeremy Karpatkin'; 'Kevin Coakley'; 'Liza M. Walsh'; 'Agnes Antonian'; 'Jeremy Farrell (jfarrell@jcnj.org)'; 'Jason T. Watson (jwatson@jcnj.org)'; 'Kevin M. Kinsella'; 'Francis J. Borin'; 'David Isabel'; Eric Tomaszewski; Kathleen L. Millian
Subject: Lower Passaic Comments
Attachments: 2014-08-18 Comments to EPA Reg 2 re Passaic River lower 8 mile proposed remedy plan (00078983xC4E0D).PDF

Please see the attached comment letter.

Alicia C. Alcorn
Terris, Pravlik & Millian, LLP
1121 12th Street N.W.
Washington, DC 20005-4632
Main Telephone: 202-682-2100 ext.8471
Direct Dial: 202-204-8471
Facsimile: 202-289-6795
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TERRIS, PRAVLIK & MILLIAN, LLP

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CAROLYN SMITH PRAVLIK
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tpminfo@tpmlaw.com

TODD A. GLUCKMAN
MICHAEL L. HUANG
NICHOLAS SOARES
LAUREN E. SEFFEL

August 18, 2014

VIA ELECTRONIC MAIL
Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 100007-1866

Re: *Lower 8 Miles of the Lower Passaic River Superfund Proposed Plan*

Dear Ms. Yeh:

On behalf of Interfaith Community Organization and Hackensack Riverkeeper, Inc., we submit the following comments regarding the Superfund Proposed Plan for the Lower 8 Miles of the Passaic River, issued by the U.S. Environmental Protection Agency ("EPA"), Region II, on April 21, 2014.

Hackensack Riverkeeper, Inc. will be submitting additional comments on the Proposed Plan for the Lower 8 Miles of the Passaic River under separate cover.

We represent Interfaith Community Organization and Hackensack Riverkeeper, Inc., in *Interfaith Community Organization, et al., v. Honeywell International, Inc.*, 263 F. Supp. 2d 796 (D.N.J. 2003), affirmed, 399 F.3d 248 (3d Cir.), certiorari denied, 125 S. Ct. 2951 (2005), and Hackensack Riverkeeper, Inc., in *Hackensack Riverkeeper, Inc., et al., v. Honeywell International, Inc.*, D.N.J., Civ. No. 06-022 , consolidated under Civ. No. 95-2097(JLL), both of which are citizen suits brought under the Resource Conservation and Recovery Act.

These citizen suits compelled remediation of chromium contamination to soils, groundwater, surface waters, and Hackensack River sediments associated with numerous properties, totaling approximately 130 acres, along the Hackensack River in Jersey City, New Jersey. These various properties are designated by the New Jersey Department of Environmental Protection (NJDEP) as Study Areas 5-7. Study Area 7 is also known as the former Roosevelt Drive-In site. These properties are shown on the map attached as Exhibit 1.

Pursuant to the judgment of the federal court in *Interfaith Community Organization v. Honeywell International, Inc.*, and several consent decrees entered by the federal court in *Hackensack Riverkeeper v. Honeywell International, Inc.*, Study Areas 5-7 have been or are in the

process of being remediated. The remediation includes the excavation and removal of more than two million of tons of toxic hexavalent chromium residue, capping in-place other hexavalent chromium residue, long-term remediation of ground water, and dredging and/or capping of sediments in the Hackensack River.

Special Master Robert G. Torricelli was appointed by the federal court to oversee the remediation of Study Areas 6-7, including the Hackensack River sediments.

In 2012 and 2013, Honeywell International, Inc., implemented most of the required remedial measures related to chromium contaminated sediments in the Hackensack River. Certain limited areas will be remediated in the future. The remedial measures included dredging and capping along the shoreline of Study Area 7 and capping of contaminated sediments elsewhere in the River. The remediated sediments are located from approximately Droyers' Cove to the Route 1&9 Lincoln Highway bridge. A map showing the areas of the Hackensack River where the remedy has been completed is attached as Exhibit 2.[1/]

The areas of the Hackensack River where the remedy has been completed are just north of Newark Bay in the tidal portion of the Hackensack River. As EPA is aware, both the Passaic and Hackensack Rivers flow into Newark Bay which is tidal. Therefore, suspended material and sediment can be carried by the tides from Newark Bay upstream into the Hackensack River. In light of the tidal flow of waters in this area, we request that EPA take steps to ensure that contaminated sediment and suspended material from the lower Passaic River sediment remediation will not migrate via water flow and the tides into the lower Hackensack River where it can potentially re-contaminate the river sediments that have recently been remediated.

We support the EPA's proposed clean-up plan, known as Alternative 3 with dredged soils management scenario B, that includes capping and dredging for flooding and navigation with off-site disposal of dredged materials. However, we request that EPA carefully consider all potential impacts of the proposed plan for the lower eight miles of the Passaic River to the Hackensack River sediments remedy that has been implemented by Honeywell under the oversight of Special Master Torricelli. In addition, we request that EPA require that the Passaic River Lower 8 Miles remediation include all measures necessary and appropriate to prevent contamination of the recently remedied Hackensack River sediments from migration of contaminated materials suspended in the water column during the Passaic River Lower 8 Miles remediation.

Thank you for your consideration of these comments. If you have any questions or require additional information or documentation regarding the Hackensack River sediments remedy, please contact Alicia Alcorn at 202-204-8471.

[1/]Exhibit 2 indicates that capping is in progress in one area designated in yellow and that verification of the cap is pending in 2 areas designated in orange. The cap has been completed and verified in all three of these areas.

Sincerely,

s/ Alicia Clark Alcorn

Bruce J. Terris
Kathleen L. Millian
Alicia Clark Alcorn

Counsel for Plaintiffs

cc: Special Master Robert Torricelli
Michael Daneker/Jeremy Karpatkin
Kevin Coakley/Liza Walsh/Agnes Antonian
Jeremy Farrell/Jason Watson
Kevin Kinsella/Frank Borin
David Isabel/Eric Tomaszewski

Exhibit 1

N
W E
S

Study Areas 5-7
Jersey City, NJ

CARPENTER ENVIRONMENTAL ASSOCIATES, Inc.
CEA ENGINEERS, P.C.

Miles
0 0.125 0.25 0.5

Exhibit 2

Hackensack River

South Kearny

NAVIGATION CHANNEL

NAVIGATION CHANNEL

0 400
Scale In Feet

Hudson Mall

SA-7

Droyer's Point – Society Hill

Jersey City Dept. of Public Works

Hudson Toyota & Nissan

LEGEND

- Area Approved for Capping
- Capping In Progress
- Capping Complete, Pending Verification
- Capping Verified
- Dredged Area
- Area Approved for Monitoring Only

SA-7 AMENDED REMEDIATION PLAN AS OF SEPTEMBER 30, 2013

ENVIRON

SA–7 AMENDED REMEDIATION PLAN
HONEYWELL

FIGURE
1–2

Yeh, Alice

From: Keri Jenkins <Keri@tparkerhost.com>
Sent: Wednesday, August 20, 2014 12:19 PM
To: Region2 PassaicLower8MileComments
Cc: Jeff Keever; Keri Jenkins
Subject: Proposed Plan for the Lower 8 Miles of the Lower Passaic River Released for Public Comment
Attachments: EPA - Lower Passaic River.pdf

Please find T. Parker Host, Inc.'s comment on the proposed plan for the Lower 8 Miles of the Lower Passaic River attached. If you have any trouble in opening, please contact me.

Regards,
Keri

Keri D. Jenkins
Keri.Jenkins@tparkerhost.com

T. Parker Host, Inc.
As Agents Only
500 E Plume Street, Stuite 600
Norfolk, VA 23510
757.627.6286
www.tparkerhost.com

T. Parker Host, Inc.

Ship Agents and Brokers

500 Plume Street East
Suite 600
Norfolk, Virginia 23510

August 20, 2014

RE: Lower Eight Miles of the Lower Passaic River
Part of the Diamond Alkali Superfund Site
Essex and Hudson Counties, New Jersey

Ms. Alice Yeh
Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

We are writing in response to the public comment period for the Lower Eight Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey. As ship agents, terminal operators and transportation providers in Virginia since 1923, and with operations along the U.S. East and Gulf Coasts, as well as in foreign countries, we believe we are in a unique position to comment on some aspects of the existing proposal to transport this dredged material only by rail. Additionally, we operate a marine terminal with the capability to receive this material and dispose of it according to the regulations at either our facility, or other facilities within a short trucking haul from our terminal on the James River, just south of Richmond, Virginia.

In your publication titled, "An Overview of EPA's Proposal for the Lower Eight Miles, May 2014" the proposed clean-up plan includes language that states, "Sediment would be dewatered locally and prepared for transport by rail for incineration and/or disposal in landfills." While this method could certainly allow the EPA to achieve the desired results, we suggest that the EPA not lock itself into only one method of transport, by rail.

We propose you consider, in addition to the rail transport, that barging the material for incineration and/or disposal in landfills is another option for the EPA. Most often water transportation is the least expensive method of transportation and by far, the safest. In Virginia, we have facilities that are capable to accept such material, of course after the analytics are determined, to dispose of the material. By locking in a singular solution the potential for delays, cost overruns and congestion may create unnecessary burdens on the completion of this clean- up of the Passaic River.

Please consider such language as you deliberate the direction of the clean-up of the Passaic River, "Sediment would be dewatered locally and prepared for transport by rail or barge for incineration and/or disposal in landfills." We appreciate the opportunity to submit our comments and hope you will incorporate our suggestions in your final decision regarding the Passaic River.

Sincerely,

G. Adam Anderson
President

Mailing Address: Post Office Box 3729/Customhouse Station/Norfolk, Virginia 23514
Telephone: 757-627-6286 *Telex:* 6734694 Host Va *Fax:* 757-627-3948
E-mail: ops@tparkerhost.com
www.tparkerhost.com

Serving the U.S. East and Gulf Coast Ports

Yeh, Alice

From: Mary Anderson <andint@aol.com>
Sent: Wednesday, May 07, 2014 1:09 PM
To: Region2 PassaicLower8MileComments
Subject: Lower Passaic River Superfund Site

Dear Ms. Yeh, Environmental Project Manager,

My question regards the plan to remediate the lower 8 miles of the Passaic River:
Based on preceding phases of cleanup, how do you think the contaminated sediments will be dewatered, and what chemical additives will be used to accelerate dewatering?
Thank you
Mary Anderson

Yeh, Alice

From: Bob Andres <bobnygt@aol.com>
Sent: Monday, May 12, 2014 5:02 PM
To: Region2 PassaicLower8MileComments
Subject: We Support The Lower Passaic Clean-Up Plan

My family strongly supports the Lower Passaic River Clean-up Plan.

Sincerely,

Bob Andres

email: bobnygt@aol.com
Mobile: 973.464-6147

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, July 28, 2014 4:47 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jose Arce
jose@jaffecom.com
96 Dewey Street
Garfield
New Jersey
07026

Yeh, Alice

From: Demetrio Arencibia <darencibia@hcnj.us>
Sent: Wednesday, August 20, 2014 4:00 PM
To: Yeh, Alice; Kluesner, Dave
Cc: Harold Demellier; Laurie Cotter; Massiel Ferrara; Joseph Glembocki; John Lane
Subject: Comments on EPA Clean Up of Lower Passaic River

On June 23, 2014, as the County Engineer for Hudson County, I attended the EPA's third public hearing, in Belleville, NJ, to state for the record my concerns regarding potential impacts from the EPA's Lower Passaic River Restoration Project. EPA's presentation of the various different plan options and impacts of each was very informative. I am adding public comments for the record knowing that the deadline to submit comments is today, August 20th.

Hudson County owns three movable bridges jointly with Essex County that span over the Passaic River: from north to south they are Clay Street bridge, Bridge Street Bridge and Jackson Street bridge. We share all responsibilities and costs equally with Essex. They are all over 100 years old and listed as historic with the State Historic Preservation Office. Based on the inspection reports, both the Clay Street Bridge and the Bridge Street Bridge are in overall Poor condition and Structurally Deficient.

The Hudson-Essex Joint Bridges have experienced serious problems in the last two years. During Hurricane Sandy, all three bridges sustained mostly electrical damage from the tidal surge. Electrical repairs including motors were made at a cost of $303,010. We are expecting at least 80% reimbursement under the Federal Emergency Relief Program. Subsequently last year, the steel shaft at Bridge Street Bridge ruptured and needed replacement. Our mechanical contractor provided the repairs at a cost of about $157,000. Nearly all structural and mechanical components on these bridges require special manufacturing as the parts are unique or obsolete. CPG through their engineer CH2M Hill provided last year about $133,500 to Hudson County for $15,000.00 in reimbursements for repairs to the Jackson Street bridge, $32,480.00 for bridge operators overtime and $86,020 for our vendor to perform manual Bridge Street bridge openings for them when the shaft broke.

Notwithstanding, the County of Hudson has already undertaken a feasibility study for Clay Street Bridge (for rehabilitation, replacement, no-build or re-alignment) which is expected to be completed by the end of 2015. After the study, design and permitting could take another three to five years to complete. A replacement bridge option can cost up to $100 million. Similarly, the County of Essex will shortly begin a feasibility study for Bridge Street Bridge.

The County of Hudson wants to support the best solution that expeditiously cleans up the Passaic River with as few bridge openings as possible. Additionally, both Essex and Hudson Counties need assurance that it will be supported financially by the State or Federal government in the event any of its bridges encounter failure of any kind due to the dramatic increase in river traffic from the clean-up operation. Due to the advanced age of the bridges many mechanical parts and other bridge components are no longer being produced and will need special manufacturing order requiring 90 days or more to produce. Hudson and Essex Counties cannot be held liable or accountable for any claims, damages or delay resulting from bridge failures and malfunctions.

Furthermore, concern has been expressed from multiple parties about the abundant bridge openings that would severely affect traffic conditions and public safety in the west Hudson County communities and the City of Newark. I understand from the EPA Public Hearing that as part of the feasibility study, the EPA will evaluate the Hudson-Essex Joint Bridges in terms of traffic impact, structural/mechanical condition and ability to operate safely and efficiently with the potentially astonishing amount Passaic River Clean-Up openings.

I appreciate EPA's public outreach efforts and allowing me to express my comments. Should you have any questions, please do not hesitate to contact me

Demetrio A. Arencibia, PE, PP
County Engineer
darencibia@hcnj.us
Phone: 201-369-4340 Fax: 201-369-4346

Hudson County Engineer's Office
Building 3, 2nd Floor
595 County Avenue
Secaucus, NJ 07094

Yeh, Alice

From: Ann A. Aust <anniecloudgazer@gmail.com>
Sent: Thursday, June 19, 2014 5:00 PM
To: Region2 PassaicLower8MileComments
Subject: An area of great potential....

To Whom It May concern:
Being a native New Jerseyan (though I now live in New York), I want to see as much of my home cleaned up and as healthy as possible. During the holidays I take the train to visit family, connecting in Newark. It really saddens me to see the waters and other parts of the area the way it is. Likewise, however, I've often dreamed of how wonderful it could be if these areas were cleaned up and restored to being healthy & vibrant again. I believe it can be done - it only takes will. Please, let's do the right thing!
Sincerely,
-Ann

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 06, 2014 10:55 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Matthew Barone
mattbarone@gmail.com
344 Lisa Way
Cinnaminson
NJ
08077-____

9083975510

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 06, 2014 10:55 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Melissa Barone
menendezmelissa@yahoo.com
344 Lisa Way
Cinnaminson
NJ
08077-____

9083975510

New Jersey
ALLIANCE for ACTION INC.®

PHILIP K. BEACHEM
President

P.O. Box 6438 • Raritan Plaza II • Edison, New Jersey 08818-6438
(732) 225-1180 • FAX (732) 225-4694
www.allianceforaction.com

GERALD T. KEENAN
Executive Vice President

July 7, 2014

Ms. Alice Yeh
Remedial Project Manager
United States Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

Dear Ms. Yeh:

The New Jersey Alliance for Action is a non-profit, non-partisan statewide coalition of more than 2,500 business, labor, professional, academic and government leaders. The Alliance is an advocate of investment in infrastructure for New Jersey's economy, environment and quality of life. Since our creation in 1974, we have worked closely with each New Jersey Governor, the Cabinet, the Legislature and local government as well as our members to create funding and secure permits for road, bridge and rail improvements, water projects, school construction, aviation enhancements, shore preservation, business expansion and other key infrastructure investments.

In March of 2013, The New Jersey Alliance for Action formally announced our support for the Sustainable Remedy Proposal in a letter to the U.S. Environmental Protection Agency. This letter will serve as a follow up to reinforce that support for the Sustainable Remedy Proposal.

We again ask the EPA to consider the Sustainable Remedy approach that has been proposed by the Lower Passaic River Cooperating Parties Group. This approach will:

- Minimize impacts to the business community and residents
- Allow for the highest level of surface sediment to be cleaned up and capped in 5 years.
- Bring new green infrastructure projects and employment to individuals in New Jersey.
- The most highly contaminated sediment would be removed from the River in a quicker time period.

The Sustainable Remedy Proposal would utilize adaptive management to ensure that the initial goals set by the EPA would be met for reducing risk to humans and ecology in the Passaic River.

It's for these reasons that the NJ Alliance for Action asks the EPA to strongly consider the benefits of the Sustainable Remedy Proposal during its comment period on the Proposed Plan for the Lower 8 Miles of the Passaic River.

Thank you for your consideration.

Sincerely,

Philip K. Beachem
President

Yeh, Alice

From: Betty <bettyjanem@verizon.net>
Sent: Saturday, July 26, 2014 2:58 PM
To: Region2 PassaicLower8MileComments
Subject: Dimond's clean up

I feel Dimond's successors should be made to remove all sediment contamination from the Passaic River. An easy less expensive way should not even be considered. Too many lives were ruined and what they did to the river is unconscionable.

Elizabeth J. Bedrosian
Montvale, NJMG

Sent from my iPad

Yeh, Alice

From: Raji K. Singh-Bhathal <rajisingh34@yahoo.com>
Sent: Friday, August 15, 2014 2:17 PM
To: Region2 PassaicLower8MileComments
Subject: Support Alternative 2

Hello,

Alternative 2 is a full bank to bank dredging of the lower 8.3 miles to depths of 20-30' that would totally remove the contaminants and permit boating to return to its pre-1950 levels.
Alternative 2 would permit new docks, boat ramps, and bulkheads to be built. No maintenance is required with Alternative 2.
Alternative 2 holds the polluters fully responsible and is truly a Restoration of the Passaic River.
Alternative 3 would cap the river and not dredge the bottom. This will not work because of flooding and scouring of River. It is being proposed because it is cheaper, but will not last since ultimately the caps will fail. Bank to bank capping has never been done before. This Alternative would also require regular costly maintenance.
The Alternative 3 capping results in no Improved Boating, a no wake policy and a no anchor policy. The River would be capped after 80 years of silting, leaving the mud flats that prevent boats to reach the shore line, except at high tide. New docks, boat ramps, bulkheads, and shoreline development would be prohibited.
Alternative 3 would prohibit yachts, passenger and sightseeing boats from bringing fans to Red Bull Stadium, the Gateway Center, NJPAC, Hampton Hotel, and nearby restaurants. The unimproved depth would prohibit the return of commercial shipping to North Newark. Capping leaves the bulk of the contaminated sediment in the River.
Dioxin is one of the most deadly substances known to man that bio accumulates in people and is known to be the most carcinogenic. Dioxin is an extremely harmful substance not only to humans, but to the ecosystem as well. The Diamond Alkali plant manufactured pesticides, weed killers, and Agent Orange, the defoliant used during the Vietnam War.
Under both state and federal law companies that discharge toxic chemicals into the environment that cause a loss of public use are assessed with Natural Resource Damages. The public fisheries, aquatic ecosystems, wetlands, rivers, and estuaries belong to all of us. When a company contaminates and prevents the use of that resource they have to pay damages.
Rivers should not be Superfund sites they should be places where people can walk along the river bank or kayak.

Sincerely,
Rajdeep Bhathal

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 9:25 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Anita Bianchini
Bettibee5@aol.com
338 West Passaic Ave
Bloomfield
NJ
07003

973-893-0329

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 06, 2014 3:16 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Megan A Bianchini
mbianchini23@gmail.com
17 Colts Lane
Flemington
NJ
08822

9085816710

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 06, 2014 3:13 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Tony Bianchini
abianchini23@hotmail.com
17 Colts Lane
Flemington
NJ
08822

9082272185

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 05, 2014 11:14 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

David Blacker
forsale1141@hotmail.com
1141 cooper rd
Scotch Plains
NJ
07076

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 05, 2014 7:49 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Steven Bloom
sbloom13@live.com

07974

Yeh, Alice

From: jonathanbone@netscape.net
Sent: Thursday, May 08, 2014 3:56 PM
To: Region2 PassaicLower8MileComments
Subject: Comments on the EPA proposal for the Lower 8 Mile cleanup

I represent one of the users of the river for whom the proposed cleanup has immediate impact. I and the approximately eight hundred (plus) other rowers who have been reclaiming the lower Passaic for recreational/sport use in the past decade or so have an existential stake in the EPA's proposed operations from river mile 8.3 to the mouth. I completely understand both the legal and the moral necessity of removing toxic contaminants from the accumulated sediment. In principle, I support wholeheartedly the EPA's efforts to ameliorate the situation. But I have grave practical concerns about first the project as described and second the proposed timetable.

First of all, the scope. If significant amelioration is needed upstream from mile 8.3, as seems likely given for example the ongoing Mile 10.9 dredge-and-cap operation, the logic of river flow would seem to argue that any upstream work should be done before the downstream. I understand that there are all sorts of issues involved with the Cooperating Parties Group, which has its own proposed remedies for the river. And I understand that tonight's meeting is on the lower 8.3 miles. But when are you going to resolve on a plan for the stretches upstream? At a minimum I'd like to hear some indication sometime of what's being considered for the stretches to the north, particularly the fine-grained mudflats north of the PVSC facility, and why Mile 10.9 was so "hot" that it to be remediated at least a year or more before work will begin on the presumably more polluted lower river.

As for the proposed timetable, the ongoing work at Mile 10.9 was supposed to have been completed last fall and not affect the spring rowing season. Then it was supposed to resume in February and be completed in a month or so. As of today, May 7, there are still barges clogging the river north of the DeJessa Bridge and while the capping has finally ceased, installation of the promised habitat layer doesn't look likely to be completed until maybe Memorial Day, if then. If that's any indication of the amount of resources and organization the EPA expects to mobilize for the 4.3 million cu yds of dredging proposed for the lower 8.3 miles, by my rough calculations work will be completed not in five years but in two hundred eighty nine. Obviously that's not going to happen - more resources are going to be involved. But that in turn implies more traffic on the river, and on more stretches of the river at any one time, potentially clogging/closing the lower 8.3 miles (and maybe more, depending on staging areas) to the detriment of some of the very river use the EPA is supposed to be doing this for.

As a member of the community and a river user, I am apprehensive that the EPA's plans for remediation to date have given us recreational/sport users comparatively scant attention. It goes without saying that we want a clean Passaic - as a single-scull rower, I can pretty much guarantee that in the last ten or twelve years I've been IN the river, and in its mudflats, more than most. I've had all the first-hand experience with river pollution I care to, thank you, and I don't want future generations to have to burn their socks if they go wading. But at the same time, I suggest that the EPA has a ethical and institutional responsibility to work with the high school, college, and community rowing programs already on the river to ensure that the removal of toxins doesn't inadvertently destroy our activities in the process. I urge the EPA -- and whoever the work is contracted to -- to reach out to the rowing community, and to make every effort to ensure that its efforts to improve what's under and in the water also take into account those of us *on* the water.

Jonathan Bone
730 Ft. Washington Ave. #5G
New York NY 10040

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Yeh, Alice

From: Bongiorno Productions <bonpix@verizon.net>
Sent: Wednesday, August 20, 2014 7:45 PM
To: Region2 PassaicLower8MileComments
Subject: Resident Comments to Proposed Plan for the Lower Eight Miles (of the Passaic River)

Dear Ms. Alice Yeh, Regional Project Manager, EPA-

Re: public comment period on the Proposed Plan for the Lower Eight Miles (of the Passaic River):

To the EPA:
1. Can you fully apprise us of the health risks that we've been exposed to in past Passaic River Cleanups and will be exposed to in Proposed Plan and others?
2. Are you planning to trap odors in your future Cleanups?
3. Are you planning to station inspectors 24/7 in Newark to police odors?

If the EPA cannot respond in the affirmative to all three aforementioned questions, then the EPA cannot proceed on the Proposed Plan for the Lower Eight Miles of the Passaic River.

Kindly confirm receipt.

Sincerely,
Marylou & Jerome Bongiorno
Forest Hill Newark Residents/filmmakers

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, July 30, 2014 11:47 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jama Bowman
jama.b@comcast.net
563 Pierson Street
Westfield
NJ
07090

Yeh, Alice

From: Office <hawaiiancarlsson@hotmail.com>
Sent: Monday, April 14, 2014 12:35 PM
To: Region2 PassaicLower8MileComments
Subject: Passaic River Clean Up

Good Afternoon,
I read the press releases regarding the proposed lower Passaic River Clean Up and would like to get some more information. Are you able to tell me if there will be a bid process for the clean up work to be performed and if so, when that bidding period is scheduled to commence? Will this be open to vendors eligible to work with the NJDEP or will all contracts be managed by the US DEP through the federal vendor system? If there is a purchasing agent who will be responsible for the bids/contract work that you can put me in touch with, that would be extremely appreciated as well. Thank you in advance for your time and I look forward to earing from you.
Eric Carlsson
609-575-4456

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 15, 2014 11:34 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Janice M Cassimatis
jmcassimatis@gmail.com
3 Featherbed Ln
Hillsborough
New Jersey
08844-2507

9086258051

Yeh, Alice

From: Donald Harris <dlh1226519@gmail.com>
Sent: Tuesday, August 19, 2014 2:04 AM
To: Yeh, Alice
Subject: Additional Letter of Support, alternative to the proposed FFS Plan.
Attachments: download-1408428062217.docx

INTEGRATED BENEFITS RESOURCES, LLC.

333 SYLVAN AVENUE, ENGLEWOOD CLIFFS, 07632

August 18, 2014

Ms. Alice Yeh

Remedial Project Manager

Environmental Protection Agency

290 Broadway, 19th Floor

New York, NY 10007-1866

Dear Ms. Yeh:

Integrated Benefits Resources, LLC (IBR) is recognized as an independent voice of business in the State of New Jersey. We continue to work towards promoting a vibrant business environment and economic prosperity through vision expertise and innovative solutions.

IBR is writing to you today to express our significant concerns with the Environmental Protection Agency's (EPA) Proposed Plan to dredge the Lower Passaic River from Newark Bay to River Mile 8.3. We have real concerns that this approach would take decades to complete and would deter business development in River communities in Essex, Hudson, Passaic, and Bergen counties for years to come.

There are a number of reasons that we are concerned with a bank-to-bank dredge of the lower 8 miles of the River, including:

- The EPA's Proposed Plan estimates that it will take 5 years to complete the dredging of the 4.3 million cubic yards from the River. If the project in Lyndhurst at River Mile (RM) 10.9 is any indication, it will likely take decades to dredge this amount of material out of the River. A multi-decade dredging project would hinder new development in North Jersey and discourage our existing businesses from further investing in the area.

- As shown by the work at RM 10.9 and the recent replacement work on the Pulaski Skyway, New Jersey's transportation infrastructure is aging and in need of repair. During the RM 10.9 project, multiple bridges broke causing project delays that doubled the length of project completion. A 4.3 million cubic yard dredge would require thousands of openings of the 15 bridges that cross the River between Newark Bay and RM 8.3. Has the EPA considered what the impact of this project will be to the business community if one or more of these bridges breaks again?

- The EPA's Proposed Plan only addresses the lower 8 miles of the River and due to the high volume of material that will be dredged, there is the likelihood that recontamination will occur throughout the River. A solution that addresses the full 17 miles and minimizes recontamination should be considered.

- While bank-to-bank dredge of the lower 8 miles will address sediment contamination, the plan does nothing to address storm water runoff discharges from combined sewer outflows and other sources that

continue to contribute pollution to the Lower Passaic River. Until these sources are addressed, the River will never be truly clean.

IBR believes there is a more effective way to address risk to human health and the ecology and minimize disturbance to North Jersey's economy.

We understand that the Lower Passaic River Study Area Cooperating Parties Group (CPG) has proposed a Sustainable Remedy that could be implemented more quickly and follows EPA's own guidance for remediation in complex river systems. In addition, the shorter implementation schedule of the Sustainable Remedy when compared to a bank-to-bank dredge could encourage new businesses to invest in and develop new projects in the Passaic River region.

This remedy also includes green infrastructure projects that would reduce the pollution that continues to enter the River. We believe that these infrastructure projects would bring new employment and improve "quality-of-life" and business opportunities for New Jersey citizens.

Integrated Benefits Resources hopes that the EPA will consider the impact that a bank-to-bank dredge of the lower 8 miles will have on the business community. We believe that the Sustainable Remedy would be just as effective as a bank-to-bank dredge, while being less intrusive to the business community.

We hope that the EPA will seriously consider this remedy during the public comment period.

Sincerely,

Jerry Chambers

Managing Partner

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 19, 2014 3:09 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Lauren Chevlin
laurenotr@hotmail.com
571 Rosedale Road
Princeton
NJ
08540

609-822-3432

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 06, 2014 3:16 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Matt Chiller
mattchiller@hotmail.com

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Saturday, August 02, 2014 8:52 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Marilyn Cipriano
gammi50@aol.com
229 Phillips Terrace
Union
NJ
07083

9086872833

Yeh, Alice

From: George Clark <firefly4tcdd@gmail.com>
Sent: Wednesday, August 20, 2014 12:09 PM
To: Region2 PassaicLower8MileComments
Cc: Gary Spewak; George C. Clark; George Clark; Jessica Lowder
Subject: Comments on Proposed Plan for the Lower 8 Miles of the Passaic River
Attachments: 2014-08-19 Comment to Alice Yeh about Passaic River remediation.pdf; 2014-08-19 CALUX flyer.pdf; Mathematical model for environmental samples - prediction of GC-MS dioxin TEQ fro XDS-CALUX bioassy data DBrown G Clark Environ Sci Technol 41 (2007) 43.pdf; ES&T_2007_41(24)_8376-8382.pdf

19 August 2014

Alice Yeh, Remedial Project Manager

U.S. Environmental Protection Agency

290 Broadway

New York, New York 10007-1866

Or email to:

PassaicLower8MileComments.Region2@epa.gov

Re: Comments on the Clean-Up Plan for the Lower 8 miles of the Passaic River

Dear Alice Yeh:

Xenobiotic Detection Systems International (XDSI) offers analysis for chlorinated Dioxins/Furans with EPA method 4435 or the CALUX® bioassay for Dioxins. EPA method 4435 is a rapid high throughput analysis system for Dioxins that would provide great cost savings and time savings during the remediation of the Passaic River. During remediation, analysis of the success of Dioxin removal or sequestration should be performed. EPA method 4435 can be performed on site with a mobile laboratory and offer results in approximately 24-48 hours for less than $300/per sample. This rapid reporting and cost savings would be very beneficial in speeding the remediation effort if the results were available on the site.

I am enclosing attachments to this email. Included attachments are a one page synopsis of the CALUX® bioassay for Dioxins (EPA Method 4435), and two scientific papers explaining the benefits of using our rapid analysis system during site remediation. The EPA Method 4435 was approved for use by the NJIT through the New Jersey Corporation of Technology (NJCAT) program and is an approved method by the NJDEP. The CALUX® bioassay for Dioxin analysis should be used to save time and money in the remediation of the Passaic River.

I would be glad to forward to you much more information. Please contact me (email: georgeclark@dioxins.com; phone 919-688-4804) so that we may discuss how the CALUX® bioassay could benefit the remediation effort of the Passaic River.

Best regards,

George C. Clark

George C. Clark, Dr.P.H.

President

Xenobiotic
Detection
Systems
International

"Dioxin Bioassays"

1601 East Geer St., Suite S
Durham, NC 27704
Phone: (919) 688-4804
Toll Free: 888-DIOXINS
Fax: (919) 688-4404
Web: www.dioxins.com
Email: info@dioxins.com

19 August 2014

Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway
New York, New York 10007-1866
Or email to:
PassaicLower8MileComments.Region2@epa.gov

Re: Comments on the Clean-Up Plan for the Lower 8 miles of the Passaic River

Dear Alice Yeh:

Xenobiotic Detection Systems International (XDSI) offers analysis for chlorinated Dioxins/Furans with EPA method 4435 or the CALUX® bioassay for Dioxins. EPA method 4435 is a rapid high throughput analysis system for Dioxins that would provide great cost savings and time savings during the remediation of the Passaic River. During remediation, analysis of the success of Dioxin removal or sequestration should be performed. EPA method 4435 can be performed on site with a mobile laboratory and offer results in approximately 24-48 hours for less than $300/per sample. This rapid reporting and cost savings would be very beneficial in speeding the remediation effort if the results were available on the site.

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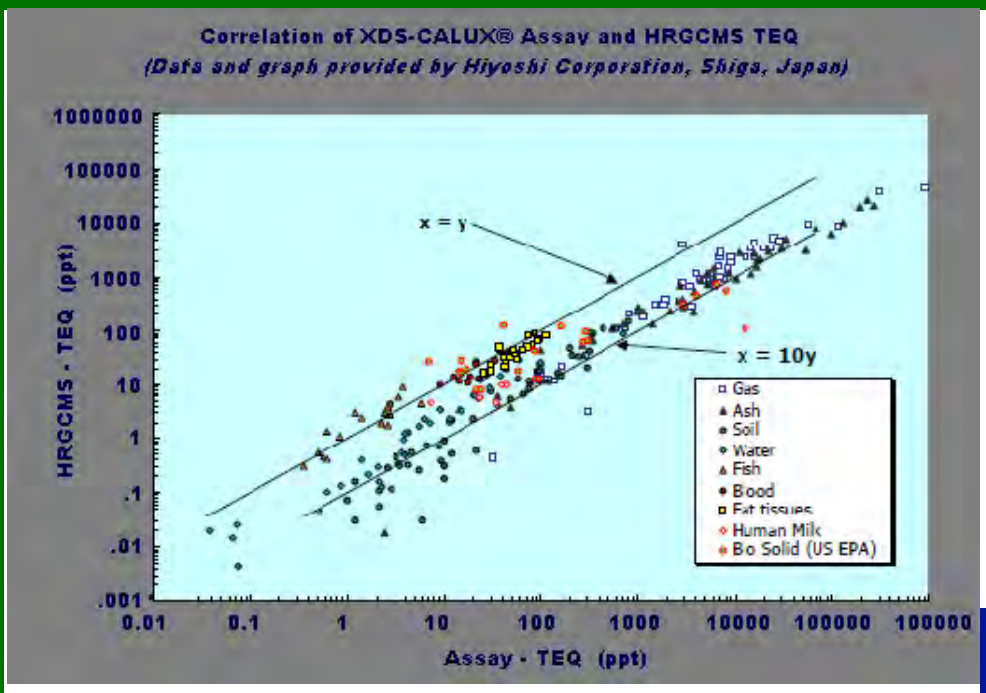
Best regards,

George C. Clark

George C. Clark, Dr.P.H.
President

XENOBIOTIC DETECTION SYSTEMS, INC. PRESENTS EPA METHOD 4435:

CALUX® Assay



- EPA Method 4435
- ISO 17025
- SW846 Approval
- Detects Dioxins, Furans and PCBs
- Sensitivity of <1ppt
- Detection in any medium
- Cheaper than GC/MS
- 7, 14 & 30 day returns

FAST
RELIABLE
AFFORDABLE
REPEATABLE

The XDSI Calux Assay is ideal for use as a low cost research tool to determine biological activity of dioxins, furans and PCBs. These toxins have been known to accumulate in animals, causing species-specific and tissue-specific toxic effects.

The firefly luciferase gene, used by XDSI's CALUX Assay, activates dioxins in a time, dose and AhR dependent manner. Furthermore, the XDSI's CALUX Assay was designed to detect these toxicants in any medium or matrix.

This system is an effective screening tool that can be used to protect food supply, protect the environment and measure contamination (for instance, at industrial sites.). Our system is currently used in the United States, Japan, Chile and Poland.

1601 East Geer Street, Suite S
Durham, NC 27704
Phone: 919-688-4804
Fax: 919-688-4808
E-mail: info@dioxins.com

Xenobiotic Detection Systems International ®

"XDSI is committed to providing quality analysis and developing biological assays to their fullest potential. I am confident that our testing methods will exceed your expectations. We look forward to fulfilling your testing needs"

-Dr. George Clark, President

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Application of Site-Specific Calibration Data Using the CALUX by XDS Bioassay for Dioxin-like Chemicals in Soil and Sediment Samples

Amy Dindal, Elizabeth Thompson, Laura Aume, and Stephen Billets

Environmental Science & Technology, 2007, 41(24), 8376-8382

Environ. Sci. Technol. **2007,** *41,* 8376–8382

Application of Site-Specific Calibration Data Using the CALUX by XDS Bioassay for Dioxin-like Chemicals in Soil and Sediment Samples

AMY DINDAL,*,† ELIZABETH THOMPSON,† LAURA AUME,† AND STEPHEN BILLETS‡

Battelle, 505 King Avenue, Columbus, Ohio 43201, and U.S. Environmental Protection Agency/National Exposure Research Laboratory, 944 East Harmon Avenue, Las Vegas, Neveda 89119

Received June 01, 2007. Revised manuscript received September 07, 2007. Accepted September 13, 2007.American Chemical Society

The Chemically Activated Luciferase Gene Expression (CALUX) by Xenobiotic Detection Systems (XDS) bioassay was evaluated for the determination of the presence of dioxin and dioxin-like compounds in soil and sediment in two studies conducted under the U.S. Environmental Protection Agency's Superfund Innovative Technology Evaluation Monitoring and Measurement Technologies Program. In the first study, the results were compared with those generated by established laboratory methods (EPA Method 1613B) using high-resolution mass spectrometry (HRMS). The study results demonstrated that the technology could be used to screen for dioxin concentrations above and below threshold values (e.g., less than or greater than 1 or 50 picograms of toxicity equivalents per gram [pg TEQ/g]); however, the results were not linearly correlated to the HRMS results. A second study was initiated to evaluate performance on a site-specific basis. During the second study, the data from the XDS technology were evaluated in four ways: (1) uncalibrated to HRMS, (2) calibrated using an overall statistical model, (3) calibrated using statistical models generated on a site-specific basis, and (4) calibrated using site-specific calibration factors. The results showed that TEQ data produced by the XDS technology were more precise than the data reported during the first study. The second study also demonstrated that site-specific statistical models were better tools for understanding the relationship between the XDS and HRMS data than a single overall model generated from data from multiple sites. Ultimately, site-specific calibration was shown to be the best approach because it was a simple and accurate way of correcting the XDS data and improving comparability with HRMS.

* Corresponding author e-mail: dindala@battelle.org; phone: (561) 422-0113; fax: (614) 458-6697.

† Battelle.

‡ U.S. Environmental Protection Agency/National Exposure Research Laboratory.

Introduction

Conventional analytical methods for the determination of concentrations of dioxin and dioxin-like compounds in environmental samples are considered time-consuming and costly. U.S. Environmental Protection Agency (EPA) standard methods require solvent extraction of the sample, processing the extract through multiple cleanup columns, and analysis by gas chromatography (GC)/mass spectrometry (MS) using EPA methods such as 8280, 8290, or 1613 to quantify specific congeners of dioxin. Budgetary constraints and lengthy turnaround times for data reporting often limit the use of these methods to characterize or monitor for dioxin at contaminated sites. High-resolution mass spectrometry (HRMS) analyses using EPA methods 1613 or 8290 can cost from $800 to 1200 per sample, depending on the complexity of the sample, the level of quality assurance/quality control incorporated into the analyses, and the reporting requirements. A more simple and cost-effective analytical method would allow site personnel to assess the extent of contamination or direct and monitor remediation with less expensive and timelier data.

The EPA's Office of Research and Development (ORD), National Exposure Research Laboratory (NERL), contracted with Battelle (Columbus, Ohio) to investigate whether commercially available bioanalytical methods produced quantitative results comparable to HRMS data under the EPA's Superfund Innovative Technology Evaluation (SITE) Monitoring and Measurement Technology (MMT) Program. Technologies evaluated under the SITE MMT Program are expected to provide better, faster, or more cost-effective methods for the production of real-time data during site characterization and remediation activities. One of the technologies evaluated under the SITE MMT Program, Xenobiotic Detection Systems Chemically Activated Luciferase Gene Expression (CALUX by XDS), is a bioassay based on a generically engineered murine cell line that carries a firefly luciferase reporter gene driven by an aryl hydrocarbon receptor (AhR) dependent promoter that is activated when the cells are exposed to dioxins and other dioxin-like chemicals (*1*). The performance of the CALUX by XDS was evaluated in two studies. The first study was a 2004 field demonstration conducted in Saginaw, MI. The results of the first study, published as an EPA report (*2*), suggested that CALUX by XDS could be used to screen for dioxin concentrations above and below threshold values (e.g., less than or greater than 1 or 50 picograms of toxicity equivalents per gram [pg TEQ/g]). However, the XDS values did not demonstrate a high linear correlation with HRMS method 1613B data that were generated for comparison. After publication of these results and presentations of the information at seminars and conferences, the user and regulatory community showed significant interest in evaluation of the performance on a site-specific basis. Consequently, in May 2006, a second study was launched to evaluate the CALUX by XDS on a site-specific basis. This paper presents a comparison of the results from the two SITE MMT studies, demonstrating how relative performance was changed through the use of a site-specific calibration procedure. While there are many excellent articles in the literature that compare the CALUX bioassay data with HRMS results for TEQ measurement in environmental samples (*1, 3–6*), none of these studies use a site-specific calibration procedure.

10.1021/es071303x CCC: $37.00 © 2007 American Chemical Society

Published on Web 11/10/2007

TABLE 1. Similarities and Differences between CALUX by XDS and HRMS Methods

method step	similarities	differences
sample preparation	solvent extraction	XDS extraction followed a modification of the EPA SW-846 Method 8290. Samples were extracted in an ultrasonic bath with a 20% solution of methanol in toluene and then twice with toluene. The extracts were filtered, pooled, and concentrated by vacuum centrifugation. HRMS extraction followed EPA Method 1613B sample preparation. Samples were extracted with methylene chloride using accelerated solvent extraction.
	chromatographic column cleanup techniques	XDS cleanup method employed a dual-column chromatographic procedure in which the sample was suspended in hexane and rapidly processed through a 33% sulfuric acid silica gel column in series with a patented XCARB activated carbon column to produce two extracts, one containing chlorinated dioxins/furans and one containing PCBs. HRMS cleanup method followed 1613B in which gel permeation chromatography, acid/base back extraction, carbon columns, multilayer silica, and alumina columns were used as needed.
sample analysis	laboratory-based methods technically trained operator	CALUX by XDS assay used a cellular culture that is incubated to produce optimal expression of the luciferase activity and the induction of luciferase activity (which is directly related to the amount of dioxin-like chemicals) is quantified using the luciferase assay kit from Promega. 1613B used HRMS.
quality control	reagent blanks laboratory control samples matrix spikes reference samples	^{13}C-labeled standards used for HRMS methods were not used for CALUX by XDS bioassay, but radioactively labeled standards were used with the XDS bioassay.
data presentation	results reported in TEQ	Results for the CALUX by XDS bioassay were based on relative potency values and called "bio-TEQ". Congener specific analysis for HRMS was based on World Health Organization's Toxic Equivalency Factors.

Analytical Methods

Table 1 summarizes the HRMS and XDS methods, which are similar in that they involve comparable sample extraction and cleanup procedures, but they differ in analytical finish. For the first SITE study, the HRMS data were generated following traditional EPA Method 1613B (*7*). The HRMS method estimates TEQs by calculation of the concentration of individual chemical congeners and then multiplication of this concentration by the relative toxicity of each congener. The relative toxicities are assigned using toxic equivalency factors (TEFs) determined by a World Health Organization (WHO) committee (*8*) on dioxin-like chemicals. The WHO TEFs were revised in 2006 (*9*), but the HRMS data in this manuscript were generated prior to the release of the 2006 values. For the second SITE study, the HRMS data were generated from a method used to characterize all of the samples prior to the first study that was based on Method 1613B, but with modifications (see Table S1 in the Supporting Information for a summary of the differences in the traditional and modified Method 1613B). The modifications, including the use of accelerated solvent extraction instead of Soxhlet extraction, lack of secondary column confirmation, analysis of less than 10 g of sample, and the use of estimated data when the calibration ranges were exceeded, were performed to reduce the time and cost of the analyses since the intent was to provide an initial characterization of the TEQ values, prior to analysis of the samples by traditional Method 1613B. It was demonstrated during the first study that data generated by modified Method 1613B (x) were comparable and highly correlated to the data generated by traditional Method 1613B (y) when plotted one-to-one ($y = 0.86x + 41$, $R^2 = 0.99$) (*2*). Therefore, for simplicity, all reference data are referred to as "HRMS" throughout this manuscript; no specific distinction is made between the traditional and modified 1613B methods.

Estimations of TEQs based on biological response, such as from the CALUX by XDS system, are often referred to as "bio-TEQ" results because these estimates do not determine the TEQs of individual dioxin/furan congeners but, rather, are based on the biological response of the entire sample. XDS implements a methodology involving a cell-based method, coupled with processing of the samples, designed to remove most of the nondioxin-like chemicals that may activate the AhR before quantitative determinations of bio-TEQ. XDS recognizes that not all nondioxin-like chemicals will be removed, and additional cleanup for some compounds, such as polynuclear aromatic hydrocarbons (PAHs), may be necessary if the contaminants are present at high levels (*1*). More detailed information about the CALUX by XDS bioassay has been reported in the literature (*1*, *4*) and can be found on the company's web site (http://www.dioxins.com/pages/Publicationstechnical.shtml).

It should also be noted that both the HRMS and XDS methods are capable of analysis of separate fractions for polychlorinated biphenyls (PCBs). Since the focus of the second study was limited to analysis of dioxin/furan congeners, the results discussed in this manuscript are for dioxin/furan congeners only.

Experimental Design

In the first SITE MMT study, a total of 209 soil, sediment, and extract samples with a variety of distinguishing characteristics, such as high levels of PCBs and PAHs, were analyzed as described in the project's demonstration plan (*10*). Samples known to contain dioxin-contaminated soil and sediment

were collected from 10 different sites around the country. Prior to use in the demonstration, the samples were homogenized and characterized by modified Method 1613B to ensure that the concentrations of dioxins were over a large dynamic range (<50 to >10 000 pg/g). Certified samples were included in the study as ongoing performance assessments for the reference method (see Table S2 in the Supporting Information for a brief description of the site locations and major contaminants for the environmental and certified samples). XDS was not given information regarding the concentration levels, dioxin congener patterns, sample types, or sampling sites because technology developers did not feel that such qualitative or quantitative information about the samples collected from the sites was required. The XDS and HRMS data were compared on a sample-to-sample basis.

In the second SITE MMT study, a total of 112 samples were analyzed, segregated into five site batches. Soil and sediment samples were obtained from those archived after the first study, including some previously analyzed samples as part of the first study and some unique samples that were not used as part of the original study but were taken from the same sampling locations. Samples included in the site-specific calibration study experimental design were taken from five of the ten original study sites. The samples were stored in a walk-in freezer (approximately −20 °C) for approximately three years, since the time when the samples were collected for the first study. One sample from each site was reanalyzed by HRMS to confirm that the concentrations had not changed significantly (<20% relative percent difference [RPD]) since the initial analysis (see Table S3 in the Supporting Information for RPD values by site). Certified samples were not included in the second study because the focus was on site-specific calibrations. In contrast to the first study, where all sample information was unknown, relevant information regarding the environmental site for each batch was provided. XDS was provided with the TEQ concentration and congener data for one quality control (QC) sample per site batch; all other sample concentrations were unknown. XDS was given the HRMS data for the QC sample to simulate a confirmatory analysis that could be used to apply a site-specific calibration.

In both studies, four individual replicates of each environmental sample were included as blind samples so that the precision could be assessed. In addition, several replicates of an uncontaminated (blank) soil matrix were included. Other QC techniques integral to the method, including calibration and matrix spiking protocols, were also employed.

Results and Discussion

Comparison of Results from the First and Second Studies. The XDS results from the first study are fully described in an EPA report (*2*), which is posted on the EPA SITE program web site (www.epa.gov/ORD/SITE). The results from the second study are first reported in this document. The results of both studies are included to show the difference in the XDS results obtained by changing the analytical approach and modifying the data analysis.

In the first study, XDS provided bio-TEQ results using a single determination for each sample, operating the technology in the "screening" mode (i.e., the sample extract was analyzed once). XDS operated the technology in the screening mode because the initial study was conducted primarily as a field demonstration (although some samples were also analyzed in XDS's laboratory). Table 2 summarizes the performance of the CALUX by XDS technology in the first study, including precision (reported in terms of percent relative standard deviation [RSD]) and comparability (reported as the ratio of the XDS and HRMS values and called percent recovery [%R]). Table 2 represents a subset of the total data set from the first study because it includes only the TEQ data for samples that were also reported in the second study. As shown in Table 2, the range of RSD values for the XDS data was 13–84%. For comparison, the range of RSD values for the HRMS data was 2–28%. The range of %R values was 113–1611%, with an average %R value of 352%. Acceptable values for RSD are typically less than 25%, while %R values are typically between 75 and 125%. It is concluded that the XDS results were less precise and generally showed a significant high bias relative to the HRMS results.

TABLE 2. Comparison between HRMS and CALUX by XDS Results: First Study, Uncalibrated

	HRMS		XDS		
sample ID	av[a] (pg TEQ/g)	RSD (%)	uncalibrated av[b] (pg TEQ/g)	RSD (%)	%R[c]
Winona					
cell #12	7318	2	32 796	13	448
cell #2	9998	9	161 095	78	1611
Tittabawassee River					
DNR 1	475	10	1689	16	356
DNR 2	37	6	136	46	373
IMP 2	1062	26	2517	34	237
Solutia					
SS 2	65	13	218	24	338
SS 3	2923	5	4789	56	164
SS 4	2015	7	2282	84	113
Raritan Bay					
RB 1	11	5	24	18	227
RB 2	13	2	30	21	232
RB 6	11	5	28	23	265
Newark Bay					
NB 1	41	6	60	37	144
NB 5	16	28	30	32	185
NB 6	56	22	133	62	239

[a] Average based on analysis of four replicate samples. [b] Average based on analysis of screening results (single analysis) of four replicate samples. [c] %R = (av bio-TEQ result/av HRMS result) × 100%.

To reduce the variance of their results, XDS implemented its "comprehensive" analysis protocol (i.e., the sample extract was analyzed three times) in the second study to provide a more precise estimate of bio-TEQ. To minimize cost, all second-study analyses were performed in XDS's laboratories, which is preferred for the CALUX by XDS method unless a specially configured mobile laboratory is available. Table 3 lists the XDS bio-TEQ and HRMS TEQ results for each sampling site. In a manner similar to that in Table 2, comparability is expressed as percent recovery of the XDS results relative to the HRMS results. As shown in Table 3, across all sampling locations, the %R values for the XDS results relative to HRMS results ranged from 96 to 662%, with an average %R value of 279%. XDS results had the least comparability to the HRMS results at the Winona site, with percent recoveries ranging from 487 to 662%. The Winona site was also contaminated with pentachlorophenol and PAHs; it had the highest levels of PAHs of any of the sites evaluated in the second study. The Tittabawassee River and Raritan Bay sites also had poor comparability, with %R values ranging from 240 to 371% and 289 to 365%, respectively. Contributions from other contaminants for these sites (such as PCBs and PAHs) were low. XDS results for the Solutia and Newark Bay sites had the best comparability to the HRMS results, with percent recoveries ranging from 96 to 227% and 118 to 140%, respectively. These sites had low-level PCB contamination (1–100 pg TEQ/g) and low PAH contamination (<5 mg/kg). As a measure of precision, the RSDs for all sampling locations ranged from 1 to 28% for the HRMS data

TABLE 3. Comparison between HRMS and CALUX by XDS Results: Second Study, Uncalibrated

sample ID	HRMS av[a] (pg TEQ/g)	HRMS RSD (%)	XDS uncalibrated av[b] (pg TEQ/g)	XDS RSD (%)	%R[c]
Winona					
cell #10	8648	28	57 238	14	662
cell #12	8831	1	51 597	22	584
cell #2	11 071	2	56 021	10	506
cell #4	11 410	4	55 599	18	487
cell #8	11 259	4	59 452	22	528
Tittabawassee River					
DNR 1	435	5	1613	9	371
DNR 2	42	23	127	23	304
FFP 1	3127	7	8828	23	282
FFP 2	1048	19	2511	17	240
IMP 2	808	10	2101	28	260
Solutia					
SS 1	846	18	840	38	99
SS 2	48	10	109	25	227
SS 3	3257	11	3946	24	121
SS 4	1833	19	2177	47	119
SS 5	1279	10	1234	28	96
SS 6	3951	5	3913	27	99
Raritan Bay					
RB 1	14	7	51	18	365
RB 2	12	8	39	10	325
RB 4	15	11	43	10	289
RB 5	14	3	43	14	310
RB 6	13	7	42	17	319
Newark Bay					
NB 1	45	26	61	13	135
NB 2	38	10	53	13	140
NB 3	32	6	39	19	123
NB 5	16	26	22	15	139
NB 6	62	14	73	9	118

[a] Average based on four replicate results. [b] Average based on analysis of comprehensive results (triplicate analysis) of four replicate samples. [c] %R = (av bio-TEQ result/av HRMS result) × 100%

and 9 to 28% for the XDS data, with the exception of the Solutia site; in that case, the RSD ranged from 24 to 47% for the XDS data and 5 to 19% for the HRMS data.

In the comparison of the RSD and %R values for XDS data in the two studies, the second study demonstrated a significant improvement in the precision of the XDS data. However, the HRMS TEQs and the XDS bio-TEQs for most samples still largely differed because the %R values were typically significantly higher than 100%. To account for some of these differences, the bio-TEQ data set was statistically modeled to determine a relationship between the XDS bio-TEQ data and the HRMS TEQ data. In addition, the TEQ and bio-TEQ data were compared after a site-specific calibration factor was applied to the bio-TEQ data.

Statistical Modeling. Statistical modeling was performed to establish a relationship between the XDS bio-TEQ and HRMS TEQ values and to generate an equation to convert XDS data to HRMS and vice versa. A similar approach using a mathematical model to describe the relationship between XDS bioassay and HRMS data has been previously published by XDS (*1*).

Statistical tests during the model-fitting procedure indicated that the raw data were not normally distributed. After a linear model of the untransformed data was fitted, the residuals were tested for normality, and the null hypothesis that the residuals were normally distributed was rejected with a p-value of <0.01. Therefore, a linear scale was not used. A natural log (ln) transformation of both the HRMS and XDS values put the data on a more evenly spaced scale and produced residuals that appeared to be normally distributed. The transformed values of the replicates for each sample and method were averaged. Least squares linear regression analysis (*11*) was performed on the data. The average ln-transformed data were statistically modeled in two ways: as a whole data set across all sites (with XDS bio-TEQ as the independent variable and HRMS TEQ as the dependent variable) and with separate slopes for each site (where site and XDS bio-TEQ were both independent variables and HRMS TEQ was the dependent variable). Predictive equations and 95% prediction intervals were produced for each statistical model. The predictions can be transformed back from the log scale (exponential) so that 95% prediction intervals can be produced for HRMS values (see Figures S1–S6 in the Supporting Information for the plots and equations for the statistical modeling).

There was good correlation ($p < 0.0001$, $R^2 = 0.9708$) between the log-transformed bio-TEQs and HRMS TEQs with the data not segregated by site. However, when either the TEQs or the bio-TEQs were high, the 95% prediction intervals were rather wide. For example, when XDS reported a bio-TEQ of 10, the predicted HRMS value was 3 with a 95% prediction interval of 1–8, meaning a 95% certainty that HRMS TEQ will be between 1 and 8 pg/g. If XDS reported a bio-TEQ at a higher level, such as 60 000 pg/g, the predicted HRMS TEQ was 10 782 pg/g with a 95% prediction interval between 3772 and 30 820 pg/g.

When the TEQs were log-transformed and statistically modeled by site, there was a better fit ($p < 0.0001$, $R^2 = 0.9966$) than with the overall model ($p < 0.0001$, $R^2 = 0.9708$). Table 4 shows the 95% prediction intervals for each site, with the corresponding 95% prediction intervals for the overall model. Bio-TEQ values were selected to compare HRMS TEQ values generated by the site-specific and overall models. As shown in Table 4, using the same bio-TEQ values, there is less variability in the prediction intervals by statistically modeling the data based on site. In most cases, the variability is decreased by a factor of 2. In addition to decreased variability, a site-specific statistical model is more representative of site conditions than an overall model. Because the congener patterns and matrix interferences vary by site, no fixed relationship would exist between the HRMS-derived TEQ and the CALUX by XDS response; thus, a site-specific statistical model is a better representation of site conditions.

To test the site-specific statistical models using actual XDS bio-TEQ data, the unique data from the first study were inserted into the site-specific statistical models (generated using the second study's data). This was possible because the first study contained unique samples from the same sites used in the second study. HRMS TEQ values were predicted from the XDS bio-TEQ values using the site-specific models and compared with actual HRMS TEQ values generated in the first study. The site-specific models worked well for prediction of the HRMS TEQs from the first study's bio-TEQs for Raritan Bay samples, where 88% of the time the model was able to predict a TEQ within a difference of ≤30% from the HRMS average results in the first study. The site-specific statistical models were not as accurate at predicting the HRMS TEQs for the other sites. The site-specific statistical model predicted HRMS TEQ within a difference of ≤30% of the HRMS average value from the first study 38% of the time for Newark Bay, 25% of the time for Solutia, 50% of the time for Tittabawassee River, and 50% of the time for Winona. Each site-specific statistical model's ability to predict HRMS TEQ data compared with actual data from the first study was likely also impacted by sample analysis in the screening mode, which by design was less accurate and less precise than XDS's comprehensive mode designed to reduce variance. In sum-

TABLE 4. 95% Prediction Intervals for HRMS TEQs Based on XDS bio-TEQs Comparing Site-Specific Statistical Model and Overall Statistical Model

XDS (pg TEQ/g)	predicted HRMS (pg TEQ/g)		95% prediction interval	
simulated value	site-specific statistical model	overall statistical model	site-specific statistical model	overall statistical model
Winona				
50 000	9033	9944	5078–16 069	3502–45 849
Tittabawassee River				
50	19	24	11–32	9–110
1000	327	668	208–514	244–1830
8000	3149	3529	1894–5236	773–9082
Solutia				
50	30	24	18–51	9–110
1000	796	668	513–1235	244–1830
3500	3693	1938	2328–5856	382–4438
Raritan Bay				
40	13	18	8–21	8–90
50	15	24	9–25	9–110
Newark Bay				
25	19	10	11–31	5–60
50	38	24	25–59	9–110
70	55	37	34–89	13–148

mary, statistical modeling of the data was rather complex and did not prove to be highly accurate at predicting HRMS values, although site-specific modeling was preferred to overall modeling because of higher correlation and reduced variance.

Use of Site-Specific Calibration Factor. Site-specific calibration, used by EPA and other organizations (*12, 13*), involves calibration of an alternative technology using one or more sample results generated using a standard reference method. It is most commonly used in conjunction with immunochemical techniques to normalize the assay cross-reactivity to site-specific contaminants (*14, 15*).

In the second SITE MMT study, the site-specific calibration factor was derived from a QC sample in each environmental site by dividing the HRMS TEQ result by the XDS bio-TEQ result for the QC sample. Each XDS bio-TEQ result was then multiplied by that factor to generate a site-calibrated bio-TEQ result. Table 5 lists the averages of the bio-TEQ data after the site-specific calibration factors and multisample site-specific calibration factors were applied. The XDS bio-TEQ results are dramatically more comparable to the HRMS results after application of the site-specific calibration factors. Percent recoveries across all sampling locations ranged from 60 to 218% (compared with 96 to 662% as shown in Table 3), with an average %R value of 109% (compared with 279%). XDS results for Winona and Newark Bay ranged from 84 to 115% and 104 to 124%, respectively. XDS results for the Tittabawassee River ranged from 60 to 91%. The site-corrected XDS data for Solutia had the least agreement with the HRMS data, with percent recoveries ranging from 93 to 218%. Because one sample from a site may not be representative of all site conditions, after the data were received, three to five additional data points were used to refine the site-specific correction factor. Results were slightly more comparable when a multisample ($n = 5$) correction factor was applied to the Solutia data, with percent recoveries ranging from 80 to 189%. A similar improvement was achieved when a multisample ($n = 3$) correction factor was applied to the XDS data for Raritan Bay. Percent recoveries ranged from 121 to 152% for the site-corrected XDS data, and the recovery range improved to 97 to 123% when a multi-sample correction factor was applied to the data. When either the single- or multi-sample site-specific calibration correction for a given site shown in Table 5 is considered, the XDS bio-TEQ data generated %R values within 75 to 125% for 22 of 26 sample sets (85% of the time), compared with 27% of the time (7 out of 26 sample sets, shown in Table 3) when the XDS data were not calibrated using HRMS data.

To further evaluate this procedure, the site-specific calibration approach was applied to the first study's data. The results in Table 2 were calibrated using single-sample and multi-sample (where appropriate) site-specific calibration factors derived in the second study. Because XDS implemented a more precise analytical method (comprehensive versus screening) in the second study, application of the second study's calibration factor to the first study's data will not be ideally representative. Although the site-specific calibration factor is not representative of the specific analytical conditions of each method, a trend may be noted because application of the factor should demonstrate closer agreement to the HRMS data. Table 6 presents the results of this evaluation. All 14 of the %R values in Table 6 had lower %R values than when uncalibrated (Table 2), demonstrating closer agreement to the HRMS values. In addition, half-of the %R values in Table 6 fell between 75 and 125%, where only one value was in this range in Table 2. The average %R value was 143% compared with 352%. This assessment further substantiates that the site-specific calibration factor is viable for the transformation of the XDS bio-TEQ data into results more comparable to the HRMS data.

On the basis of the results of these studies, the uncorrected XDS bio-TEQ values and the HRMS TEQ values were not considered to be directly comparable. A site-specific statistical model proved to be a better tool for correlating the XDS and HRMS TEQ values than an overall model that used data from multiple sites. However, using a simplistic site-specific calibration factor, a technique recognized and applied by the EPA, yielded data that transformed the biologically-based CALUX by XDS data to better agree with chemically-derived HRMS estimates of contamination and, overall, was shown to be the best approach for improving the correlation between the XDS bio-TEQ and HRMS TEQ values. This data treatment was straightforward, and the site-specific calibration factor generated XDS bio-TEQ data within 25% of the HRMS TEQ data 85% of the time.

TABLE 5. Comparison between HRMS and CALUX by XDS Results: Second Study, Site-Specific Calibration Factor

sample	HRMS av[a] (pg TEQ/g)	HRMS RSD (%)	XDS site-specific calibrated av[b] (pg TEQ/g)	XDS RSD (%)	%R[c]
Winona					
cell #10	8648	28	9921	14	115
cell #12	8831	1	8944	22	101
cell #2	11 071	2	9257	4	84
cell #4	11 410	4	9637	18	84
cell #8	11 259	4	10 305	22	92
Tittabawassee River					
DNR 1	435	5	396	10	91
DNR 2	42	23	32	23	76
FFP 1	3127	7	2222	23	71
FFP 2	1048	19	632	17	60
IMP 2	808	10	529	28	65
Solutia					
SS 1	846	18	807	38	95
SS 2	48	10	105	25	218
SS 3	3257	11	3790	24	116
SS 4	1833	19	2178	54	119
SS 5	1279	10	1185	28	93
SS 6	3951	5	3759	27	95
Solutia[d]					
SS 1	846	18	701	38	83
SS 2	48	10	91	25	189
SS 3	3257	11	3292	24	101
SS 4	1833	19	1891	54	103
SS 5	1279	10	1029	28	80
SS 6	3951	5	3210	34	81
Raritan Bay					
RB 1	14	7	21	18	152
RB 2	12	8	16	10	136
RB 4	15	11	18	10	121
RB 5	14	3	18	14	130
RB 6	13	7	19	1	145
Raritan Bay[d]					
RB 1	14	7	17	18	123
RB 2	12	8	13	10	110
RB 4	15	11	15	11	97
RB 5	14	3	15	14	105
RB 6	13	7	15	1	117
Newark Bay					
NB 1	45	26	54	13	119
NB 2	38	10	47	13	124
NB 3	32	6	36	22	112
NB 5	16	26	20	15	123
NB 6	62	14	65	9	104

[a] Average based on three to four replicate results. [b] Average based on analysis of comprehensive results (triplicate analysis) of four replicate samples. [c] %R = (av bio-TEQ result/av HRMS result) × 100%. [d] Calculated using a multisample site-specific calibration factor.

Because the direct linear correlation between CALUX by XDS technology and the HRMS method was not always within the normal acceptance range even after application of site-specific calibration factors, the XDS method warrants further investigation for other aspects beyond the scope of the studies described in this manuscript. For example, identification of other compounds contained in the XDS extracts that would respond to and be quantified by the bioassay method but are not being quantified by the HRMS method may reveal why the results of the two methods are not directly comparable. It is also possible that other factors inherent to the XDS method (such as selection of a dilution factor, which often varied within replicate sample analysis, and the precision of the method, which was sometimes above generally accepted levels) may influence the comparability.

TABLE 6. Comparison between HRMS and CALUX by XDS Results: First Study, Site-Specific Calibration Factor

sample ID	HRMS av[a] (pg TEQ/g)	HRMS RSD (%)	XDS site-specific calibrated av[b] (pg TEQ/g)	XDS RSD (%)	%R[c]
Winona					
cell #12	7318	2	5685	13	78
cell #2	9998	9	27 923	78	279
Tittabawassee River					
DNR 1	475	10	425	16	94
DNR 2	37	6	34	46	90
IMP 2	1062	26	633	34	60
Solutia					
SS 2	65	13	210 (182)[d]	24	325 (282)[d]
SS 3	2923	5	4600 (3996)	56	157 (137)
SS 4	2015	7	2192 (1904)	84	109 (95)
Raritan Bay					
RB 1	11	5	10 (8)	18	95 (76)
RB 2	13	2	13 (10)	21	97 (78)
RB 6	11	5	12 (9)	23	111 (89)
Newark Bay					
NB 1	16	28	27	32	164
NB 2	56	22	117	62	211
NB 3	41	6	53	37	127

[a] Average based on four replicate results. [b] Average based on analysis of comprehensive results (triplicate analysis) of four replicate samples. [c] %R = (av bio-TEQ result/av HRMS result) × 100%. [d] %R values in parentheses were calculated using a multisample site-specific calibration factor.

On the basis of the findings of the studies, the XDS procedure appears to work best to screen samples or to monitor cleanup activities after HRMS data have been obtained to characterize the site and provide the necessary calibration data. Overall, HRMS and the CALUX by XDS technology can be used in conjunction to provide a useful tool for risk assessment and risk management decisions on remediation of hazardous waste and contaminated sites. The use of these two techniques in combination for estimation of potential human health hazards in contaminated sites would both speed remediation and reduce costs.

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Supporting Information Available

Equations, plots of the six statistical models (Figures S1–S6), and summary tables describing the difference between the traditional and modified Method 1613B (Table S1), the environmental and performance evaluation samples that were included in the studies (Table S2), and analytical confirmation data for the archived samples (Table S3). This material is available free of charge via the Internet at http://pubs.acs.org.

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Mathematical Model Developed for Environmental Samples: Prediction of GC/MS Dioxin TEQ from XDS-CALUX Bioassay Data

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Remediation of hazardous waste sites requires efficient and cost-effective methods to assess the extent of contamination by toxic substances including dioxin-like chemicals. Traditionally, dioxin-like contamination has been assessed by gas chromatography/high-resolution mass spectrometry (GC/MS) analysis for specific polychlorinated dibenzo-*p*-dioxins, dibenzofurans, and biphenyl congeners. Toxic equivalency factors for these congeners are then used to estimate the overall dioxin toxic equivalency (TEQ) of complex mixtures found in samples. The XDS-CALUX bioassay estimates contamination by dioxin-like chemicals in a sample extract by measuring expression of a sensitive reporter gene in genetically engineered cells. The output of the XDS-CALUX assay is a CALUX-TEQ value, calibrated based on TCDD standards. Soil samples taken from a variety of hazardous waste sites were measured using the XDS-CALUX bioassay and GC/MS. TEQ and CALUX-TEQ from these methods were compared, and a mathematical model was developed describing the relationship between these two data sets: $\log(\text{TEQ}) = 0.654 \times \log(\text{CALUX-TEQ}) + 0.058 - (\log(\text{CALUX-TEQ}))^2$. Applying this equation to these samples showed that predicted and GC/MS measured TEQ values strongly correlate ($R^2 = 0.876$) and that TEQ values predicted from CALUX-TEQ were on average nearly identical to the GC/MS-TEQ. The ability of XDS-CALUX bioassay data to predict GC/MS-derived TEQ data should make this procedure useful in risk assessment and management decisions.

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Introduction

Hazardous waste site remediation is a complex and expensive process, at least in part because the sites are typically contaminated with a large number of diverse chemical substances (*1*, *2*). Initial characterization of these sites requires rapid identification of the nature and amount of contaminants, and improved technologies for this purpose would significantly expedite the initial phases of remediation. Because dioxins and dioxin-like chemicals (DLCs) contaminate many hazardous waste sites under remediation, the United States Environmental Protection Agency (U.S. EPA) Superfund Innovative Technology (SITE) Program has been evaluating novel technologies and comparing them to the established high-resolution gas chromatography/mass spectrometry (GC/MS) technology for quantifying DLCs.

DLCs refer to a subset of halogenated aromatic hydrocarbons, specifically 2,3,7,8-chloro-substituted polychlorinated dibenzo-*p*-dioxins and dibenzofurans and 3,3′,4,4′-chloro-substituted biphenyls that produce a common spectrum of Ah receptor-dependent toxicological and biological effects (*3*, *4*). These compounds induce similar toxicological effects in animals including weight loss, thymic atrophy, immune suppression, hepatoxicity, porphyria, chloracne and related dermal lesions, cancer, and reproductive toxicity (*4*−*7*). The spectrum of toxicological effects in humans may not include all of the effects observed in animal studies (*8*). The prototypical member of the dioxin family is 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD). While the exact mechanism by which dioxins and related DLCs exert their toxic effects is not known, what is clear is that the alterations in gene expression induced by these compounds are mediated by their ability to bind to and activate the aryl hydrocarbon receptor (AhR), a soluble intracellular ligand-dependent transcription factor. Following binding to the AhR, the DLC/AhR complex migrates from the cytosol into the cell's nucleus, wherein it is converted into its DNA binding form and stimulates transcription of a battery of genes (*9*−*14*). It is believed that the toxicity of TCDD and related DLCs is related to the ability of these chemicals to induce persistent expression of target genes.

The toxicity of a dioxin congener is related to the ability of the congener to bind to and activate the AhR, and the difference in relative potency between congeners can be several orders of magnitude. To assist with quantifying the overall impact of a mixture of congeners, the World Health Organization (WHO) established toxic equivalency factors (TEFs) for 17 polychlorinated dibenzo-*p*-dioxin (PCDD) and polychlorinated dibenzofuran (PCDF) congeners and 12 polychlorinated biphenyl (PCB) congeners. TCDD, the most potent congener, is arbitrarily assigned a TEF of 1.0, and the TEF for less toxic congeners is <1.0 (*15*, *16*). Reevaluation of the 1998 WHO TEFs was recently reported, and minor changes were made in some of the TEF values (*17*). In a typical analytical study, the concentration of DLCs in a complex chemical mixture is determined by GC/MS, the amount of each congener present in the mixture is multiplied by the congener's TEF to obtain a toxic equivalent quotient (TEQ) for that congener, and the sum of the individual TEQs represents the overall toxic potency of the chemical mixture. The TEQ estimate can be used for risk assessment studies involving different complex mixtures (*15*−*17*).

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The XDS-CALUX bioassay, developed by Xenobiotic Detection Systems, is based on a mechanistic understanding of the ability of dioxin to activate gene expression, a step critical in the toxic and biological effects of dioxins and related DLCs. XDS-CALUX uses a genetically engineered murine cell line that carries a firefly luciferase reporter gene driven by an AhR-dependent promoter that is activated when the cells are exposed to dioxin or DLCs (*18*, *19*). The magnitude of the induction response is directly proportional to the concentration of DLC in the sample and the degree of AhR receptor occupancy and activation. When specific sample processing procedures are used to eliminate the many non-dioxin-like AhR ligands/agonists (*20*, *21*) present in a sample extract, this bioassay can detect dioxin and DLCs with a high specificity and sensitivity in extracts from various matrices (*22*−*24*). Furthermore, the XDS-CALUX bioassay is highly quantitative, and using a TCDD standard curve, the reporter gene signal can be converted to a CALUX-toxic equivalency quotient (CALUX-TEQ). The CALUX-TEQ is a surrogate for the standard TEQ generated by GC/MS. For the purpose of this paper, TEQ will refer to GC/MS estimates of toxic equivalency, and CALUX-TEQ will refer to XDS-CALUX estimates of TCDD equivalency calculated from a TCDD standard curve.

The present modeling procedure was evolved from a SITE study sponsored by the U.S. EPA. The SITE study analyzed environmental soil and sediment samples from 10 hazardous waste sites contaminated with complex mixtures of dioxin-like chemicals. Samples were analyzed both by XDS-CALUX and by GC/MS, and CALUX-TEQ and GC/MS-TEQ values were calculated and compared. Mathematical modeling was employed to determine the relationship between these two data sets. Subsequently, the equation determined by mathematical modeling of the SITE data sets was applied to a second unrelated data set of environmental samples (part of an EPA SW846 validation study) to predict GC/MS-TEQ. Predicted TEQ and GCMS TEQ values were compared to assess the validity of the modeled equation. The relevance of the current results for future dioxin risk assessment and risk management studies is discussed.

Materials and Methods

Chemicals. PCDD and PCDF standards were purchased from Wellington Laboratories (Guelph, Ontario, Canada). Solvents and chromatography matrices for sample extraction and cleanup were purchased from Fisher Scientific and were ACS grade or higher (Pittsburgh, PA).

Environmental Samples. The U.S. EPA, the Battelle Corporation, and XDS conducted a U.S. EPA SITE study of 209 soil and sediment samples, including spiked samples and standard extracts, in March 2004. Samples were obtained from 10 hazardous waste sites undergoing remediation and included Warren County PCB Landfill in North Carolina; Tittabawassee River Flood Plain in Michigan; residential sites in Midland, MI; Winona Post site in Winona, MO; Solutia site in Nitro, WV; New York/New Jersey Harbors; Newark Bay in New Jersey; two sites on the Saginaw River in Michigan; and the Brunswick Wood Preserving Site in Glynn County, GA (*25*). Samples contained various contaminants including dioxins, PCBs, PCP, and PAHs. A complete description of the sites and samples is available in a U.S. EPA report (*25*). GC/MS analysis was performed by Axys Analytical Services (Sidney, British Columbia, Canada), while XDS-CALUX analysis was carried out by XDS, in a mobile laboratory stationed in Saginaw, MI (40 samples), or at XDS, in Durham, NC (169 samples). Thirty-six soil samples and eight ash samples (part of an SW846 validation study) were used to test the proposed mathematical model. Soil and ash samples collected in Japan were analyzed by GC/MS at Hiyoshi Corporation (ash and soil) (Omihachiman, Shiga, Japan), soil samples collected at a U.S. EPA remediation site in Hawaii were analyzed by GC/MS at Southwest Laboratories (Tempe, AZ), and XDS-CALUX analysis was conducted at XDS, in Durham, NC. XDS was blinded to the sample design and GC/MS data in the U.S. EPA SITE study as well as to the GC/MS data in the SW846 validation study (GC/MS data were sent to an independent statistician).

XDS-CALUX Sample Preparation. Sample extraction and cleanup were conducted as described previously (*26*−*28*). Briefly, aliquots of each sample were extracted with toluene and then purified by acid silica column chromatography and a patented carbon column chromatography procedure (*29*). Two fractions were subsequently collected from the carbon column. The first fraction contained chlorinated biphenyls, and the second fraction contained primarily PCDD/Fs (*27*, *29*). Isolated fractions were exchanged into dimethylsulfoxide (DMSO), for measurement of CALUX-TEQ in the XDS-CALUX bioassay. Both fractions were analyzed for CALUX-TEQ; however, in this paper, results for only the PCDD/Fs fraction are presented and analyzed.

XDS-CALUX Bioassay Analysis. XDS-CALUX was conducted in H1L6.1c2 cells, a mouse hepatoma (hepa1c1c7) cell line stably transfected with the pGudLuc6.1 reporter plasmid that carries an AhR responsive mouse mammary tumor virus promoter and firefly luciferase gene (*18*, *19*). Samples in DMSO were suspended in cell culture medium (RPMI 1640 supplemented with 8% fetal calf serum and 1% Pen/Strep antibiotics) and added to monolayer cultures of the H1L6.1c2 cell line in 96 well plates. Each assay was calibrated with a TCDD standard curve and included positive controls (solutions of TCDD and PCB 126) and negative controls (DMSO and solvent blanks). Plates were incubated for 20 h in a humidified 5% CO_2 atmosphere at 37 °C, the medium was removed, and the luciferase activity was quantified (Promega luciferase assay kit, Promega, Madison, WI) using a Berthold Orion Microplate Luminometer (Oak Ridge, TN). All sample measurements were made in the linear range of the assay (i.e., values near the middle of the standard curve). Quality control criteria used for the analysis of XDS-CALUX bioassay results were as described in Brown et al. (*26*). The TCDD standard curve was modeled to a four-parameter Hill equation using the least-squares best fit method, and the resulting standard curve was used to calculate CALUX-TEQ for unknown samples (*26*, *27*). CALUX-TEQ and TEQ data were collected and analyzed in a double-blinded manner with statistical analysis conducted by an independent statistician. The 209 EPA SITE samples were extracted and analyzed in the screening mode of analysis in the XDS-CALUX method that includes a single extraction of a sample. Upon un-blinding of the SITE study design, it became evident that there were 49 total samples within the study. A summary of the breakdown of the sample classes was 32 samples of soil and sediment analyzed in quadruplicate (124 samples), 12 performance evaluation samples analyzed in quadruplicate except for two samples that were replicated seven times (58 samples), and five extracts that were replicated from four to eight times within the 209 total samples (*25*). The performance evaluation samples and solutions contained reference materials with certified concentrations of dioxin, furans, and/or PCBs, spiked samples with a certified concentration of dioxin and/or other contaminants, and blank samples. A complete description of the SITE study design has been described (*25*). Analysis of the samples by GC/MS was not blinded, and the replicate criteria for generation of TEQ by GC/MS are not available to XDS. SW846 samples were extracted and analyzed in triplicate for CALUX-TEQ determination and presented as mean values, and GC/MS TEQ analysis was based on single instrumental determinations of DLCs by GC/MS determination of TEQ.

TABLE 1. TEF REP Conversion for Representative Soil Sample[a]

congener	GC/MS (pg/g)	WHO-TEF	CALUX-REP	WHO-TEQ (pg of TCDD/g)	CALUX-TEQ (pg of TCDD/g)
2378-TCDD	ND	1	1		
12378-PeCDD	4.6	1	0.73	4.6	3.358
123478-HxCDD	7.2	0.1	0.075	0.72	0.54
123678-HxCDD	17	0.1	0.098	1.7	1.666
123789-HxCDD	13	0.1	0.061	1.3	0.793
1234678-HpCDD	320	0.01	0.031	3.2	9.92
OCDD	7100	0.0001	0.00034	0.71	2.414
2378-TCDF	2.5	0.1	0.067	0.25	0.1675
12378-PeCDF	10	0.05	0.14	0.5	1.4
23478-PeCDF	13	0.5	0.58	6.5	7.54
123478-HxCDF	30	0.1	0.13	3.0	3.9
123678-HxCDF	34	0.1	0.14	3.4	4.76
123789-HxCDF	4.3	0.1	0.11	0.43	0.473
234678-HxCDF	82	0.1	0.31	8.2	25.42
1234678-HpCDF	270	0.01	0.024	2.7	6.48
1234789-HpCDF	44	0.01	0.044	0.44	1.936
OCDF	380	0.0001	0.0016	0.038	0.608
				37.688	71.376

TEQ/CALUX-TEQ = 37.688/71.376 = 0.528

[a] TEF and REP values are shown for PCDD and PCDF congeners in a representative SW846 soil sample. Conversion factor was calculated as described previously (*31*).

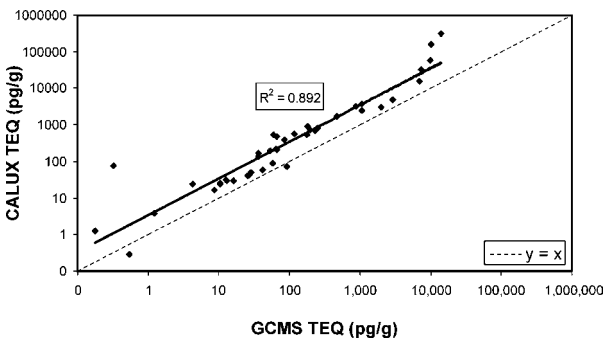

FIGURE 1. Comparison of GC/MS-TEQ and CALUX-TEQ for SITE samples. TEQ was determined by GC/MS, CALUX-TEQ was determined by XDS-CALUX as described, and the average results for each quadruplicate analysis of 42 soil and sediment samples are graphed. Solid line is the data trend line; for comparison, the dashed line represents $y = x$ (slope = 1 and intercept = 0). The regression line equation for the data is $y = 3.356x^{1.0067}$.

Mathematical Modeling. GC/MS TEQ and CALUX-TEQ values were fit to a statistical model. Initially, a generalized estimating equation (GEE) (*30*) that accounted for the correlation due to replicates using a base 10 logarithmic transformation of the two variables was used. However, the final model was based on the mean of the replicates. Input data for mathematical modeling initially included all samples. Subsequently, in developing a model for dioxins, seven samples were eliminated that were PCB standards, and data were limited to samples with TEQ values between 1 and 3000 pg/g with the model being generated on the means of 34 samples. Data presented are on 42 samples without elimination of the samples below 1 pg/g or greater than 3000 pg/g.

TEF/REP Conversion Factor. Calculation of conversion factors for samples based on differences between WHO TEF values and XDS-CALUX relative potency (REP) values was conducted as described previously (*31*). TEQ values for SW846 samples were recalculated using GC/MS congener specific concentrations and XDS-CALUX REP values (*32*) (see Table 1). GC/MS measurements for some congeners in SW846 samples were reported without non-detect (ND) negative control values. Therefore, for this study, all ND values were set to zero. Conversion factors (or averaged conversion factors, where $n > 1$) were calculated by dividing the TEQ for the sample by the TEQ calculated using CALUX REP values. The TEF/REP corrected estimate of TEQ was derived by multiplying this factor by the XDS-CALUX measured value for CALUX-TEQ.

Results

Comparison of GC/MS-TEQ and CALUX-TEQ. GC/MS and XDS-CALUX assays were performed on 209 SITE samples as described in the Materials and Methods. During data analysis, sample replicates within the data set were identified, the data presented in the graphs represent the average for each of 42 samples analyzed in quadruplicate, and the mean was calculated for the samples after un-blinding of the data. GC/MS-TEQ and CALUX-TEQ values calculated from GC/MS and XDS-CALUX, respectively, are compared graphically in Figure 1. The results show that GC/MS-TEQ and CALUX-TEQ values are highly correlated ($R^2 = 0.892$). Variance is observed between the two methods at very low or high GC/MS-TEQs or CALUX-TEQs. This may indicate that GC/MS and XDS-CALUX assays demonstrate increased variance at or near the limits of detection of both analytical procedures. The variance is also greater at extremely high concentrations of dioxin-like chemicals. This is probably due to the XDS-CALUX bioassay detecting additional compounds that activate AhR but are not detected or measured by GC/MS methods. The extreme dilution of the sample to allow detection in the linear range of the standard curve also contributes to the variance in estimating the CALUX-TEQ for the sample. CALUX-TEQ values are consistently higher than TEQ values (Figure 1), with CALUX-TEQs averaging 9.4 times higher than TEQ values. This is consistent with what has been observed previously for environmental samples (*22*, *33*).

Modeling the Relationship between GC/MS-TEQ and CALUX-TEQ. The data in Figure 1 (excluding samples with TEQ values ≤1 or ≥3000 pg of TCDD/g) were used to derive a statistical model for the relationship between GC/MS-TEQ and CALUX-TEQ as follows:

$$\log(\text{TEQ}) = 0.654 \times \log(\text{CALUX-TEQ}) + 0.058(\log(\text{CALUX-TEQ}))^2 \quad (1)$$

This model was evaluated by predicting TEQ from CALUX-TEQ using input CALUX-TEQ data from the SITE

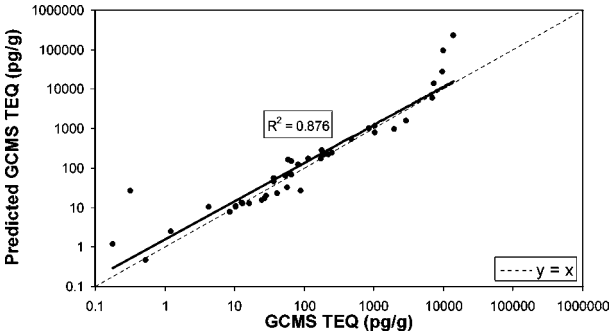

FIGURE 2. Modeling the relationship between predicted GC/MS-TEQ and GC/MS-TEQ. The TEQ was predicted from CALUX-TEQ values for SITE samples using eq 1. Solid line is the data trend line; for comparison, the dashed line represents $y = x$ (slope = 1 and intercept = 0). The regression line equation for the data is $y = 1.7789x^{0.9384}$.

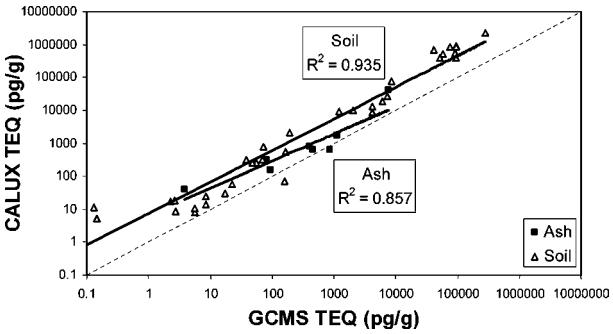

FIGURE 3. Comparison of GC/MS-TEQ and CALUX-TEQ for SW846 samples. TEQ was determined by GC/MS, and CALUX-TEQ was determined by XDS-CALUX as described. Solid line is the data trend line; for comparison, the dashed line represents $y = x$ (slope = 1 and intercept = 0). Sample matrix was ash (■) or soil (△).

study (Figure 1). The results showed a linear relationship with a correlation of 0.876 (Figure 2), which is slightly lower than the direct correlation between GC/MS-TEQ and CALUX-TEQ. However, since the data trend line almost coincides with the dashed diagonal line through the origin, the predicted TEQ values are very close to the TEQ values measured by GC/MS. For these data, CALUX predicted TEQ was on average 0.997 times the TEQ measured by GC/MS. As observed previously, the discrepancy between GC/MS measured TEQ and CALUX predicted TEQ was greater for samples with very low or high TEQ values.

Testing the Mathematical Model. The mathematical model was tested with XDS-CALUX data from an independent data set, SW846, that included 36 dioxin contaminated soil samples and eight ash samples. CALUX-TEQ and GC/MS-TEQ values for these samples had correlation values of 0.857 and 0.935 for ash and soil samples, respectively (Figure 3). As observed previously, CALUX-TEQ values for the SW846 samples were consistently higher than TEQ values. For these data, CALUX-TEQ was on average 12.6-fold higher than TEQ (3.4-fold for ash samples and 14.6−fold for soil samples).

On the basis of our mathematical model and eq 1, CALUX-TEQ values were used to predict TEQ values, and the predicted and measured GC/MS-TEQ values for the SW846 data set were compared (Figure 4). Correlation coefficients were 0.817 for ash samples and 0.922 for soil samples. Predicted TEQ was on average 6.5-fold higher than measured GC/MS-TEQ (1.3-fold for ash and 7.7-fold for soil). Note that these values change when samples with extreme GC/MS-TEQ values (i.e., ≤1 or ≥3000 pg/g) were excluded from the analysis (see Table 2 and Discussion).

Prediction of SW846 Data using TEF REP Conversion Factors. The XDS-CALUX bioassay has been used to define

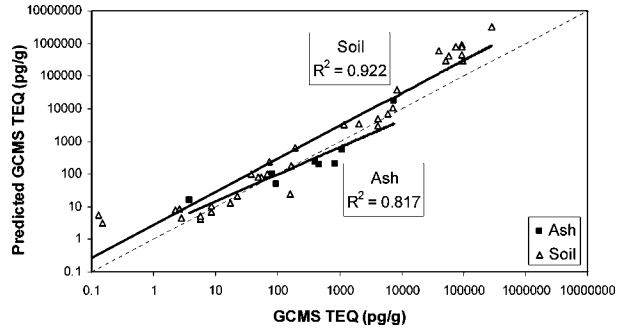

FIGURE 4. Predicting GC/MS-TEQ from CALUX-TEQ for SW846 samples. TEQ was predicted from CALUX-TEQ determinations using eq 1. Solid line is the data trend line; for comparison, the dashed line represents $y = x$ (slope = 1 and intercept = 0). Sample matrix was ash (■) or soil (△). The regression line equation for ash is $y = 6.49x^{0.82}$ and for soil is $y = 5.86x^{0.97}$.

congener specific toxic equivalencies called REP values (*32*) based on the method described in refs *34* and *35*. REP is an XDS-CALUX specific equivalent of TEF, as determined by the WHO using GC/MS. TEF REP conversion factors were calculated for each sample in the SW846 data set; the result for a representative sample is presented in Table 1, and average results for all ash and soil samples are summarized in Table 3. Results for individual samples are summarized graphically in Figure 5. By using TEF REP conversion factors, the overall discrepancy between CALUX-TEQ and TEQ is reduced but not eliminated (also see Table 2), with predicted TEQ on average 7.0−fold higher than TEQ (2.3-fold for ash samples and 8.0-fold for soil samples). Thus, applying a TEF REP conversion eliminates approximately half of the difference between CALUX-TEQ and GC/MS-TEQ.

Discussion

The XDS-CALUX bioassay is a sensitive method for measuring the bioactivity of dioxin and dioxin-like chemicals. Using a recombinant cell line containing a stably transfected AhR responsive promoter and firefly luciferase reporter gene, the XDS-CALUX bioassay estimates the concentration of DLCs by measuring the ability of a sample to activate AhR-dependent luciferase gene expression. While the XDS-CALUX bioassay generates a CALUX-TEQ value, which reflects the relative bioactivity of DLCs in the sample, the traditional GC/MS analytical method for measuring dioxin-like compounds generates a TEQ value by physical measurement of the concentrations of individual chlorinated dioxin congeners and multiplication by a TEF and summation to generate a TEQ in the mixture. While both methods are efficient and accurate, they are based on different methods with differences in the underlying mechanisms. CALUX-TEQ and GC/MS-TEQ values are not expected to be identical due to differences in the TEF and REP values, measurement of other DLCs, or non-additive interactions that may occur in the XDS-CALUX method. The goal of this study was to define the relationship between CALUX-TEQ and GC/MS-TEQ. To this end, CALUX-TEQ and GC/MS-TEQ values were measured and compared for two data sets, a mathematical model was derived using the first data set, and the model was tested with a second data set. The results suggest that XDS-CALUX can be a useful and relatively accurate method for estimating the concentration of DLCs in complex environmental samples and that CALUX-TEQ and GC/MS-TEQ data can be compared.

CALUX-TEQ and GC/MS-TEQ were calculated and compared for 209 SITE samples that represented 32 soil and sediment samples with quadruplicate analysis by GC/MS after un-coding of the blinded data, allowing comparison to XDS-CALUX determinations. During data analysis, replicates of samples were identified, and some samples (blanks, PCB

TABLE 2. Summary of Overall Discrepancy between CALUX-TEQ and TEQ Values for SW846 Samples[a]

transformation method	all samples	all samples in range (1−3000 pg/g)	ash samples	ash samples in range (1−3000 pg/g)	soil samples	soil samples in range (1−3000 pg/g)
none	12.6	4.2	3.4	1.9	14.6	5.4
mathematical model	6.5	1.6	1.3	1.1	7.7	1.7
	(52%)	(82%)	(89%)	(88%)	(51%)	(83%)
TEF REP conversion factor	7.0	2.3	2.3	1.3	8.0	3.0
	(48%)	(57%)	(45%)	(68%)	(48%)	(55%)

[a] Average fold difference between CALUX-TEQ and TEQ is shown for all samples or sample subsets as indicated. TEQ values were derived using no transformation, mathematical modeling (eq 1), or TEF REP conversion, as indicated. Values in parentheses show what fraction of the discrepancy between CALUX-TEQ and TEQ is accounted for by mathematical modeling or TEF REP conversion, respectively.

TABLE 3. Average TEF/REP Conversion Factors for Soil and Ash Samples in SW846 Data Set

matrix	*N*	min	max	median	av	SD	rel SD (%)
ash	8	0.52	0.80	0.69	0.69	0.11	16
soil	36	0.35	0.75	0.53	0.55	0.10	18

standards, TCDD standards, and other DLCs to evaluate limits of detection and specificity) were eliminated from the final data used for modeling. On average, CALUX-TEQ values were 9.4-fold higher than TEQ values, and these values demonstrated greater variance at extreme ends of the CALUX-TEQ/TEQ distribution. Mathematical modeling of these data (excluding samples with TEQ values ≤1 and ≥3000 pg of TCDD/g) produced a model for the relationship between CALUX-TEQ and TEQ (eq 1). Applying eq 1 to SITE samples showed that predicted and GC/MS measured TEQ values are strongly correlated ($R^2 = 0.876$) and that TEQ values predicted from CALUX-TEQ values were on average nearly identical to the GC/MS-TEQ (multiple of 0.997). The model was further tested using soil and ash samples from an independent data set, SW846. When eq 1 was applied to this data set, a strong correlation was again observed between predicted and TEQ measured values by GC/MS ($R^2 = 0.922$ for soil samples and $R^2 = 0.817$ for ash samples). Prior to transformation, CALUX-TEQ was on average 12.6-fold higher than TEQ, but after transformation using eq 1, the difference was reduced by 52% (Table 2). If the analysis was limited to samples with TEQ values in the range of 1−3000 pg of TCDD/g, predicted TEQ was 1.6-fold higher than TEQ. Thus, the model accounted for approximately 82% of the systematic difference between CALUX-TEQ and GC/MS-TEQ for this data set. Table 2 also shows that the difference between CALUX-TEQ and GC/MS-TEQ is generally higher in soil than in ash samples. While the reason for this difference is not entirely clear, it suggests that CALUX-TEQ and GC/MS-TEQ may be more similar for some sample types/matrices than others. This also suggests that the use of mathematical modeling should be conducted on a matrix-by-matrix basis. Analysis comparing XDS-CALUX and GC/MS on a matrix basis should aid in estimating TEQ since it would provide an estimate of the contribution of other halogenated dioxins/furans and biphenyls and other active compounds such as chlorinated napthalenes that may contribute to CALUX-TEQ but not to GC/MS estimates of TEQ.

A previous study proposed a way of comparing GC/MS-TEQ and CALUX-TEQ results based solely on the difference between WHO TEF values and bioassay REP values (*31*). While this method takes into account only one source of variation between GC/MS-TEQ and CALUX-TEQ results, in some sample matrices, it appears to provide acceptable results. XDS-CALUX REP values, which are a measure of the relative potency of specific dioxin congeners, are similar but non-identical to WHO estimates of TEF values (*32*). To determine

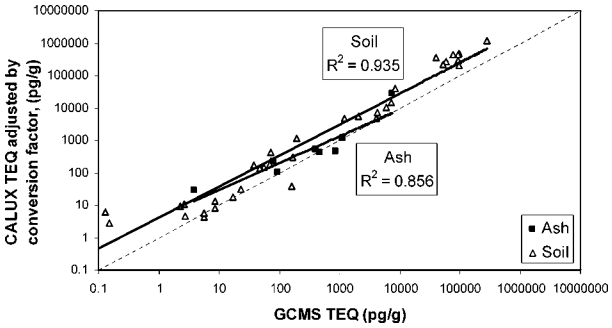

FIGURE 5. Predicted CALUX-TEQ by TEF/REP conversion comparison with GC/MS TEQ. TEQ was calculated from XDS-CALUX data using TEF REP conversion factors as described previously (ref *32*; also see Tables 1 and 3). Solid line is the data trend line; for comparison, the dashed line represents $y = x$ (slope = 1 and intercept = 0). Sample matrix was ash (■) or soil (△). The regression line for ash is $y = 4.49x^{0.82}$ and for soil is $y = 3.88x^{0.97}$.

how much of the observed variation between GC/MS-TEQ and CALUX-TEQ values resulted from differences in the relative potency for specific PCDD and PCDF congeners, this method of conversion was also conducted on the SW846 data set. Table 3 and Figure 5 show that this conversion reduced the average fold difference between CALUX-TEQ and GC/MS-TEQ from 12.6 to 7.0 (all samples) or 4.2 to 2.3 (all samples in the range of 1−3000 pg of TCDD/g). Thus, TEF REP conversion accounts for approximately half of the difference between CALUX-TEQ and TEQ. Given that the TEF values themselves may possess an order of magnitude in variance in establishing these values, the point estimates between CALUX-TEQ and TEQ correlate remarkably well (*15*−*17*).

On the basis of the previous analysis and results from prior studies, we propose that at least three factors account for the observed differences between CALUX-TEQ and GC/MS-TEQ: (i) XDS-CALUX may detect bioactivity of AhR agonists that are not normally measured by GC/MS such as polychlorinated naphthalenes (*34*, *35*) or brominated dioxin-like compounds (*36*, *37*); (ii) XDS-CALUX, but not GC/MS, can detect non-additive interactions between AhR ligands (refs *38*−*40* and reviewed in ref *41*); and (iii) specific dioxin-like chemicals have different relative potency values using GC/MS and XDS-CALUX (i.e., TEF and REP, respectively). The use of conversion factors based on the difference between TEF and REP values can correct for the third factor, but for the ash and soil samples in the SW846 study, this only accounted for about half of the observed differences. In contrast, mathematical modeling as conducted in this study can take into account all three factors. The model provides an average basis for estimation of GC/MS-derived TEQ from CALUX-TEQ based upon sampling of 10 sites that are under remediation for these contaminates.

Studies are ongoing with the U.S. EPA and the Battelle Corporation to identify the hypothesized DLCs and other

chemical entities in these sample extracts that are acting as AhR agonists. The patented sample processing method (U.S. Patent 6,720,431 (*29*)) has been demonstrated to remove greater than 99.8% of 14 different non-halogenated aromatic hydrocarbons that are AhR agonists (*28*). Two aromatic hydrocarbons (beno (*b*) fluoranthene and indeno (1,2,3 *cd*) pyrene) were removed from sample extracts to a lesser extent (94.3 and 97.5%, respectively). This suggests that non-halogenated aromatic hydrocarbons that are AhR agonists are probably not responsible for the higher estimates of CALUX-TEQ observed in the samples from the SITE study. However, this possibility cannot be completely discounted if extremely high concentrations of aromatic hydrocarbon AhR agonists are present in the samples. Brominated and/or mixed bromo/chloro dioxins and furans and halogenated naphthalenes are two classes of chemicals that could contribute to the higher XDS-CALUX activity.

The previous analysis also suggests that XDS-CALUX and GC/MS agree more closely for samples falling in the midrange of detection limits for these analytical methods (i.e., samples with TEQ >1 and <3000 pg of TCDD/g in this study). The variance observed with very dilute or concentrated samples in this study was likely due to threshold and saturation effects that are typical for most analytical methods. It is also possible that for samples with low levels of dioxin contamination, the bioactivity of other AhR agonists that are not measured by GC/MS could be relatively more important contributors to the overall biological response. Because of its broader specificity, XDS-CALUX may provide a better assessment of relative potency in extremely complex samples.

In summary, this study demonstrates that mathematical modeling can expand our ability to quantify the toxic potential of complex environmental samples containing dioxin and dioxin-like chemicals and compares the results obtained through different analytical methods. While GC/MS is used in current U.S. EPA regulatory requirements for quantifying dioxin contamination, XDS-CALUX is an important alternative method that can provide data for risk assessment and remediation decisions. Because of its high capacity and broad specificity, XDS-CALUX may be the preferred method (due to lower cost and time) for high-throughput screening or to accommodate samples with high or unknown complexity. The results presented here make it possible to compare analytical studies that use XDS-CALUX and GC/MS. Thus, the XDS-CALUX bioassay, coupled with the model presented here, may have important future applications in risk assessment and risk management associated with dioxin contamination and/or hazardous waste site remediation.

Acknowledgments

This work was supported by a grant from the National Institutes of Environmental Health Sciences, Small Business Initiated Research (SBIR) Grant ES08372 and an NIEHS Superfund Basic Research Grant (M.S.D., ES04699). The authors acknowledge the valuable contributions of Dr. Miriam Sanders of Page One editorial services in revising the manuscript.

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Joseph Mele, Class IV Member
Daniel Danay, Counsel liaison
Carol Wagner

Public Comment Concerning Clean-up Method for the Passaic River

Introduction

The Passaic River has been industrialized and urbanized for more than two centuries; it has served as the receiving environment for industrial and municipal waste discharges since the nineteenth century. However, the river is now being used increasingly for recreational activities, such as boating and fishing, as parks and boat ramps are actively being restored or newly established. As documented within focused investigations high concentrations of dioxin, Polychlorinated Biphenyls (PCBs), Poly Aromatic Hydrocarbons (PAHs) and various heavy metals exist within the river sediments.

Provided below is an overview of two remedial approaches being considered to address these contaminants. Both approaches utilize dredging and sediment disposal followed by the installation of an engineered cap, which acts as a physical barrier and is constructed primarily of sand and stone that is placed over the dredged areas to protect against erosion or other physical disturbances. This engineered cap would need to be maintained in perpetuity.

United States Environmental Protection Agency (USEPA)

- The USEPA's approach addresses the lower 8.3 mile stretch (from Newark Bay to River Mile 8.3) and is referred to as a "bank to bank approach". They propose the bank to bank deep dredging and disposal from river mile (RM) 0 to 2. This is proposed in order to prevent flooding and allow for commercial navigation. The remainder of the area, from RM 2 to 8.3, will consist of bank to bank dredging of the upper two feet of surface sediment across the entire width of the river. Followed by the installation of an engineered cap.
- The USEPA anticipates active remediation (i.e. bank to bank dredging, sediment disposal and capping of RM 0 to 8.3) will be complete within 5 years of initiation.

The Cooperating Parties Group (CPG)

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- The CPG approach anticipates that active remediation (i.e. "hot spot" dredging, sediment disposal and capping) of the 17 mile stretch of the Lower Passaic River will be complete within 5 years from initiation.

- The CPG approach is referred to as a "targeted approach". They propose the dredging and disposal of the upper two feet of surface sediment only in areas where the most highly contaminated sediments were identified (these areas are referred to as "hot spots") followed by the installation of an engineered cap. CPG's targeted remediation proposes to remove sediment from approximately 150 acres at key locations across the 17 mile stretch of the Lower Passaic River (from Newark Bay to the Dundee Dam in Garfield) which would reduce the current average surface concentration by approximately 80%.
- The CPG contends that areas that are not dredged will recover naturally due to removal of contaminated sediment from the target areas. CPG has developed a food web model that is based on EPA and CPG data as well as the life histories of Lower Passaic River species. The base of the food chain in the Lower Passaic River is made up of small benthic invertebrates that inhabit the top ~2 cm of the river bottom. The targeted remedy will reduce surface concentrations so that benthic feeding invertebrates and benthic feeding fishes (carp, mummichug etc.) will ingest sediments with lower concentrations of contaminants over time as the river recovers. CPG argues that EPA models assume that all organisms, even pelagic feeding fish (bass, perch etc.), are exposed to the entire sediment column (top 6 inches), an assumption that they believe is incorrect and inconsistent with life histories of the Lower Passaic River species and leads.

Fair Lawn Environmental Commission Analysis

Neither plan provides a timely and complete removal across the entire 17 mile stretch of the river, but after evaluating the two plans, including a review of both proposals and attendance at several meetings with the EPA, NJDEP, the CPG, and the Passaic River Coalition, the Fair Lawn Environmental Commission supports the CPG plan for the following reasons:

- The CPG plan proposes to remediate the entire 17 mile stretch of the river where as the USEPA plan only proposes to address the lower 8 miles,
- The CPG plan anticipates the date of completion (for the entire 17 mile stretch of the river) within 5 years from initiation where as the USEPA plan proposes to remediate less than half of the river within the same timeframe,
- The Fair Lawn Environmental Commission monitored the CPG's implementation of the targeted approach during recent cleanup efforts at RM 10.9 in order to get a feel for real world efficacy of the targeted approach.
- The Passaic River has several aged and historical bridges which are not used to frequent or daily opening and closing. During the limited RM 10.9 cleanup, the opening and closing of these bridges to allow barges to transport sediment downstream caused several of these bridges to fail at great expense to repair, and delay to cleanup efforts. It stands to reason that the USEPA deep dredge bank to bank plan will require the transportation of significantly more sediment, in more barges which will increase the opening and closing of these bridges and result in further damage and delay. It is anticipated that the targeted approach will require less barges and thus less impact on the bridges and delay to cleanup efforts.
- The USEPA plan proposes to remediate the lower 8 miles prior to the up-gradient portions of the river. At the point remediation is initiated in the upper portions of the river, re-contamination of the newly remediated lower 8 miles may occur. This reverse

sequencing may be attributed to the USEPA's inclusion of deep dredging (between river miles 0-2) and disposal in order to facilitate deeper navigation channels and increased flood capacity. The Fair Lawn Environmental Commission acknowledges the potential need for these items. However, while increased navigation may have a positive commercial impact on the State of NJ this should not be paid for out of funds allocated for environmental cleanup of contaminants. Likewise, while Fair Lawn is acutely aware of flood concerns having suffered significant flooding during Hurricane Irene and therefore agrees that flood measures need to be addressed, such measures should be implemented after the upper portions of the river have been remediated and with negotiated budget cost sharing related to the additional dredging and sediment disposal as flood issues were also not caused by environmental contamination and should not be addressed with limited funds which are allocated to the cleanup of one of the most polluted rivers in the country.

- Given the magnitude of the remediation both approaches will require a robust maintenance and monitoring plan implemented after completion of the active remediation. The purpose of the plan would be to assess the effectiveness of the remediation as it relates to river ecology etc. If in the future it is determined that the CPG "targeted approach" was not effective, additional remediation can still be implemented.

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Daniel Danay, Counsel liaison
Carol Wagner

August 12, 2014

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Re: <u>Public Comment Concerning Clean-up Method for the Passaic River</u>

Ms. Yeh:

On behalf of the Fair Lawn Environmental Commission, after careful review of the proposed clean-up plans, communications with the NJDEP and attendance by Commissioners at several public meetings conducted by the EPA, NJDEP, the Passaic River Coalition and the Cooperating Parties Group, attached please find the Fair Lawn Environmental Commission's Public Comment Concerning the Proposed Clean-up Methods for the Passaic River. Please feel free to contact the Commission should you have any questions.

Best Regards,

/s/ Wendy Dabney
Wendy Dabney, Chair
Fair Lawn Environmental Commission

Yeh, Alice

From: WENDY DABNEY <bwdabs@msn.com>
Sent: Wednesday, August 20, 2014 11:26 AM
To: Region2 PassaicLower8MileComments
Cc: Carol Wagner; Caroline Newman; James S Montano; Joe Mele; Nancy Sperling; Pessar Janice; vinko grskovic
Subject: Passaic Lower 8 Mile Public Comment
Attachments: Letter-Fair Lawn Environmental Commission Publ...pdf; Fair Lawn Environmental Commission Public Comment on Passaic River Clean-up.doc

Dear Ms. Yeh,

Attached please find correspondence and Public Comment submitted on behalf of the Fair Lawn Environmental Commission regarding the proposed cleanup methods for the Passaic River.

Would you kindly acknowledge receipt of this email and both attachments, so I am assured that they have reached you before the deadline for close of comments? Thank you for your attention to this matter.

Best Regards,

Wendy S. Dabney, Chair

Fair Lawn Environmental Commission

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Alice Yeh
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

August 20, 2014

Re: Passaic Lower 8 Mile Comments

Dear Ms. Yeh,

The New Jersey Sierra Club is opposed to Alternative 3, the preferred cleanup plan for the lower eight miles of the Passaic River. We support Alternative 2 as the cleanup plan for the River. This contamination has been posing risks to both human health, marine ecosystem, and the community for far too long. The New Jersey Sierra Club is calling for a full removal of the contamination to restore the environment and protect public health.

We had hoped that the EPA's plan would finally end this long toxic nightmare. We believe that EPA and others groups are pushing for Alternative 3, which will not clean up the River and instead cap the River. This makes absolutely no sense because capping a moving river will not last for generations. We believe this capping will not work and will fail. We are concerned that River flooding and scouring will erode or cause the cap to fail washing toxic sediments into the river.

We believe that the cleanup has to be complete and not just remove hot spots and capping. The New Jersey Sierra Club fully supports Alternative 2, which will completely clean up the River while we believe the other Alternatives will not. Alternative 2, which is a full bank to bank dredging of the lower 8.3 miles to depths of 12-30' that would totally remove the contaminants and permit boating to return to its pre-1950 levels. This Alternative would not only completely clean up the River, but allow for boating and shipping which will help to bring back communities along the Passaic River especially in Newark. Alternative 2 also holds the polluters fully responsible and is truly a Restoration of the Passaic River.

We oppose the preferred Alternative 3. We believe this proposal would not work since they are only going to dredge down a few feet leaving most of the contaminated sediment behind. Then putting an unproven mesh, stone, and sand on top of the sediment they left behind. We believe this will not work because of flooding and scouring of River. Also underwater springs and tidal influences will also undermine the caps. Capping is being proposed because it is cheaper, but will not last since ultimately the caps will fail. This Alternative would also require regular costly maintenance. Alternative 3 would also not promote shipping or boating in the area because of a no

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build, no wake, and no wake policy to protect the cap. We have already seen area where they have done this with this type of capping being swept away at the 10.9 in Lyndhurst.

The only real remedy is removal and disposal of this contaminated River. It will bring the River back to life and allow the public to use the River that belongs to all of them. As we work to restore the river having tons of contamination under this cap is a recipe for failure. If they are doing this in the most contaminated part of the River where the most problems are we are concerned there will not be an adequate cleanup for the other 9 miles. We are concerned that EPA is looking at what is most cost effective for the polluters not what is best for the people or the River.

We need to clean the river edge to edge to remove all the dioxin as well as PCBs, heavy metals, mercury, and toxins. We need a thorough clean up that will help return the River back to the community and right now EPA's preferred proposal will not do that. Only Alternative 2 will fully restore the Passaic River.

Yeh, Alice

From: Nicole Dallara <nicole.dallara@sierraclub.org>
Sent: Wednesday, August 20, 2014 11:26 AM
To: Region2 PassaicLower8MileComments
Subject: Comment on Passaic River Lower 8 Miles Proposed Cleanup
Attachments: LowerPassaicComments.doc

Ms. Yeh,

Attached please find the New Jersey Sierra Club's comments on the proposed cleanup of the Lower 8 miles of the Passaic River. Thank you.

--
Nicole Dallara, Outreach Coordinator
New Jersey Sierra Club
145 W. Hanover Street
Trenton, NJ 08618
609-656-7612
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Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 18, 2014 5:18 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Glenn Davila
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3122 Fire Rd, Ste 202
Egg Harbor Twp
Nj
08234

609-646-0414

NATIONAL RAILROAD PASSENGER CORPORATION
Office of the General Manager
Northeast Corridor Services
400 West 31st Street
5th Floor
New York, NY 10001

August 19, 2014

Ms. Alice Yeh
Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

EMAIL SUBMISSION: PassaicLower8MileComments.Region2@epa.gov

Dear Ms. Yeh:

The purpose of this communication to is to provide Amtrak's formal comments on the EPA's Focused Feasibility Study (FFS), the agency's proposed plan for the lower eight (8) miles of the Passaic River. Our review of the FFS indicates that 4.3 million cubic yards of sediment from the lower eight (8) miles of the Passaic River will be removed and the remaining river sediments will be capped. According to the proposed plan, it is estimated that the project will take at least five (5) years to complete.

We believe that one key community element was completely neglected in the FFS evaluation process: Impacts to passenger rail are not discussed in this document. This dredging project will impact hundreds of thousands of commuters and intercity rail passengers daily due to the expected frequent bridge openings on the Northeast Corridor (NEC), which is the busiest rail line in the United States.

Amtrak owns and operates Dock Bridge, a moveable bridge that spans the Passaic River, just east of Newark Penn Station on the NEC. This bridge carries approximately 400 trains per day, including: Amtrak's Acela Express, Keystone, Regional and Long-distance trains, as well as New Jersey Transit (NJT) commuter trains from multiple lines throughout New Jersey. In addition, to Amtrak and NJT trains, PATH trains traveling between Newark and the World Trade Center also use this bridge and will be impacted by the number of openings. In short, the majority of all passenger trains travelling between New York City and Newark must cross Dock Bridge.

Amtrak's operation of Dock Bridge is governed by United States Coast Guard regulations. These regulations specify when and how the bridge must be opened for marine traffic. In order to accommodate the extremely voluminous rail traffic, Coast Guard regulations specify that Dock Bridge be closed to marine traffic weekdays between 7:20 am and 9:20 am, as well as between 4:30 pm and 6:50 pm. Outside of these rush hour restrictions, any request to open the bridge for marine traffic requires 24 hour notice to Amtrak. See, 33 CFR 117.739.

Amtrak estimates that at least 10 bridge openings a day will be necessary to accommodate EPAs proposed project schedule. It is unclear from the FFS, but if EPA was expecting to run barges during the marine traffic "blackout" periods specified in the regulations, this schedule would potentially violate federal law. Moreover, 10 bridge openings per day would result in significant delays to numerous passenger trains using this portion of the NEC. Please understand that each opening can cause delays to dozens of trains. Further, it can take hours to get the trains using the NEC back on schedule following an opening due to the heavy usage and capacity restraints in this section of the railroad.

Since Dock Bridge openings are typically scheduled on or around a high tide and given the amount of barge traffic this project will generate, passenger rail traffic between Newark and New York would likely come to a complete standstill at every high tide. This amount of disruption to intercity and commuter rail traffic is simply unacceptable. An alternate plan for transportation of spoils and capping materials must be developed for the project that takes into account its impact on intercity and commuter rail traffic. .

Amtrak also has concerns about the EPA's plan to dredge near/close to the Dock Bridge. Dock Bridge has a lateral buffer zone within which dredging cannot take place. Protection of the bridge abutment and footings, fender system, as well as the utility tunnel under the bridge must be considered in the Remedial Design.

Thank you for the opportunity to provide Amtrak's concerns and comments about the EPA's proposed plan for the lower 8 miles of the Passaic River. We look forward to receiving your reply.

Respectfully,

Michael DeCataldo
General Manager, Northeast Corridor
Amtrak

cc: Joe McHugh,
Craig Caldwell

Yeh, Alice

From: Caldwell, Craig <CaldweC@amtrak.com>
Sent: Tuesday, August 19, 2014 11:46 AM
To: Region2 PassaicLower8MileComments
Subject: FW: Dock Bridge-Passaic River Dredging
Attachments: Passaic River Dredge.pdf

Ms. Yeh

Attached are Amtrak's comments on the Passaic River FFS.

Please contact me should you have any questions.

Craig Caldwell

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 01, 2014 8:02 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Nicole Delhagen
nikkid92@yahoo.com

Yeh, Alice

From: Kluesner, Dave
Sent: Tuesday, May 06, 2014 2:23 PM
To: Region2 PassaicLower8MileComments; Yeh, Alice; Ayala, Wanda; Karlen, Delmar; Butler, Elizabeth; Schaaf, Eric; Flanagan, Sarah; Hick, Patricia; LaPadula, John; LaPoma, Jennifer; Nace, Charles; Naranjo, Eugenia; Olsen, Marian; Basso, Ray; Sebastian, Chris; Vaughn, Stephanie; Wagner, Amelia; Mugdan, Walter
Subject: EPA Passaic River Clean Up Plan

From: Enck, Judith
Sent: Tuesday, May 06, 2014 1:18 PM
To: Plevin, Lisa; Basso, Ray; Kluesner, Dave
Subject: Fw: EPA Passaic River Clean Up Plan

From: Joseph Della Fave <info@ironboundcc.ccsend.com> on behalf of Joseph Della Fave <jdellafave@ironboundcc.org>
Sent: Tuesday, May 6, 2014 4:54:27 PM
To: Enck, Judith
Subject: EPA Passaic River Clean Up Plan

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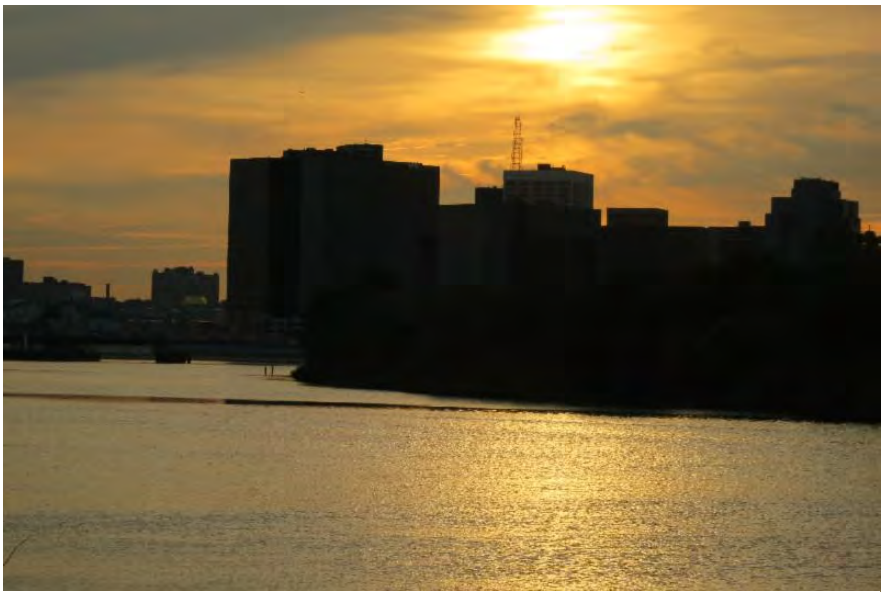

Dear ICC Family and Friends,

Ironbound Community Corporation supports the EPA's Focused Feasibility Study (FFS) and proposed COMPLETE bank to bank Passaic River cleanup with off-site disposal.

This cleanup and disposal method will be beneficial in longterm effectiveness and will reduce toxicity, ecological impacts, and risk to human health.

The EPA's preferred cleanup method consists of bank to bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two-foot cap.

In addition to cleaning the river, the plan also asks polluters to commit to providing:

- Local hiring opportunities and community benefits through projects like the Super Job Training Initiative that puts local residents to work directly on the cleanup
- Restoration of the river after the cleanup is completed

Ironbound Community Corporation strongly believes in the EPA plan ***that the companies responsible for the***

Send mail to:
317 Elm St.
Newark, NJ 07105

973-465-0555
www.ironboundcc.org

pollution do the right thing for our residents, children and community as a whole. Those of us who live and work in the area deserve a clean and healthy environment. Our children deserve cleaner, healthier and greener places to play.

Please Help!
What can you do?

1) Share the online petition with friends and family. Forward this email to your contacts.

2) Come to the EPA Public Meeting tomorrow:
Wednesday, May 7th at 7pm
55 Prospect Street (Portuguese Sports Club)
Newark, NJ 07105

3) Ask friends and family to join you at the meeting!

Your help is really needed and truly appreciated!

Questions? Please call Molly at 973-817-7013 ext. 215.
Preguntas? Llame a Cynthia al 973-817-7013 ext. 214.

Have you signed the **online petition** yet? If not, do it now!

SIGN THE ONLINE PETITION(click here)

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This email was sent to enck.judith@epa.gov by jdellafave@ironboundcc.org |
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Ironbound Community Corporation | 1 New York Avenue | Newark | NJ | 07105

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COMMUNITY CORPORATION

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Children's Center
1 New York Avenue
Newark, New Jersey 07105
973.589.6873
fax: 973.589.2479

Community Center
432 Lafayette Street
Newark, New Jersey 07105
973.465.0947
fax: 973.589.4668

Family Success Center
West
317 Elm Street
Newark, New Jersey 07105
973.465.0555
fax: 973.465.9505

Family Success Center
East
29-31 Cortland Street
Newark, New Jersey 07105
973.344.5949
fax: 973.344.0397

Early Head Start
380 East Kinney Street
Newark, New Jersey 07105
973.466.3053
fax: 973.466.3190

Judith A. Enck
Regional Administrator
US Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

August 20, 2014

Dear Administrator Enck:

Over half-a-century has passed since workers at the Diamond Shamrock facility were ordered to dump Agent Orange into the Passaic River. This act, as well as contributions of numerous toxins and chemicals from over 70 polluting companies, sealed off the Passaic River from the nearby communities, leaving behind a toxic graveyard. Year after year, residents have organized to make those responsible clean up the river.

Ironbound Community Corporation (ICC), a 45-year-old non-profit organization based in the Ironbound community of Newark, NJ, serves as Co-Chair of the Community Advisory Group (CAG) for the Passaic River Superfund Site. ICC has always advocated for a full cleanup and restoration of the Passaic River. ICC works with residents and allies to improve the quality of life in our community. This work includes fighting for environmental justice and the development of over 15 acres of park space, which has allowed the community to gain access to the Passaic River for the first time in many years. Decades after the contaminating substances were dumped in the river, our community has finally been presented with a cleanup plan.

In May of 2014, during the public comment period for the Passaic River Cleanup, hundreds of Newark residents joined ICC in attending the first public hearing following the release of the EPA's proposed cleanup plan. During the hearing, we witnessed resounding support for the EPA's preferred cleanup method, which consists of bank-to-bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the river, with a two-foot cap and off-site disposal of contaminated sediment. We believe this proposed approach to the cleanup and disposal will be beneficial with respect to long-term effectiveness, and that it will reduce toxicity, ecological impacts, and the risk to human health. Our hope is that this bank-to-bank cleanup will deliver environmental and economic benefits to the communities surrounding the river for generations to come.

While we believe that any remedy short of complete removal of contamination will fall short of reaching a truly just solution, we do understand that there will be trade-offs in a project of this scope. We believe that the EPA's proposed plan will allow our community to safely enjoy the river and benefit from its economic, recreational, ecological and riverfront development opportunities. We believe that because of the EPA's commitment to working with impacted communities throughout the cleanup and restoration process, many of our concerns about the cleanup can be addressed to ensure that a restored river will connect people to the water, provide a restored ecosystem habitat, and support a wide range of benefits that communities can expect from a healthy waterway.

Please be aware that ICC does not support any plan that involves the "no action" or "hot spot removal" alternatives (Alternatives 1 and 4). The polluters profited for years from the destruction of the river and it is time that they assume responsibility for a complete bank-to-bank cleanup and full restoration of the river, as well as ensuring that there are benefits in place for the impacted communities.

The Ironbound Community Corporation supports the US EPA's proposed cleanup plan for the lower eight miles of the Passaic River. This proposal calls for Alternative #3, which includes bank-to-bank dredging to remove 4.3 million cubic yards of sediment, followed by the installation of an engineered cap and off-site disposal of the dredged materials in a certified landfill.

While we generally support this alternative, there are several critical concerns we would like to raise and ask that your agency take into consideration while moving ahead with a speedy cleanup process:

CAD and CDF Disposal

We do not support a CAD cell in Newark Bay. After the "discovery" of dioxin near the old Diamond Shamrock site on Lister Avenue, people wearing protective clothing were sent to vacuum up Agent Orange from Ironbound streets. Contamination is still entombed in perpetuity at the Diamond Shamrock site. This superfund site is a constant reminder of our toxic legacy and will forever render that section of waterfront land inaccessible. It is with this in mind that our community strongly opposes the development of a CAD cell in Newark Bay. We believe a CAD cell would be detrimental to the healthy functioning of a restored riverine habitat and could lead to the bay becoming a national dumping ground for the region's toxic sediments.

In the Focused Feasibility Study (FFS), alternative disposal options, such as thermal treatment technologies, are raised. ICC is adamantly opposed to these technologies. We recognize that there is no perfect solution to the long-term disposal of this very toxic material, and that it must go somewhere. However, our community strongly opposes incineration projects in any form and we believe, based on the evidence we have seen, that the "thermal" option is not an economically or environmentally

viable alternative. Our community has already lived with decades of dioxin contamination in the river ecosystem and we do not support any option that brings with it the stigma of being the nation's - and potentially the world's - dumping ground for contaminated sediment incineration. Turning a water pollution problem into an air pollution problem is not an acceptable solution.

We therefore express our strong opposition to any remedy that would thermally "treat" or incinerate Passaic River sediments and in particular, the development of such a facility in or near environmental justice communities like ours.

- The scale of such a facility is unprecedented and very risky. There is no facility in the world that utilizes this technology at the scale needed to treat even the smallest estimated amounts of contaminated river sediment from the Passaic River. The potential engineering failures and maintenance issues related to such a large facility pose serious risks to nearby communities. The bench scale pilots produced significant engineering and maintenance failures and illustrated the problems connected with making this type of facility operational.
- Even if operated and maintained perfectly, such a facility has the capacity to emit levels of pollution that would increase the environmental burden of already overburdened and vulnerable communities. The **cumulative impact** of multiple emissions sources in areas that are densely populated and have large concentrations of existing polluting industries makes the addition of another facility in our - or any other environmental justice community - even more problematic and poses a significant **environmental injustice**.
- The emissions from such a facility pose potential risks to human health and the environment that are unacceptable from a precautionary approach. The science of high heat intensive chemical processing facilities, such as those proposed for this scenario, is still emerging. Concerns have been raised about the potential health and environmental impacts from emissions of even small amounts of toxic chemicals, such as particulate matter, hazardous air pollutants (HAPs), VOCs, and heavy metals and nano-particles from these facilities.
- In this proposed scenario, Newark Bay could become the final disposal site for all manner of hazardous dredged materials, including Superfund sites from around the NY/NJ Harbor, such as the Gowanus Canal and Newtown Creek. For the reasons listed above, the worst scenario would be to burn any of the region's hazardous waste here.

Off-site Incineration

We understand that the Resource Conservation and Recovery Act (RCRA) rules require that some parts of the dredged material be incinerated prior to disposal. We want to be sure that this incineration will be conducted at an off-site disposal facility and that no local incineration will take place. The selected location for incineration should be held to the highest air pollution control standards.

Sediment Processing Facility
Ironbound is an environmental justice community already disproportionately burdened by numerous industrial facilities. The siting of the proposed 26- to 40-acre sediment processing facility will have a major impact on the community. We therefore offer the following comments:

- Regarding Table 3-3 in Appendix G of the FFS, community members request that EPA identify the two sites with rail access located less than two miles from the former Diamond Alkali plant, and the two sites with rail access located two- to five- miles from the plant, since these four sites seem to be the most likely sites of the sediment processing facility.
- ICC requests that EPA build a sediment processing facility that is enclosed within a building designed to minimize the impacts (noise, vibration, dust, odors) on nearby communities and residents.
- ICC recommends that, like the sediment processing facility used in Phase I of the cleanup, this facility be completely decommissioned following completion of the project and that it not accept or process sediments from other cleanup projects.
- Should the facility not be decommissioned and is instead sold or used for another purpose, the community must be notified and there must be a process for public input.

Quality of Life Impacts During Construction
During Phase I of the cleanup, ICC worked with the EPA to ensure that lines of communication remain open to ensure that quality of like impacts be held at a minimum and that if they did occur, residents would be informed of who to contact to have their concerns addressed. We know that noise, traffic, closed-off areas of the river, and other activities will cause significant quality of life impacts on local communities during the cleanup phase. However, we want to ensure that proper planning and community interaction is carried out, in order to mitigate such impacts.

The EPA should develop comprehensive Quality of Life Performance Standards such as those implemented at the Hudson River site, in coordination with the CAG and local groups from the lower river communities. Regular communication will be critical for the community to understand the activities, impacts, and progress markers of this complex and lengthy process. and manage interaction with key activities over time. We request that the EPA ensure the following:

- Explain the plans for mitigating quality of life impacts on local communities and interact with local communities to provide needed information throughout the project.
- Share the plans with the City of Newark's Office of Emergency Management, the Newark Environmental Commission and local libraries.
- Work with ICC to make sure that information is shared with the community in an accessible way, and especially that information be made available in Spanish, English, and Portuguese.

- Traffic is a key component of any major project, and for our community truck routes are extremely important. We ask that EPA work with ICC to minimize the impact of truck traffic and require that trucks and construction equipment be the cleanest technology available.

Community Benefits Agreement
It is of great importance to ICC that local residents access jobs on the cleanup. The experience during Phase I, in which ICC coordinated the Superfund Jobs training program (Super JTI) was successful. We request that during this next phase, local residents be able to train for and access jobs of greater responsibility and better pay. ICC would like to see a continuation the community benefits initiated during Phase I of the cleanup, in which local businesses were utilized wherever possible.

- The EPA should encourage, to the extent possible, local contracting, hiring and procurement during the lower eight miles cleanup phase.
- EPA and the Cooperating Parties Group (CPG) should establish a website similar to the Hudsonworks Marketplace (http://www.hudsonworks.net) to encourage local contracting and procurement for the project.

Reasonably Anticipated Future Use And Natural Resource Restoration
ICC is committed to continuing to advocate for restoration of the river. Future uses should be taken into account during the cleanup. Coordination should be conducted to ensure that future restoration projects are not precluded unnecessarily due to cap design and placement. Future development along the river, including waterfront parks, is a critical component of community and river recovery.

Long-Term Monitoring and Maintenance
As EPA is leaving the majority of contamination in place, the long-term maintenance of the cap will ultimately determine the actual effectiveness of the remedy. The 30-year monitoring period assumed in the FFS is insufficient, since maintenance must take place in perpetuity.

- EPA should prepare a much more robust analysis and plan with regard to how it will ensure that the cap will remain protective and effective in perpetuity. This plan must incorporate the financial, legal, and practical requirements and responsibilities for carrying out long term monitoring and maintenance.

The CPG is composed of 70 companies that will share the cost of the cleanup over several years. These companies benefitted financially by dumping their waste in the Passaic River rather than dispose of it properly. They have put our communities at risk with their behavior. We ask that there be no more delays and no more gimmicks, such as the spot removal plan they have proposed. The cleanup should begin immediately.

Sincerely,

Joseph Della Fave

Joseph Della Fave
Executive Director

Yeh, Alice

From: Cynthia Mellon <cmellon@ironboundcc.org>
Sent: Wednesday, August 20, 2014 11:04 AM
To: Region2 PassaicLower8MileComments
Subject: Passaic River Comments from Ironbound Community Corporation
Attachments: ICC_Comments_Passaic_River_Cleanup.pdf

Dear Alice:

Attached please find ICC's comments on the Passaic River Cleanup.

Best regards,

Cynthia

--
Cynthia Mellon
Environmental Justice Organizer
Ironbound Community Corporation
317 Elm St.
Newark, NJ 07105
973-817-7013, ext. 214
862-763-2903 cell

Yeh, Alice

From: Nic <nic777d@yahoo.com>
Sent: Tuesday, August 12, 2014 10:13 AM
To: Region2 PassaicLower8MileComments
Subject: Passaic River

To whom it may concern:

The EPA it needs to fully clean up the Passaic River so the people of Newark and beyond can enjoy the natural resource that belongs to all of us.
This is the first real step forward for cleaning up the Passaic River however there has to be a complete clean up not just removing hot spots and capping. I fully support Alternative 2, which will completely clean up the River while the other Alternatives will not. Thank you for your time.

Regards,
Nichole Diamond

8 August 2014

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866
Fax: (212) 637-4439
E-mail: PassaicLower8MileComments.Region2@epa.gov

Dear Ms. Yeh:

My neighbours and I strongly disagree with your plans to dredge the Passaic River from bank-to-bank up to the 8.3 mile mark in Kearny. We strongly urge you to consider the alternative plan — to attack all of the hot-spots from the 0 mile mark, up to mile 17.

I am a lifelong resident of Lyndhurst and since 1972 I have lived just a few hundred yards from the Passaic River at the 10.9 mile. This matter is of great importance to me and my family – especially with the four flood events that we've had since 1999.

I, along with my neighbours, have attended many information sessions regarding the 10.9 project that was just completed as well as the meetings regarding this new proposal. The meeting at the Passaic River Institute was the most informative. We do understand how the EPA can put forth the current proposal; especially with all of the lessons learned during the clean-up off the banks of Lyndhurst (10.9).

We urge you to not move forward with your bank-to-bank proposal that will take place from mile 0 to 8.3. Instead we beg you to take the much more practical, logical, and realistic approach and perform the clean-up of only the hot-spots; while at the same time going from mile 0 and far beyond mile 10.9 to mile 17.

I thank you for considering the more prudent choice and abandoning the current proposal.

Sincerely Yours,

Thomas A. Di Mascio
273 Park Avenue
Lyndhurst, NJ 07071
+1-201-965-9860

Yeh, Alice

From: Di Mascio, Thomas A. <Thomas.DiMascio@dcentertainment.com>
Sent: Tuesday, August 19, 2014 5:50 PM
To: Region2 PassaicLower8MileComments
Subject: comment letter from citizen of Lyndhurst
Attachments: tdimascio passaic letter.pdf

comment letter from citizen of Lyndhurst

8 August 2014
Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866
Fax: (212) 637-4439
E-mail: PassaicLower8MileComments.Region2@epa.gov

Dear Ms. Yeh:

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We urge you to not move forward with your bank-to-bank proposal that will take place from mile 0 to 8.3. Instead we beg you to take the much more practical, logical, and realistic approach and perform the clean-up of only the hot-spots; while at the same time going from mile 0 and far beyond mile 10.9 to mile 17.
I thank you for considering the more prudent choice and abandoning the current proposal.

Sincerely Yours,

Thomas A. Di Mascio
273 Park Avenue
Lyndhurst, NJ 07071
+1-201-965-9860

Yeh, Alice

From: Dinda Evans <dindamcp4@yahoo.com>
Sent: Monday, August 11, 2014 12:54 PM
To: Region2 PassaicLower8MileComments
Subject: Passaic River..please clean it up

the EPA it needs to fully clean up the Passaic River so the people of Newark and beyond can enjoy the natural resource that belongs to all of us.
This is the first real step forward for cleaning up the Passaic River however there has to be a complete clean up not just removing hot spots and capping. The New Jersey Sierra Club fully supports Alternative 2, which will completely clean up the River while the other Alternatives will not.
Talking Points:
Alternative 2 is a full bank to bank dredging of the lower 8.3 miles to depths of 20-30' that would totally remove the contaminants and permit boating to return to its pre-1950 levels.
Alternative 2 would permit new docks, boat ramps, and bulkheads to be built. No maintenance is required with Alternative 2.
Alternative 2 holds the polluters fully responsible and is truly a Restoration of the Passaic River.
Alternative 3 would cap the river and not dredge the bottom. This will not work because of flooding and scouring of River. It is being proposed because it is cheaper, but will not last since ultimately the caps will fail. Bank to bank capping has never been done before. This Alternative would also require regular costly maintenance.
The Alternative 3 capping results in no Improved Boating, a no wake policy and a no anchor policy. The River would be capped after 80 years of silting, leaving the mud flats that prevent boats to reach the shore line, except at high tide. New docks, boat ramps, bulkheads, and shoreline development would be prohibited.
Alternative 3 would prohibit yachts, passenger and sightseeing boats from bringing fans to Red Bull Stadium, the Gateway Center, NJPAC, Hampton Hotel, and nearby restaurants. The unimproved depth would prohibit the return of commercial shipping to North Newark. Capping leaves the bulk of the contaminated sediment in the River.
Dioxin is one of the most deadly substances known to man that bio accumulates in people and is known to be the most carcinogenic. Dioxin is an extremely harmful substance not only to humans, but to the ecosystem as well. The Diamond Alkali plant manufactured pesticides, weed killers, and Agent Orange, the defoliant used during the Vietnam War.
Under both state and federal law companies that discharge toxic chemicals into the environment that cause a loss of public use are assessed with Natural Resource Damages. The public fisheries, aquatic ecosystems, wetlands, rivers, and estuaries belong to all of us. When a company contaminates and prevents the use of that resource they have to pay damages.
Rivers should not be Superfund sites they should be places where people can walk along the river bank or kayak.

Vinson&Elkins

Carol E. Dinkins cdinkins@velaw.com
Tel +1.713.758.2528 **Fax** +1.713.615.5311

March 20, 2014

By Email
James E. Woolford
Director
Office of Superfund Remediation and Technology Innovation
Office of Solid Waste and Emergency Response
USEPA, Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Room S5622 Mail Code: 5201P
Washington, DC 20460

Re: Lower Passaic River Focused Feasibility Study

Dear Mr. Woolford:

On behalf of our clients, Occidental Chemical Corporation, Maxus Energy Corporation, and Tierra Solutions, Inc., we thank you for the opportunity to meet on Tuesday. We appreciated, as well, Region 2 representatives joining by telephone. As we discussed, please find attached a narrative explanation of some of the policy issues we raised and discussed on Tuesday, as well as the PowerPoint we presented at our meeting.

Mr. Ells, as we departed our meeting, observed that an evaluation of fish tissue would have been helpful in considering MNA. Please find attached a summary prepared by Arcadis of two fish tissue sampling programs approximately ten years apart, along with Maxus' proposal to conduct additional fish tissue sampling. Also, within the next few weeks our clients will submit to EPA a conceptual bioremediation approach to sediment remediation.

Finally, our clients would like to take a step back from specific concerns on the FFS and ask that EPA Headquarters consider the broader public interest, which we believe it is able to consider better than any of the other parties, including us, who are more closely attached to the Site.

In our view, the process for decisionmaking on the Passaic River fails to follow protocol and is operating on the edge of if not outside the bounds of the clear, delineated, traditional, legally-defensible Superfund process. The FFS is not a process of statute or regulation, only guidance, and even in guidance, such a process was only intended for much smaller, less technically and legally complex sites. And the RI/FS for the same stretch of river, and importantly, upstream portions that should likely be cleaned up ahead of downstream stretches to avoid recontamination, is likely to be completed shortly after the release of the FFS, confusing matters and likely causing further complication and contradiction. We fear that the RI/FS itself is biased in that it is being led by a subset of PRPs attempting to avoid or drastically minimize their own liability by developing a technical document that focuses only on dioxin and not on the other key COCs in the River, including PCBs, mercury, and PAHs. Hundreds of millions of dollars have been spent on studies, litigation, and public relations, while relatively little has been spent on actual remediation, other than the work Maxus funded on the OU1 site itself and the first phase of sediment removal.

Our clients respectfully ask that EPA Headquarters work with all parties, including us, to determine in a time-limited, focused way, if the entire process of decisionmaking could not be re-engineered to lead, in the long run, to better, faster, more widely-supportable, defensible remedial decisions. We believe that if all parties stay with the current course, the PRPs will have little alternative but to challenge the remedy in every way possible. Our clients would much prefer to expend their resources in actual remediation. To date, unfortunately for the public and the citizens of New Jersey and the residents along the River, too much money has been spent on transaction costs rather than environmental remediation and restoration.

Our clients propose that EPA Headquarters create no more than a three-month "time out" to review the entire process for remedial decisionmaking on the Passaic River. We understand that EPA and other parties at other sites have developed collaborative, mission-driving, efficient processes to improve collaboration, reduce conflict, increase efficiency, and speed remedial decisionmaking. While they recognize that this mega site is particularly complex in every way, our clients believe it in the public interest to take a bounded "time

out" to seek a better way forward. It is our understanding that EPA has access to the best mediators and process experts in the country when it comes to Superfund cleanup through a blanket five-year contract under EPA's Conflict Prevention and Resolution Center. We are aware that EPA has successfully used alternative dispute resolution to improve decisionmaking at many sites across the country. We propose that the RPs fund, via EPA through this contract, to immediately retain two or three of the best Superfund mediators in the country to conduct a conflict and process assessment.

Through this time-limited, intensive intervention, the conflict resolution professionals could assist all of us in:

1) interviewing confidentially the parties' principals and in-house counsel only (EPA Headquarters, EPA Region 2, New Jersey DEP, New Jersey Governor's Office, City of Newark, Occidental/Maxus/Tierra Solutions, and key members of the Cooperating Parties Group (CPG);

2) exploring with these entities ideas for re-engineering the current set of relationships, processes, organizations, and interactions to increase information, decrease or mitigate conflict, separate more clearly remedial decisionmaking from contentious allocation decisions, minimize redundancies and concurrent processes, leverage joint resources, and speed decisions to remedial action;

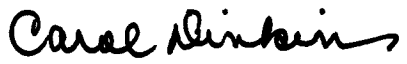
3) sharing the results with all parties, in draft, in writing, with process recommendations and options; and

4) convening at least one well-organized, well-structured, mediated "no commitments" workshop among these entities to explore and consider these recommendations.

Our clients do not want to be the entities with key interests left outside the key decisions affecting the cleanup of this site and be forced to expend their resources almost solely on defense, litigation, alliance building, lobbying and self-protection. Rather, they would much prefer to be part of a re-imagined process that can much better serve the public interest.

We are available to answer follow-up questions, if there are any. Thank you again for your courtesy, time, and consideration.

Yours very truly,



Carol E. Dinkins

Attachment

cc: Steve Ells
Walter Mugdan
Eric Schaaf

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March 20, 2014

Policy Issues Raised by the Prospect of an FFS for the Lower Passaic

1 - The Use of an FFS for Remedy Determination for the Lower 8 Miles of the Lower Passaic River ("LPR") Is Inconsistent with the National Contingency Plan

An FFS is a tool used by EPA to expedite CERCLA cleanups when a presumptive remedy or interim action will be employed. As explained in more detail below, FFSs have been used in limited circumstances where there are few technical issues surrounding a remedial action or to implement interim remedies while a detailed environmental investigation is completed. A remedy of the scale contemplated by the LPR FFS—some combination of dredging and capping eight miles of river, at a cost estimated to range between $400 million and $3.5 billion or more, to be implemented over the course of many years—should be evaluated and selected through CERCLA's well-established RI/FS process, rather than characterized as an "interim remedy" subject only to an abbreviated FFS process. The scale of two of the three remedial alternatives (the only alternatives considered in the draft FFS in 2007) being considered by Region 2 goes far beyond anything ever developed through an FFS process. If implemented, either of those two proposed alternatives would constitute one of the largest, if not the largest, sediment remedy ever selected by USEPA. Region 2's proposed course reflects a misuse of the FFS process, which was conceived and intended for truly focused work, not to prematurely select a final remedy for eight miles of an urban river immediately prior to the scheduled completion of an RI/FS that has been under preparation for 20 years, a testament to the need for extensive data collection and analysis at the Site. That it is taking Region 2 seven years to finalize the FFS underscores the complexity of developing remedial alternatives for the LPR, the unsuitability of an FFS to do so, and the need for EPA to comply with the NCP.

There is no precedent for Region 2's decision to proceed with an FFS for the lower eight miles of the Passaic. In fact, an examination of the origin of the FFS and USEPA's past practice in using an FFS as part of a CERCLA cleanup demonstrate that the use of an FFS in the lower Passaic is inconsistent with USEPA's policy and practice. For a cleanup as large and complex as that being contemplated for the Passaic, a full RI/FS is necessary before a remedial action may be selected. As explained below, the FFS is a tool of USEPA's invention

that is not governed by the NCP. Region 2's use of an FFS in the lower eight miles of the Passaic appears to be an attempt to advance Region 2's preferred remedy of dredging without thorough consideration of the data being collected in the ongoing RI/FS, thereby circumventing the requirements of the NCP. Importantly, major portions of the FFS are incomplete, unpublished, unreviewed, and possibly have not even been initiated. This consideration is particularly salient given the uncertainties surrounding the question of how much to dredge and where; what risks will be associated with re-entrainment of contaminated sediment; and the apparent absence of sufficient evaluation of natural attenuation, costs, and disposal option difficulties.

The term "focused feasibility study" is not found in the NCP. The first use of the concept appears to be in USEPA's 1994 Guidance on Accelerating CERCLA Environmental Restoration at Federal Facilities. This guidance memorandum was intended to support the "accelerat[ion] and develop[ment of] streamlined approaches to the cleanup of hazardous waste" at federal facilities. The guidance memorandum encourages the development of presumptive remedies as standardized methods to approach similar or recurring contamination problems. The guidance states that "[f]ollowing site characterization, a focused Feasibility Study (FS) or Engineering Evaluation/Cost Analysis (EE/CA) may be sufficient when employing the presumptive remedy approach." Notably, the USEPA's 1994 Guidance was issued to provide specific guidance for federal facilities as a companion to the earlier OSWER Directive 9203.1-03 for privately-owned facilities (USEPA, 1992). This earlier directive mentions neither presumptive remedies nor the use of an FFS.

It does not appear that USEPA has issued any subsequent guidance on why and when it is appropriate to initiate an FFS rather than an FS. An evaluation of USEPA practice reveals that the use of the FFS process has grown over time to exceed the limited circumstances outlined in the USEPA's 1994 guidance memorandum. A review of USEPA's practice reveals three primary situations in which the FFS has been used:

1. <u>Interim Remedial Actions</u>: FFSs have been used to evaluate alternatives for interim remedial actions in situations where a full remedy will follow. However, when an FFS is used to implement an interim remedy, it is critical that any actions taken under the FFS be consistent with the broader RI/FS.

2. <u>Implementation of a Presumptive Remedy</u>: The use of the FFS outlined in the original USEPA guidance memorandum was for the implementation of a presumptive remedy. Presumptive remedies are implemented at sites where there are not significant, site-specific technical issues that require evaluation before implementation of a remedy.

3. <u>Implementation of a Remedy at a Similarly-Situated Operable Unit (OU) within a Larger Site</u>: When significant amounts of data have been obtained and

analyzed during previous RIs, Remedial Designs (RDs), or RI/FSs performed at other OUs at a site, an FFS may be used to implement a remedy at a newly-addressed, similarly situated OU. In practice, an FFS will only be used at a later OU when a full RI/FS has already been conducted for the similar, earlier remediated OU.

Each of these applications demonstrates that the FFS can be an important tool to increase efficiency and decrease costs when further data collection and analysis are not required to develop and choose among a set of remedial alternatives. However, this is not the case in the lower eight miles of the Passaic River. At this time, the ongoing RI/FS for the LPR has yet to resolve questions regarding the distribution of contaminated sediment, pathways for redistribution of contamination, or the remedial options that will most effectively address the contaminated sediment that is present in the environment. The complexities arising from the variable distribution of contaminated sediment, scope of the study area, contaminants from ongoing sources, and the magnitude of the remedies under consideration all lead to the conclusion that the Lower Passaic River is not the type of site to which a presumptive remedy can be applied.

Furthermore, significant technical questions that will influence both the baseline risk assessment and ultimate remedy selection remain in the ongoing RI for the LPR. At the same time, Maxus, on behalf of Occidental have implemented interim remedial actions in the LPR. Given that the areas of greatest concern are already being addressed and significant technical issues remain unresolved, an FFS is not justifiable for the lower eight miles of the Passaic River. At least one of the alternatives being considered under the FFS may well not be consistent with the FS preferred remedy for the entire LPR, given that they involve bank-to-bank dredging and the FS remedy may involve targeted dredging. Additionally, the RI/FS remedy may require some form of upland or upriver actions to control ongoing sources of contamination that impact the lower eight miles of the River. An FFS performed before the RI/FS is completed for the entire LPR could obstruct the final process and is inconsistent with the NCP and USEPA guidance. In addition, the FFS deprives the PRPs the opportunity to meaningfully participate in the RI/FS process as provided in the RI/FS guidance before selection of significant and costly remedial actions.

There is substantial risk that, if Region 2 acts on the basis of the abbreviated FFS process, it will select an alternative that will fail, partially or fully, to achieve the desired risk management objectives and/or will be inconsistent with the final remedy determined from the full RI/FS. These considerations suggest that Region 2 should allow the RI/FS process to continue on its schedule and not divert resources to the FFS that would later have to be amended to conform to the RI/FS. Rather than select a final remedy in the guise of an “interim action” based on an abbreviated process, Region 2 should develop a measured approach based on the full RI/FS, which will allow Region 2 to implement a logical, iterative action plan for the entire 17 miles of the River.

2 - Region 2 has not adequately considered the ability of dredging to meet risk-based goals or the alternative of monitored natural recovery.

Environmental dredging is a complex and expensive process that does not always meet- and may actually delay or impede- environmental risk reduction goals. Based on the information provided in the FFS Summary, it is not clear that Region 2 has adequately considered the challenges associated with implementation of environmental dredging or the benefits of monitored natural recovery (MNR) as an alternative.

MNR consists of allowing natural processes to reduce sediment contamination below risk levels. Enhanced monitored natural recovery (EMNR) broadcasts coarse-grained materials over the sediment surface to accelerate the process of natural recovery. USEPA guidance states "[d]ue to the limited number of cleanup methods available for contaminated sediment, generally, project managers should evaluate each of the three potential remedy approaches (sediment removal, capping, and MNR) at every sediment site. At large or complex sites, project managers have found that alternatives that combine a variety of approaches are frequently cost effective (USEPA 2005). It is not clear that Region 2 considered MNR as a stand-alone remedy that could avoid the challenges posed by environmental dredging.

Remedial alternatives that rely primarily on dredging to achieve risk-based goals have demonstrated limitations as a result of the effects of sediment resuspension and residuals (Bridges et al. 2010), and the timeframes for reaching acceptable risk levels at the site may span decades. These considerations must be accounted for in the development and evaluation of the alternatives. When a Feasibility Study is performed, each potential alternative must have a remedy-specific risk assessment to determine to what extent levels of risk will be reduced and/or <u>how long it will take to reach remediation goals.</u> Many sediment sites can reach targeted risk levels over time via MNR or enhanced MNR without the additional risks created by dredging and associated resuspension. The agency recognizes the use of MNR as an appropriate alternative for Superfund sites, especially where remediation costs are extremely high, as is the case here.

If many sediment remedies (even no further action) can result in achievement of remediation goals over time, the decision maker needs to balance the cost of different alternative remedies against the time it will take to achieve such goals. As there are no hard and fast rules governing the timing to achieve remediation goals, it becomes a judgment of the decision maker to decide how much money is too much to reduce the time it takes to meet remediation goals.

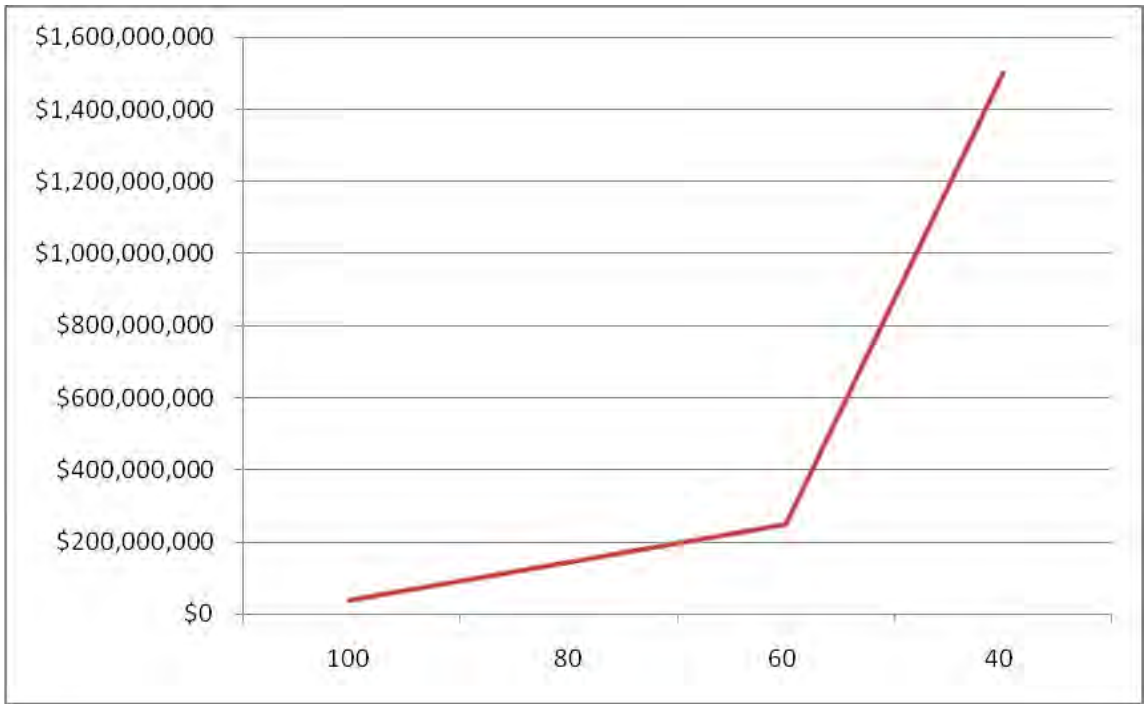
The issue to be considered is whether it is good public policy to require the expenditure of huge amounts of dollars for the deep dredging or bank-to-bank dredging and capping remedies to achieve remediation goals if it takes "x" years,

when perhaps a much less costly MNR or EMNR remedy will only take “y” years longer?

Below please find a **hypothetical** example of a type of analysis that would be useful to explore in a Feasibility Study for such a large remedy.

Since there are no hard and fast rules governing the timing to achieve remediation goals, it becomes the reasoned judgment of the Superfund remedy decision maker in deciding the cost effectiveness of spending substantially more moey in the hope of reducing the time to achieve remediation goals by x years.

The following chart illustrates this concept:



The x - axis depicts years to reach remediation goals. The Y axis is remedy cost beyond MNA cost. The $0 line is the MNA remedy. One can see that one will spend $250M more than MNA costs to shorten achievement of compliance 40 years (100-60 years), but must spend $1.25 Billion to shorten compliance achievement by another 20 years (60-40 years).

This type of analysis is crucial to sound decision-making for a complex, expensive and multi-year remedy.

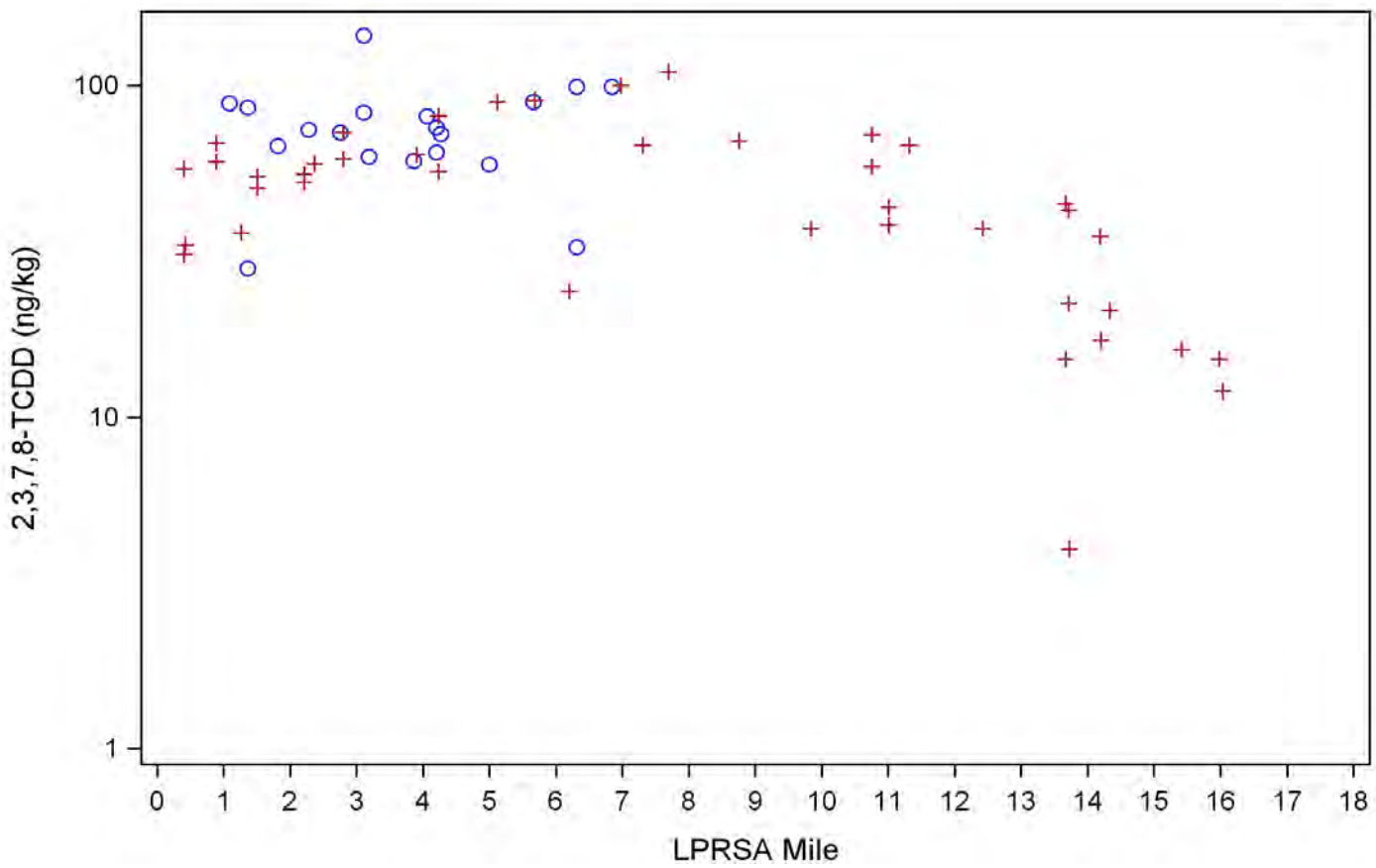
Thomas C Voltaggio
March 20, 2014

Briefing on Fish and Crab Tissue Data in the Lower Passaic River Study Area Relative to Decision-Making in the USEPA's Revised Focused Feasibility Study (FFS)

The available fish and crab tissue chemistry data for the Lower Passaic River Study Area (LPRSA) are not sufficient to appropriately and reasonably evaluate any spatial or temporal trends in the concentrations of chemicals of concern. Nearly all of the fish and crab tissue data were collected during only two sampling periods---1999/2000 (Tierra/USEPA) and 2009/2010 (CPG/USEPA). For each of these sampling events/periods, the species and spatial area of the river sampled differed. In 1999/2000, Tierra sampled only the lower 6 miles of the LPRSA, and collected primarily marine/estuarine species. In 2009/2010, the CPG focused primarily on the upper 11 miles of the LPRSA and collected primarily freshwater/estuarine species. The CPG collected some data from the lower 6 miles of the LPRSA in 2009/2010 for three of the edible fish/shellfish species that were sampled by Tierra in 1999/2000. These species include white perch (resident fish species), American eel (migratory fish species), and blue crab (resident shellfish species). The summary statistics for concentrations of 2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin (TCDD) and total polychlorinated biphenyls (PCBs) in these species are provided in Table 1 for the entire LPRSA, and Table 2 the lower 8 miles of the LPRSA only.

Because there are limited tissue data from only two time periods to compare, it is not possible to conduct a reasonable statistically-based evaluation of potential trends in chemical concentrations. However, in looking at the averages for the LPRSA as a whole and the lower 8 miles only for these species (Tables 1 and 2), it appears that there may be a downward trend in the overall concentrations of both TCDD and PCBs. Figures 1 and 2 show blue crab TCDD and total PCB data by river mile and time period for the LPRSA. Data for this species are the most robust in terms of sample numbers and spatial overlap between the 1999/2000 and 2009/2010 sampling events. It appears in the graphs for both TCDD and PCBs that the concentrations are generally lower in 2009/2010 than they were in 1999/2000.

Determination of whether a trend in fish and crab tissue data does or does not exist is critical to drawing any conclusions regarding future risks in the river, and for consideration related to any remedial actions. A trend analysis would require more tissue data to be collected for the same species throughout the LPRSA. Maxus proposes that such a dataset be collected in 2014, and that such data be considered in the FFS before it is issued and risk/remedial decisions are made. Maxus's consultants are presently preparing a conceptual plan for a focused 2014 tissue sampling program aimed at providing the appropriate data to conduct a tissue chemistry trends analysis. Maxus will provide this conceptual plan to USEPA for consideration next week.



Notes:
LPRSA = Lower Passaic River Study Area
ng = nanogram ; kg = kilogram
TCDD = tetrachloro-*p*-dibenzodioxin

Year of Sampling ○ 1999-2001 + 2009-2010

Lower Passaic River Study Area
Bioaccumulation Model

2,3,7,8-TCDD in Blue Crab (Whole Body Soft Tissue)

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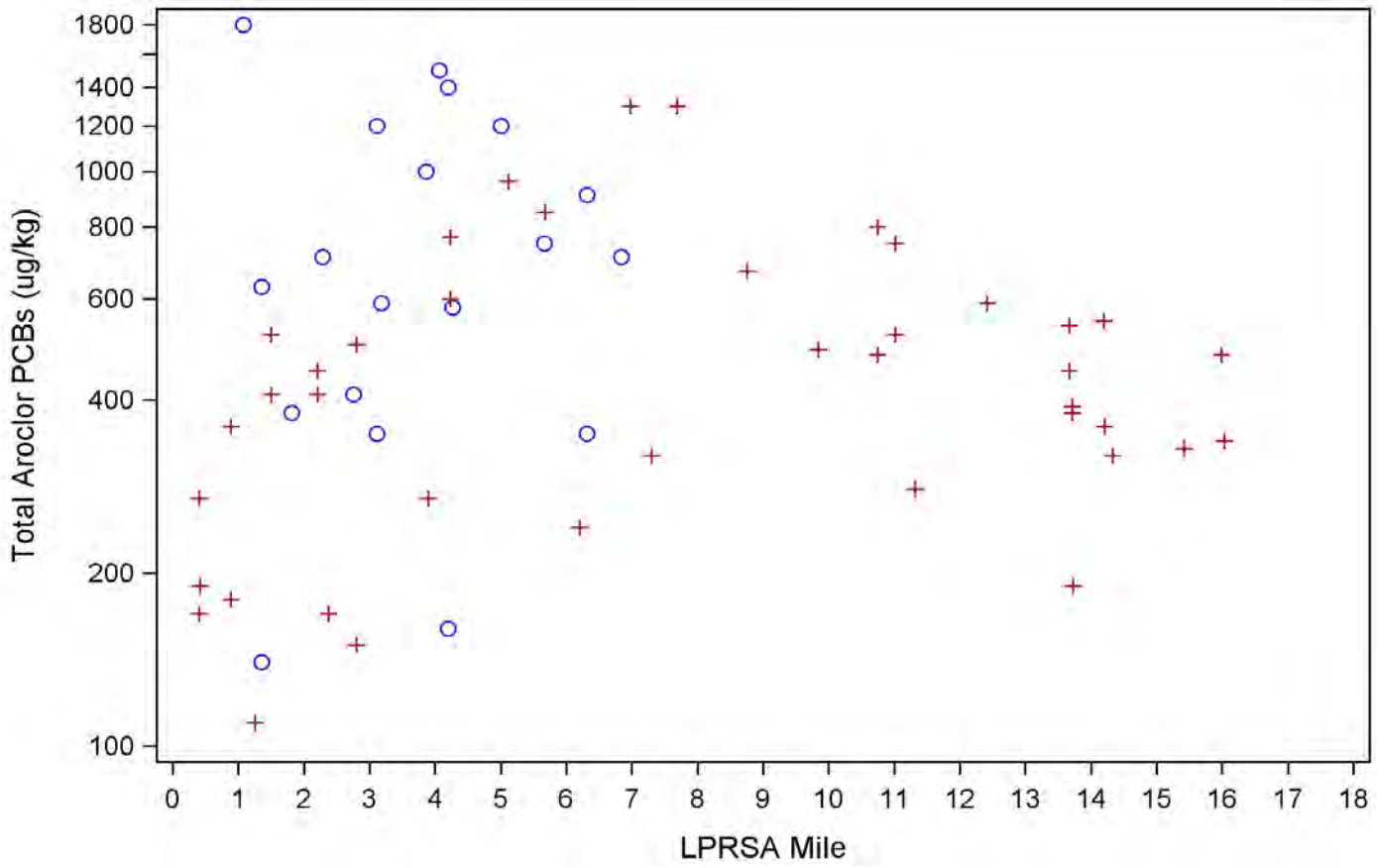
FIGURE
1



Notes:
LPRSA = Lower Passaic River Study Area
µg = microgram ; kg = kilogram
PCB = polychlorinated biphenyl

Year of Sampling ○ 1999-2001 + 2009-2010

Lower Passaic River Study Area
Bioaccumulation Model

Total PCBs (7 Aroclors) in Blue Crab (Whole Body Soft Tissue)

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FIGURE
2

Table 1. Tissue Concentrations in Selected Species Collected in the Lower Passaic River Study Area (LPRSA) by Sampling Period

Chemical	Species	Tissue Type	Sampling Period	N	Number of Detects	Frequency of Detection	Mean	Standard Deviation	Minimum	Maximum
2,3,7,8-TCDD (ng/kg)	American Eel	Fillet	1999-2001	7	7	100%	21.7	6.49	14.6	32.2
	American Eel	Fillet	2009-2010	32	32	100%	13.5	9.84	0.31	41
	American Eel	Whole Body	1999-2001	6	6	100%	9.7	6.34	4.53	20.6
	American Eel	Whole Body	2009-2010	19	18	95%	16.8	15.0	0.11	47
	Blue Crab	Hepatopancreas	1999-2001	15	15	100%	262	45.0	195	371
	Blue Crab	Hepatopancreas	2009-2010	7	7	100%	143	63.8	41	210
	Blue Crab	Muscle	1999-2001	18	18	100%	17.6	3.94	10.9	22.7
	Blue Crab	Muscle	2009-2010	21	21	100%	7.48	5.65	0.82	20
	Blue Crab	Whole Body (Soft Tissue)	1999-2001	19	19	100%	75.0	24.8	28	141
	Blue Crab	Whole Body (Soft Tissue)	2009-2010	41	41	100%	49.2	25.0	4	110
	White Perch	Fillet	1999-2001	6	6	100%	64.9	22.2	34.4	88.9
	White Perch	Fillet	2009-2010	19	19	100%	41.0	24.1	3.6	99
	White Perch	Whole Body	1999-2001	18	18	100%	212	81.1	73.6	352
	White Perch	Whole Body	2009-2010	19	19	100%	129	71.5	18.0	250
Total PCBs (ug/kg)	American Eel	Fillet	1999-2001	7	7	100%	1,624	745	670	2,800
	American Eel	Fillet	2009-2010	32	32	100%	1,185	882	310	4,900
	American Eel	Whole Body	1999-2001	6	3	50%	810	710	75	1,700
	American Eel	Whole Body	2009-2010	19	19	100%	1,849	1,681	670	7,500
	Blue Crab	Hepatopancreas	1999-2001	15	15	100%	5,513	1,958	3,200	11,000
	Blue Crab	Hepatopancreas	2009-2010	7	7	100%	3,300	1,233	1,200	5,100
	Blue Crab	Muscle	1999-2001	18	4	22%	64	22	16	75
	Blue Crab	Muscle	2009-2010	21	19	90%	31	27	3.5	100
	Blue Crab	Whole Body (Soft Tissue)	1999-2001	19	19	100%	777	467	140	1,800
	Blue Crab	Whole Body (Soft Tissue)	2009-2010	41	41	100%	473	277	110	1,300
	White Perch	Fillet	1999-2001	6	6	100%	842	179	600	1,100
	White Perch	Fillet	2009-2010	19	19	100%	551	298	190	1,300
	White Perch	Whole Body	1999-2001	18	18	100%	3,989	1,821	1,200	10,000
	White Perch	Whole Body	2009-2010	19	19	100%	2,308	1,124	470	4,200

Notes: Includes all samples collected in the river. The 1999-2001 sampling events include the 1999 Late Summer/Early Fall RI-ESP Sampling Program; the 2000 Spring RI-ESP Sampling Program; andthe 2001 Supplemental RI-ESP Biota Sampling Program. The 2009-2010 sampling period includes samples collected by the Cooperating parties group during that period. 1/2 detection limit substituted for non-detected values. Field duplicate results were averaged. Total PCB concentrations are the sum of 7 Aroclors.

Table 2. Tissue Concentrations in Selected Species Collected in the Lower Passaic River below LPRSA Mile 8 by Sampling Period

Chemical	Species	Tissue Type	Sampling Period	N	Number of Detects	Frequency of Detection	Mean	Standard Deviation	Minimum	Maximum
2,3,7,8-TCDD (ng/kg)	American Eel	Fillet	1999-2001	7	7	100%	21.7	6.49	14.6	32.2
	American Eel	Fillet	2009-2010	16	16	100%	14.9	9.91	4.70	41
	American Eel	Whole Body	1999-2001	6	6	100%	9.7	6.34	4.53	20.6
	American Eel	Whole Body	2009-2010	8	8	100%	24.8	13.2	5.70	47
	Blue Crab	Hepatopancreas	1999-2001	15	15	100%	262	45.0	195	371
	Blue Crab	Hepatopancreas	2009-2010	5	5	100%	176	34.4	130	210
	Blue Crab	Muscle	1999-2001	18	18	100%	17.6	3.94	10.9	22.7
	Blue Crab	Muscle	2009-2010	11	11	100%	11.10	5.23	3.80	20
	Blue Crab	Whole Body (Soft Tissue)	1999-2001	19	19	100%	75.0	24.8	28	141
	Blue Crab	Whole Body (Soft Tissue)	2009-2010	22	22	100%	61.6	22.1	24	110
	White Perch	Fillet	1999-2001	6	6	100%	64.9	22.2	34.4	88.9
	White Perch	Fillet	2009-2010	11	11	100%	48.9	22.5	22.0	99
	White Perch	Whole Body	1999-2001	18	18	100%	212	81.1	73.6	352
	White Perch	Whole Body	2009-2010	10	10	100%	158	45.8	73.0	250
Total PCBs (ug/kg)	American Eel	Fillet	1999-2001	7	7	100%	1,624	745	670	2,800
	American Eel	Fillet	2009-2010	16	16	100%	1,271	1086	450	4,900
	American Eel	Whole Body	1999-2001	6	3	50%	810	710	75	1,700
	American Eel	Whole Body	2009-2010	8	8	100%	2,780	2,299	760	7,500
	Blue Crab	Hepatopancreas	1999-2001	15	15	100%	5,513	1,958	3,200	11,000
	Blue Crab	Hepatopancreas	2009-2010	5	5	100%	3,900	725	3,200	5,100
	Blue Crab	Muscle	1999-2001	18	4	22%	64	22	16	75
	Blue Crab	Muscle	2009-2010	11	11	100%	40	30	17	100
	Blue Crab	Whole Body (Soft Tissue)	1999-2001	19	19	100%	777	467	140	1,800
	Blue Crab	Whole Body (Soft Tissue)	2009-2010	22	22	100%	477	353	110	1,300
	White Perch	Fillet	1999-2001	6	6	100%	842	179	600	1,100
	White Perch	Fillet	2009-2010	11	11	100%	649	319	190	1,300
	White Perch	Whole Body	1999-2001	18	18	100%	3,989	1,821	1,200	10,000
	White Perch	Whole Body	2009-2010	10	10		2,630	748	1900	4,200

Notes: Includes only samples collected below LPRSA river mile 8. The 1999-2001 sampling events include the 1999 Late Summer/Early Fall RI-ESP Sampling Program; the 2000 Spring RI-ESP Sampling Program; andthe 2001 Supplemental RI-ESP Biota Sampling Program. The 2009-2010 sampling period includes samples collected by the Cooperating parties group during that period. 1/2 detection limit substituted for non-detected values. Field duplicate results were averaged. Total PCB concentrations are the sum of 7 Aroclors.

Vinson&Elkins

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March 31, 2014

James E. Woolford
Director
Environmental Protection Agency
Office of Superfund Remediation and Technology Innovation
1200 Pennsylvania Avenue, N.W.
Room S5622 (MC5201P)
Washington, DC 20460

Dear Mr. Woolford:

In our letter of March 20, 2014, we noted an observation of Mr. Steve Ells concerning the amount of fish tissue data that exists for the Lower Passaic River, in response to which we submitted Maxus' proposal to conduct additional fish tissue sampling. At Maxus' request, its consultant, ARCADIS, has prepared a conceptual sampling plan for fish and crab, which is enclosed. Our clients, Occidental, Maxus and Tierra, would appreciate the opportunity to meet with you and Mr. Ells to discuss the plan and receive feedback and questions.

We look forward to hearing from you.

Very truly yours,

Carol Dinkins

Carol E. Dinkins

cc: Walter Mugdan
Steve Ells
Eric Schaaf

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MEMO

To:
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Jen Bryz-Gornia, ARCADIS
Shannon Dunn, ARCADIS
Jackie Iannuzzi, ARCADIS

From:
Tim Iannuzzi

Date:
March 26, 2014

ARCADIS Project No.:
B0009968.0000.00001

Subject:
Conceptual Fish and Crab Sampling Plan for Lower Passaic River Study Area

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This technical memorandum (memo) presents a proposed plan and approach for the collection of fish and crab tissue data in the Lower Passaic River Study Area (LPRSA) in 2014. The LPRSA includes the tidal portion of the Passaic River from its confluence with Newark Bay upstream to the Dundee Dam—approximately 17 river miles (Figure 1). In June 2007, a group of 73 potentially responsible parties, named the Cooperating Parties Group (CPG), entered into an Administrative Order on Consent (AOC) with U.S. Environmental Protection Agency (USEPA) to conduct the Comprehensive Environmental Response, Compensation and Liability Act – Water Resources Development Act Remedial Investigation/Feasibility Study for the LPRSA (USEPA 2007). Subsequent to the CPG entering into the 2007 AOC, USEPA and other agencies developed a draft Focused Feasibility Study (FFS) to evaluate the need to undertake an early action in the lower 8 miles of the river. This FFS process is ongoing, with a subsequent report set to be released by USEPA in the near future. This memo has been prepared to describe a data collection program to fill a known data gap that would inform the pending FFS. It presents a conceptual sampling plan to collect additional fish and crab tissue data for the primary chemicals of concern (COCs) in order to conduct statistical trends analysis for biota tissue chemistry data in the LPRSA. The need and justification for such a program is described herein, along with the details of a sampling program that can be implemented in 2014.

Background

Nearly all of the fish and crab tissue data available for the LPRSA were collected during only two sampling periods: 1999-2001 (Tierra Solutions, Inc. [Tierra]/USEPA) and 2009/2010 (CPG/USEPA). For each of these sampling events/periods, the species and spatial area of the river that was sampled differed. In 1999-2001, Tierra sampled the lower 6 miles of the LPRSA and collected primarily marine/estuarine species. In 2009/2010, the CPG focused primarily on the upper 11 miles of the LPRSA and collected mostly freshwater species (e.g., catfish). The CPG collected some estuarine data from the lower 6 miles of the LPRSA in 2009/2010 for three of the edible fish/shellfish species that were sampled by Tierra in 1999-2001: white perch (*Morone americana*), a resident fish species; American eel (*Anguilla rostrata*), a migratory fish species; and blue crab (*Callinectes sapidus*), a mostly resident shellfish species.

Because there are limited tissue data from only two time periods, some of which lack spatial overlap, it is not possible to conduct a defensible statistically-based evaluation of potential trends in chemical concentrations. However, in looking at the averages for the LPRSA as a whole and the lower 8 miles only for these species[1], it appears that there may be a downward trend in the overall concentrations of both TCDD and PCBs. Figures 2 and 3 show blue crab TCDD and total PCB data by river mile and time period for the LPRSA. Data for blue crab are the most robust in terms of sample numbers and spatial overlap between the 1999-2001 and 2009/2010 sampling events. Figures 2 and 3 appear to indicate that both TCDD and PCB concentrations are generally lower in 2009/2010 than they were in 1999-2001; however, a third dataset is needed to confirm the trend.

Determination of whether a statistically significant trend in fish and crab tissue data does or does not exist is critical to drawing any conclusions regarding future risks in the river, and for consideration related to any remedial actions. The present datasets are insufficient for this purpose. For this reason, the release of the FFS with proposed risk-based remedial actions that are primarily focused on reductions in COCs in fish and crab tissue in the LPRSA is premature. Instead, the FFS should be postponed until another biota tissue dataset can be collected, and a statistical evaluation of any trends is performed. A trend analysis will require more tissue data to be collected for the same species and primary COCs as were collected in both the previous time periods (1999-2001 and 2009/2010) throughout the LPRSA. Assuming these data are collected this calendar year, the dataset would represent additional fish tissue concentrations 4 to 5 years newer than the latest dataset and provide important information about potential spatial and temporal trends in tissue concentrations. The conceptual plan for fish and crab sampling in the LPRSA is presented in the remainder of this memo. Because we have the collective knowledge regarding successful fishing/crabbing methods and locations, and related Quality Assurance Project Plans (QAPPs) and reports from the previous two LPRSA programs, it will be fairly straightforward to develop a detailed QAPP and

[1] The summary statistics for concentrations of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) and total polychlorinated biphenyls (PCBs) in these species are provided in Table1 for the entire 17-miles of the LPRSA, and Table 2 for river mile (RM) 0 to RM 8 only.

related documentation for this sampling plan, in order to expedite its approval by USEPA and its Partner Agencies, and the mobilization for and implementation of the sampling program in 2014.

General Sampling Design

The objective of this sampling plan is to collect fish and crab tissue from the LPRSA to evaluate potential statistical trends in COC concentrations from data representing different timeframes. In addition to evaluating potential spatial and temporal trends in COCs, human health risk, ecological risk, and possible remedial alternatives within the LPRSA, will also be evaluated using the new data. This tissue sampling event can be conducted any time between the late spring and early fall of 2014. A goal of this program is to maintain consistency in the types of species/tissue types that have been collected/analyzed in the past programs, and the (successful) sampling approaches used to obtain the historic samples.

The tissue sampling and analysis program proposed herein includes targeting several species of fish and shellfish that were sampled in the previous two programs. The target species were chosen based on their relative importance to assessing potential human health and ecological risk, and their relative abundance in the LPRSA (i.e., those species that have been shown to be most widespread and abundant in the river during the two historical sampling events). Target species include catfish, a benthic omnivore; white perch, an epibenthic/pelagic invertivore; American eel, a demersal piscivore; and blue crab, a benthic omnivore. These species have been collected throughout the LPRSA in substantial numbers and represent species consumed by both humans and wildlife. Tissue samples will consist of composites of multiple fish or crabs [2] of the same species to provide sufficient tissue mass for chemical analysis and for consistency with the previous USEPA-approved 1999-2001 Ecological Sampling Program (ESP; Tierra 1999) and the CPG's Tissue Sampling for the entire 17-mile stretch of the river (Windward 2009a,b).

The general sampling design divides the LPRSA into two major zones according to surface water salinity: the estuarine zone (RM 0 to RM 8) and the freshwater zone (RM 8 to RM 17.4). Each zone is subdivided into 2-mile river reaches and sampling locations are allocated among these reaches. Sampling locations will be located within each 2-mile river reach in areas of known or likely habitat based on results of the 2010 field reconnaissance (Windward 2013) and prior field sampling events (Tierra 1999; Windward 2010, 2011). This will ensure that tissue samples targeted in each zone are collected spatially throughout the zone. Figures 4a and 4b depict previous samples collected from the estuarine zone (Figure 4a) and freshwater zone (Figure 4b), and show the breakdown of the sampling reaches within each zone. A breakdown of the major zones, reaches and river miles is as follows:

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[2] Composite tissue sampling provides a cost-effective approach for developing an estimate of the mean concentration of chemicals in tissue (USEPA 2002), is consistent with the human health risk assessment data use objective of estimating mean concentrations in tissue consumed by humans over a long-term period of exposure (USEPA 1989a, 1989b, 2000), ensures sufficient tissue mass for the program's extensive analytical requirements, and provides comparability with the sampling that was conducted under the ESP and CPG programs.

Zone	Reach	River Mile
Estuarine	1	0 – 2
	2	2 – 4
	3	4 – 6
	4	6 – 8
Freshwater	5	8 – 10
	6	10 – 12
	7	12 – 14
	8	14 –17.4

The target sampling area for all species will focus on localized habitat areas (i.e., areas with a radius of approximately 100 ft). At least two target sampling locations will be sampled in each reach based on the locations identified by CPG and so that sampling locations are distributed evenly per zone; however, additional sampling areas may be identified in the field in order to collect sufficient numbers of fish to meet the tissue mass requirements. Composites will be created for each target tissue type and analyzed separately. The number of individuals in a single composite will be based on analytical mass requirements.

A full suite of chemical (COC) analyses will be conducted on the tissue samples. These include metals[3] (including mercury and methylmercury), organochlorine pesticides (excluding toxaphene), butyltins, PCBs (Aroclors and 209 individual congeners), dioxins/furans, semi-volatile organic compounds, polycyclic aromatic hydrocarbons (PAHs; excluding alkylated PAHs), percent moisture, and lipid content. Herbicides and volatile organic compounds (VOCs) will not be analyzed. All analyses will have low level detection limits, which will be identified in advance in the (QAPP).

Target tissue types for the human health risk assessment (HHRA) include fish fillets, edible crab muscle, and hepatopancreas composite samples. Target tissue types for the ecological risk assessment (ERA) include whole-body fish and whole-body crab (all soft parts without shell). To meet the needs of both risk assessments with one sampling event, catfish fillets will be analyzed separately from the remaining tissue (carcass). Catfish fillet chemical concentrations then will be combined mathematically (proportionally to the average weight of the species) with carcass chemical concentrations to compute whole-body concentrations. This is consistent with the USEPA-approved approach used in the 2009/2010 CPG sampling program and will reduce the number of catfish samples required for analysis. Because white

[3] Metals analysis will include the following metals: aluminum, antimony, arsenic (total and inorganic), barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, titanium, vanadium, zinc.

perch and American eel are anticipated to be more abundant throughout the river than catfish, separate fillet and whole-body composite samples will be analyzed.

A maximum number of sampling attempts per location will be established; however, it may not be possible to collect adequate tissue mass at each specified sampling location to constitute a full analytical sample. In such cases, Tierra will work closely with USEPA during sampling to make decisions regarding compositing. If insufficient tissue has been collected after the maximum number of attempts, the target area will be expanded, or alternative species may be collected, depending on the fish catch. Tissue from different species will not be combined. After additional attempts have been exhausted, a chemical prioritization scheme will be employed for the analysis of the volume of tissue collected. Some sampling locations may need to be relocated or abandoned.

Estimates of Sample Size

When sampling an aquatic system the size of the LPRSA, reasonable estimates of the distribution of chemical concentrations in fish and shellfish tissue are needed to estimate potential risks to wildlife and humans that may consume them. To determine the number of samples sufficient for the sampling objectives, ARCADIS conducted statistical evaluations using the existing fish and shellfish tissue datasets from the 1999-2001 ESP and 2009/2010 CPG tissue sampling programs in the LPRSA.

Sample sizes for each species/tissue type were selected with the following objectives:

- To estimate 95% upper confidence limits on the mean (95UCL) with reasonable precision (i.e., small relative error)

- To have sufficient power to detect differences in the mean when the new dataset is compared to data collected in the two previous time periods (i.e., 1999-2001 and 2009/2010).

For mean estimation, sample sizes can be calculated according to the following formula found in Chapter 8 of the USEPA's ProUCL 5.0 Technical Guidance Document (USEPA 2013):

$$n = Z^2_{1-(\alpha/2)} (\text{standard deviation/difference from true mean})^2 + Z^2_{1-(\alpha/2)}/2$$

where Z is the standard normal deviate that cuts off (1-(α/2))% of the distribution and 1-α/2 is the required confidence interval range. This equation can be modified to calculate sample size using relative error (as fraction of true mean) and coefficient of variation (CV) instead of using actual variance and margin of error (Gilbert 1987). The resulting equation is as follows:

$$n = Z^2_{1-(\alpha/2)} (\text{CV/relative error})^2 + Z^2_{1-(\alpha/2)}/2$$

Sample size estimates were calculated for the range of CVs that have been observed in the existing tissue datasets and a range of relative errors, as provided below:

Sample Size Estimates as a Function of Relative Error and CV

Relative Error	Coefficient of Variation					
	0.25	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**
20%	6	13	19	26	35	45
25%	5	9	13	17	23	30
30%	4	7	9	13	17	21
35%	3	5	7	10	13	16

Because CVs for the tissue data are generally less than 0.6, a sample size of 13 will result in 95UCLs with a relative error of 30% or less. The mean differences in concentrations noted between time periods in Tables 1 and 2 are generally in the range of 20 to 30%. Therefore, a sample size of 13 was selected as the minimum sample size for most species and tissue types where a 95UCL could be calculated by zone. The exception to this was for blue crab muscle and hepatopancreas, which tend to show lower CV and can be characterized with a smaller sample size.

Sample Numbers and Rationale

The statistics presented in Tables 1 and 2 provide evidence that tissue concentrations may be decreasing over time in the LPRSA. If such a trend truly exists, it is important that sample sizes be adequate to detect differences in mean concentrations over time. Power (β) is the probability of detecting a statistically significant difference in the mean of two populations at a prescribed Type I[4] error rate (α) when the means are in fact different. Power calculations require assumptions of the true difference in the means between the populations, the size of the sample collected from each population, and the standard deviation of the two populations.

Power calculations for this analysis were performed using SAS 9.3 (SAS Institute 2012) and are based on the observed attributes of the previous tissue datasets for 2,3,7,8-TCDD and total PCBs (sum of 7 Aroclors). Assumptions of the mean difference are based on the observed difference in means between the 1999-2001 ESP dataset and the 2009/2010 CPG dataset for RM 0 to 8. No tissue data are available for RM 8 to17 for the 1999-2001 time period. The standard deviation is assumed to be equal to the observed standard deviation in the 2009/2010 dataset. The power equation can be rearranged to calculate the required sample size of a new sample given the samples collected and α and β are

[4] The Type I error rate is the probability of rejecting a hypothesis when it is in fact true. In this case the Type I error rate refers to the probability of rejecting the hypothesis that two means are equal when in fact they are equal. The Type II error rate is equal to 1-β, and is the probability of accepting a hypothesis when it is false.

specified. The sample size for the first sample is the actual sample size of the 2009/2010 dataset (RM 0 to 8). The sample size for the proposed dataset is calculated to, at a minimum, provide 70% power to detect a difference between means at an alpha = 0.10 using a one-sided two sample t-test. Table 3 provides the results of the power analysis.

The sample size estimates provided in Table 3 represent the sample size necessary for a comparison of data from RM 0-8 only. Since we do not have the data to support a power calculation for a river-wide (i.e., 0-17 miles) analysis, we estimate that using double the sample size would result in adequate power ($\beta > 0.7$) to detect temporal differences. The results of the power analysis indicate that for some species/tissue types a sample size greater than 13 may be needed to provide adequate power to detect a difference at least as small as the difference already observed between the 1999-2001 and 2009/2010 datasets, particularly for whole body blue crab samples. The target sample size for blue crab was increased to 22 to ensure that statistical comparisons for 2,3,7,8-TCDD would have adequate power. For white perch fillet, the power analysis indicates that a sample size of 17 is needed for a RM 0-8 calculation. The sample size for white perch fillet was not increased since a river-wide comparison will have adequate power. Another consideration in assessing sample size requirements is the number of comparisons being made. Since multiple comparisons will be made (i.e., one comparison for every combination of species, tissue type, and chemical constituent), the probability of detecting an overall temporal trend in the river will be much greater than the power of an individual test. Therefore these minimum sample sizes are very conservative.

Based on the power evaluation and considering the sample size estimates as a function of relative error and CV, proposed sample sizes for fish and crab tissue are below.

Feeding Guild	Species	No. of Composite Samples per Tissue Type per Zone	Type of Sample	Total No. of Analytical Samples
Invertivore	white perch[a]	13 13	skinless fillet whole body	52
Benthic omnivore	catfish[b]	13 13	skinless fillet remaining carcass	26
Piscivore	American eel[a]	13 13	skin-on fillet whole body	52
Epibenthic omnivore	blue crab	22 8 8	whole body edible muscle hepatopancreas[b]	44 16 16
			Total	**206**

Notes:

a. White perch and American eel samples may be analyzed as individual fish or composite samples, depending on size.

b. While white catfish (*Ameiurus catus*) will be targeted, other types of catfish including channel catfish (*Ictalurus punctatus*) and brown bullhead (*Ameiurus nebulosus*) may be considered depending on abundance. Catfish only targeted in the freshwater zone, which is the extent of their range in the LPRSA.

c. From a subset of crabs collected for edible muscle analysis.

Proposed Sampling Methods

Several methods are proposed to collect fish and blue crab throughout the LPRSA, including minnow/eel traps, crab traps, trotlines, and gillnets. While the majority of fish will be captured from the shoal areas near the shoreline, gillnets will also be positioned mid-channel as necessary. Boat and/or backpack electrofishing will be conducted as salinity and conductivity allow, but will likely be restricted to reaches 4 through 8 (RM 6 through 17.4). Bait will vary by method but may include bologna, cheese dough, chicken legs, blood dough, commercially processed blue crab, shrimp, worms, and chicken livers. Additional information on sampling methods will be provided in the standard operating procedures (SOPs). The SOPs and QAPP for this sampling event will be adopted from the comparable documents developed by the CPG for the 2009/2010 sampling program. These will be developed and submitted to USEPA in an expedited manner for review and approval, so that this program can proceed in 2014.

Summary

Fish and shellfish tissue samples will be collected from various locations throughout the LPRSA. A summary of the total number of fish and shellfish samples is presented above and summarized below.

- Blue crabs: A total of 44 whole body blue crab samples will be collected from the LPRSA; 22 crabs will be collected from each zone (estuarine and freshwater) and submitted to the analytical laboratory. Eight additional crab tissue samples will be collected from each zone and will consist of separate samples of edible tissue and hepatopancreas tissue samples.

- White perch: A total of 52 white perch samples will be collected from the LPRSA; 26 white perch samples will be collected from each zone (estuarine and freshwater) and submitted to the analytical laboratory. 13 samples will be submitted as skinless fillets; 13 samples will be submitted as whole body fish. Composite samples will consist of fish smaller than 30 centimeters. Larger fish will be submitted as individual samples.

- American eel: A total of 52 American eel samples will be collected from the LPRSA; 26 American eel samples will be collected from each zone (estuarine and freshwater) and submitted to the analytical laboratory. 13 samples will be submitted as skin-on fillets; 13 samples will be submitted as whole body eels. Composite samples will consist of fish smaller than 30 centimeters. Larger fish will be submitted as individual samples.

- Catfish: White catfish (*Ameiurus catus*) will be the targeted species; however, other types of catfish including channel catfish (*Ictalurus punctatus*) and brown bullhead (*Ameiurus nebulosus*) may be considered depending on abundance. A total of 26 catfish samples will be collected, primarily from the freshwater zone (i.e., RM 8 to 17) of the LPRSA. 13 samples will be submitted to the laboratory as skinless fillets; the remaining skin-on carcass will also be analyzed and used

to derive whole body chemical concentrations. Composite samples will consist of fish smaller than 30 centimeters. Larger fish will be submitted as individual samples.

Overall, this conceptual sampling program is anticipated to provide the additional fish and crab tissue dataset required to evaluate potential statistically significant trends in concentrations of COCs in tissue over time and throughout the LPRSA. These data are also paramount in evaluating ecological and human health risks and possible remedial options as part of the FFS for the LPRSA. This sampling program has been developed taking into consideration prior sampling programs/events, including target species, numbers and locations of previous samples, necessary statistical power, as well as the sampling methods and effort required to capture fish from the LPRSA.

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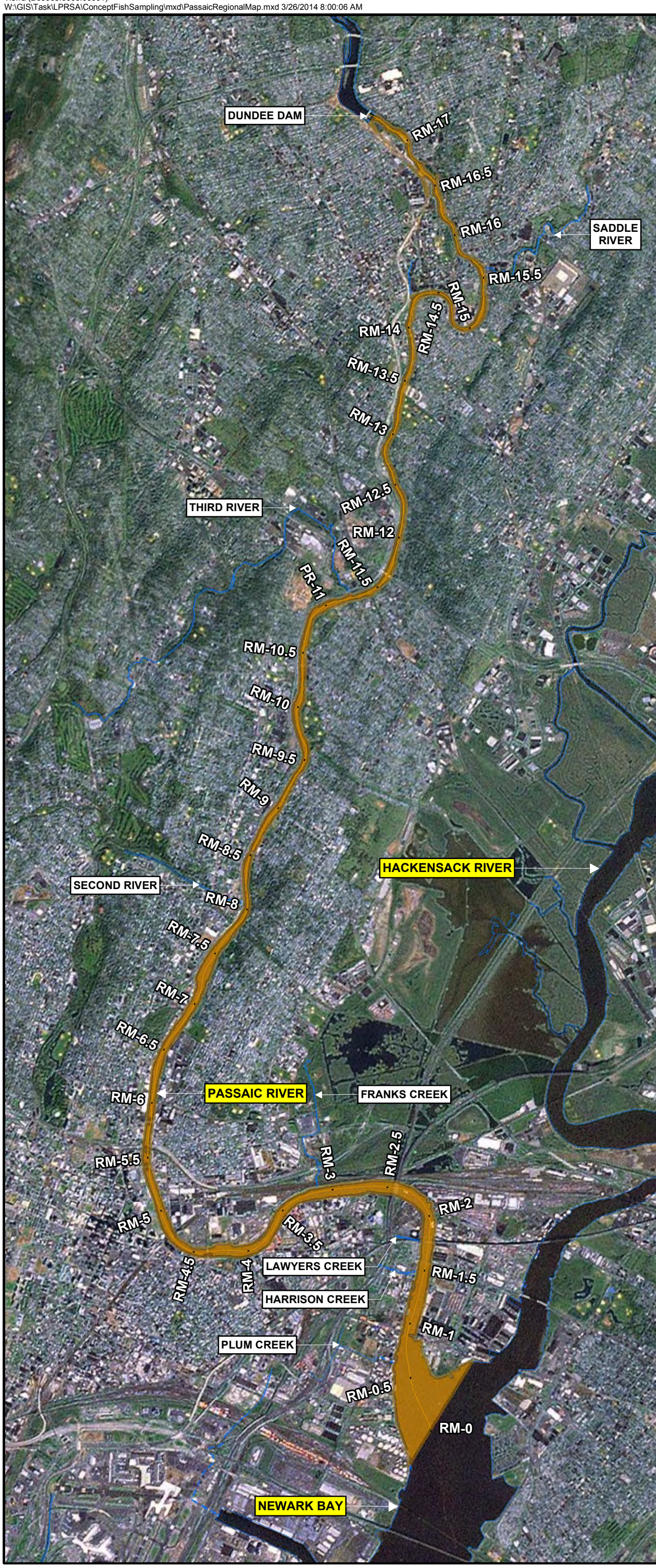
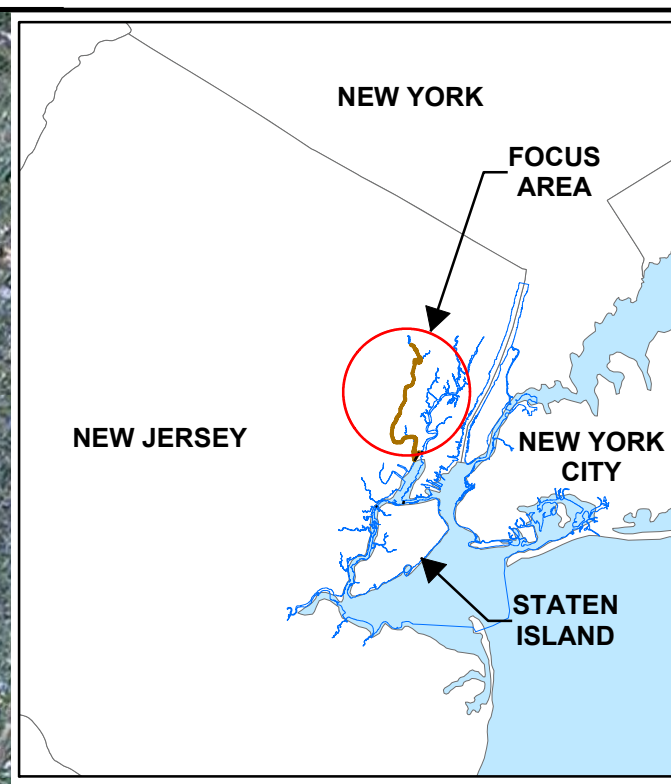




LEGEND:

LPRSA RIVER MILE

LOWER PASSAIC RIVER STUDY AREA

NOTES:

1. BASEMAP INFORMATION FROM NOAA CHARTS 12331, 12333, AND 12337, DATED MAY 4, 1995.
2. 2007 IMAGERY FROM ESRI BING IMAGERY.

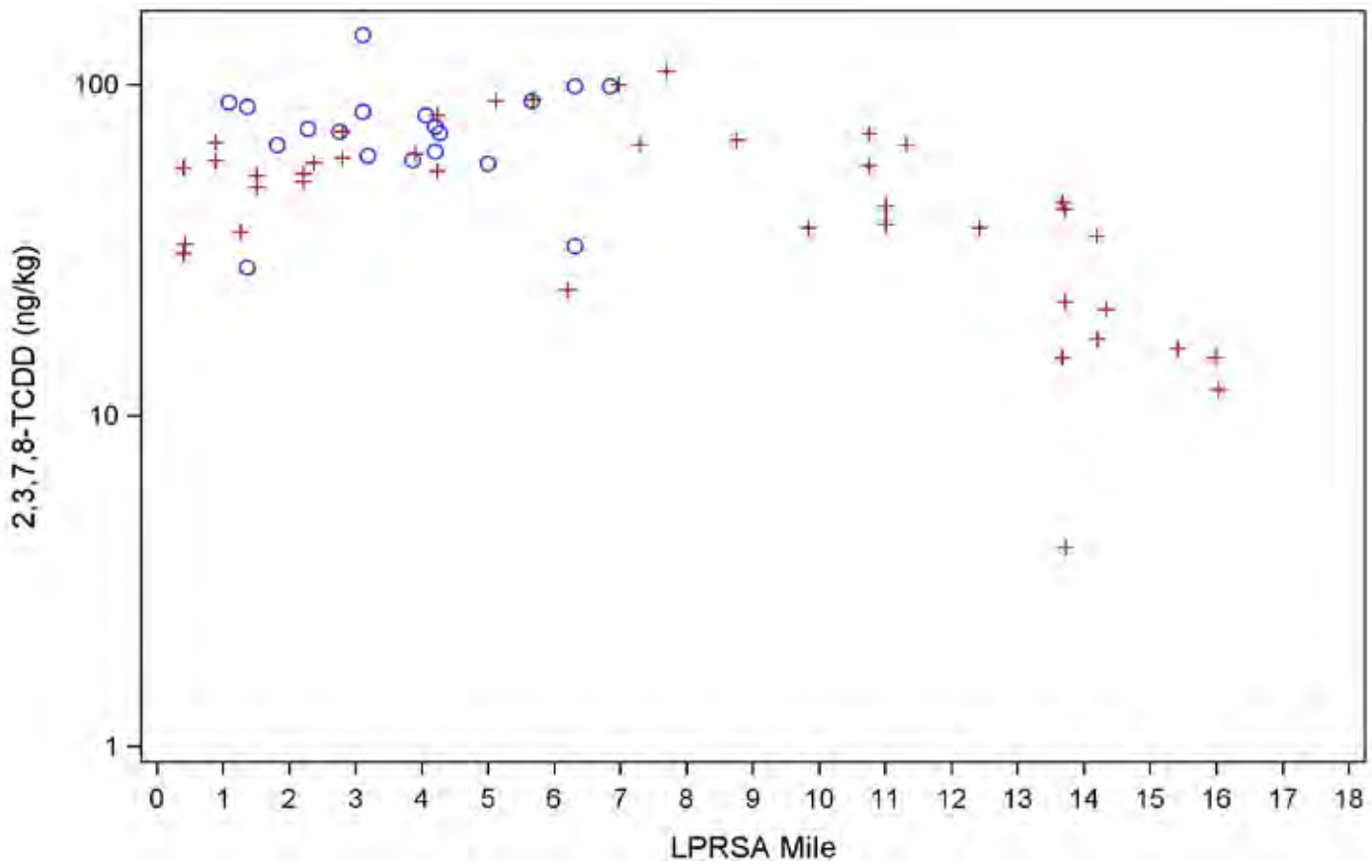
0 0.9 1.8 Miles
GRAPHIC SCALE

LOWER PASSAIC RIVER STUDY AREA
CONCEPTUAL FISH AND CRAB SAMPLING PLAN

LOWER PASSAIC RIVER STUDY AREA

MARCH 2014

FIGURE
1



Notes:
LPRSA = Lower Passaic River Study Area
ng = nanogram ; kg = kilogram
TCDD = tetrachloro-*p*-dibenzodioxin

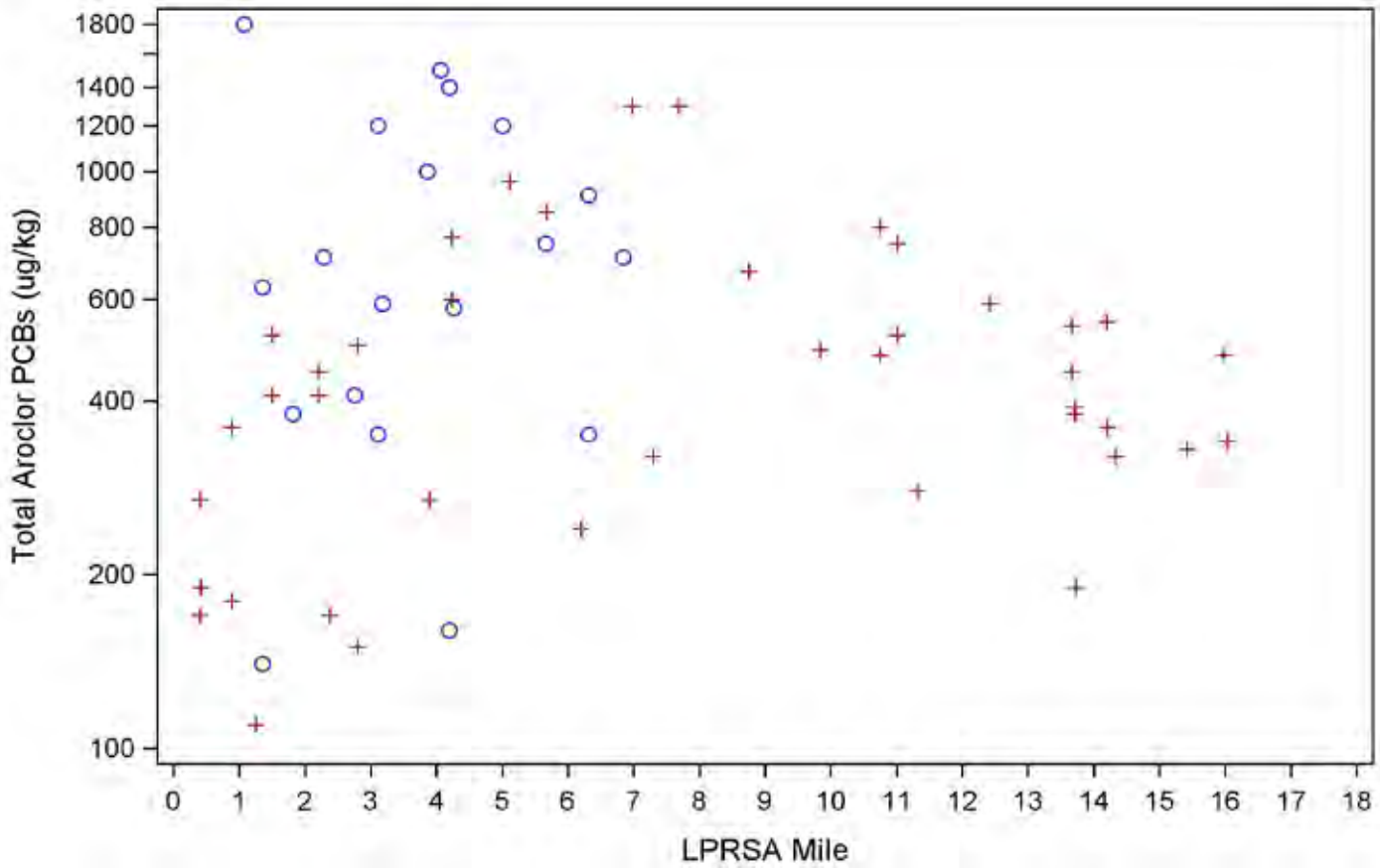
Year of Sampling ○ 1999-2001 + 2009-2010

Lower Passaic River Study Area
Conceptual Fish and Crab Sampling Plan

2,3,7,8-TCDD in Blue Crab (Whole Body)

ARCADIS
Infrastructure · Water · Environment · Buildings

FIGURE
2



Notes:
LPRSA = Lower Passaic River Study Area
µg = microgram ; kg = kilogram
PCB = polychlorinated biphenyl

Year of Sampling ○ 1999-2001 + 2009-2010

Lower Passaic River Study Area
Conceptual Fish and Crab Sampling Plan

Total PCBs (7 Aroclors) in Blue Crab (Whole Body)

ARCADIS
Infrastructure · Water · Environment · Buildings

FIGURE
3

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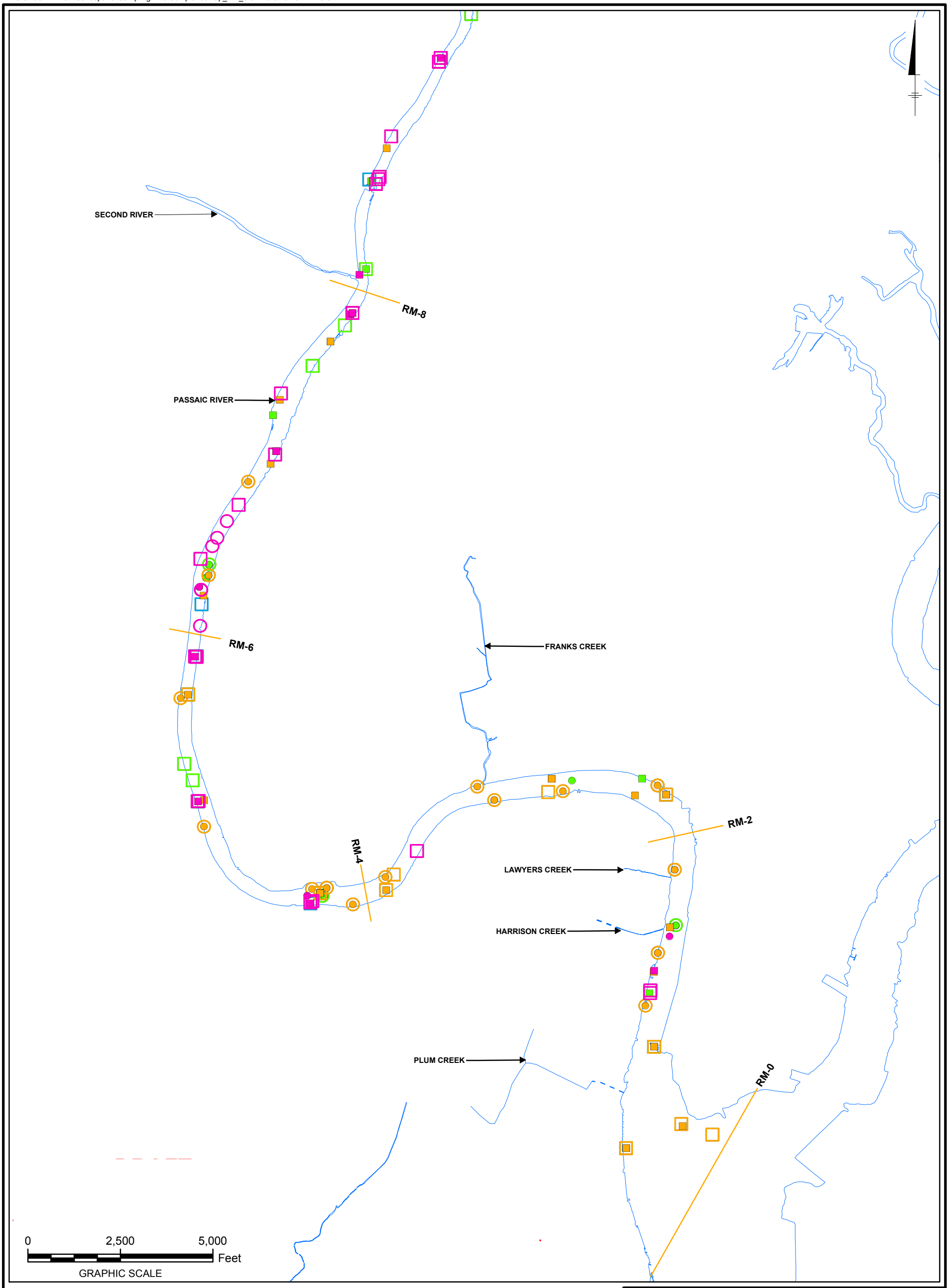

LEGEND:

SAMPLING EVENT
- ● 1999-2001 ESP
- ■ 2009-2010 CPG TISSUE

WHOLE BODY	FILLET OR MUSCLE	
		AMERICAN EEL
		BLUE CRAB
		WHITE PERCH
		WHITE CATFISH

- PROPOSED SAMPLING REACH
- SHORELINE
- UNDERGROUND TRIBUTARY

NOTES:

1. BLUE CRAB HEPATOPANCREAS SAMPLE LOCATIONS ARE NOT SHOWN.
2. PROPOSED SAMPLING REACHES ARE DEPICTED BY LPRSA RIVER MILES.

LOWER PASSAIC RIVER STUDY AREA

CONCEPTUAL FISH AND CRAB SAMPLING PLAN

PROPOSED SAMPLING REACHES IN THE ESTUARINE ZONE (RM 0 - 8) AND LOCATIONS OF HISTORICAL SAMPLES

MARCH 2014

FIGURE **4a**

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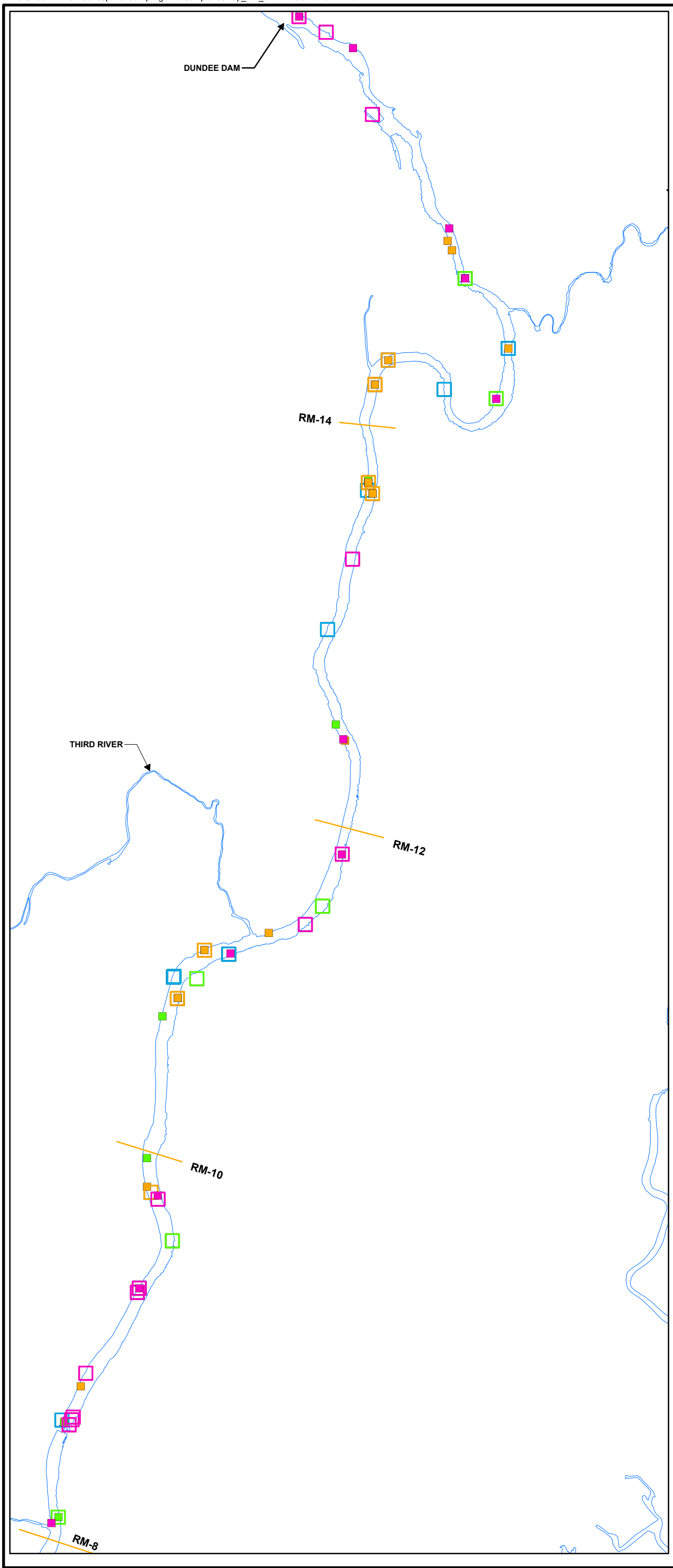

LEGEND:

SAMPLING EVENT

- ● 1999-2001 ESP
- ■ 2009-2010 CPG TISSUE

WHOLE BODY	FILLET OR MUSCLE	
■	□	AMERICAN EEL
■	□	BLUE CRAB
■	□	WHITE PERCH
■	□	WHITE CATFISH

- PROPOSED SAMPLING REACH
- SHORELINE
- UNDERGROUND TRIBUTARY

NOTES:

1. BLUE CRAB HEPATOPANCREAS SAMPLE LOCATIONS ARE NOT SHOWN.
2. PROPOSED SAMPLING REACHES ARE DEPICTED BY LPRSA RIVER MILES.

0 2,500 5,000 Feet
GRAPHIC SCALE

LOWER PASSAIC RIVER STUDY AREA
CONCEPTUAL FISH AND CRAB SAMPLING PLAN

PROPOSED SAMPLING REACHES IN THE FRESHWATER ZONE (RM 8 - 17) AND LOCATIONS OF HISTORICAL SAMPLES

MARCH 2014

FIGURE
4b

Table 1. Tissue Concentrations in Selected Species Collected in the Lower Passaic River Study Area (LPRSA) by Sampling Period

Chemical	Species	Tissue Type	Sampling Period	N	Number of Detects	Frequency of Detection	Mean	Standard Deviation	Minimum	Maximum
2,3,7,8-TCDD (ng/kg)	American Eel	Fillet	1999-2001	7	7	100%	21.7	6.49	14.6	32.2
	American Eel	Fillet	2009-2010	32	32	100%	13.5	9.84	0.31	41
	American Eel	Whole Body	1999-2001	6	6	100%	9.7	6.34	4.53	20.6
	American Eel	Whole Body	2009-2010	19	18	95%	16.8	15.0	0.11	47
	Blue Crab	Hepatopancreas	1999-2001	15	15	100%	262	45.0	195	371
	Blue Crab	Hepatopancreas	2009-2010	7	7	100%	143	63.8	41	210
	Blue Crab	Muscle	1999-2001	18	18	100%	17.6	3.94	10.9	22.7
	Blue Crab	Muscle	2009-2010	21	21	100%	7.48	5.65	0.82	20
	Blue Crab	Whole Body (Soft Tissue)	1999-2001	19	19	100%	75.0	24.8	28	141
	Blue Crab	Whole Body (Soft Tissue)	2009-2010	41	41	100%	49.2	25.0	4	110
	White Perch	Fillet	1999-2001	6	6	100%	64.9	22.2	34.4	88.9
	White Perch	Fillet	2009-2010	19	19	100%	41.0	24.1	3.6	99
	White Perch	Whole Body	1999-2001	18	18	100%	212	81.1	73.6	352
	White Perch	Whole Body	2009-2010	19	19	100%	129	71.5	18.0	250
Total PCBs (ug/kg)	American Eel	Fillet	1999-2001	7	7	100%	1,624	745	670	2,800
	American Eel	Fillet	2009-2010	32	32	100%	1,185	882	310	4,900
	American Eel	Whole Body	1999-2001	6	3	50%	810	710	75	1,700
	American Eel	Whole Body	2009-2010	19	19	100%	1,849	1,681	670	7,500
	Blue Crab	Hepatopancreas	1999-2001	15	15	100%	5,513	1,958	3,200	11,000
	Blue Crab	Hepatopancreas	2009-2010	7	7	100%	3,300	1,233	1,200	5,100
	Blue Crab	Muscle	1999-2001	18	4	22%	64	22	16	75
	Blue Crab	Muscle	2009-2010	21	19	90%	31	27	3.5	100
	Blue Crab	Whole Body (Soft Tissue)	1999-2001	19	19	100%	777	467	140	1,800
	Blue Crab	Whole Body (Soft Tissue)	2009-2010	41	41	100%	473	277	110	1,300
	White Perch	Fillet	1999-2001	6	6	100%	842	179	600	1,100
	White Perch	Fillet	2009-2010	19	19	100%	551	298	190	1,300
	White Perch	Whole Body	1999-2001	18	18	100%	3,989	1,821	1,200	10,000
	White Perch	Whole Body	2009-2010	19	19	100%	2,308	1,124	470	4,200

Notes: Includes all samples collected in the river. The 1999-2001 sampling events include the 1999 Late Summer/Early Fall RI-ESP Sampling Program, the 2000 Spring RI-ESP Sampling Program, and the 2001 Supplemental RI-ESP Biota Sampling Program. The 2009/2010 sampling period includes samples collected by the CPG during that period. 1/2 detection limit substituted for non-detected values. Field duplicate results were averaged. Total PCB concentrations are the sum of 7 Aroclors.

Table 2. Tissue Concentrations in Selected Species Collected in LPRSA River Mile 0 to 8

Chemical	Species	Tissue Type	Sampling Period	N	Number of Detects	Frequency of Detection	Mean	Standard Deviation	Minimum	Maximum
2,3,7,8-TCDD (ng/kg)	American Eel	Fillet	1999-2001	7	7	100%	21.7	6.49	14.6	32.2
	American Eel	Fillet	2009-2010	16	16	100%	14.9	9.91	4.70	41
	American Eel	Whole Body	1999-2001	6	6	100%	9.7	6.34	4.53	20.6
	American Eel	Whole Body	2009-2010	8	8	100%	24.8	13.2	5.70	47
	Blue Crab	Hepatopancreas	1999-2001	15	15	100%	262	45.0	195	371
	Blue Crab	Hepatopancreas	2009-2010	5	5	100%	176	34.4	130	210
	Blue Crab	Muscle	1999-2001	18	18	100%	17.6	3.94	10.9	22.7
	Blue Crab	Muscle	2009-2010	11	11	100%	11.10	5.23	3.80	20
	Blue Crab	Whole Body (Soft Tissue)	1999-2001	19	19	100%	75.0	24.8	28	141
	Blue Crab	Whole Body (Soft Tissue)	2009-2010	22	22	100%	61.6	22.1	24	110
	White Perch	Fillet	1999-2001	6	6	100%	64.9	22.2	34.4	88.9
	White Perch	Fillet	2009-2010	11	11	100%	48.9	22.5	22.0	99
	White Perch	Whole Body	1999-2001	18	18	100%	212	81.1	73.6	352
	White Perch	Whole Body	2009-2010	10	10	100%	158	45.8	73.0	250
Total PCBs (ug/kg)	American Eel	Fillet	1999-2001	7	7	100%	1,624	745	670	2,800
	American Eel	Fillet	2009-2010	16	16	100%	1,271	1086	450	4,900
	American Eel	Whole Body	1999-2001	6	3	50%	810	710	75	1,700
	American Eel	Whole Body	2009-2010	8	8	100%	2,780	2,299	760	7,500
	Blue Crab	Hepatopancreas	1999-2001	15	15	100%	5,513	1,958	3,200	11,000
	Blue Crab	Hepatopancreas	2009-2010	5	5	100%	3,900	725	3,200	5,100
	Blue Crab	Muscle	1999-2001	18	4	22%	64	22	16	75
	Blue Crab	Muscle	2009-2010	11	11	100%	40	30	17	100
	Blue Crab	Whole Body (Soft Tissue)	1999-2001	19	19	100%	777	467	140	1,800
	Blue Crab	Whole Body (Soft Tissue)	2009-2010	22	22	100%	477	353	110	1,300
	White Perch	Fillet	1999-2001	6	6	100%	842	179	600	1,100
	White Perch	Fillet	2009-2010	11	11	100%	649	319	190	1,300
	White Perch	Whole Body	1999-2001	18	18	100%	3,989	1,821	1,200	10,000
	White Perch	Whole Body	2009-2010	10	10		2,630	748	1900	4,200

Notes: Includes only samples collected below LPRSA river mile 8. The 1999-2001 sampling events include the 1999 Late Summer/Early Fall RI-ESP Sampling Program, the 2000 Spring RI-ESP Sampling Program, and the 2001 Supplemental RI-ESP Biota Sampling Program. The 2009/2010 sampling period includes samples collected by the CPG during that period. 1/2 detection limit substituted for non-detected values. Field duplicate results were averaged. Total PCB concentrations are the sum of 7 Aroclors.

Table 3. Results of Power Calculations Using Tissue Data from the LPRSA (RM 0 to 8)

Chemical	Species	Tissue Type	Sampling Period	N[a]	Mean	SD	Mean Difference	Number of Samples (α = 0.1; β = 0.70)[b]
2,3,7,8-TCDD (ng/kg)	American Eel	Fillet	1999-2001	7	21.7	6.49	6.8	13
			2009/2010	16	14.9	9.91		
	Blue Crab	Hepatopancreas	1999-2001	15	262	45.0	86	2
			2009/2010	5	176	34.4		
		Edible Muscle	1999-2001	18	17.6	3.94	6.5	3
			2009/2010	11	11.10	5.23		
		Whole Body (Soft Tissue)	1999-2001	19	75.0	24.8	13	22
			2009/2010	22	61.6	22.1		
	White Perch	Fillet	1999-2001	6	64.9	22.2	16	17
			2009/2010	11	48.9	22.5		
		Whole Body	1999-2001	18	212	81.1	54	4
			2009/2010	10	158	45.8		
Total PCBs (ug/kg)	American Eel	Fillet	1999-2001	7	1,624	745	354	--
			2009/2010	16	1,271	1086		
	Blue Crab	Hepatopancreas	1999-2001	15	5,513	1,958	1613	1
			2009/2010	5	3,900	725		
		Edible Muscle	1999-2001	18	64	22	23	12
			2009/2010	11	40	30		
		Whole Body (Soft Tissue)	1999-2001	19	777	467	300	6
			2009/2010	22	477	353		
	White Perch	Fillet	1999-2001	6	842	179	193	54
			2009/2010	11	649	319		
		Whole Body	1999-2001	18	3,989	1,821	1359	2
			2009/2010	10	2,630	748		

Notes:

a) Number of samples from LPRSA RM 0-8.

b) Number of samples needed to detect a significant difference using a one-sided t-test with a probability of 70% at an alpha of 0.10 assuming that the sample size of the first group is equal to the 2009/2010 sample size.

-- Indicates sample size is incalculable.

Yeh, Alice

From: Carolyn Dorflinger <cdorflinger@gmail.com>
Sent: Wednesday, August 13, 2014 4:28 PM
To: Region2 PassaicLower8MileComments
Subject: I support Alternative 2

Please clean up the Passaic River so the people of Newark and beyond can enjoy the natural resource that belongs to all of us. Only Alternative 2 will dredge the river and also allow future boat ramps and extensive boating. Also, Alternative 2 will not require further maintenance. Please stand up for the best cleanup method for the Passaic!

Carolyn Dorflinger
10 Schindler Ct
Chatham NJ

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 10:44 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Don egan
Donte1128@me.com
155 Laidlaw
Jersey city
Nj
07306

THE STATE CHAMBER

June 10, 2014

Alice Yeh
Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh:

The New Jersey State Chamber of Commerce ("State Chamber") is recognized as an independent voice of business in the State of New Jersey. With a broad membership ranging from Fortune 500 companies to small proprietorships, representing every corner of the State and every industry, our members provide jobs for over a million people in New Jersey. We continue to work towards promoting a vibrant business environment and economic prosperity through vision, expertise and innovative solutions.

We are writing to you today to express our significant concerns with the Environmental Protection Agency's (EPA) Proposed Plan to dredge the Lower Passaic River from Newark Bay to River Mile 8.3.

As New Jersey's State Chamber, we have real concerns that this approach would take decades to complete and would deter business development in River communities in Essex, Hudson, Passaic and Bergen counties for years to come.

There are a number of reasons that we are concerned with a bank to bank dredge of the lower 8 miles of the River, including:

- The EPA's Proposed Plan estimates that it will take 5 years to complete the dredging of 4.3 million cubic yards from the River. If the project in Lyndhurst at River Mile (RM) 10.9 is any indication, it will likely take decades to dredge this amount of material out of the River. A multi-decade dredging project would hinder new development in North Jersey and discourage our existing businesses from further investing in the area.
- As shown by the work at RM 10.9 and the recent replacement work on the Pulaski Skyway, New Jersey's transportation infrastructure is aging and in need of repair. During the RM 10.9 project, multiple bridges broke causing project delays that doubled the length of time for this project. A 4.3 million cubic yard dredge would require thousands of openings of the 15 bridges that cross the River between Newark Bay and RM 8.3. Has the EPA considered what the impact of this project will be to the business community if one or more of these bridges breaks again?

NEW JERSEY CHAMBER OF COMMERCE • 216 WEST STATE STREET • TRENTON, NJ 08608
PHONE: 609-989-7888 • FAX: 609-989-9696 • WWW.NJCHAMBER.COM

- The EPA's Proposed Plan only addresses the lower 8 miles of the river and due to the high volume of material that will be dredged, there is the likelihood that recontamination will occur throughout the River. A solution that addresses the full 17 miles and minimizes recontamination should be considered.
- While a bank-to-bank dredge of the lower 8 miles will address sediment contamination, the plan does nothing to address stormwater runoff, discharges from combined sewer outflows and other sources that continue to contribute pollution to the Lower Passaic River. Until these sources are addressed, the River will never be truly clean.

The State Chamber believes there is a more effective way to address risk to human health and the ecology and minimize disturbance to North Jersey's economy.

We understand that the Lower Passaic River Study Area Cooperating Parties Group (CPG) has proposed a Sustainable Remedy that could be implemented more quickly and follows EPA's own guidance for remediation in complex river systems. In addition, the shorter implementation schedule of the Sustainable Remedy when compared to a bank to bank dredge could encourage new businesses to invest in and develop new projects in the Passaic River region.

This remedy also includes green infrastructure projects that would reduce the pollution that continues to enter the River. We believe that these infrastructure projects would bring new employment and improve the quality of life opportunities for New Jersey citizens.

The State Chamber hopes that the EPA will consider the impact that a bank-to-bank dredge of the lower 8 miles with have on the business community. We believe that the Sustainable Remedy would be just as effective as a bank-to-bank dredge, while being less intrusive to the business community. We hope that the EPA will seriously consider this remedy during the public comment period.

Sincerely,

Michael Egenton

Michael Egenton
Senior Vice President
Government Relations

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 20, 2014 8:24 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Michael Egenton
michael@njchamber.com
216 West State Street
Trenton
New Jersey
08608

609-989-7888

Celanese
225 E John Carpenter Fwy
Suite 1200
Irving, TX 75062

August 20, 2014

By Hand Delivery and Electronic Mail

Ms. Alice Yeh
Remedial Project Manager
U.S. Environmental Protection Agency, Region 2
290 Broadway, New York, New York 10007-1866
PassaicLower8MileComments.Region2@epa.gov

Re: Focused Feasibility Study Report and Superfund Proposed Plan for the Lower Eight Miles of the Lower Passaic River

Dear Ms.Yeh:

Celanese Corporation has worked with the U.S. Environmental Protection Agency, Region 2 (EPA) in good faith to address conditions on the Lower Passaic River. As a member of the Cooperating Parties Group (CPG) since 2007, we have agreed to perform a Remedial Investigation and Feasibility Study (RI/FS) for the entire seventeen miles of the Lower Passaic River and to participate in an interim removal action for a portion of the River. These actions are being performed in cooperation with EPA and as interim steps necessary to select a cost-effective, long-term solution for the entire Lower Passaic River. We have done so even though we have no ongoing operations on or near the Passaic River and our historical operations in the vicinity, which ceased twenty to forty years ago, did not generate the principal contaminants of concern found in the River (or, to our knowledge, contribute *any* contaminants of concern to the River).

We write this letter to express our disappointment over EPA's decision to issue the Focused Feasibility Study (FFS) and to propose a remedy for a portion of the River before the CPG has had the opportunity to complete the RI/FS and to propose a remedy for the entire River. This unprecedented and precipitous action is inconsistent with the cooperative relationship that the CPG and EPA have developed over the years and makes little technical sense. It also is inconsistent with EPA's own guidance and regulations. The result is a proposed remedy that will not only be the most expensive clean up in EPA history, but, as EPA concedes, one that will not and cannot achieve the remedial goals that EPA relies upon to justify its selection.

We also write to highlight the more significant scientific and technical deficiencies in the FFS and EPA's preferred remedy. These deficiencies undermine the feasibility and utility of the preferred remedy. First among them is the fact that the FFS relies upon assumptions to characterize the risks presented rather than actual, reliable and available

site data. This error is compounded in the conceptual site model, which again ignores actual data in favor of averages and unrealistic assumptions. The result is a conceptual model that is of little use in predicting River conditions or the effectiveness of the remedial options. The FFS also fails to consider available and appropriate technologies and methods to clean up the River and employs assumptions that dramatically underestimate the time, costs, and community impact of the preferred remedy. Finally, the FFS fails to address the fact that, because Region 2 selected contaminant remediation goals at least an order of magnitude less than background concentrations, the portion of the River addressed in the FFS will become recontaminated over time, rendering the proposed remedy ineffective. Individually, these deficiencies raise serious questions about the technical reliability of the FFS; collectively, they impugn EPA's selection of the preferred remedy.

Our detailed comments are enclosed. Please note that these comments are not exhaustive, but are intended to explain the bases for our key, overarching scientific and technical concerns with the FFS. We reserve the right to raise additional objections to FFS, and in particular, arguments about how Region 2's actions are arbitrary, capricious, and violative of applicable laws, rules, regulations, guidance, and standards.

Celanese remains committed to working in good faith with the CPG, EPA and other interested parties on a reliable and cost-effective solution for the River. The premature release of the FFS and the selection of the preferred remedy threaten this cooperative effort. In order to avoid what appears to be an impending impasse over the appropriate path forward, we suggest that Region 2 pause the current FFS process, allow the feasibility study for the entire Lower Passaic River to be completed later this year, and work with the parties involved to identify, develop and ultimately select a remedy that is protective of human health and the environment.

Sincerely yours,

E. Karl Enters, PhD

Global Manager,
Product Stewardship and Retained Environmental Matters

Executive Summary of Celanese Comments

Celanese performed a thorough and independent review of the Focused Feasibility Study for the Lower Eight Miles of the Lower Passaic River (FFS) prepared for the U.S. Environmental Protection Agency, Region 2 (EPA). This review identified a series of fundamental flaws in the FFS. As discussed herein, the FFS (i) mischaracterizes the human health and ecological risks present in the lower 8 miles of the Lower Passaic River (the FFS Study Area); (ii) employs a conceptual site model to evaluate remedial alternatives that is incapable of predicting future conditions within the FFS Study Area or comparing the effectiveness of the remedial alternatives; (iii) fails to consider viable technologies for cleaning up the FFS Study Area and dramatically underestimates the time, cost, and community impact of EPA's preferred remedy; and (iv) fails to acknowledge that the FFS Study Area will become recontaminated over time, rendering the cleanup ineffective. The FFS additionally incorporates biases throughout that favor EPA's preferred remedy and includes distortions about what EPA's preferred remedy for the FFS Study Area will accomplish (i.e., EPA's preferred remedy will *not* achieve the remediation goals identified, if implemented).

These comments, which focus on the scientific and technical aspects of the FFS, are aligned with the comments provided by the Cooperating Parties Group (CPG), of which we are a member. However, we are concerned enough about the FFS that we felt it necessary to submit separate comments to highlight certain critical issues with the FFS. Our comments can be summarized as follows.

Mischaracterization of Human Health and Ecological Risks.

The human health and ecological risks presented in the FFS are greatly overestimated due to the failure to use available site-specific information and the use of overly-conservative assumptions in the human health and ecological risk assessments. Remediation goals set by EPA for the cleanup of the FFS Study Area are based on the outcomes of these risk assessments and are used for evaluating the protectiveness of the FFS remedial alternatives. However, as a result of EPA's flawed risk assessments, the risk-based remediation goals identified are unrealistic and unattainable. EPA's own analysis shows that none of the proposed FFS remedial alternatives, including EPA's preferred remedy, will meet EPA's identified remediation goals.

The Flawed Contaminant Fate and Transport Model.

The contaminant fate and transport model does not consider all of the data available to determine initial conditions for the model and employs averaging of the data used, reducing the variability in the starting data set. The model also predicts changes in sediment contaminant concentrations that conflict with actual observations. These flaws prevent the model from providing an accurate prediction of future long-term sediment concentrations within the FFS Study Area. In addition, the model uses a mixing layer depth that is at odds with EPA's bioaccumulation model and that favors EPA's preferred remedy over less disruptive (and expensive) alternatives.

Inadequate FFS Alternatives Analysis and Implementability Problems.

The evaluation of possible remedial alternatives in the FFS does not consider a wide range of available technologies that would be appropriate to address the contamination in the FFS Study Area. Additionally, the assumptions used to assess the implementability of the alternatives considered do not reflect the realities of a complex large-scale dredging project. As a result, the FFS significantly underestimates the time and cost required to implement the preferred remedy. Moreover, the FFS does not include an appropriate evaluation of the impacts that such a large-scale dredging project would have on the river system or the surrounding community.

Lower Passaic River Long-Term Recontamination.

Contrary to EPA guidance, EPA selected remediation goals for several key contaminants of concern that are 1 to 2 orders of magnitude *less* than background concentrations in the Upper Passaic River. As a result, over the long term, EPA's own Empirical Mass Balance (EMB) model demonstrates that the Lower Passaic River will become recontaminated, with contaminant concentrations predicted to increase to levels approximately 10 to 30 times higher than EPA's risk-based remediation goals.

* * * *

These comments do not present an exhaustive assessment of the FFS, but instead focus on fundamental flaws with the FFS of particular concern to Celanese. As noted in the comments of the CPG, the FFS suffers from a number of additional flaws that also render the FFS inappropriate as the basis for any remedial action related to the Lower Passaic River. Further, Celanese has not attempted to address in these comments the inherent conflict between the FFS and the Feasibility Study the CPG is in the process of completing at the request of EPA.

1.0 Mischaracterization of Human Health and Ecological Risk

1.1 EPA's BHHRA overstates risk by failing to consider site-specific information and adopting a series of overly-conservative assumptions.

Based on the results of EPA's Baseline Human Health Risk Assessment (BHHRA); Appendix D of the Remedial Investigation Report for the Focused Feasibility Study of the Lower Eight Miles of the Lower Passaic River [The Louis Berger Group et al. 2014], the most significant human health risks in the FFS Study Area were determined to be the consumption of fish or shellfish caught within this area. Because the consumption of fish and shellfish has the highest potential risk of any human health scenario, it is critical that the underlying assumptions used to derive consumption risk-based values be legitimate and defensible. BHHRAs are an integral component of the Remedial Investigation/Feasibility Study (RI/FS) process, providing a foundation for assessing remedial alternatives. The results of the BHHRA are used in the development of risk-based Preliminary Remediation Goals (PRGs) for a site, which are used to evaluate the ability of each remedial alternative to reduce long-term human health risks. Any unreasonable assumptions used in the determination of human health risks could skew the overall outcome of the BHHRA, undermining the legitimacy of the results and ultimately the entire RI/FS process.

Our review of EPA's BHHRA found that EPA failed to consider site-specific information and applied multiple, overly-conservative assumptions in their derivation of human health consumption risk values within the FFS Study Area, as described in further detail below. As a result, we conclude that EPA's BHHRA fails to meet the applicable standards for such assessments and does not provide a sound basis for evaluating the FFS remedial alternatives. The overly-conservative risk-based values derived by EPA give a distorted assessment of human health risk within the FFS Study Area, set remediation goals for the FFS Study Area far greater than what is reasonably necessary or attainable, and were used by EPA in support of their selection of a preferred alternative for the FFS Study Area that requires bank-to-bank removal of sediment.

The conservative assumptions used by EPA in their derivation of fish and shellfish consumption risks in the BHHRA resulting in the greatest impacts to the overall risk-based values included the following:

- **Fish consumption rates.** Consumption rates used by EPA are based on non-site-specific surveys, both of which have questionable relevance to the FFS Study Area. The studies used include the 1999 Angler Survey of Newark Bay (Burger 2002) and the 1991 Statewide Angler Survey (Connelly et al. 1992). Neither of these surveys were designed to estimate consumption rates for the target population or for the Passaic River, and thus their use in the BHHRA is not appropriate nor supported. It is unclear why EPA's consumption rates are not based on the CPG's site-specific creel/angler survey that was conducted on the Lower Passaic River in 2011/2012. Given the impact of fish consumption rate assumptions on the selected risk-based PRGs, use of consumption rate data from a site-specific survey is not only preferable, it is absolutely critical.

- **Fish tissue data.** In determining the fish exposure point concentration (EPC) for the BHHRA, EPA considers fish and crab tissue data collected by the CPG throughout the FFS Study Area. The limited fish fillet dataset used consisted of 16 American eel, 11 white perch, 6 white catfish, 4 common carp, 1 white sucker, and 1 smallmouth bass. EPA specifically states in the BHHRA that "in the absence of site-specific data to support consumption patterns, equal intake of all representative species was consumed." However, this statement is not an accurate characterization of EPA's approach in the BHHRA. EPA instead derived the fish EPC, or the value used to represent the chemical concentration available from a particular route of exposure, based on the number of samples of each species in the total pool of samples, rather than equal weighting (i.e., American eel is assumed to be 41 percent of the fish diet, smallmouth bass 3 percent, etc.). The EPC determined by EPA is thus an artifact of the sampling and analysis program, and is not based on either the relative abundance of fish caught by the community, or the species that are typically of interest to recreational fishers.
- **Fish preparation.** Fish caught in the FFS Study Area are generally filleted and cooked prior to consumption. The BHHRA, however, assumed that fish fillets were consumed raw. Loss of hydrophobic chemicals upon cooking is well-known and can have a significant effect on the chemical concentrations consumed. EPA ignored this recognized and quantifiable effect in its analysis.
- **Fish sources.** The site fraction, or the fraction of fish from the site included in an individual's diet, is assumed to be 1.0, meaning that **ALL** fish consumed in an individual's diet is assumed to be caught from within the FFS Study Area, and no store-bought fish, restaurant fish, or fish caught from outside the FFS Study Area is consumed. It also assumes that there is availability to numerous accessible sites for fishing within the FFS Study Area and sustainable fish populations. It simply is not credible to assert that the FFS Study Area could maintain a sustainable fishery at these intense fishing levels for the 30-year period assumed in the BHHRA, or that individuals would obtain all of their dietary fish consumed from the FFS Study Area.

When combined with other very conservative aspects of the risk assessment process, the exposure assumptions used by EPA result in unrealistic projections of both current and future risk within the FFS Study Area. EPA's analysis is flawed to the point where it cannot form the basis for appropriate risk-based cleanup goals.

1.2 EPA's evaluation of benthic and ecological risk uses screening level assumptions and does not incorporate available site-specific data.

To assess risks to the benthic community within the Lower Passaic River Study Area (LPRSA), the CPG used a multiple lines of evidence approach in their Baseline Ecological Risk Assessment (BERA), as required by EPA. The CPG's approach included the use of benthic community structure, toxicity testing, and sediment chemistry data (referred to as the Sediment Quality Triad) for characterizing benthic risk. This approach allows the holistic evaluation of the impacts to the benthic community and how sediment chemistry data are related to those impacts. Although data addressing each of the lines of evidence were available to EPA for assessing benthic risk, EPA based their evaluation of benthic toxicity in their BERA solely on sediment chemistry data (Appendix D of the Remedial Investigation Report for the Focused Feasibility Study of the Lower Eight Miles of the Lower Passaic River [The Louis Berger Group

et al. 2014]). For their benthic risk assessment, EPA compared sediment chemistry data to conservative sediment benchmarks, which are typically only intended to be used as preliminary screening values or in conjunction with site-specific data. It is unclear why EPA did not use the Sediment Quality Triad approach in their BERA.

Similarly, EPA selected a number of critical body residues and toxicity reference values for use in their BERA that are not appropriate for the evaluation of ecological risk beyond their use as screening tools because they are overly conservative. Because the underlying screening level risk assessment approaches used in EPA's BERA are overly conservative, EPA's ecological risks within the FFS Study Area are greatly overestimated.

Other significant issues with EPA's failure to use site-specific data in the BERA include the following.

1.2.1 Use of Generic Fish

EPA used a "generic" fish category to evaluate potential risks to fish within the FFS Study Area. The "generic fish" is a composite of available fish data from a number of species with different feeding habits (omnivorous, invertivorous, piscivirous) and different preferred habitats, and, therefore, different exposure pathways. EPA's approach for the evaluation of fish risk is not appropriate. Fish risk should be derived by species or, at a minimum, by trophic level.

Additionally, only two of the fish species included in EPA's "generic" fish category (American eel and white perch) were collected throughout the FFS Study Area. Other fish species are limited by salinity and were only present above River Mile (RM) 5 (carp and brown bullhead) or RM 7 (white sucker and smallmouth bass). The grouping of these fish to combine a single EPC for the entire FFS Study Area is not appropriate and does not represent the accurate range of where these species are present.

This generic fish category was also used to evaluate risks to other wildlife receptors, such as a variety of birds and mink. Again, this is inappropriate—dietary preferences of other species are limited by fish size and availability, habitat, and other factors, and the use of a generic EPC to evaluate potential risk posed by fish consumption to these species is not reflective of a realistic exposure scenario.

1.2.2 Ecological Conceptual Site Model

EPA's BERA did not use available site-specific data to develop the Conceptual Site Model (CSM) that is critical to understanding the outcome of remediation. This leads to a poor understanding of the ecology of the FFS Study Area and overstates the impact of the preferred alternative on ecosystem recovery. For example, EPA's BERA should use site-specific information to evaluate the trophic transfer of contaminants from sediment through the food chain, or identify the relationship between sediment chemistry data and benthic toxicity.

An important component of evaluating benthic exposure and trophic transfer is establishing the depth at which sediment exposures (also known as the biologically active zone [BAZ)] are expected to occur. In their BERA, EPA establishes the BAZ in the top 15 centimeters (cm) of bedded sediment. EPA states that the basis of the depth is "site-specific empirical evidence." However, the site-specific evidence cited is limited data collected in Newark Bay (14 locations)

in 2008 (Diaz 2008), and not collected in the FFS Study Area itself. EPA's rationale for the decision to use these data, rather than the significant amount of sediment data collected in the FFS Study Area, is unclear and appears arbitrary.

In 2005, EPA funded a sediment profile imaging (SPI) study through the consultant group that collected images at approximately 90 locations throughout the FFS Study Area (Germano & Associates 2005). As stated above, these data were not used by EPA in the establishment of the BAZ depth, and are only referenced generically in the BERA as follows: "the SPI results for Newark Bay and the FFS Study Area demonstrate strong similarities in community structure as well as depth of typical biological activity." However, these data do not appear similar to Newark Bay, actually showing that the majority of biologically activity occurs in the aerobic zone at much shallower depths, with only a few instances of deeper feeding voids observed.

Additional evidence EPA uses to support the 15-cm depth is literature describing habitat along the Atlantic Coast, but not the FFS Study Area or the LPRSA specifically. Again, this non-site-specific evidence is not appropriate for application to the FFS Study Area when empirical evidence is available.

The selection of the exposure depth of 15 cm has important implications in EPA's bioaccumulation model, which is used to assess the protectiveness of the various potential remedies. EPA's bioaccumulation model assumes that chemical concentrations in fish are a function of chemical concentrations in the top 15 cm of bedded sediment, which, based on the empirical evidence described above, exaggerates the potential for buried contaminants (with higher concentrations) to enter the food chain. This model, in concert with EPA's contaminant fate and transport model (which assumes a 10-cm mixing zone, which is also a deeper exposure depth than what is typically observed in the site data) ends up favoring bank-to-bank dredging alternatives and downplays the value of selective dredging, as further discussed below in Section 2.0. Thus, EPA's selection of a 15-cm BAZ rather than a shallower interval supported by FFS Study Area data has significant impacts on the selection of the preferred alternative and results in a remedial extent that is wholly unnecessary.

1.3 EPA's proposed bank-to-bank remedy will not meet EPA's risk-based remediation goals, and, therefore, does not provide adequate benefit for the remedial costs.

EPA's National Contingency Plan (NCP; 40 CFR 300 [EPA 1990]) establishes a cancer risk in excess of one-in-a-million as a "point of departure" for establishing remediation goals. Excess cancer risks between 10^{-6} and 10^{-4} represent a range for consideration of the need for remedial action. For non-carcinogens and ecological risk, contaminants of potential concern (COPCs) with Hazard Quotients calculated as greater than 1 are identified as the COPCs that have the potential to exert an adverse health effect on human or ecological receptors. EPA's BHHRA determined that consumption of seafood collected from the FFS Study Area poses significantly greater human health risks than those posed by direct contact with contaminated sediments. The total cancer risks to the combined adult and child receptor for fish and crab consumption are 5×10^{-3} and 2×10^{-3}, respectively, based on EPA's reasonable maximum exposure scenario. Total non-cancer health hazards to the child are 195 and 67 for fish and crab consumption, respectively. Most of both the cancer and non-cancer risk is associated with exposure to dioxins/furans and polychlorinated biphenyls (PCBs) in seafood tissue, with methylmercury also contributing some excess non-cancer risk (about 2 percent of the total risk).

The intent of a remedial action is to significantly reduce health risks to human and ecological receptors posed by contamination. However, EPA's preferred remedial alternative does not meet the NCP target human health risk levels for either cancer or non-cancer risks, if one gives credence to the overly-conservative assumptions underlying EPA's BHHRA. In fact, EPA's preferred alternative is only projected, using EPA's assumptions, to achieve cancer risk levels of 4×10^{-4} and 3×10^{-4} for fish and crab consumption by the combined adult and child receptor 30 years after implementation of the preferred alternative, which result in less than an order of magnitude decrease in risk compared with the baseline human health risks and still remain greater than the NCP remediation goals. Further, all of the remedial alternatives considered by EPA in the FFS alternative fail to meet the NCP remediation goals following implementation based on EPA's analysis. Similarly, EPA's BERA indicates that risks to ecological receptors for EPA's preferred remedy will still be present post-remedy, with hazard quotients estimated to remain above 1. For example, the hazard estimate to macroinvertebrates (crab and benthos) is estimated to remain as high as 7 approximately 25 years after implementation of the preferred alternative is completed.

Based on EPA's analysis, their preferred remedy will not adequately address the human and ecological health risks derived by EPA, or alleviate the need for continuing institutional controls. Nor will any of the other alternatives being considered in the FFS. For a remedy to be appropriate, the level of protection must be commensurate with the scope and cost of the remedy. The minimal risk reduction predicted to be attained post-remedy by EPA's preferred remedy does not meet the intent of the NCP—even if this highly disruptive and prohibitively expensive remedy is implemented, fish will not be safe to be consumed by humans in significant quantities according to EPA's overly conservative risk analyses, fish advisories will remain in effect, and wildlife will continue to be at risk. EPA's proposed bank-to-bank remedy will not meet EPA's own overly conservative risk-based levels for human and ecological health, and, therefore, EPA cannot justify the unprecedented remedial costs associated with this remedy.

2.0 The Flawed Contaminant Fate and Transport Model

As constructed, EPA's contaminant fate and transport model cannot provide an accurate prediction of future long-term sediment concentrations within the FFS Study Area or provide a fair comparison of the results of the FFS remedial alternatives. A general overview of some of the key issues we have identified with this model are presented below; however, it is beyond the scope of our comments to provide a detailed analysis of all of the problems with EPA's modeling approach.

Several of the issues we have identified concern the data used to set up the contaminant fate and transport model and the calibration of this model. EPA did not consider all the data available, particularly the most recent data collected by the CPG, to help determine initial conditions for the model. Also, EPA's averaging approach for the data used to set up the model considerably reduced the variability in the starting data set. Additionally, the model predicted faster recovery or declines in sediment contaminant concentrations than what was actually observed in the sediment over time. Only one parameter, the rate of particle mixing in the sediment, was adjusted in the model as part of the calibration in order to get the model to more accurately predict the change in observed concentrations between 1995 and 1998 in the initial conditions data set. EPA also increased, or scaled up, the initial 1995 surface sediment concentrations within the model, so that, on average, the concentrations declined over time to the observed 2008 sediment values. We have serious reservations about the data and procedures used to fit the model (parameter tuning and data scaling). We, therefore, have serious reservations about the model's ability to predict future conditions within the FFS Study Area following remediation and EPA's use of the model as the basis for their regulatory decisions.

Another key concern we have with EPA's contaminant fate and transport model is the discrepancy between the depth of mixing (or the presumed BAZ) that is used in the contaminant fate and transport model and the biological exposure depth used in EPA's bioaccumulation model and the effect this discrepancy has on skewing the assessment of protectiveness in the FFS remedial alternatives analysis. As discussed above in Section 1.2.2, benthic exposures to the surface sediment are assumed by EPA to occur to a depth of 15 cm. Based on this exposure assumption, EPA uses surface sediment concentrations averaged over the top 15 cm in their bioaccumulation model to predict fish tissue concentrations within the FFS Study Area. This information is then used to assess remedy effectiveness, or the ability of a remedial alternative to meet EPA's selected risk-based remediation goals. However, to predict future surface sediment concentrations within the FFS Study Area, EPA uses their contaminant fate and transport model with a mixing layer depth of 10 cm. Contaminant concentrations in this upper mixed sediment layer or BAZ are dynamic and generally decline over time via naturally occurring processes (i.e., natural attenuation), whereas, contamination present below this mixing depth generally remains buried and relatively stable over time.

Therefore, while declines in contaminant concentrations are observed in the top 10 cm in the contaminant fate and transport model over time, elevated concentrations of contaminants remain at depth. These contaminant fate and transport model results are used in the bioaccumulation model to help assess remedy protectiveness; however, the contaminant profiles are averaged over 15 cm in the bioaccumulation model. This means that for the FFS no

action alternative and the targeted removal/capping alternative the 0- to 15-cm average concentration becomes controlled by contaminant mass trapped beneath the 10-cm mixing layer used in the contaminant fate and transport model, even though the contaminant fate and transport model assumes that biological activity is not occurring to this depth. This disconnect between the two models ends up minimizing the protectiveness of the FFS no action alternative and the targeted removal/capping alternative relative to the FFS bank-to-bank alternatives. If a shallower exposure depth is used for assessing remedial protectiveness (which is more consistent with site-specific data), then the claimed benefit of the bank-to-bank alternatives is significantly less in comparison to the other less disruptive alternatives.

3.0 Inadequate FFS Alternatives Analysis and Implementability Problems

The methods and assumptions EPA used in the development and evaluation of the FFS remedial alternatives result in a FFS that does not evaluate a range of alternatives, but instead focuses prematurely on dredging and sand capping as the only viable alternatives. The assumptions used in the FFS evaluation also result in a substantial under-estimation of project duration, and over-estimation of alternative feasibility. The following sections describe our main FFS alternative analysis and implementability critiques in greater detail.

3.1 The technology screening conducted in the FFS does not consider a range of appropriate technologies for cleanup of the FFS Study Area.

The methods used in the FFS to conduct a preliminary technology screening, and identify a single "representative process option to represent each technology type," prematurely eliminates a number of technologies that should be evaluated and considered in the detailed alternatives evaluation. Additionally, more creative thinking to address the site complexity is needed to generate alternatives that meet the remedial design goals while keeping costs to a feasible level. The following are our primary issues with the preliminary technology screening and alternatives evaluation:

- The process for technology screening conducted in the FFS does not allow for appropriate evaluation of remedial options for the FFS Study Area. By "selecting one representative process option to represent each technology type," evaluation of alternative capping methods that would not require dredging prior to placement (grout mat, clay, geomembrane liners) are not fully evaluated, and have significantly different benefits, constraints, and applicability compared to sand caps. The FFS needs to include an alternative that evaluates the feasibility of placement of a thin cap with no pre-dredging. The rationale in the FFS for elimination of thin caps is "the large area being considered for remediation and the limited precedent for using active caps and geotextiles." Given that placement of a thin cap could eliminate or significantly reduce the volume of dredging required, and that dredging and material processing account for over half of the proposed remedy cost, determination of the feasibility and cost of implementing a thin cap needs to be conducted, and compared to the cost and feasibility of dredging alternatives.
- The FFS does not evaluate Enhanced Natural Recovery (ENR), and only evaluates Monitored Natural Recovery. Because all the other alternatives evaluated do not fully achieve remedial goals, a less invasive and disruptive technology, such as ENR should be included in the detailed evaluation, so a comparison of the degree of alternative benefits can be conducted. ENR should be included and evaluated as a potential remedial option. The FFS discusses resuspension of silts within the project area as the main source of contamination to the area. Along these lines, placement of an ENR layer would reduce the degree of resuspension, and recontamination, while avoiding the requirement for significant dredging and flood control actions. The cost for such an alternative would be significantly less than the proposed dredging alternatives, which would allow for a more comprehensive cost versus benefit comparison of alternatives in the FFS.

- The stated rationale for dredging prior to cap placement in the FFS alternatives is maintenance of the navigation channel, and flood control. Other methods for flood control, either in-water or at a basin-wide level, and other methods for capping that do not require dredging (such as geotextile liners or grout mats) need to be evaluated. The FFS does not consider implementation of basin-wide flood control measures to address flooding concern. With a basin-wide flood control measure, filling of the waterway that reduces flood capacity would no longer be a design driver, and could allow for capping without substantial dredging. The cost savings from eliminating the requirement to dredge substantial volumes of sediment may be more than the cost of implementing a basin-wide flood control system, and should be evaluated.

3.2 EPA's proposed dredging remedies as presented in the FFS significantly under-estimate the time required for remedy implementation.

The assumptions in the FFS for dredging and dredge material processing rates do not reflect the realities of complex large-scale dredging projects. The assumptions presented are unrealistic, and the actual project duration will be substantially longer than stated in the FFS.

The FFS assumes a daily dredge production rate for each of two primary mechanical dredges of 2,000 cubic yards (CY) per 24-hour day per mechanical dredge, or 4,000 CY combined, based on a test of environmental dredging conducted in the FFS Study Area by U.S. Army Corps of Engineers (USACE) and New Jersey Department of Transportation (NJDOT) in 2005, and other large-scale dredging projects. Our review of other large-scale projects determined that multiple projects were able to achieve a total daily dredge rate of 2,000 CY per day; however, these projects operated multiple dredges, realizing per-dredge rates of only 400 to 800 CY per day. Importantly, the recent removal work conducted at the Diamond Alkali facility, and RM 10.9, should also be considered, as these projects are on the same river, with identical site condition constraints. The Diamond Alkali project achieved an average dredge production rate of 500 CY per day, while the RM 10.9 work achieved an average daily dredge removal rate of less than 200 CY per day. These "real world" examples indicate that the 2,000 CY per dredge production rate is completely unachievable, which has a direct impact on the project cost and schedule assumptions.

Our primary comments regarding EPA's assumptions that affect the construction duration are the following:

- **Consideration of community impacts from noise.** The dredge production rate proposed by EPA does not consider local requirements and their impacts to the proposed work window. EPA assumes dredging operations will occur 24 hours a day, 6 days a week, 40 weeks a year (with EPA's preferred alternative taking approximately 5 years). These dredge operational hours have the potential to be in direct violation of multiple municipal codes concerning noise.
    - Noise Control Ordinances for the City of Newark, Essex County, prohibit construction, operating or permitting the operation of tools or equipment used in construction, drilling, demolition, or similar work between the hours of 8:00 p.m. and 7:00 a.m. These restrictions apply on weekdays and Saturdays, and at any time on Sundays or legal holidays. The exception to this is emergency work,

work with special variance, or when the resulting sound levels do not exceed the applicable Maximum Permissible Sound Levels.

- Similarly, Noise Control Ordinances in all municipalities in Hudson County, prohibit construction, drilling, earthmoving, excavating, or demolition work during the same work hours as the City of Newark.
- The State of New Jersey's Noise Control Act of 1971 authorized the New Jersey Department of Environmental Protection (NJDEP) to promulgate codes, rules, and regulations relating to the control and abatement of noise. NJDEP has developed a Model Noise Ordinance that can be adopted by local municipalities. The Noise Control Act allows municipalities to adopt noise control ordinances that are more stringent than the state code. The NJDEP promulgated noise regulations to control noise from stationary commercial and industrial sources in 1974, pursuant to the Noise Control Act of 1971, N.J.S.A. 13:1G-1 et seq. Within the noise regulations, there are established sound level standards of 50 decibels during nighttime (10:00 p.m. to 7:00 a.m.) and 65 decibels during the day.
- Residential properties are located in close proximity to the entire length of the project site. In many locations, these homes are located less than 500 feet from the shoreline. Given the local noise ordinances, and the vicinity of the project to residences, the community disruption resulting from this proposed action is significantly undervalued, and not appropriately considered in the FFS assumptions regarding project work hours.

- **Fish window assumptions.** The FFS proposes an annual 12-week shutdown to account for the fish window, weather, and equipment maintenance and downtime. The document discusses conducting a study to confirm the fish window closure; however, for the purposes of the FFS, a more conservative fish window should be assumed. The applicable fish window from the RM 10.9 removal action on the Passaic River, was 17 weeks (March 1 to June 30). For the RM 10.9 project, a waiver was requested from NJDEP by EPA and granted, but was limited to cap placement and did not include dredging activities during the fish window. Assuming a 17-week fish window rather than 12 weeks is appropriate. Fish window moratoriums have also been imposed on local bridge projects in the area, for example, Goethals Bridge Replacement project located on the Arthur Kill (Channel MP 23.35) had no in-water work windows from January 1 to May 31 to minimize impacts to winter flounder early life stages and essential fish habitat and from March 1 to June 30 to minimize impacts to anadromous fish. For these projects, all in-water dredging work and construction was also conducted inside cofferdams, which is not proposed in the FFS. It is possible that any waivers granted to allow work during the fish window would also require the use of best management practices that are not assumed or costed in the FFS.

- **Cold weather considerations.** During the RM 10.9 Removal Action, there were 45 days (7 weeks) of weather delays in a single construction season. The FFS assumes only 12 weeks of shutdown annually for fish window, weather, and bridge impacts, in aggregate. This substantially underestimates the actual shutdown that is likely to occur in a year, as weather delays would not be likely to occur in tandem with the spring fish window. During the RM 10.9 work, cold weather resulted in bridges between RM 2.6 and RM 10.4 being inoperable and ordered not to open in the extreme cold weather. Because recent data on the same river are available for

work window determination, information from the RM 10.9 work should be considered rather than data from projects in other regions and river systems.

- **Bridge impacts.** The FFS needs to sufficiently consider the degree to which bridge openings will impact both the dredge rate and the surrounding community. During the RM 10.9 Removal Action, the movement of barges required the opening of 10 bridges located south of the RM 10.9 project area. There were approximately 1,000 individual bridge openings to complete the project, and 2.8 days of delay for every day of dredging. Applying similar conditions to the proposed plan, which is reasonable given the same bridges will require opening for the remedial actions proposed in the FFS, bridge openings could result in 1.8 years of delay for inclement weather and bridge operational delays for each year of dredging at the rate proposed in the FFS.

  These bridge opening delays would change the project duration assumption from 5 years to 14 years for completion of EPA's preferred alternative. For the RM 10.9 project, bridge openings were to occur during the night to minimize impacts to daytime traffic. Plans for evening bridge openings also need to consider weather, and community events, such as events at nearby stadiums when bridge openings would not be allowed. The impact of bridge openings on the project's ability to transport dredged material at the proposed rates is a significant potential impact, and should be considered in the evaluation of project implementability in the FFS, not delayed for consideration during design. Additionally, the negative impact of thousands of bridge openings to the local community and traffic should also be considered and discussed in the impact of the project on the local community. Furthermore, the cost required to upgrade, repair, and maintain bridges should be considered in project implementation. It is likely that these costs will be borne by others, and should also be a consideration in the evaluation of impacts to the surrounding community. Lastly, there are future planned bridge replacement projects (such as Clay Street Bridge) that, depending on timing, could restrict channel movement of equipment for multiple years during construction. These other projects could also impact the remedial action proposed in the FFS.

3.3 Dredge material processing facility assumptions do not align with the assumed through-put rate. Either the cost and size of the upland processing facilities are significantly under-estimated, or the through-put rate for sediment dewatering is significantly over-estimated.

- The uplands material processing facility proposed in the FFS appears to be modeled after projects of size and dredge rates similar to the Hudson River project, which has been capable of processing up to 350,000 CY of material in 129 days (constrained by access to the shoreside facility in the off-season). If a facility of a similar capability was constructed for the Passaic River, and assuming 240 days of dredging per year, a facility the size of the Hudson River facility would have a maximum capacity of around 650,000 CY per year. At this rate, the minimum project length would be seven dredging seasons (or 7 years), rather than five for EPA's preferred alternative. However, the Hudson River project shoreside facility is over 100 acres, with a 1,400-foot-long developed barge handling waterfront area and many thousands of feet of rail siding and switch yard. The Passaic River FFS states that "while dredged materials would also have to be barged to an upland processing facility under DMM

Scenarios B (Off-Site) or C (Local Decontamination), a FFS-level survey of land along the FFS Study Area Shoreline showed a number of locations suitable for an upland processing facility..." Of the 12 sites indicated by this survey, none were even half the size of the Hudson River processing facility, and all had major limiting factors (lack of waterfront ready to develop, lack of rail, limited size), and almost all were more than 10 to 20 miles from the mouth of the river into Newark Bay. Without sufficient space for a facility even half the size of the Hudson River, and with additional realistic constraints imposed by the location and distance from dredging, this will significantly extend the project duration.

- Greater effort into sizing, and identifying the dredged sediment processing facility type, location, and layout, should be conducted, as this component has the ability to determine the dredge rate, which directly affects the project duration and cost. Significant site improvements at any of the potential upland facilities such as rail improvements, waterfront barge access, and facility construction could have significant cost implications.

3.4 The FFS provides a biased evaluation of dredging, and does not adequately evaluate the negative impacts of dredging to the river system and the surrounding community, or the likelihood that dredging will not achieve cleanup standards.

- The FFS should be updated to discuss the possibility of community exposures via inhalation and ingestion of dust from dredging work located in close proximity to residences. Residential property is within 500 feet of the shoreline along the majority of the river where dredging is proposed.
- Although not included in the remedial costs, the impacts to local businesses are not adequately considered in the remedial alternatives evaluation. Impacts to marinas, water-borne businesses and activities, shipping, and waterfront businesses should be discussed, as the cost to these businesses is an administrative implementability consideration, particularly when considering the likelihood that construction of EPA's preferred alternative would occur over more than a decade. This is more than a "temporary" impact to the surrounding community as a whole.
- The proposed dredging alternatives do not provide an adequate discussion or evaluation of the negative impact of dredging on the river system via resuspension and redistribution.
    - Section 3.5 of the FFS discusses the significant limitations and constraints associated with silt curtains and sheetpile walls, and how these may not be applicable for the proposed remedy. The remedy descriptions do not clearly discuss the type of technologies—if any—to be placed during construction to control migration of resuspended sediment.
    - Section 4.2.3 of the FFS states containment around dredge areas is not proposed, except during placement of dredged materials in confined aquatic disposal (CAD) cells under dredged material management (DMM) Scenario A (refer to FFS Section 4.2.6). "For the remainder of the FFS Study Area, it is

      assumed that application of best management practices and state of the art technology would be employed to minimize resuspension (refer to Appendix F)."

However, no discussion of what these state-of-the-art technologies are is included. Given the likelihood of significant sediment resuspension and migration during dredging, additional detail regarding the methods to be employed, and the effectiveness of these methods, should be included in the FFS.

- The comparison and evaluation of remedial technologies is biased toward the proposed remedy, and should be revised to more accurately compare the remedial options proposed.
  - EPA's discussion of the implementability of FFS Alternative 4 (EPA's focused capping alternative) does not discuss the significant benefit of reducing the total dredge volume. The implementability of Alternative 4 should be higher than that of the larger dredge alternatives (FFS Alternatives 2 and 3), as a significant reduction in dredge volume directly affects the implementability of the remedial option. The rationale for a lower implementability rating for FFS Alternative 4 is stated as a result of administrative issues with deauthorization of the navigation channel below RM 2.2. "The screening level implementability evaluation for Alternative 4 is similar to that for Alternative 3 above, except that Alternative 4 may face an additional administrative implementability challenge with respect to obtaining deauthorization of the federally-authorized navigation channel in the lower 2.2 miles of the river, where a USACE study has shown commercial navigation is ongoing and is projected to continue in the future."
  - The description of FFS Alternative 4 states that "…although Alternative 4 is not effective in meeting RAOs and PRGs within a reasonable time frame and is not protective of human health and the environment, it has been retained for detailed analysis to serve as a basis for comparison with the other active remedial alternatives that are all bank-to-bank in scope." This statement summarizes the biased alternatives evaluation, as FFS Alternatives 2 and 3, which are bank-to-bank in scope also do not meet all remedial action objectives (RAOs) and PRGs within the model-simulated timeframes as previously described. This is a clear summarization of the FFS over-valuing the benefit of sediment removal actions that do not result in full achievement of cleanup goals, for exorbitant cost. The cost/benefit of these removal alternatives does not justify the action, and should be re-evaluated to more accurately consider the benefit of the action for the associated cost.

3.5 Quantities used in the remedial cost estimates are not transparent and appear inconsistent.

Details regarding the quantities used in the cost estimates, and the assumptions made (such as volume to tonnage conversion factors), should be included. Based on the information provided, it was not possible to reproduce the quantities used in EPA's cost estimates. For example, in the "preferred alternative," FFS Alternative 3 with DMM Scenario B, on Page 110 of Appendix H, the numbers shown are mixed tonnages and yardages, but if the units are reasonably converted to yardage for comparison, dredging is stated to be 4,304,000 CY and the total of disposal options only totals approximately 2,600,000 CY. Additional detail is required to identify where the remaining 40 percent of the dredged material is accounted for. Similar discrepancies exist for the other alternatives as well.

3.6 The cost assumptions significantly underestimate the actual project cost.

- The FFS is applying a discount rate of 7 percent to the cost estimate net present value calculations, and although consistent with EPA guidance, this value is out of date, and not applicable to current economic conditions. The result of this rate substantially discounts the present value of future costs, underestimating the actual remedial action cost shown in the FFS. The current federal discount rate is 0.75 percent. Use of a discount rate that is +/-2 percent of the federal rate is much more appropriate than the 1992 value of 7 percent.
- If the discount rate is updated, the duration of the project then does become a factor that impacts overall project cost. The underestimation of the proposed alternative project duration by 10 to 15 years will substantially underestimate project cost.

4.0 Lower Passaic River Long-Term Recontamination

4.1 EPA has selected sediment remediation goals for the FFS Study Area for several contaminants of concern (COCs) that are much less than background sediment concentrations, inconsistent with their own guidance.

EPA has defined Upper Passaic River concentrations as the background concentrations for the FFS Study Area. However, it remains unclear why EPA has selected sediment remediation goals for mercury, total PCBs, and total dichlorodiphenyltrichloroethane (DDT) that are much less than these background concentrations. EPA's own guidance document has indicated that remediation goals less than background will generally not be used for remedial decisions (EPA 2005). EPA makes the argument for the FFS Study Area that the water and suspended sediment coming from above Dundee Dam is just one of the many sources of these materials reaching the FFS Study Area. However, as described below, the Upper Passaic River is the largest external source of contamination to the FFS Study Area and has background concentrations for many contaminants comparable to the concentrations currently present within the Study Area. EPA provides no justification for breaking from its guidance and selecting remediation goals 1 to 2 orders of magnitude less than its selected background concentrations for the FFS Study Area.

4.2 The Upper Passaic River is a significant source of contamination to the Lower Passaic River for many of the site COCs.

One of our major technical critiques of EPA's proposed alternative, as well as the other FFS alternatives, is the long-term recontamination of the lower 8 miles of the Lower Passaic River following implementation for many of the site COPCs and contaminants of potential ecological concern (COPECs). Based on EPA's EMB modeling analysis, the Upper Passaic River is currently the largest external source of sediment, PCBs, 4,4'-dichlorodiphenyldichloroethylene (DDE), gamma-chlordane, copper, lead, and polycyclic aromatic hydrocarbons (PAHs) to the Lower Passaic River and is also a significant external source of mercury to the Lower Passaic River. The FFS also notes that the current levels of contamination for PCBs, total chlordane, and PAHs in the Upper Passaic River fine-grained sediment are comparable to the concentration levels of these contaminants found in the recently-deposited Lower Passaic River sediments. No cleanup actions addressing the Upper Passaic River are currently proposed, so the Upper Passaic River will continue to be a significant and ongoing source of contamination for many of the site COPCs and COPECs to the Lower Passaic River in the future. EPA's EMB Forecasting Model predicts that, over the long term, concentrations of many of the site COCs will approach Upper Passaic River concentrations and mercury, total PCBs, and total DDT will stabilize at 1 or 2 orders of magnitude greater than the FFS Study Area selected remediation goals.

As presented in both the executive summary of the FFS and the Proposed Plan, the portrayal of recontamination post-remediation for many of these site contaminants is extremely misleading and inaccurate over the long term. On Page 4 of the FFS executive summary, the text states the following:

> "While the Superfund program generally does not clean-up to concentrations below natural or anthropogenic background levels (EPA 2002b), the flow of water and suspended sediment over Dundee Dam (background for the FFS Study

> Area) is just one of many sources of surface water and sediment into the FFS Study Area. Post-remediation, the suspended sediment from the Upper Passaic River will mix with suspended sediment from other sources entering the FFS Study Area (e.g., Newark Bay, Saddle River, Third River, and Second River), with the cleaner solids in the water column resulting from a remediated FFS Study Area and with any clean material placed on the river bed as part of the remediation. As a result, contaminant concentrations in the top six inches (bioactive zone evaluated in the risk assessment) can end up being much less than background concentrations coming over Dundee Dam."

Similar text is presented on Page 18 of the Proposed Plan. This text is true for any short-term projections of the Lower Passaic River's surface sediment contaminant concentrations following remedy implementation as any external sources of sediment contamination reaching the Lower Passaic River would be diluted out by the massive amount of clean cap material placed within the lower 8 miles of the Lower Passaic River. This would be particularly true for EPA's FFS Alternatives 2 and 3, which cap or dredge the entire lower 8-mile stretch of the river. Effectively, the massive remedial action and import of clean material "dilutes out" sediment contamination, but only temporarily.

Over time, the on-going input of sediment from the Upper Passaic River, and its associated contamination, to the Lower Passaic River would increase contaminant concentrations within the Lower Passaic River, and over the long term these inputs would effectively negate any of these dilution effects and the site surface concentrations would begin to more closely reflect concentrations of contaminants in the Upper Passaic River, the major external source of sediment to the Lower Passaic River (according to the FFS Appendix A, Data Evaluation Report No. 2, 90 percent of the upland delivery of solids to the Lower Passaic River comes from the Upper Passaic River, with tributaries, combined sewer outfall, and stormwater outfalls making up the other 10 percent of the solid load).

In fact, EPA's EMB modeling analysis of future contaminant concentrations of surface sediment within the Lower Passaic River for EPA's FFS Alternatives 2 and 3 supports this assertion, with the model first showing a significant drop in the Lower Passaic River surface sediment concentrations initially following remedy implementation, but then over the long term (30 years following implementation of Alternative 2, projected to be in 2059) the Lower Passaic River's surface sediment concentrations of total PCBs, gamma-chlordane, 4,4'-DDE, copper, lead, mercury, and high molecular weight polycyclic aromatic hydrocarbons (HPAHs) for FFS Alternatives 2 and 3 would begin to approach EPA's selected current Upper Passaic River concentrations for these contaminants. FFS Alternative 4 also shows an initial decrease in Lower Passaic River surface sediment concentrations following remedy implementation in EPA's EMB model; however, not nearly to the same degree as FFS Alternatives 2 and 3. For FFS Alternative 4, over the long term the projected Lower Passaic River surface sediment concentrations for these same contaminants are not all that different from EPA's selected current Upper Passaic River concentrations.

For total PCBs, gamma-chlordane, 4,4'-DDE, copper, lead, mercury, and HPAHs, the surface sediment concentrations in the Lower Passaic River over the long term ***do not*** end up being significantly less than the background concentrations coming over Dundee Dam based on EPA's EMB modeling analysis for any of the remedial alternatives (and, as discussed below, the

mercury, total PCBs, and total DDT sediment concentrations end up being significantly higher than EPA's risk-based sediment remediation goals).

Additionally, for these same contaminants, the long-term surface sediment concentrations for FFS Alternatives 2, 3, and 4 compared to FFS Alternative 1, the no-action alternative, are not all that different based on EPA's EMB modeling analysis. The long-term projected concentrations are all within a factor of three from one another for these four alternatives—yet the expense and disruption of these alternatives varies drastically.

As noted above in Section 4.1, in the FFS there are defined risk-based sediment remediation goals for four of the Lower Passaic River COCs, including 2,3,7,8-tetrachlorodibenzodioxon (2,3,7,8-TCDD), mercury, total PCBs, and total DDT. For two of these contaminants, mercury and total PCBs, the selected remediation goals are approximately an order of magnitude lower than EPA's selected Upper Passaic River or background concentrations. For total DDT, the selected remediation goal is 2 orders of magnitude lower than EPA's selected background concentration. Unlike these other contaminants, the background surface sediment concentration for 2,3,7,8-TCDD is slightly greater than EPA's selected remediation goal for 2,3,7,8-TCDD. For mercury, total PCBs, and total DDT, it is likely that over the short-term these remediation goals would be met within the Lower Passaic River as the sediment cap would effectively dilute out any recontamination reaching the Lower Passaic River; however, EPA's EMB model indicates that in less than 5 years following remedy implementation the surface sediment concentrations for these three contaminants would already have increased to concentrations greater than these remediation goals.

Over the long term for EPA's preferred alternative (FFS Alternative 3), the forecasted concentrations of mercury, total PCBs, and total DDT using EPA's EMB model are projected to be approximately 11, 9, and 33 times their remediation goals, respectively, and generally comparable to the Upper Passaic River concentrations as a result of recontamination of the FFS Study Area.

Recontamination from PAHs within the Lower Passaic River is a particular concern following remedy implementation, as currently EPA's EMB modeling shows that approximately 53 percent of the benzo(a)pyrene and 47 percent of the fluoranthene in the recently deposited surface sediment within the Lower Passaic River comes from the Upper Passaic River. EPA's concentration for total PAHs in the Upper Passaic River is approximately 61 milligrams per kilogram (mg/kg; summing the concentrations for HPAHs and low molecular weight polycyclic aromatic hydrocarbons [LPAHs]), already greater than both the current total PAH mean and median surface sediment concentrations within the Lower Passaic River of 48 and 31 mg/kg, respectively. EPA has concluded that the Upper Passaic River is likely the dominant source of total PAHs to the Lower Passaic River and that "any recovery of PAH concentrations in recently-deposited sediments of the Lower Passaic River will only occur in response to a decline in the Upper River Source" (FFS Appendix A, Data Evaluation Report No. 2). PAHs have been identified as an ecological COC for the Lower Passaic River; however, no remediation goal for the FFS Study Area was defined by EPA for this contaminant.

Without addressing the contaminated sediment present in the Upper Passaic River first, it is illogical to clean up the Lower Passaic River at such an extreme cost only to have it recontaminated with many of the Lower Passaic River COPCs and COPECs over the long term, particularly to levels possibly an order of magnitude greater than the selected risk-based

remediation goals. Furthermore, given the inevitable recontamination, EPA should not sell the remedy as “protective” to the public in the long-term versus other, more constrained actions with better cost-benefit scoring.

4.3 Inputs and assumptions used in EPA’s EMB model underestimate the potential recontamination to the FFS Study Area and make comparison of the FFS alternatives difficult.

EPA’s selected inputs into the EMB model result in inaccurate predictions of the contaminant reductions that EPA’s Alternatives will achieve in the FFS Study Area surface sediments over the long term.

- EPA’s sediment concentrations for the Upper Passaic River are based on a small sample size. FFS Appendix C states that the Upper Passaic River sediment input into the model was characterized using four beryllium-7 isotope (Be-7)-bearing surface sediment samples (only two of these were analyzed for organic contaminants), four Be-7-bearing dated sediment core tops, and the suspended solids from two sediment traps. Additionally, it is a technically flawed approach to consider only data from recently-deposited sediment (0- to 1-inch depth) for the characterization of the Upper Passaic River sediment in the model. FFS Appendix C Table 4-5 shows that recently-deposited sediment within the Upper Passaic River had contaminant concentrations measured at significantly lower concentrations compared to contaminant concentrations measured in surface sediment samples collected from the top 6 inches of sediment. It is noted by EPA that these 0- to 6-inch surface sediment samples are likely characterizing deeper legacy sediments within the Upper Passaic River. By basing their characterization of the Upper Passaic River sediments only on the recently-deposited sediment in the model, EPA fails to account for what will happen in the future if these deeper surface sediments with higher contaminant concentration are resuspended, such as in a flooding event, with potential transport into the Lower Passaic River. EPA includes legacy sediment resuspension within the Lower Passaic River in their EMB model, but does not take it into account in the upper reach of the river.
- EPA uses average concentrations to characterize the Upper Passaic River (background) surface sediment concentrations. This may not be appropriate. It may be more appropriate for background concentrations for the site to be based on a statistical analysis of the data such as an upper-bound estimate of the central tendency or upper background threshold values, as has been used at other Superfund sites.
- The release of sediments and contaminants during the dredging process is not represented in the EMB forecast model (refer to Page 5-18 of FFS Appendix C). It is important to note that the FFS Alternatives do not assume the use of silt curtains or sheetpile walls during implementation to reduce the impacts of resuspension during dredging. This means that the inevitable release of contaminants during dredging is not accounted for.
- The EMB model is applied by EPA between RM 2 and RM 12; however, all of the FFS remedial alternatives would be implemented between RM 0 and RM 8. The potential for recontamination within the FFS Study Area from sediment contamination

remaining between RM 8 and RM 12 following remedy implementation is unaccounted for in the model. Yet, the FFS notes that there is little or no trend in COC median surface sediment concentrations with river mile from RM2 to RM12. The river upstream of RM 8 is a current source, and potentially a future source, of contamination to the FFS Study Area that has not been adequately analyzed or portrayed in the FFS.

- EPA's representation of FFS Alternative 4 in the EMB forecasting model is misleading as it assumes that while one-third of the FFS Study Area would be remediated under FFS Alternative 4, the average surface sediment concentration within the FFS Study Area would only decline by one-third as well, following implementation of this alternative. Yet, FFS Alternative 4 was intended by EPA to focus "on discrete areas of the FFS Study Area sediment that release the most contaminants into the water column" and in those areas with "the highest gross and net fluxes of COCs" (EPA Proposed Plan, page 25). A targeted removal of sediments from the one-third of the FFS Study Area with the greatest impacts would decrease the average surface sediment concentration by much greater than one-third. EPA's assumption of a linear decrease in the surface sediment concentration in the EMB model for FFS Alternative 4 significantly underestimates the potential decreases in COC concentrations within the FFS Study Area over time for this alternative, making any comparison to the other FFS Alternatives misleading, and biasing EPA's conclusion toward more expansive, disruptive, and expensive remedies.

4.4 EPA has two models for predicting long-term surface sediment concentrations for the FFS Study Area that show very different outcomes over the long term.

EPA uses two different modeling approaches in the FFS to predict surface sediment concentrations within the FFS Study Area over the long term following remediation, but EPA does not attempt to reconcile the models. The EMB model, as discussed above, is one of EPA's modeling approaches (FFS Appendix C). The other modeling approach used by EPA is a contaminant fate and transport model (FFS main text and FFS Appendix B). As discussed above in Section 2.0, we have significant technical issues with the EPA's contaminant fate and transport model, as well. The two modeling approaches show very different results for the predicted long-term surface sediment concentrations of the select contaminants modeled (2,3,7,8-TCDD, mercury, total PCBs, and total DDT) within the FFS Study Area for EPA's FFS bank-to-bank alternatives (FFS Alternatives 2 and 3).

As described above, EPA's EMB model predicts that mercury, total PCBs, and total DDT surface sediment concentrations within the FFS Study Area will begin to approach EPA's selected background surface sediment concentrations and will level out at concentrations greater than EPA's selected risk-based remediation goals for these contaminants (1 or 2 orders of magnitude) in the long term, following remedy implementation of FFS Alternatives 2 and 3.

However, EPA's contaminant fate and transport modeling results for EPA's FFS Alternatives 2 and 3 show that, following remediation, the concentrations of mercury and total PCBs in the FFS Study Area will be near EPA's selected remediation goals and be an order of magnitude lower than the Upper Passaic River concentrations and will generally remain at these concentrations over the long term (30 years). The contaminant fate and transport modeling results for total DDx (DDT, DDE, and dichlorodiphenyldichloroethane [DDD]) for EPA's FFS

Alternatives 2 and 3 also show surface sediment concentrations leveling off following remediation approximately an order of magnitude less than the Upper Passaic River surface sediment concentration for total DDx, but total DDx concentrations are predicted to remain an order of magnitude greater than the selected total DDx remediation goal.

Predicted long-term 2,3,7,8-TCDD surface sediment concentrations in the FFS Study Area between the two models is also very different for FFS Alternatives 2 and 3, with the contaminant fate and transport model showing predicted long-term concentrations near the selected remediation goal and nearly five time lower than the EMB model's predicted long-term concentrations for 2,3,7,8-TCDD. In contrast, the long-term predicted 2,3,7,8-TCDD, mercury, total PCB, and total DDx concentrations for EPA's FFS Alternatives 1 and 4 are much more similar between the two modeling approaches. EPA has not attempted to reconcile these very serious discrepancies between the models.

Therefore, EPA has generated two widely different predictions of long-term surface sediment concentrations for their key COCs within the FFS Study Area for Alternatives 2 and 3. While EPA's two FFS modeling approaches show very different results for Alternatives 2 and 3, only the results of the contaminant fate and transport model for EPA's alternatives are presented in the main text of the FFS. The contaminant fate and transport model results portray EPA's FFS bank-to-bank alternatives as significantly more effective in meeting the selected remediation goals over the long term compared with EPA's EMB model. No comparison of the results from these two modeling approaches is provided anywhere in the FFS main text or appendices. Celanese is concerned about the implications for remedy selection in the FFS Study Area if EPA bases their decisions on the outcomes of only one model instead of acknowledging a wider range of predicted long-term concentrations in the FFS following remedy implementation. Ultimately, the long-term effectiveness of FFS Alternatives 2 and 3 may not be as effective as EPA's contaminant fate and transport model is predicting.

Additionally, the long-term modeling predictions for average surface sediment between RM 8 and RM 17 using EPA's contaminant fate and transport model (FFS Figures 5-1a through 5-1d) show that concentrations of 2,3,7,8-TCDD, mercury, total PCBs, and total DDT remain much greater than (1 or 2 orders of magnitude) the FFS Study Area remediation goals 30 years from now. Without remediation of the upriver portion of the Lower Passaic River occurring prior to remediation of the FFS Study Area, the upriver portion of the Lower Passaic River remains a significant source of contamination to the remediated FFS Study Area.

5.0 References

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List of Abbreviations and Acronyms

Abbreviation/ Acronym	Definition
2,3,7,8-TCDD	2,3,7,8-Tetrachlorodibenzodioxin
BAZ	Biologically active zone
BERA	Baseline Ecological Risk Assessment
BHHRA	Baseline Human Health Risk Assessment
CAD	Confined aquatic disposal
cm	Centimeters
COC	Contaminant of concern
COPC	Contaminant of potential concern
COPEC	Contaminant of potential ecological concern

Abbreviation/ Acronym	Definition
CPG	Cooperating Parties Group
CY	Cubic yards
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DDx	DDD, DDE, and DDT
DMM	Dredged material management
EMB	Empirical Mass Balance
ENR	Enhanced Natural Recovery
EPA	U.S. Environmental Protection Agency, Region 2
EPC	Exposure point concentration
FFS	Focused Feasibility Study
FFS Study Area	Lower 8 miles of the Lower Passaic River
HPAH	High molecular weight polycyclic aromatic hydrocarbon
LPAH	Low molecular weight polycyclic aromatic hydrocarbon
LPRSA	Lower Passaic River Study Area
mg/kg	Milligrams per kilogram
NCP	National Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PRG	Preliminary Remediation Goal
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
RM	River Mile
SPI	Sediment profile imaging
USACE	U.S. Army Corps of Engineers

Yeh, Alice

From: McCall, Duke K., III <Duke.McCall@bingham.com>
Sent: Wednesday, August 20, 2014 2:11 PM
To: Region2 PassaicLower8MileComments
Cc: Enters, Karl, Celanese/US (karl.enters@celanese.com); katheryn.coggon@celanese.com
Subject: Celanese Comments on EPA's FFS and Proposed Plan for the Lower Eight Miles of the Lower Passaic River
Attachments: Celanese Comments.pdf

Dear Ms. Yeh:

Attached are comments of Celanese Corporation on EPA's Focused Feasibility Study Report and Superfund Proposed Plan for the Lower Eight Miles of the Lower Passaic River. Please let me know if you have any difficulty opening the attachment.

Sincerely,

Duke McCall

Duke K. McCall, III
T 202.373.6607
F 202.373.6001
duke.mccall@bingham.com
B I N G H A M
Bingham McCutchen LLP
2020 K Street NW
Washington, DC 20006-1806

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Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 19, 2014 3:08 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

joe esposito
jesposito738@gmail.com
284 american legion dr apt 1a
hackensack
nj
07601

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 01, 2014 11:22 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Warren Faure
mwfaure@optonline.net
871 Sherwood Road
Bridgewater
NJ
08807

9085959094

COMMENT CARD

PASSAIC RIVER PROPOSED PLAN

June 23, 2014

Belleville, New Jersey

Commenter Name Anthony Fazio **Contact Information (Optional)**

Incredible amount of moveable bridges on River. Will this be taken into consideration when planning a methodology. One rail bridge alone can move over 100,000 people. An aggressive remediation without considering this fact could make a difficult situation for hundreds of thousands of people. When will agencies & local bridge owners be notified of work & schedule?

Note: If this is a request for information, please give us a way to get in touch with you. Thank you.

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 11, 2014 11:29 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Edward Fears
eddiefears@gmail.com
21 Oak Hill Road
Short Hills
New Jersey
07078

973.495.8713

Yeh, Alice

From: Jennifer Fenstermaker <jfenstermaker@sdtvault.com>
Sent: Thursday, July 17, 2014 1:56 PM
To: Yeh, Alice
Cc: Fred Brody
Subject: Site Remediation pre-treatment
Attachments: Product Data Sheet.pdf

Good afternoon, Ms. Yeh -

I am sending along the attached information as a follow up to your conversation with Fred Brody from a few weeks ago. As Fred may have mentioned, we are a manufacturer of a totally green accelerated sedimentation system that can be used as a pre-treatment for site remediation projects.

Very briefly, the WTS2000 is set in the treatment sequence between the sediment holding tanks and the oil/water separators. Because it successfully reduces sediment, hydrocarbons, and some heavy metals, its role is to contribute to the overall treatment of the remediated material and **extend the life of the carbon filters**, thus keeping costs down. While this is a very brief overview of the system's capabilities, I hope it is enough to explain the reason for my email.

I have reviewed www.ourpassaic.org and I understand you are nearing the end of the open comment period. I have attached, for your information, a product page with details on the WTS2000. I hope to have the chance to discuss this further and see how we might assist in this very ambitious and important effort.

Regards,
Jennifer

Jennifer Fenstermaker
Chief Operating Officer

Aqualete Industries, LLC
3417 Sunset Avenue | Ocean, New Jersey 07712
P: 732.695.6336 | F: 732.922.1022 | E: jfenstermaker@sdtvault.com

AqualeteIndustries.com
Pioneering the Science of Clean Water™

Aqualete Industries Product Data

WTS2000 - Portable Sediment Tank

DEP approved to be on your jobsite today

About Our Company

Aqualete Industries is an original equipment manufacturer of innovative water treatment systems headquartered in Ocean, NJ.

The WTS2000 portable sediment tank is used to remove suspended sediments, hydrocarbons and pollutants from water and is approved to comply with the requirements for portable sediment tanks under EPA standards.
There is no other device on the market today that can match the efficiency and reduction rates of the WTS2000.

The WTS2000 Is

- Easy to operate
- Accessible & affordable
- A tow-behind sedimentation device; and

Accelerated Sedimentation

Water is pumped into the WTS2000 using a standard construction pump. Once pumped into the unit, the water goes through a four-phase treatment process making over 100 right hand turns in our patent-pending system, which has the highest reduction in:

- Sediment: sand, silt, dirt, clay, gravel and other highly organic soils
- Hydrocarbons: oil, gas and grease
- Heavy metals
- Debris and bio-mass
- Turbidity
- Phosphorous
- Nitrogen
- Nutrients and other pollutants

Green Technology For Treating Water

- Our product is DEP approved for sediment control, dewatering and MTD maintenance.
- Contractors are able to discharge treated water into a variety of locations or recycle / reuse
- Jobsites are kept running on schedule due to our product's convenience, portability & efficiency

Product Is Approved By

- Environmental Protection Agency
- Department of Environmental Protection
- State Soil Conservation Committee
- Department of Agriculture

Aqualete Industries, LLC
3417 Sunset Avenue
Ocean, NJ 07712 USA
Office: (732) 695-6336
Fax: (732) 922-1022
www.aqualeteindustries.com

Approved Applications

- Sediment Control & Dewatering
- SWPP & Post-Construction Stormwater Compliance
- MTD Cleanout & Maintenance
- Pre-Treatment for Site Remediation
- Sediment Basin Maintenance
- Construction Site Discharge
- Equipment, Car, Truck & Heavy Machinery Washing
- Marina and Boat Basin Maintenance
- Drying Dredge Material
- Oil/Water Separation
- Trench Discharge
- Groundwater Dewatering
- Decanting Water From Storage Tanks

Ease Of Use & Mobility

- Keeps projects on time and on schedule
- Mobile, tow-behind unit with simple setup and clean-out
- Easy to move to multiple locations on a jobsite
- Can be connected in parallel to obtain higher GPM's
- No costly trainings or certifications

Saves Time, Money & Man Power

- No downtime dewatering
- Keep jobsites dry with little maintenance
- Reduces preventable interruptions and site delays
- Proper usage ensures compliance with regulations
- Significant savings when disposing sediment and solids
- Uses no chemicals or electricity to reduce pollutants

Built To Work

- Built from 316 marine grade stainless steel
- Ability to use the unit in fresh and salt water conditions
- Handles high volumes of water using standard jobsite pumps
- Collected clean fill can be returned to the jobsite
- No replaceable filters

Our Systems Are Available For

- Ownership
- Long Term Lease
- Daily, Weekly & Monthly Rental

Aqualete INDUSTRIES®

Aqualete Industries Product Data

Current State Approvals:

New Jersey, New York, Illinois, Indiana, Maryland, Michigan, Ohio, Pennsylvania, Washington, West Virginia and many more.

System Flow Rates:

Our system is designed with two sides, which can be run independently or simultaneously for maximum treatment. Multiple systems can be connected in parallel to garner a higher flow rate, if necessary. The expected flow rate will depend on the material and soil composition.

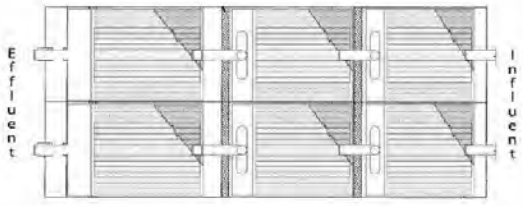
Single Side Flow Rate: up to 190gpm
Full Unit Flow Rate: up to 375gpm

Average Reduction Rates For Sediment Control & Dewatering:

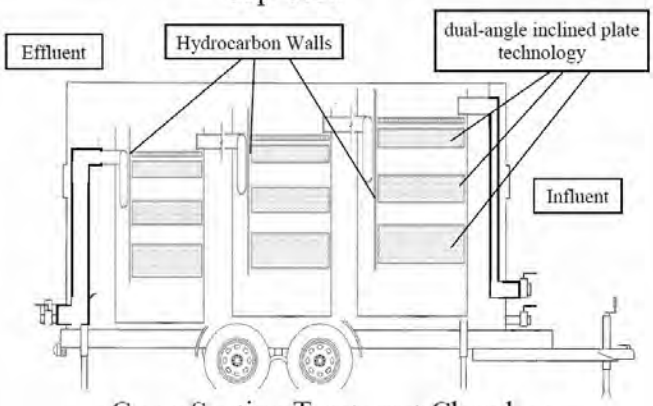
Total Suspended Solids (TSS):	87%
Nephelometric Turbidity Units:	75%
Total Phosphorus:	83%
Total Kjeldahl Nitrogen:	83%
Hydrocarbons & Heavy Metals:	97%

Average Reduction Rates For Pollutant & Hydrocarbon Reduction:

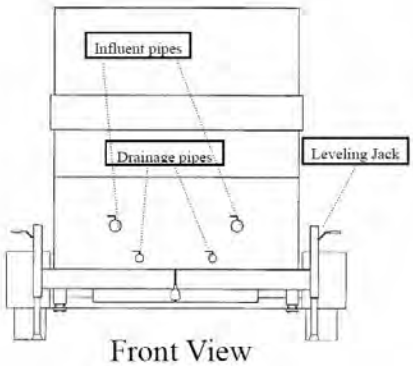
Total Suspended Solids (TSS):	88%
Nephelometric Turbidity Units:	90%
Hydrocarbons:	99%
Biochemical Oxygen Demand:	97%
Chemical Oxygen Demand:	82%



Top View



Cross Section Treatment Chamber



Front View

Aqualete Industries LLC - Michael Bavaro - Internal National Sales - (732) 695-6336 - mbavaro@sdtvault.com				
Company Name:	**Pyrz Water Supply**	**Douglas, Incorporated**	**Dave Heiner Associates**	**J.L. Moore**
Sales Territory:	PA, South NJ, DE	IN, IL, OH, MI, KY, WI, WV	North NJ and Lower NY	Middle and Upper NY
Contact:	David Pyrz	Ty Douglas	Scott Hansen	Craig Moore
Number:	(215) 256-8430	(317) 862-3681	(862) 254-0662	(716) 912-8799
Email:	dave@pyrzwater.com	ty@douglassinc.com	shansen@daveheinerassoc.com	cmoore@jlmooreinc.net

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Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Saturday, August 09, 2014 8:09 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jon Ferrao
Jferrao74@yahoo.com
212 Longview rd
Bridgewater
NJ
08807

(908) 239-1286

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 12:50 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

melissa ferrao
melisferrao@gmail.com

Yeh, Alice

From: Isabel Simoes <isimoes@townofharrison.com>
Sent: Tuesday, August 19, 2014 3:27 PM
To: Region2 PassaicLower8MileComments
Cc: pjzarbetski@townofharrison.com; mstanton@mbi-gs.com; Schenine.Mitchell@epa.gov
Subject: Town of Harrison - Comments to EPA Focused Feasibility Study
Attachments: 2014 - 08-19 Comments to EPA.pdf

Isabel Simoes

Town of Harrison - Legal Department
318 Harrison Avenue, Harrison, NJ 07029

P. 973.268.2442 -- ***F.*** 973.484.4575

isimoes@townofharrison.com

Please consider the environment before printing this email.

HARRISON, NEW JERSEY
OFFICE OF THE MAYOR

JAMES A. FIFE
MAYOR

August 19, 2014

Via E-Mail (PassaicLower8MileComments.Region2@epa.gov) & Regular Mail
Ms. Alice Yeh
Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

RE: Town of Harrison - Comments to EPA Focused Feasibility Study

Dear Ms. Yeh:

As you may know, Mayor Raymond McDonough died suddenly in February. I was appointed by the Town Council as the new mayor of the Town of Harrison, and have spent the last few months getting up-to-speed on the many issues that face our Town. Mayor McDonough was keenly aware of the EPA's Focused Feasibility Study ("FFS"), and was very concerned with the effect that implementation of same would have on the Town of Harrison and its residents. Based upon my review of this matter, as presented to me by various Town officials, I present this letter as the Town of Harrison's comments to the FFS.

Town officials have been following the debate over the restoration of the Passaic River closely for the last few years. Multiple personnel from the Town have been involved with the removal of soil/sediment from the Passaic River in Lyndhurst (the "River Mile 10.9 Removal") as same related to the bridge openings in Harrison that were required for that project. Based upon that involvement, I would like to share the following.

Bridge Openings

The Town of Harrison is surrounded on three sides by the Passaic River. Three (3) county-owned and operated bridges span the Passaic in the Harrison area: Clay Street; Bridge Street; and Jackson Street. These bridges are owned and operated jointly by Hudson and Essex Counties. Prior to the River Mile 10.9 Removal project, all three (3) of these bridges were opened approximately 3-4 times a year. The River Mile 10.9 Removal required at least 100 bridge openings of each of these bridges to support the project over a ten (10) month period. As I believe you are aware, the Bridge Street Bridge broke twice during the project and caused significant issues in Harrison.

There are no hospitals in Harrison or its land-connected neighbor, Kearny. Harrison relies principally on Newark-based hospitals for the emergency care of its residents and commuter

population. Accessing these Newark hospitals requires crossing the Passaic River. Having the Clay, Jackson and Bridge Street bridges opened as many times as will be needed for the FFS presents a safety concern for Harrison.[1] If Harrison EMS units cannot cross the Passaic River in a timely manner to access the Newark hospitals, significant treatment delays will occur.

Another problem with the bridge opening during the River Mile 10.9 Removal was the extensive coordination that had to occur between multiple owners and operators from Lyndhurst south (NJ TRANSIT, PATH, NJDOT, Hudson/Essex Counties, Conrail, and Amtrak). In addition to restrictions placed on bridge openings by the individual owners and operators, we were forced to deal with movements of barges up and down the Passaic River during high tides. If, for some reason, one of the many bridges could not be opened, the entire schedule was cancelled and placed on hold. Once the bridges were opened to allow the passage of barges, traffic patterns in Harrison were adversely impacted.

Given the disruption and safety issues that the Town of Harrison experienced during a 16,000 cubic yard removal in Lyndhurst, the Town of Harrison is naturally very concerned about the impact from the 4.3 million cubic yard removal proposed in the FFS. The Town of Harrison is also concerned that the projected project schedule of five (5) years may be underestimated, causing impact to the Town for an even greater period. If the River Mile 10.9 Removal of 16,000 cubic yards took ten (10) months, the estimate of sixty (60) months to remove 4.3 million cubic yards may be unrealistic.

Red Bulls Stadium

As I am sure you are aware, the Town of Harrison is the home of Red Bulls Stadium. On game days/nights, thousands of patrons come to Harrison to dine at our restaurants and attend a Red Bulls game. During the River Mile 10.9 Removal, there were a number of conflicts where the scheduled movements of barges and opening of bridges were in direct conflict with Red Bulls games/events. On game days/nights, a significant amount of traffic crosses the three (3) county-owned/operated bridges to get to and from the Red Bulls Stadium. The Town uses all of the bridges in its pre-game and post-game traffic plans. Thankfully, we were able to work directly with the contractors in charge of the River Mile 10.9 Removal to adjust the bridge-opening schedule around Red Bulls games/events. The Town of Harrison is concerned, given the scale of the FFS, that numerous traffic disruptions will occur.

---

[1]Although there is a 4th bridge that crosses the Passaic River that did not have to open for the River Mile 10.9 Removal (the Stickel Bridge), when the other 3 bridges are open all river-crossing traffic is diverted to that bridge, causing traffic issues.

PATH & Redevelopment

The Town of Harrison is also the home of the Harrison PATH Station and a number of commuter parking lots that feed that rail station for service to and from New York City. As a result, the Town of Harrison has heavy peak traffic flows during the morning and evening rush hours, with a large number of vehicles entering and leaving the Town of Harrison. Further, the Port Authority of NY & NJ is building a new $250 Million PATH station in Harrison. The Town is also in the midst of a large-scale redevelopment project of its entire waterfront area involving over 250 acres. Much of this redevelopment is located adjacent to the Jackson and Bridge Street Bridges. The Town is concerned that the FFS and resulting bridge openings/traffic will have a negative impact on these important aspects of Harrison.

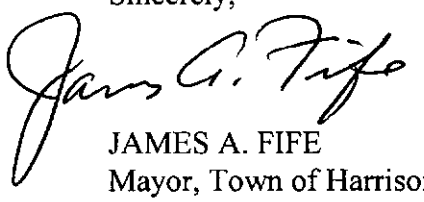
Pedestrian Traffic & Recreational Access

It should not be forgotten that numerous people walk across the three (3) county bridges every day. The Bridge Street Bridge in particular appears to be the most utilized bridge for pedestrian traffic. Obviously, if the bridges are open, pedestrians, like cars, cannot cross. Further, the Town has constructed, both itself and through developers, a waterfront walkway on the River. We are concerned that a five (5) year dredging will render the walkway useless to our residents. If the dredging takes longer, then this disruption will be extended.

Based upon all of the foregoing, the Town of Harrison is concerned that the EPA may not have taken into account the significant negative impacts to the Town that can occur from implementation of the FFS. Accordingly, the Town requests that all of the above-referenced issues be taken into account by the EPA when deciding how best to address the Passaic River contamination.

The Town appreciates the opportunity to provide comments, and looks forward to a reply.

Sincerely,



JAMES A. FIFE
Mayor, Town of Harrison

cc: Harrison Town Council
Congressman Albio Sires
Senator Nick Sacco
Assemblywoman Angelica Jimenez
Assembly Speaker Vincent Prieto
Governor Chris Christie
Commissioner Bob Martin, NJDEP
US Senator Robert Menendez
US Senator Cory Booker
Congressman Bill Pascrell
Congressman Donald Payne
Hudson County Executive Tom DeGise
Gina McCarthy, EPA Administrator
Judith Enk, EPA, Region 2
Schenine Mitchell, Brownfields Project Manager

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 9:04 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Dwayne Fisher
dwaynefisher@yahoo.com

Kendall Park
New Jersey

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 6:45 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Neil Fox
nfox0546@aol.com
44 Wintergreen Drive
Manalapan
New Jersey
07726

732 792 6813

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 7:54 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Paula Fox
pmfox16@aol.com
44 Wintergreen Drive
Manalapan
NJ
07726

732 208 1488

COMMENT CARD

PASSAIC RIVER PROPOSED PLAN

MAY 7, 2014

NEWARK, NEW JERSEY

Commenter Name

Tobias A. Fox

Contact Information (Optional)

tobiasfox1@gmail.com
646-399-0337

I'm a Newark resident, born here, attended school here, experienced joy and pain here. This is my belored city, and I'm pleased that the EPA has identified the polluters of the Passaic River and has taken action to have those responsible own up to their responsibilities of cleaning up our river, ~~[illegible]~~ regardless of the cost. This is one public health concern we can't afford to ignore.

Note: If this is a request for information, please give us a way to get in touch with you. Thank you.

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Sunday, August 03, 2014 9:53 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Linda Friedman
Lrfdes2@hotmail.com

New Jersey
08827

8143601950

DARLING
INTERNATIONAL INC.

August 11, 2014

Ms. Alice Yeh
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway
New York, New York 10007-1866

Re: Proposed Plan for the Lower Eight Miles of the Passaic River

Dear Ms. Yeh:

On behalf of Darling Ingredients Inc., I am submitting herewith our comments on the Proposed Plan for the Lower Eight Miles of the Passaic River. Darling supports the preferred remedy, referred to as Alternative 3, Capping with Dredging for Flooding and Navigation. Further, Darling vigorously supports the dredging of the 300 foot navigational channel to its presently authorized depth of thirty feet from River Mile 0.0 to River Mile 1.2

Dredging of the navigational channel is critical to the continued viability of our port facility. We thank you for the opportunity to comment on this very important matter.

Very truly yours,

William Frish

William Frish

DARLING INTERNATIONAL INC.
America's leading provider of rendering, recycling and recovery solutions to the Nation's food industry.

825 WILSON AVENUE NEWARK, NJ 07105 973-465-1900 tel 973-465-9247 fax 800-842-5927 toll free WWW.DARLINGII.COM

DARLING
INTERNATIONAL INC

Comments Submitted by Darling Ingredients Inc.

On the Proposed Plan for the Lower Eight Miles of the Passaic River

On April 11, 2014, the United States Environmental Protection Agency ("USEPA") announced its Proposed Plan for the remediation of the Lower Eight Miles of the Passaic River. For the reasons stated below, Darling Ingredients Inc. ("Darling") supports the preferred remedy, referred to as Alternative 3, Capping with Dredging for Flooding and Navigation. Further, Darling supports dredging of the 300 foot navigational channel to its presently authorized depth of thirty feet from River Mile 0.0 to River Mile 1.2.

Our consultants, Ocean and Coastal Consultants ("OCC") have reviewed the Remedial Investigation Report and the Focused Feasibility Study, which form the basis for the Proposed Plan. As discussed in Section III, OCC believes that up to three feet of additional dredging will be needed to achieve an effective depth of thirty (30) feet in the navigational channel. OCC has also suggested a modification to the Proposed Plan which would enhance the longevity of the dredging that is proposed. That proposed modification, and a request for additional information, is set forth in Section IV of these comments.

About Darling Ingredients Inc.

Darling (formerly known as Darling International Inc.) was established in 1882, and has grown into a global developer and producer of sustainable natural ingredients from edible and inedible bio-nutrients, creating a wide range of ingredients and customized specialty solutions for customers in the pet food, pharmaceutical, feed, fuel, bioenergy and fertilizer industries. With operations on five continents, Darling recycles all aspects of animal byproduct streams into useable and specialty ingredients, such as gelatin, tallow, feed grade fats, meat and bone meal, poultry meal, yellow grease, fuel feed stocks, green energy, natural casings and hides. Value added products include edible fats, bone products, fertilizers, and blood products.

Darling also recovers and converts used cooking oil and commercial bakery residuals into valuable feed and fuel ingredients. In addition, Darling provides grease trap collection services, sells used cooking oil collection equipment to restaurants, and collects and land applies primarily food residuals.

Darling's operations provide an environmentally sound alternative to managing a wide range of byproducts derived from animal and vegetable origins that, if managed inappropriately, can create potential negative impacts for human health and the environment.

II. Current Port Limitations

Darling's operation is inextricably tied to its location and access to worldwide shipping routes. Since 1977, Darling has operated a facility located at 825 Wilson Avenue in Newark, New Jersey where it primarily recycles animal fat, bone, and used cooking oil. Raw materials are delivered to Newark via truck, while finished product is exported primarily via bulk cargo ships.

825 WILSON AVENUE NEWARK, NJ 07105 973-465-1900 tel 973-465-9247 fax 800-842-5927 toll free WWW.DARLINGII.COM

The Newark facility serves a wide area, including all of New York, New Jersey and Connecticut, Southern Massachusetts, Northern Delaware and Eastern Pennsylvania, all the way to Pittsburgh. Darling employs approximately 130 people at its Newark facility.

The Newark facility is located on Newark Bay, in an area known as the Kearny Point Reach, a portion of the Passaic River Federal Navigational Project, which stretches from where the Lower Passaic River meets the Newark Bay to River Mile 1.2. The Darling facility is located at River Mile 0.6.

From River Mile 0.0 upstream to River Mile 2.6 (Junction Light in the Newark Bay Turning Basin to the Point-No-Point Conrail Bridge) the channel has an authorized and constructed depth of 30 feet mean low water ("MLW") and is 300 feet wide.

The Passaic River has been used for commerce and industry for almost two centuries. After the Civil War, the lower Passaic River was designated as a federal navigation channel. The United States Army Corps of Engineers first dredged the Passaic River for navigation in 1874.

In 1930, the federally authorized depth of the navigational channel in the Kearny Point Reach was increased to thirty (30) feet. The channel was regularly dredged and maintained at the authorized depth for fifty (50) years.

However, the last dredging of the channel occurred in 1983. The halt in maintenance dredging was due to the presence of contaminated sediments associated with the Diamond Alkali Superfund Site, located on Lister Avenue in Newark, and concerns over the disposal of contaminated dredged spoils.

In July 2010, the United States Army Corps of Engineers issued a report entitled "Lower Passaic River Commercial Navigation Analysis." In that report, the Corps referred to the 2008 Condition Survey which described conditions in the Kearny Point Reach as follows: "The 2008 Condition Survey indicated that the minimum depth in the channel for vessels entering from Newark Bay is 12.9 feet in the left outside quarter, 14.2 feet in the middle half and 10.8 feet in the right outside quarter...Depth within the channel ranged from 10 to 29 feet, with an average depth close to nineteen feet." Id. at 14.

It can reasonably be expected that depths are even shallower today, after six additional years of sediment deposition.

The removal of contaminated sediments is critical to Darling's continued operations. The existence of a port facility was a primary driver in the Company's decision to locate in Newark. The Newark facility includes a dock and berthing facility. The company uses its port facility to export its finished products, namely used cooking oil and tallow, to Europe, the Caribbean and South America.

Darling needs to provide a safe draft for the tanker vessels that on-load these recycled materials. Because of siltation in the berthing area, the company has been forced to use a pier, in conjunction with a two barge loading operation platform, to maintain a standoff and provide the maximum acceptable draft for the ships at high tide.

The barge arrangement allows vessels to have access to the Darling terminal. The inner (landward and larger barge) is approximately 220' by 50'; the outer (offshore) barge is approximately 30' by 90'. The second barge was added approximately fifteen years ago. Its addition was necessitated by the continuing buildup of silt at the facility.

The Darling terminal takes in ocean-going tankers ranging between 7,800 and 19,000 dead weight tons (DWT), and between 110 and 150 meters in length. The draft of these vessels varies between 8 meters (approximately 26.4 feet) and 9 meters (approximately 29.7 feet).

There is approximately 6 meters (approximately 19.8 feet) of water at the berth at mean low water, and, as noted above, the average depth in the channel is less than nineteen feet.

Approximately twenty vessels per year call at the Darling terminal. The fleet of these specialized and relatively small ships is very limited, which makes scheduling very difficult.

The current two barge loading arrangement is needed because the federal channel has not been maintained at its authorized depth since 1983 and vessel access is restricted by shoaling. As a result, Darling has created a system that allows vessels calling at its facility to remain in the deepest part of the channel and load by "riding the tide." Due to the shallow water at the berth, all vessels must dock and depart at high water only. This 12-hour cycle causes delays with almost every vessel that calls. In some instances, depending on the lunar tidal swing, vessels have rested on the bottom at the facility.

In addition, there have also been occasions where a vessel has been unable to fully load the contracted amount, due to "loading window" restrictions, or draft issues. When that occurs, Darling must still pay for the freight charges, even if the boat is not fully loaded. This also hastens the need to have another vessel dock at the facility.

The Company recently received authorization to replace the existing two barge shipping operations platform with a fixed pier and single barge berthing structure, designed to provide a safer working environment. Darling will be investing an estimated two (2) million dollars to construct the new berthing facility.

However, the berthing barge, and any ship moored at the berth, would continue to occupy the same footprint as the existing two barge system in order to allow ships to moor at the facility. As noted above, the use of the loading practice of "riding the tide" has its limitations, and it is not a satisfactory way to conduct an efficient operation and to protect people and equipment.

Darling has explored other options for shipping product but found them unsuitable. For example, the company assessed re-handling its product from barges to ships at an offshore (deeper) location but found that this was impracticable. This would require a dedicated barge, which was not available, and would result in double the amount of work required to ship.

During the period 1997-2006, Darling shipped an average of 75,000 tons of finished product every year from its Newark facility. Since 2006, Darling has shipped the following amounts of finished product:

2007	60,000 tons
2008	81,000 tons
2009	63,000 tons
2010	69,000 tons
2011	65,000 tons
2012	63,000 tons

2013	60,000 tons
2014	60,000 tons (projected)

The total value of the exported product is very significant, ranging between fifty (50) and sixty-seven (67) million dollars per year.

This substantial quantity of materials requires large vessels that need considerable water depth to operate. Over the years, the excessive deposition of silt in the Kearny Point Reach has reduced the depth of the channel waterway from the federally authorized 30 feet to an average channel depth of 18.9 feet, thereby limiting the number of vessels that can access the Darling facility.

Larger ships are completely prevented from berthing at the facility due to the required draft. As a result, Darling is often forced to pay a fee to have larger vessels moor at Hudson Tank in Port Newark, and to have the material trucked there from its plant to be loaded into these larger vessels.

Darling currently pays approximately $335,000 per year to ship from Hudson Tank; that figure would rise to an economically prohibitive $2.7 million per year if the company were forced to use Hudson Tank for all of its shipments. The additional costs associated with trucking material to Hudson Tank are passed on to the company's customers and results in unnecessary air pollution and congestion from the increased truck traffic. The restrictions on when a ship can berth and what size ship can use the berth will eventually render business economically unviable at the Newark location.

III. The Proposed Plan

The Focused Feasibility Study describes Alternative 3 as comprised of sediment remediation dredging and backfilling or capping the existing federally-authorized navigation channel to targeted elevation levels between RM 0.0 to RM 2.2. This would entail dredging three (3) feet below the authorized thirty (30) foot channel to account for overdepth dredging and providing a one (1) foot safety margin of clean material. Additional dredging of the existing bathymetry in the shoal areas between RM 0.0 to 2.2, and bank to bank between RM 2.2 to RM 8.3 would receive two feet of cap material. The remaining contaminated sediment would receive a two foot thick cap.

For the reasons set forth above, and in order to continue its port operations, Darling supports Alternative 3 and in particular, supports the dredging of the navigation channel to its presently authorized depth of thirty feet from River Mile 0.0 to River Mile 1.2.

We are concerned about certain recent comments made by representatives of the US Army Corps of Engineers ("USACE") that could affect the actual depths that are realized after dredging. During the July 22, 2014 panel discussion at the New Jersey Institute of Technology, USACE representatives provided a description of the potential future of the Federal Navigational Project that passes through the entire project area. That description was at odds with the project design provided in the USEPA's Focused Feasibility Study Report and its supporting documentation.

The USACE indicated that because of the design of the proposed remediation within the Federal Channel (thickness of the proposed backfill material), they would limit future maintenance dredging to at least two feet above the beginning of the backfill. As a result, the effective depth of the Federal Channel would be only twenty-eight (28) feet, instead of thirty (30) feet. Moreover, that depth may be further

restricted to provide an additional one (1) foot of safety margin, creating a channel that is only twenty-seven (27) feet deep.

These restrictions, and our concern regarding the deposition of contaminated sediment in the channel from dredging the remainder of the remediation project, as discussed in Section IV below, causes us to conclude that the thirty (30) foot deep channel will not be realized, as currently planned. Therefore, we request that USEPA revise their proposed remediation plans, in light of the USACE comments, to allow for another three feet of dredging, so that the fully authorized depth of thirty (30) feet is obtained.

Darling supports dredging of the 300 foot navigational channel to its presently authorized depth of thirty (30) feet from River Mile 0.0 to River Mile 1.2. Darling does not support dredging of the navigational channel in this section of the River to any depth less than thirty (30) feet. Dredging to a shallower depth will not alleviate the logistical problems caused by the current conditions that force Darling to load ships by riding the tide. Further, dredging to a shallower depth now will only shorten time frame within which future maintenance dredging will be required.

Dredging the navigational channel is consistent with both USEPA guidance as well as practice at other Superfund sites. On May 25, 1995, the Agency issued OSWER Directive No. 9355.7-04 entitled "Land Use in the CERCLA Remedy Selection Process." The purpose of the Directive was to issue guidance for considering land use in making remedy selection decisions under CERCLA.

One of the major points of the Directive was that "[r]emedial action objectives developed during the RI/FS process should reflect the reasonably anticipated future use or uses." Id. at 2. That guidance was reinforced in the recently issued OSWER Directive 9355.7-19, entitled "Considering Reasonably Anticipated Future Land Use and Reducing Barriers to Reuse at EPA-Lead Superfund Remedial Sites." There, the Agency states that "[w]henver practicable, the Agency also seeks to avoid response actions that might hinder or prevent reuse consistent with the Agency's assumptions regarding reasonably anticipated future land use." Id. at 3.

The past, as well as projected future navigational needs of commercial users were well-documented in the Focused Feasibility Study Report for the Lower Eight Miles of the Lower Passaic River as well as in separate comments submitted as part of the public comment process.

Further, dredging for navigational purposes is well-established as an integral part of the CERCLA remedial selection process. Two examples of comparable circumstances where dredging for navigational purposes was included as part of the CERCLA selected remedy are the Hudson River PCBs Site (February 2002 Record of Decision) and the Lockheed West Seattle Superfund Site (August 2013 Record of Decision).

We also note that dredging of the navigational channel is supported by both the State of New Jersey and the Corps of Engineers. On November 28, 2012, the Honorable Chris Christie wrote to the Honorable Lisa Jackson, USEPA, with respect to the State of New Jerseys' position on remedial alternatives for the Lower Eight Miles of the Passaic River. Governor Christie expressed the State' support for Alternative 3, and amongst the factors cited was the State's belief that any remedy must "be consistent with reasonable long-term future uses of the Passaic River and adjacent areas, particularly its use as an important navigable waterway." Governor Christie further stated that "[a]lthough the navigational depths in alternative 3 are less than those currently authorized by Congress, the depths provide a

reasonable balance between long-term future uses of the River and the need for a cost-effective remediation."

On February 6, 2014, Mr. Joseph Seebode, Deputy District Engineer for the Corps of Engineers, New York District, wrote to Mr. Raymond Basso, USEPA, concerning the interplay between the remedial investigation and the federal authorized navigation channel. In that letter, the Corps "strongly agreed" with the USEPA's inclusion of dredging of the authorized channel within the lower 2.2 miles of the Lower Passaic River as part of the remedy. Mr. Seebode cited the most recent data for the year 2011 which indicated that "a significant volume (total of 2,615,000 short tons) of waterborne commerce was transported within that year within the Lower Passaic River." Significantly, the Corps supported not just the proposed, but also indicated a willingness to resume maintenance dredging in the future, as needed. Looking forward, Mr. Seebode stated that "[t]he current and projected future level of commercial traffic is sufficient to justify maintenance dredging of the channel should it be required, subject to budget limitations."

IV. Modifications to the Proposed Plan

As set forth below, Darling believes that a modification to the Proposed Plan will enhance the longevity of the proposed dredging.

Once dredging has occurred, the lower Passaic will be subjected to natural sediment movement that will cause infilling with sediment transported there by local currents and wave erosion. This condition will be partially exacerbated by subsequent remediation dredging in the lower Passaic River. That dredging will resuspend contaminated sediment and recreate the currents and deposition patterns that appear to have accelerated sediment deposition in the navigation channel's lowest reach area (RM 0.0 to RM 2.2).

The remediation method and the schedule of construction, along with the re-creation of the depositional hydrodynamics, are cause for concern and can be improved. Because backfilling of the dredged areas to isolate residual deposits of sediment would start once an area is dredged, the newly deepened and backfilled areas could be cleaned and then allowed to become a sediment deposition area without any contingency plan to remove the sediments that accumulate there during subsequent dredging of other project reaches and natural sediment transport events.

The Focused Feasibility Study states at page 4-24 that "[f]or dredging, a resuspension rate of three percent of the mass removed (solids, carbon, and chemical) was assumed (129,000 cubic yards). This rate is based on the environmental Dredging Pilot Study (LBG, 2012) results and similar measurements from other dredging projects. Therefore, three percent of the material in the dredge bucket was added back into the water column in the sediment transport, organic carbon production and transport and contaminated fate and transport models, with half introduced in the bottom layer and half in the surface layer."

Alternative 3 would utilize a cap to isolate contaminated sediments not removed by dredging and backfilling in areas where all contamination had been removed. Backfill is limited to portions of the navigation channel where it would be placed to control the resuspension of contaminants following dredging. It was assumed that the backfill would be placed in one lift, placed immediately after dredging is completed in a given area to sequester residuals.

USEPA has proposed that the navigation channel be dredged and backfilled at the start of the project. To minimize the impacts from the resuspended sediments, Darling recommends that the program for RM 0.0 to 1.2 areas be modified to use the channel as a sediment deposition area. The navigation channel would be dredged as scheduled, but not backfilled immediately as proposed.

Instead, the channel should be used as a deposition/accumulation area, then re-dredged and armored with backfill at the end of all remediation activities. This design would allow the capture of additional sediment created by the upstream dredging activities, thereby enhancing the life expectancy of improvements to the channel, and increase the amount of contamination removal. For the navigation channel, it would also address the possibility of creating and leaving contaminated shoals that are potential navigational problems in the area.

Because the project calculates the footprint area sediment yardage for purposes of analysis, the volume of material captured by this design change would not alter those determinations. However, the modification would reduce offsite sediment migration into Newark Bay and the potential for significant shoaling in the deepest and most needed portions of the Passaic River navigation channel.

Darling also requests a point of clarification with respect to the Proposed Plan. In Appendix G, page 1-12 of the Focused Feasibility Study, it is stated that "[i]n areas where bulkheads are present, dredging would extend to within approximately two feet of the wall and the resulting side slopes would be essentially vertical. In areas where riprap is present, the side slope of the cut would be parallel to the face of the riprap at an approximately 2H:1V slope. The cut would be offset about four feet from the face of the riprap to avoid undercutting the toe of the stone. Due to the variety of riprap shoreline stabilization in the remediation work area, additional site specific stability assessments are warranted."

Darling recently received authorization to repair riprap at its facility which was damaged during Hurricane Sandy. The calculations for the repaired riprap did not contemplate dredging within four feet of the toe of the riprap as now proposed. Darling requests a site specific characterization of the potential for failure of its riprap due to the proposed dredging. This is particularly important due to the proximity and depth of the federal navigation channel in relationship to the shore protection structure and their different angles of repose.

Submitted by:

William Frish

Vice President
Darling Ingredients Inc.

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 15, 2014 12:27 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Tony gallotto
Savvymoose@myfairpoint.net
99 Albert ave
Mill town
Nj
08850

732-470-0589

Chris Christie, Governor
Kim Guadagno, Lieutenant Governor
Joseph D. Bertoni, Acting Board Chairman
Veronique Hakim, Executive Director

NJTRANSIT
One Penn Plaza East
Newark, NJ 07105-2246
973-491-7000

Ms. Alice Yeh
Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

August 18, 2014

EMAIL SUBMISSION: PassaicLower8MileComments.Region2@epa.gov

Dear Ms. Yeh:

The purpose of this communication to is to provide NJ TRANSIT's formal comments on the EPA's Focused Feasibility Study (FFS), the agency's proposed plan for the lower eight (8) miles of the Passaic River.

As proposed, the FFS calls for the removal of 4.3 million cubic yards of sediment from lower eight (8) miles of the Passaic River. According to the propose plan, it is estimated that the project will take five (5) years to complete, with four (4) years of dredging and (1) year of capping, with work taking place 24 hours a day, six (6) days a week, 40 weeks a year.

As we understand the process, after the close of public comment period on August 20, 2014, the EPA will take six (6) to nine (9) months to review and respond to the issues raised during the public comment period and then issue a Record of Decision (ROD) sometime on 2015. Following the issuance of the ROD, the EPA has indicated that it could take approximately three (3) years to design the project and complete negotiations with the responsible parties.

Based on our review the proposed plan available on www.ourpassiac.org, NJ TRANSIT submits for the following comments and concerns for your review and consideration. We are hopeful that the EPA will consider NJ TRANSIT's comments and concerns seriously due to the fact that this project will directly impact approximately a 500,000 NJ TRANSIT customers each and every day.

NJ TRANSIT owns and operates Newark Draw movable bridge which carries our Morris & Essex Line and Midtown Direct Service over the Passaic River. Located at river milepost 5.8 this bridge sees two hundred forty (240) trains per weekday. In addition, NJ TRANSIT relies heavily on the safe and reliable operation of Amtrak's Dock Bridge, over which the Northeast Corridor Rail Line travels. As I hope you are aware, the NEC is the busiest rail line in the United States.

During the recent River Mile 10.9 project, NJ TRANSIT, together with Amtrak, worked closely with the contractors in charge of that project. That Project required in excess of 100 openings of each of the ten (10) moveable bridges that span the Passaic River over a ten (10) month timeframe.
Thankfully, we were able to accommodate the required openings without significant impacts to our customers or our infrastructure. However, the project did have a direct impact on our operating budget due to the significant increase in bridge openings from what historically has been the norm.

As I hope you are well aware, NJ TRANSIT, and every other owner/operator of bridges along the Passaic River are governed by the United States Coast Guard. Specifically CFR Title 33 Part §117.739 is what guides the manner in which we operate the bridges along the Passaic River.

Each and every bridge has an official notification designation consistent with CFR Title 33 Part §117.739 requiring that mariners provide advance notification requesting an opening (i.e. 4 hours, on demand, 24 hours etc). As it relates to NJ TRANSIT, we are allowed by the CFR to close the bridge to marine traffic for a designated period of time during the morning and evening rush hours as not to affect the commuter train traffic.

A review the EPA's proposed plan reveals that the EPA assumes a dredging rate of over 1 million cubic yards a year for four (4) straight years to achieve the objective of a 4.3 million cubic yard removal. Using the openings and the amount of material removed from the River Mile 10.9 project, NJ TRANSIT's estimates that EPA's proposed plan would require more than 10,000 bridge openings, or approximately ten (10) bridge openings a day for each moveable bridge along the Passaic River per year.

Given the constraints inherent to the Passaic River – multiple bridges, multiple owners and operators, different bridge opening notification requirements, width of the river, weather and tides – we do not believe this is realistic.

More importantly, NJ TRANSIT is very concerned about what impact ten (10) bridge openings per day would have on our customers. Assuming ten (10) bridge openings a day, at 15-20 minutes per opening could result in upwards of two (2) hours of delay per day. From a public transit operator's perspective, a two (2) hour delay is simply an unacceptable disruption. We are also concerned about the impact to our operating budgets since the amount of proposed bridge openings is a very significant increase over what has been historically done in the past.

NJ TRANSIT also has concerns about the EPA's plan to dredge near/close to the Newark Draw. How does the EPA intend on dredging close to the bridge without impacting the structural integrity of the substructure?

Finally, NJ TRANSIT is unaware of any attempts by the EPA or EPA consultants to meet with NJ TRANSIT to discuss this ambitious multi-year project. Stated simply, as

far as we know the EPA has not proactively reached out to NJ TRANSIT to discuss bridge openings and potential impacts of the FFS on NJ TRANSIT's infrastructure namely the Newark Draw Bridge.

Thank you for the opportunity to provide NJ TRANSIT's concerns and comments about the EPA's proposed plan for the lower 8 miles of the Passaic River. We look forward to receiving your reply.

Respectfully,

James M. Galvin, P.E.
Chief Engineer – Structures
NJ TRANSIT Rail Operations

Yeh, Alice

From: JGalvin@njtransit.com
Sent: Monday, August 18, 2014 2:23 PM
To: Region2 PassaicLower8MileComments
Subject: Comments on Passaic Lower 8 Mile Project
Attachments: EPACommentsPassaic.PDF

Attached are NJ TRANSIT's comments on the subject project.

James M. Galvin, P.E.
Chief Engineer - Structures
NJ TRANSIT Rail Operations
Phone: 973-491-8104
Cell: 973-417-2009
Fax: 973-232-4658

Yeh, Alice

From: PWyckoff@njtransit.com
Sent: Thursday, August 28, 2014 1:54 PM
To: Region2 PassaicLower8MileComments
Subject: NJT final attn. Alice Yeh
Attachments: NJT Comments - EPA Remediation Plan PassaicFinalversion.pdf

Alice,
Sorry for the mix-up. Thanks so much.
Please call with any questions.
Thanks,
Paul

Paul Wyckoff
Chief of Government and External Affairs

NJ TRANSIT

Executive Director's Office

973-491-7855
973-820-3935 (cell)

Chris Christie, Governor
Kim Guadagno, Lieutenant Governor
Joseph D. Bertoni, Acting Board Chairman
Veronique Hakim, Executive Director

NJTRANSIT
One Penn Plaza East
Newark, NJ 07105-2246
973-491-7000

August 18, 2014

Ms. Alice Yeh
Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

EMAIL SUBMISSION: PassaicLower8MileComments.Region2@epa.gov

Dear Ms. Yeh:

NJ TRANSIT would like to submit the following formal comments on the EPA's Proposed Plan for remediation of the lower eight miles of the Passaic River, based upon the Remedial Investigation Report (RI Report) and the Focused Feasibility Study (FFS) for the proposed project area.

The Proposed Plan identifies alternatives that call for the removal of from 1 million to as much as 9.7 million cubic yards of dredged material from the project area, with barging used to transport dredge spoils. The preferred alternative would remove some 4.3 million cubic yards of material. The Proposed Plan estimates that the project will take five years to complete, including some four years of dredging, as well as an additional year for capping. Thus, as the Plan notes, the proposed project could have a significant impact on bridges over this portion of the river, including the moveable bridges that are vital for transportation for New Jersey and the region.

NJ TRANSIT owns and operates one moveable bridge that spans the Passaic River, the Newark Draw moveable bridge, located at river milepost 5.8. This bridge carries Morris & Essex Line and Midtown Direct service over the Passaic River. Approximately 240 NJ TRANSIT trains traverse the Newark Draw Bridge each work day. In addition, NJ TRANSIT operates more than 230 trains each day over Amtrak's Dock Bridge, on the Northeast Corridor (NEC) Rail Line.

Each peak-hours revenue train carries an average of some 800 customers, and some many more. Overall, the Passaic River remediation can directly or indirectly impact some 140,000 NJ TRANSIT customers making nearly 300,000 trips each day. In short, the reliable, consistent and safe operation of these moveable bridges is critical to maintaining reliable rail travel – and the quality of life - for NJ TRANSIT customers. Meanwhile, a significant number of NJ TRANSIT customers transfer to and ride the Port Authority Trans Hudson (PATH) service which also traverses Amtrak's Dock Bridge.

Notably, NJ TRANSIT's operation of its bridge along the Passaic River, is governed by the United States Coast Guard under CFR Title 33 Part §117.739. Under this portion of the CFR, bridges have an official notification designation requiring that mariners provide advance notification requesting an opening (i.e. 4 hours, on demand, 24 hours, etc.) Meanwhile, in recognition of the potential negative effect upon the transit system, and by extension, the economy, railroads are accorded a "blackout" period during the morning and evening peak travel hours during which the bridges cannot be opened.

Analyses of the Proposed Plan have produced estimates that the project could require approximately 10 openings of each moveable bridge per day for each day of the multi-year dredging operation.

NJ TRANSIT has serious concerns these openings could create intolerable delays for our customers, even if bridge openings are coordinated and scheduled to avoid the previously-mentioned "blackout periods" during peak morning and evening travel hours. This is because each opening can require halting train traffic for 15 to 20 minutes. Assuming 10 bridge openings per day, this could produce upwards of two hours of delay each and every day – an unacceptable disruption to NJ TRANSIT customers.

It is important to note that delays do not affect just the trains in the immediate area of a bridge. Given the congestion on the rail lines, particularly into and out of New York Penn Station, every delay creates a cascade effect that delays numerous other trains up and down the lines. In other words, the impact of delays goes far beyond what might be assumed.

The sheer number of openings also creates significant concerns about the effect of these openings on the reliability of operating aging mechanical bridges, and the impact to NJ TRANSIT's operating budget, since the amount of proposed bridge openings would be a dramatic increase from historical levels.

In addition to the potential for lengthy travel delays, NJ TRANSIT also is concerned that the Proposed Plan properly provide for protection of bridge structures such as abutments and footings to avoid any negative impact on the integrity of the bridges.

Thank you for the opportunity to provide NJ TRANSIT's concerns and comments about the EPA's proposed plan for the lower eight miles of the Passaic River. We look forward to receiving your reply.

Respectfully,

Michael Gaspartich
Deputy General Manager – Infrastructure Engineering
NJ TRANSIT Rail Operations

Yeh, Alice

From: Kegan.Brown@lw.com
Sent: Tuesday, August 19, 2014 4:44 PM
To: Region2 PassaicLower8MileComments
Cc: Gary.Gengel@lw.com
Subject: Comments on Lower Passaic River Focused Feasibility Study Proposed Plan
Attachments: Letter to USEPA 8-19-14(226939_1_NJ).PDF

To Whom It May Concern:

Please see the attached letter regarding the Proposed Plan for the Focused Feasibility Study for the Lower Passaic River Study Area.

Sincerely,

Kegan A. Brown

LATHAM & WATKINS LLP
885 Third Avenue
New York, NY 10022-4834
Direct Dial: +1.212.906.1224
Fax: +1.212.751.4864
Email: kegan.brown@lw.com
http://www.lw.com

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Latham & Watkins LLP

Gary P. Gengel
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Madrid	Washington, D.C.

August 19, 2014

VIA EMAIL & FEDEX

Ms. Alice Yeh
Remedial Project Manager
U.S. Environmental Protection Agency, Region 2
290 Broadway
New York, New York 10007-1866
PassaicLower8MileComments.Region2@epa.gov

Re: Comments on the Proposed Plan for the Lower Eight Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey

Dear Alice:

In connection with the "Proposed Plan for the Lower Eight Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site," issued by the United States Environmental Protection Agency, Region 2 on April 11, 2014 (the "Proposed Plan"), Covanta Essex Company ("Covanta") and Sequa Corporation ("Sequa") join any and all public comments submitted in opposition to the Proposed Plan.

Please include this letter in the administrative record for the Proposed Plan. By submitting this letter, Covanta and Sequa do not admit any liability, issue of law or fact, or waive any rights or defenses.

Sincerely,

Gary P. Gengel
of LATHAM & WATKINS LLP

cc: Nancy D. Tammi, Esq. (Covanta)
Brian L. Buniva, Esq. (Sequa)

Yeh, Alice

From: Justin Genovino <jgenovino@gmail.com>
Sent: Thursday, May 22, 2014 9:37 AM
To: Region2 PassaicLower8MileComments
Subject: Passaic river restoration

I'd like the river cleaned because it's a beautiful river and I'd like to fish in it!

Sent from my iPad

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, July 25, 2014 8:17 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

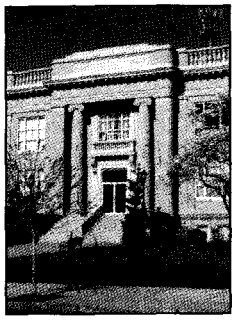
Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Ray Germann
rgermann@lowerpassaiccpg.com
1669 Edgewood Road
Yardley, PA
19067
215 588 5555



OFFICE OF THE MAYOR

MAYOR
ROBERT B. GIANGERUSO
Department of Public Safety

May 14, 2014

Ms. Judith Enk
Regional Administrator
US Environmental Protection Agency, Region ll
290 Broadway, 19th floor
New York, NY 10007

RE Request for Extension of Comment Period on EPA's FFS

Dear Ms. Enk:

This is to request that the US EPA extend the public comment period for the proposed FFS for an additional 90 days and to demand that the EPA add a fourth public hearing to its public hearing scheduled to solicit public comment and input from residents in the upper nine (9) miles of the Lower Passaic River Study Area (LPRSA).

As the largest proposed removal in the history of the EPA, it is only reasonable to allow more time for residents and key stakeholders to fully understand the proposed plan and to provide educated and meaningful comments. We are aware that on May 5, 2014 the EPA extended the public comment period an additional 30 days and respectfully request that the EPA extend that period another 90 days.

Lyndhurst Township requires more time to truly understand what is proposed, ask questions and provide meaningful comments. As you are aware, Lyndhurst Township's immediate concern is the fact that the proposed FFS focuses only on the lower 8 miles of the Passaic River and fails to provide our residents any kind of relief or benefits.

In addition, we demand that the US EPA schedule a fourth public hearing to its public hearing schedule at a location convenient to the residents in the upper 9 miles of the LPRSA. Residents and key stakeholders in the upper 9 miles of the LPRSA have sat back and watched the Passaic River be studied for decades and deserve the opportunity to be heard. Lyndhurst Township would be happy to offer the use of our Senior Center for such a public hearing.

Sincerely,

Robert B. Giangeruso
Mayor

Municipal Building • 367 Valley Brook Avenue • Lyndhurst, New Jersey 07071
T 201-804-2457 Ext. 2685 • F 201-804-4758 • www.lyndhurstnj.org

OFFICE OF THE MAYOR

MAYOR
ROBERT B. GIANGERUSO
Department of Public Safety

August 13, 2014

Ms. Alice Yeh
Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Email Submission: PassaicLower8MileComments.Region2@epa.gov

Dear Ms. Yeh:

The Township of Lyndhurst appreciates the opportunity to provide its official comments and questions concerning the EPA's proposed plan for the lower 8 miles of the Passaic River. The Township also appreciates the EPA's decision respond to Lyndhurst's request and to extend the public comment period to August 20 to allow municipalities like Lyndhurst and other stakeholders to fully understand what may be the largest removal action under the Superfund Law.

As you are well aware, Lyndhurst Township has been actively involved in the Passaic River clean up for a number of years. As you are also well aware, one of the primary concerns the residents of Lyndhurst have is major flooding events and how those flooding events impact our residents. While I understand the role of the Superfund program is focused solely on remediation, I believe the EPA has heard the residents of Lyndhurst loud and clear that one their major concerns is flooding and, more specifically, preventing what is in the river from entering households during major flooding events.

Lyndhurst elected officials and staff have been monitoring the EPA public outreach process very closely and have reviewed the proposed plan on the website – www.ourpassaic.org. As proposed, the Township of Lyndhurst cannot support the proposed plan. Below you will find our comments and concerns:

Lower 8 miles versus Full 17 miles: As proposed the EPA's proposed plan is calling for the removal of 4.3 million cubic yards of sediment in the lower 8 miles of the Passaic River. When questioned about why focus on the lower 8 miles of the River and not advance a clean up of the full 17 miles Lower Passaic River Study Area, the EPA has responded that "90%" of the most contaminated sediment resides in the lower 8 miles of the River. Assuming the EPA is correct, that would leave only 10% additional sediment in the remaining 9 miles of the River. Why not aggressively deal with that remaining 10% now? Why wait?

Tidal Flows - Recontamination: Twice a day the Passaic River ebbs and flows with the tide. The change in tides is very obvious in Lyndhurst as the mud flats clearly reveal themselves twice a day. During the EPA public hearings I heard that the proposed 4.3 million cubic yard removal will be the largest removal in the history of the EPA.

Lyndhurst is very concerned that during the removal in the lower 8 miles of the River, the tidal movement of the Passaic River will lead to a tremendous amount of recontamination, with sediment flowing upstream during high tides and "laying down" on the shores of the River. Dredging is a very messy operation and digging up this sediment from the bottom of the River will certainly lead to a great deal of re-suspension and release of contaminated material into the water column. I am told that the average rate or re-suspension during a dredging operation is six percent (6%). In fact, it is very likely that the 5.5 acres recently capped at River Mile 10.9 will become contaminated on a daily basis if the proposed plan moves forward. What plans/engineering controls will the EPA put into place to deal with the tidal nature of the Passaic River and prevent recontamination of the upper 9 miles of the Passaic River?

Schedule: As the host community for the River Mile 10.9 Removal, Lyndhurst was intimately involved with this project and saw first-hand the challenges related to performing dredging work in the Passaic River. The River Mile 10.9 project took approximately 10 months to complete and only removed 16,000 cubic yard of sediment. My understanding of the propose plan is that the EPA claims 4.3 million cubic yards can be dredged and capped in five (5) years.

Given our collective experience with River Mile 10.9 Removal, the Township of Lyndhurst is very concerned that the EPA is misrepresenting the project schedule and grossly underestimating the unique challenges inherent to the Passaic River. Tides, tidal movements, weather, bridge outages, and the full cooperation of multiple bridge owners/operators had a significant impact on the River Mile 10.9 schedule.

During the public hearing in Kearny, the EPA was asked a direct question by a representative of Hudson County – how many bridge openings will be required to support the removal of 4.3 million cubic yards in the lower 8 miles of the Passaic River? EPA's response was that they did not have an answer to that question and that issues like bridge openings would be dealt with "during the design phase of the project."

Despite that lack of a definitive answer regarding bridge openings, the EPA stood by the project schedule of five (5) years. How can the EPA continue to stand by the five year project schedule when significant issues like the number of required bridge openings has not been finalized? More importantly, if the EPA is wrong on the project schedule municipalities in the upper nine (9) miles of the River will have to wait even longer for action.

Flooding & Out of River Improvements: As I indicated earlier, flooding is a major issue for the residents of Lyndhurst. Time and time again we have been told that the EPA's Superfund project is focused solely on remediation, not flood prevention. We have also been told that the proposed plan will have no impact on flooding – "x" amount of sediment will be removed and replaced with the same amount of an engineered cap.

During the past 18 months the Passaic River and The Township of Lyndhurst have been tested. Hurricane Irene and Super Storm Sandy tested our residents' patience and surely tested the Passaic River. On both occasions, water from the Passaic River flooded the streets and homes of Lyndhurst. Fortunately, after each storm we worked with the EPA on testing the Lyndhurst Little League fields and Riverside Park and learned that during the major flooding events contaminated sediment from the Passaic River was not breaching the shoreline flooding out streets and entering our homes.

As I understand the EPA's proposed plan, the EPA has no plans to perform any work "out of river" and has no plans to move forward with any kind of restoration projects that may assist a municipality like Lyndhurst in dealing with flooding events. Please confirm my understanding of the EPA's proposed plan. Wouldn't it be more cost effective and efficient to advance some kind of out of river restoration program in conjunction with the removal action to help mitigate the adverse impacts of flooding while helping manage the flow of pollutants from the shore back into the Passaic River?

Future Development and River Access: The Lyndhurst Fire Department and recreational boaters that use the Passaic River on a daily basis have brought some issues with the River Mile 10.9 engineered cap to our attention. Both stakeholders have expressed concerns about the rocks protruding from the cap itself as well as the consistency of the top layer of the cap itself.

Recreational boaters have expressed concerns about boats being damaged by rocks and the inability to anchor on top of the engineered cap. The Lyndhurst Fire Department Dive Team has complained that the top layer of sand on top of the cap at River Mile 10.9 makes it very difficult to walk on and more difficult to enter the water in scuba gear for their regular drills. How does the EPA intend to deal with these issues? How do these issues at River Mile 10.9 impact the EPA's approach to its proposed bank to bank dredge in the lower 8 miles of the river?

The issues raised as a result of River Mile 10.9 cause Lyndhurst Township some concerns about the proposed plan. Lyndhurst has been seeking to rebuild the Lyndhurst Fire Department Boat Ramp that lies on the northern border of Riverside Park and the southern boarder of Lyndhurst Little League Park. With the engineered cap now in place, can Lyndhurst advance a project to rebuild the boat ramp? As proposed, the FFS calls for a bank to bank dredge followed by the installation of a bank to bank engineered cap. What impact would this engineered cap have on future development in the lower 8 miles of the river (installation of a retaining wall, installation of a dock, driving piles on the shores of the Passaic)

We thank EPA Region 2 for its work on the Diamond Alkali Superfund Site and appreciate the opportunity to provide our comments and concerns. Again, as proposed the Township of Lyndhurst cannot support the proposed plan. Rather than separating this project into two projects, Lyndhurst supports immediate remedial action in the full 17 miles of the LPRSA. We look forward to your reply.

Sincerely,

Robert B. Giangeruso
Mayor
Township of Lyndhurst

cc: Township of Lyndhurst Commissioners
Congressman Bill Pascrell
Senator Paul Sarlo
Assemblywoman Marlene Caride
Assemblyman Gary Schaer
Governor Chris Christie
Commissioner Bob Martin, NJDEP
US Senator Robert Menendez
US Senator Cory Booker
Congressman Albio Sires
Congressman Donald Payne
Bergen County Executive Kathleen Donovan
Gina McCarthy, EPA Administrator
Judith Enk, EPA, Region 2

Yeh, Alice

From: Amelia Jarvis <AmeliaJ@lyndhurstnj.org>
Sent: Wednesday, August 13, 2014 11:05 AM
To: Region2 PassaicLower8MileComments
Subject: FW: Letter of concern/EPA's proposal plan
Attachments: doc00548320140813110224.pdf

From: Amelia Jarvis
Sent: Wednesday, August 13, 2014 11:04 AM
To: 'PassaicLower8MileComments.Region2@epa.gov'
Subject: Letter of concern/EPA's proposal plan

Ms. Yeh,

Please find a letter /email submission from the Township of Lyndhurst; pertaining to the above subject. Mayor Giangeruso and the Lyndhurst Board of Commissioners appreciate the opportunity for comments and concerns. We look forward to your reply.

Amelia Jarvis
Administrative Assistant to Mayor Robert B. Giangeruso
Township of Lyndhurst
367 Valley Brook Avenue
Lyndhurst, New Jersey 07071
201-804.2457 Ext 2684/2685

Yeh, Alice

From: Michele Gillies <canucksintrees@yahoo.com>
Sent: Wednesday, August 20, 2014 7:34 PM
To: Region2 PassaicLower8MileComments
Subject: Public Comment on Passaic clean up plan

Thank you for the opportunity to voice my opinion. I have attended several of your meetings and also volunteer with Hackensack Riverkeeper through whom I have participated in several river clean-ups of the Passaic River. My office is located on the Passaic and I attend crew meets for Nutley H.S. on the river as well.

I would *strongly* urge choosing the **most complete** removal of **all** contaminants and the proper disposal of same (out of the river) for the following reasons:

- Based on my own life experience, I have found that a "partial" job to save time and money *always* comes back to bite you on the…toxic sludge;
- I do not "trust" that there will be sufficient funds to maintain a cap of the most toxic contaminants that are left…*in perpetuity,* and if it has to be redone, will there be enough money or will the taxpayers have to bear the burden of the cost?
- Since we cannot see what lies ahead, I have many concerns as to the long term effects of leaving the most toxic contaminants capped where they lie…for one thing, even the EPA has put out literature that there is a real possibility of more earthquakes in New Jersey's future;
- There will be a great disruption of the wildlife habitat, local use of the river and other things impacting local riverside communities for several years – what if we have to do this again if a partial clean-up is not the right choice? One and done!
- And finally, the most responsible thing to do for New Jersey and the planet, would be to RESTORE the Passaic to how it was before greedy persons with a reckless disregard for our natural resources, and the health and safety of New Jersey's wildlife and, most importantly, YOU AND ME, trashed it…with no toxic contaminants!

Wikipedia said "[the lower 8 miles of the river] is considered one of the most polluted stretches of water in the nation". It defies logic that any reasonable person would not want this cancer completely removed.

The EPA is the cavalry here. PLEASE, please do what needs to be done and do not let these polluters get away on the cheap.

Thank you for your time,
Michele Gillies

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Saturday, August 02, 2014 2:25 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Lisa Ginther
lisaginther@verizon.net
20 Fisher Place
Yardville
NJ
08620

MRCDC

149 Springfield Avenue
Newark, New Jersey 07102

August 8, 2014

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh:

As Chairman of the Metropolitan Reassertion Community Development Corporation, I write to you on behalf of our 3,500 members to request you consider a remedy for the Lower Passaic River that not only involves projects that revitalize areas outside of the River, but also minimizes impacts on Newark residents, quickly reduces risk to human and ecology and provides much needed jobs for members in our community.

For example, let me share with you some exciting details about the new veterans employment and skills training program that we are developing in the City of Newark.

This one-year pilot program was developed as a cooperative effort between Rutgers University and MRCDC. Under the direction of experts from Rutgers Cooperative Extension, the program is providing training to 15 local veterans in landscape management techniques through in-class lectures and hands-on field experience. The veterans training center is located in the Central Ward of the City of Newark in a building owned by our organization.

This program is already paying dividends to previously unemployed veterans and members of the Metropolitan Baptist Church.

Since the inception of the program, our veteran trainees have transformed a Newark-owned vacant lot into a new community garden. Veterans have trained and improved the grounds of various locations across Essex County including: Branch Brook Park, Brookdale Park, Presby Iris Gardens, and East Orange Veterans Affairs Hospital. Produce from the community garden and on-site facilities will be donated to the MRCDC's food bank.

While we cannot speak to the technical aspects of EPA's proposed plan to dredge and cap the lower 8 miles of the River, we believe that another remedy exists that fits the Agency's criteria. We believe that the Sustainable Remedy will be less intrusive, take less time than the alternatives and support it because it include projects – like the one we've developed in the City of Newark – that can benefit both the River watershed and our communities.

We respectfully request that you consider the Sustainable Remedy prior to the selection of a remedy for the Lower Passaic River.

Sincerely,

Hubert Graham
Chairman Metropolitan Reassertion Community Development Corporation

Yeh, Alice

From: Donald Harris <dlh1226519@gmail.com>
Sent: Monday, August 18, 2014 1:21 PM
To: Yeh, Alice
Subject: Emailing MRCDC letter - August 8-1.pdf
Attachments: MRCDC letter - August 8-1.pdf

Forwarded herewith, Is the Letter of Support, from MRCDC.

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 01, 2014 8:41 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Cynthia Grossano
cinkras@optonline.net
12 Robin St.
Rockaway
NJ
07866

To: The Environmental Protection Administration

Fr: Donald Harris

Re: The FFS Plan for the Passaic River

Date: May 5, 2014

The United States is the dominant economic engine and military force in the world. The American economic engine has generated massive wealth, high standards of living, and consumerism. This growth engines has also generated waste, pollution, and ecological destruction. Our government has some of the best environmental laws in the world. However, in the real world, many urban areas, such as Newark, New Jersey, has not benefitted from these laws. It is documented that Newark, New Jersey, the nation's third oldest city, may have more than ~~100~~ 20 Brownfield sites.

The residents of Newark, New Jersey, continue to be the victims of Environmental Racism, in the form Institutional Discrimination. Institutional Discrimination is defined as "actions or practices carried out by members of dominant (racial or ethnic) groups that have differential and or negative impact on a member of subordinate groups.

This form of racism buttressed by the exploitation of its natural resources, such as its land, waterways and rivers.

The day-to-day struggles confronting Newark, New Jersey's residents, is only exceeded by, the indifference demonstrated towards those who reside West of Broad Street.

The Environmental Protection Administration, defines environmental justice as the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Well this sounds great. But, the recently released FFS Plan, does not put into practice, this Policy.

From my view point, the proposed $ 1.7 billion clean-up plan, is absent of: a meaningful community-centered component too its plans. Nor, is it procedural, social or economically equitable.

Once again, "Big Brother" and a small group of vested-interest groups members, has determined," what is good for the real and longtime Gatekeepers, of the City".

This form of selected decision making. Is racist too its core.

Today, many Newark, New Jersey residents have heightened concerns about the proposed FFS Plan: including : the Bank-to-Bank concept; the length of time the FFS Plan would take; the disruption of the residents day-to-day activities; meaningful and sustainable Community-

Centered Betterments related to the proposed FFS Plan; no off River landscape improvements to the surrounding areas; no meaningful emerging and small business development opportunities, for Newark, New Jersey; no indications of improved health and wellness (many of the residents of the City, suffer from high levels of illnesses that may be traced back to the current environmental conditions of the River); programs for the residents of Newark, New Jersey; and no sustainable employment programs..

There is a real and pressing need, to have a more community-centered approach to the cleaning—up of the River. An approach that will promote: resident health and wellness; Sustainable socioeconomic resident opportunities; human capital development ventures, meaningful wealth creation strategies, etc.

The proposed FFS Plan, as outlined does not embrace any of these and other community-centered benefits.

The proposed FFS Plan will continue to economically enrich a few mainstream companies from outside of the City-limits, while leaving Newark, New Jersey residents in a more disadvantaged state.

All of which will continue to have a " Double-Burden" effect of increased levels of poverty and a disproportionate exposure to health impacting pollution conditions, o the residents.

Thank you,

Donald Harris

Yeh, Alice

From: Yeh, Alice
Sent: Friday, May 23, 2014 10:37 AM
To: Region2 PassaicLower8MileComments
Subject: FW: Expanding opportunities for greater Newark, NJ, residents participation in the Passaic River, discussion making process.

From: Donald Harris [mailto:dlh1226519@gmail.com]
Sent: Sunday, May 11, 2014 8:27 AM
To: Yeh, Alice
Subject: Expanding opportunities for greater Newark, NJ, residents participation in the Passaic River, discussion making process.

Ms. Yeh:

As stated during EPA's FFS Hearing (the conversation you and I had, pre formal Presentation, and during the break), there are well founded reasons, too expand the out-
reach process, beyond Broad Street.
In July 1996, the " Federal Interagency Working Group"(the Working Group on Brownfields) was established as a forum for federal agencies to exchange information on Brownfields activities and to develop a coordinated national agenda for addressing issues related to Brownfields.
No where in the recently released F FS Plan, was there any mention of a coordinated effort, too involve other federal agencies, in the Passaic River clean-up plans. Nor was there any mention of the Federal Work Group, indicated above.
Newark, NJ, with many of the same economic, political, and social challenges, which impact other urban centers, could benefit greatly, from such a coordinated effort.
The inclusion of other related federal agencies, in the Passaic River clean-up, would offer a community-centered , approach to the proposed FFS.
Newark, NJ, has one of the highest unemployment rates in the region, and an even higher level amongst it's youth.
Utilizing, the clean-up of the Passaic River, as a comprehensive community, and economic development tool, is much needed. And most certainly be more sustainable, in both the short and long term.
The projected cost for cleaning up the River, is estimated to be between 1.7-5.0 billion dollars, over the next 7-20 years. If used in a more community/human development mode, would enhance life outcomes, for current and future residents of the City, State, andRegion.
Expanding EPA's outreach plan, too include greater African American and Latino participation, is Mandated.
As such, I would like to recommend the following:
*. Include more African American and Latino participation/membership ,in the CAG;
*. Conducting official Hearings, at Essex County College, a location that is acceptable, and accessible to all of the City's residents;
*. Developing and distributing youth-centeted literature, at every level of the community, including schools, churches, community centers, etc.;and
*. Briefing the City's Clergy;
*. Embrace/sponsoring a major and sustainable youth development and small business creation program.
I welcome the opportunity to elevating our emails, too a working relationship (discussions).

Donald

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 13, 2014 12:29 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Donald Harris
dlh1226519@gmail.com
P.O.Box 1725
Plainfield
NJ
07061

908-644-6840

Yeh, Alice

From: Donald Harris <dlh1226519@gmail.com>
Sent: Sunday, August 17, 2014 6:15 PM
To: Yeh, Alice
Subject: My letter, relative to the EPA'S FFS Plan, for the proposed cleaning up of the Passaic River.
Attachments: download-1408313449140.docx

Donald L. Harris

P.O. Box 1724

Plainfield, New Jersey

07061

Alice Yeh, Remedial Project Manager

Environmental Protection Agency

290 Broadway, 19th Fl.

New York, New York-10007-1866

Dear Ms. Yen:

The present critical economic conditions of many if not all of the municipal governments along the Passaic River has resulted in changes how their governments are planning the future of their communities. Many economist has asserted that urban revitalization will buttress socioeconomic and improved life enhancing outcomes of urban stakeholders. Thus, urban revitalization through cleaning up its waterways and related redevelopment projects will stimulate sustainable and more meaningful employment opportunities for emerging and small business growth, development, and utilization. Which is critical to their economic recovery.

As such, EPA's FFS Plan for the Passaic River, coupled with a more Community-Centered approach to greater Stakeholder participation in all phases of the Passaic River clean-up Plan, would enhance these regional socioeconomic outcomes of current and future.

The EPA has a unique opportunity to replace its outdated approach to Brownfields clean-up programs, by adopting a more Community- Centered approach to the cleaning –up of the Passaic River. One that promotes environmental justice as "the fair and respectful treatment, and meaningful involvement of the Stakeholders, who live along the River regardless of race, color, national origin, or income".

The FFS Plan for the Passaic River, does not promote fairness, nor benefit the life outs of the Stakeholders, who live along the River.

Urban Professionals and other Planners have long associated redevelopment projects as key to stimulating and promoting sustainable and more meaningful employment opportunities, smart growth , as well as a way of assisting local governments along the Passaic River, to overcome their current financial conditions caused mainly by the national governments, recent banking policies.

It is my impression, from reading the FFS Plan, that, it is in general conflict with the needs, wants and interests of every Stakeholder along the Passaic River. It ignore or overlook the needs and interests of every segment of the Stakeholder Community, nor does it promote environmental justice.

It is not too late to correct your Plan, which continues to disregard the Stakeholder Community. The EPA, can take a more Community-Centered approach to the Passaic River clean-up by adopting or including major elements of the Sustainable Remedy for the Lower Passaic River's Plan in your approach, to the Passaic River clean-Up.

Respectfully,

Donald Harris

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, July 28, 2014 4:44 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Carol Harrison
carolnews@verizon.net
101 Summit avenue
Montclair
NJ
07043

(973) 567-1901

New Jersey
ALLIANCE for ACTION INC.®

PHILIP K. BEACHEM
President

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GERALD T. KEENAN
Executive Vice President

TESTIMONY

OF

CHRISTIAN HARTMAN

ASSISTANT VICE PRESIDENT

NEW JERSEY ALLIANCE FOR ACTION

PRESENTED TO

NEW JERSEY ENVIRONMENTAL PROTECTION AGENCY

ON

WEDNESDAY, MAY 21, 2014

Statement for EPA Public Hearing on Lower Passaic River

Christian G. Hartman, Assistant Vice President, New Jersey Alliance for Action

The New Jersey Alliance for Action is a non-profit, non-partisan statewide coalition of more than 2,500 business, labor, professional, academic and government leaders. The Alliance is an advocate of investment in infrastructure for New Jersey's economy, environment and quality of life. Since our creation in 1974, we have worked closely with each New Jersey Governor, the Cabinet, the Legislature and local government as well as our members to create funding and secure permits for road, bridge and rail improvements, water projects, school construction, aviation enhancements, shore preservation, business expansion and other key infrastructure investments.

In March of 2013, The New Jersey Alliance for Action formally announced our support for the Sustainable Remedy Proposal in a letter to the U.S. Environmental Protection Agency. The Sustainable Remedy will utilize adaptive management to ensure that initial goals set by the EPA would be met for reducing risk to humans and ecology in the River.

We again ask the EPA to consider the Sustainable Remedy approach that has been proposed by the Lower Passaic River Cooperating Parties Group. This approach will:

- Minimize impacts to the business community and residents
- Allow for the highest level of surface sediment to be cleaned up and capped in 5 years.
- Bring new green infrastructure projects and employment to individuals in New Jersey.
- The most highly contaminated sediment would be removed from the River in a quicker time period.

On behalf of the New Jersey Alliance for Action, I thank you for your time.

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 19, 2014 3:08 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Susan P. Hart
arnsue51@aol.com
51 Vineyard Court
Monroe
NJ
08850

609-860-1080

Yeh, Alice

From: Alan Harwick <alan@harwicklaw.com>
Sent: Monday, August 11, 2014 11:17 AM
To: Region2 PassaicLower8MileComments
Subject: Please support and adopt alternative 2

The entire Passaic River region deserves a cleanup as outlines in Alternative 2 to bring this once vibrant area back to life. Please adopt Alternative 2.

Sent from my iPhone

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 1:58 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Bill Healey
wrh2@nyu.edu
49 Pony Lane
Flemington
NJ
08822

908-334-7229

Yeh, Alice

From: Robert Fabricant <bobfabricant@aol.com>
Sent: Wednesday, August 20, 2014 2:23 PM
To: Region2 PassaicLower8MileComments
Cc: bob fabricant
Subject: Substitute Comments for Volcano Partners
Attachments: Volcano Partners Passaic PRAP Comments 8-20-14.pdf

Please substitute my earlier submission with the attached pdf. The earlier version contained several mark ups not intended for filing. Thank you. Bob Fabricant (Volcano Partners) 908 370-8063

VOLCANO PARTNERS LLC

Empire State Building, 350 Fifth Avenue, Suite 5310, NY, NY 10118

August 20, 2014

Ms. Alice Yeh
Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866
PassaicLower8MileComments.Region2@epa.gov

VIA ELECTRONIC MAIL

Re: Comments to United States Environmental Protection Agency Regarding the Proposed Plan for the Lower Passaic River Superfund Site

Dear Ms. Yeh:

Please find below Volcano Partners, LLC (Volcano Partners) comments on the Superfund Proposed Plan for the Lower Eight Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site, Essex and Hudson Counties, New Jersey (PRAP) published by the United States Environmental Protection Agency (EPA), Region 2 - April 2014.

Volcano Partners commends EPA's determination that local decontamination treatment technologies with beneficial reuse, such as Cement-Lock® technology, are technically viable options that can minimize project impacts and generate beneficial uses for the highly contaminated sediments at the site. Although EPA's preferred alternative is out-of-region incineration with long-haul transport for the most contaminated dredged material at the site (projected 10 percent of the total dredged material), Volcano Partners is actively working to secure a regional site and the approvals necessary to construct and operate a facility with a capacity to handle the volumes identified by EPA for out-of-region incineration. Consistent with the PRAP, we support EPA's adoption of the preferred option in the Record of Decision (ROD) provided that viable treatment alternatives to out-of-region incineration (e.g.,

Cement-Lock®) will have the opportunity to demonstrate site(s) control and other approvals necessary to construct and operate a facility during the remedial design phase. As EPA instructed in the PRAP: "one or more vendors might succeed in demonstrating that their technology could decontaminate Lower Passaic River sediments and might be able to site and construct a decontamination technology facility in the New York-New Jersey Harbor Estuary. Should this happen during the remedy design phase, EPA could modify the selected remedy through a ROD amendment or Explanation of Significant Differences in such a way as to allow for local decontamination and beneficial use (DMM Scenario C) of all or a portion of the sediment."

As discussed in more detail below, we have made advances in design, siting and permitting the Cement-Lock® manufacturing facility in the New York-New Jersey Harbor Estuary. Furthermore, Cement-lock® technology meets the evaluation criteria of the Focused Feasibility Study (FFS) and PRAP and would be an effective and cost-competitive treatment alternative for inclusion in the ROD.

I. Volcano Partners supports EPA's adoption of the preferred option in the ROD provided that viable treatment alternatives to out-of-region incineration will have the opportunity to demonstrate site control and other approvals necessary to construct and operate a facility during the remedial design phase

Volcano Partners is the owner of the patented Cement-Lock® manufacturing process. Cement-Lock® uses a high temperature thermo-chemical process that effectively destroys organic contaminants in dredged sediments, including dioxin/furans, pesticides, petroleum aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs), and immobilizes any remaining metals in a beneficial use product, Ecomelt®, that serves as a substitute for portland cement in the production of concrete. The Cement-Lock® manufacturing facility also captures waste heat from the manufacturing process to generate electricity for use by the facility and for export to the grid.

The EPA successfully demonstrated the ability of the Cement-Lock® process to create Ecomelt® in 2007. Since the completion of the demonstration program, the facility and process designs have been advanced by Foster Wheeler Corporation (Foster Wheeler). Cement-Lock® technology is now ready for commercialization. Volcano Partners has identified several viable sites in the New York-New Jersey Harbor Estuary and has commenced pre-permitting discussions with state agencies. The projected permitting timeline is 6 to 9 months. Final design and construction for the proposed plant is projected to require 18 months. With some overlap between permitting and final design, the timeline from start to operational readiness is estimated by Foster Wheeler at 24 months.

The contaminants of concern (COCs) to human and ecological health in the sediments at the Lower Passaic River Superfund Site include dioxins and furans, PCBs, PAHs, pesticides, mercury, lead and copper. The Cement-Lock® manufacturing process would effectively destroy, immobilize in a beneficial use product, or capture in air pollution control (APC) equipment any and all of these identified COCs.

Finally, as discussed in more detail below, the use of the Cement-Lock® manufacturing process would have additional benefits when compared to other treatment options reviewed by EPA in the PRAP and advance EPA objectives of promoting beneficial use, providing local jobs and reducing direct and

ancillary impacts of the remedy to local and out-of-state communities. For example, by centralizing processing, dewatering and treatment into a single location, the use of the Cement-Lock® manufacturing process would dramatically reduce the number of truck trips required by the use of DMM Scenario B by eliminating the transport of 1) the filter cake material by truck to a transfer facility and 2) treated sediment plus treatment process waste materials to a landfill.

II. Cement-Lock® Manufacturing Technology Delivers Sustainable, Integrated, Cost-Effective Sediment Management

The Cement-Lock® manufacturing technology is a sustainable, integrated, cost-effective sediment management system that supports Remedial Action Objectives (RAOs) for the Lower Passaic River Superfund Site and USEPA guidance supporting the use of innovative, sustainable technology. EPA guidance[1] urges project managers to utilize innovative technology when such technology offers the potential for comparable or superior treatment performance or implementability, fewer or lesser adverse impacts than other available approaches, or lower costs for similar levels of performance than demonstrated technologies. Additionally, in the course of manufacturing products for which there is a market demand, the Cement-Lock® process meets state and federal treatment criteria for PCBs and dioxins/furans.

Under this technology option, the dredged material would be screened, dewatered and processed at a single site located in New York-New Jersey Harbor Estuary. Sediment would be offloaded from barges and mechanically screened for debris and oversized material. Debris would be washed and disposed in a landfill. Screened sediment would be run through hydrocyclones to remove sand for recycling. The fine material would be dewatered using filter presses. Ecomelt® would be manufactured from the resulting "filter cake". Finally, the Cement-Lock® manufacturing facility captures waste heat from the manufacturing process to generate electricity for use by the facility and for export to the grid.

A. Summary of Cement-Lock® Manufacturing Technology

Cement-Lock® manufacturing technology is the first sustainable manufacturing process specifically designed to produce a construction-grade, pozzolanic product from contaminated dredged sediments. The technology consists of feeding a mixture of contaminated sediment and modifiers to a rotary kiln melter that operates at temperatures of 2400° to 2600° F. During processing, the sediment-modifier mixture is thermo-chemically transformed to a homogeneous, lava-like melt that encapsulates inorganic contaminants (heavy metals). Organic contaminants are disassociated and destroyed at these elevated temperatures. Inorganic contaminants present in the sediment are immobilized or "locked" within the pozzolanic glassy product matrix.

Development of the process was initiated under a contract with the U.S. Department of Energy Brookhaven National Laboratory (BNL) with funding through EPA Region 2 from the federal Water Resources Development Act (WRDA) under the New York/New Jersey Harbor Sediment

[1] United States Environmental Protection Agency. 2005. *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*. OSWER 9355.0-85.

Decontamination Program (1993-2010). Bench, pilot and demonstration-scale test programs were conducted with funding from BNL as well as the Gas Research Institute (GRI). Additional support for the demonstration program was provided by the New Jersey Department of Transportation, Office of Maritime Resources (NJ-DOT/OMR) Sediment Decontamination Demonstration Program.

The demonstration-scale plant was constructed in 2003 at IMTT, Bayonne, New Jersey. A block flow diagram of the process for the demonstration plant is presented in Figure 1. Photos of the rotary kiln and the overall plant are shown in Figures 2 and 3, respectively.

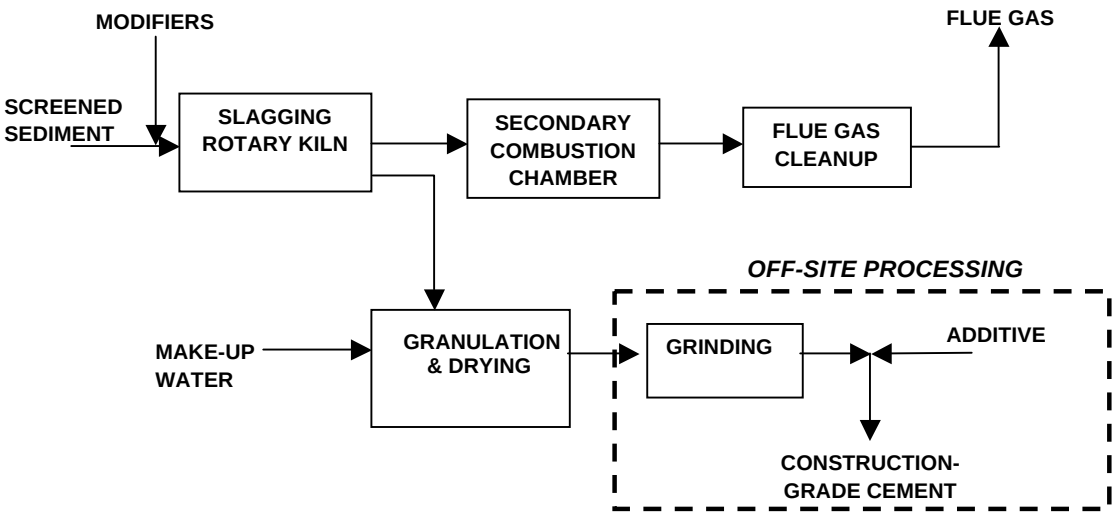

FIGURE 1. Schematic diagram of Cement-Lock® demonstration plant.

FIGURE 2. Cement-Lock® demo rotary kiln

FIGURE 3. Cement-Lock® demo plant.

The manufacturing process is specifically designed to use contaminated sediments as a feedstock or raw material. After dewatering, contaminated sediments are processed into a homogenous “filter cake”.

The patented technology then combines the filter cake with proprietary modifiers necessary for production of a pozzolanic material. The mixture is then run through a high temperature manufacturing process (slagging rotary kiln). This process produces a molten mixture that is then quickly quenched in a water bath to create the beneficial use product - Ecomelt®.

The primary beneficial use product is a glassy, pozzolanic material, which when dried and finely ground, can be used as a partial replacement for portland cement in the production of concrete.

The high temperature (2400° to 2600°F) involved in the manufacturing process has the benefit of destroying organic contaminants present in the feedstock. This thermo-chemical manufacturing process also effectively immobilizes inorganic contaminants, such as heavy metals, in the pozzolanic matrix.

The process is a proprietary technology including the (i) slag modifiers, (ii) residence time, (iii) physical arrangement and type of burners, and the temperature and turbulence.

B. Ecomelt® Exceeds EPA Leachability Standards

As set forth in detail by the 2008 Report,[2] leaching tests conducted during the course of the demonstration project confirmed that the product readily passed the EPA Toxicity Characteristic Leaching Procedure (TCLP) criteria. The product can be blended with ordinary portland cement at a 40:60 Ecomelt®/portland cement weight ratio. The use is consistent with ASTM C 595 (Standard Specification for Blended Hydraulic Cements) and confirmed by the demonstration project testing results.

Metals in product samples exhibit very low leachability when subjected to the TCLP. The TCLP results (Table 1) show that none of the samples leached any of the priority metals above regulatory limits. Most analyses were below detection limits for priority metals.

TABLE 1. Results of TCLP tests for metals on Ecomelt® produced from the Cement-Lock® demonstration plant with Passaic River sediment.

Metal	TCLP Limit, mg/L	Average Ecomelt®, mg/L
As	5	0.5 U
Ba	100	1 U
Cd	1	0.0057
Cr	5	0.0108
Co	--*	0.05 U
Cu	--	0.0475
Pb	5	0.5 U
Mn	--	0.070
Hg	0.2	0.0002 U
Ni	--	0.0533

Se	1	0.5 U
Ag	5	0.01 U
Zn	--	0.282

* Not a TCLP priority metal.
** U = below the analytical detection limit.

C. Ecomelt® Exceeds ASTM Compression Strength and Flex Standards

Tests were also conducted on a sample of the product from Passaic River sediment to evaluate its performance as a partial replacement for portland cement in concrete. These tests were conducted by the CTL-Group (Skokie, IL). Concrete specimens were prepared in which the product replaced 40% of the portland cement normally required. Specific tests were conducted on the concrete specimens.

Major tests included compressive strength, flexural strength, drying shrinkage, freeze-thaw testing, deicing-scaling, and chloride permeability. The compressive strength tests results (Table 2) showed that the final compressive strength results were the same as the Control Concrete (6,650 psi) after 28 days of curing. A concrete specimen set up for a flexural strength test is shown is Figure 4.

TABLE 2. Results of compressive strength tests conducted on concrete samples made with Ecomelt®/portland (40:60 wt %) blended cement and control concrete.

Ecomelt®/Portland Blended Cement Concrete	Control Concrete
28-day Compressive Strength, psi (MPa)	
6,650 (45.85)	6,650 (45.85)

FIGURE 4: Concrete specimen in place for flexural strength testing

A demonstration of the beneficial use component was performed in 2008. Product from Passaic River sediment was ground to cement fineness (<50 µm). The ground product was used as a partial

replacement for Portland cement in a batch of concrete for a length of sidewalk (165 feet long by 6 feet wide) situated in a "high use" area of Montclair State University's (MSU) campus, in Montclair, NJ. The concrete has been monitored for evidence of wear, cracking, and spalling. This sidewalk is readily available for inspection by the public. Figure 5 shows a sample of the glassy product (before grinding) that was used in the demonstration test. Figure 6 shows the laying of the concrete sidewalk at MSU for the demonstration test. Figure 7 shows the cured sidewalk at MSU.

FIGURE 5: Ecomelt® Granules prior to grinding

FIGURE 6: Laying concrete at MSU

FIGURE 7: Cured concrete at MSU

III. Cement-Lock® Manufacturing Design Enhancements by Foster Wheeler Corporation

As discussed above, the efficacy and feasibility of the manufacturing process was proved by the 2007 demonstration project in Bayonne, NJ that produced the beneficial use product from approximately 500 cubic yards of Passaic River sediment. The demonstration yielded considerable valuable operational data that has been used to refine the engineering design for a commercial-scale manufacturing facility specifically designed for the use of dredged sediments as a feedstock.

The Cement-Lock® 2007 demonstration[1] identified a number of plant equipment-related challenges; however, the production of Ecomelt® and the results from performance testing of the product met or exceeded design expectations. In part, these issues were the result of the adaptation of a rotary kiln originally designed for non-slagging medical waste processing. The subsequent equipment modification design study as part of the NJ-DOT/OMR project recommended modifications that were largely implemented and tested. The recommendations of that study and test results have been incorporated into the updated design.

Volcano Partners has assembled an engineering and environmental process team to evaluate the changes and modifications to advance the process to a commercialization phase. Areas of enhancement include (1) comprehensive design, (2) permitting, and (3) cost evaluation in support of a "project-based" 4.4-meter diameter rotary kiln operating at 6-10 tons per hour of feed sediment and modifiers. All mechanical systems are commercially available and in widespread use worldwide. The permitting, design and construction timeline for such a plant is projected at 24 months.

This section summarizes the key Foster Wheeler design developments since the IMTT demonstration, including any engineering "fixes" to correct problems encountered in the demonstration project and advances proposed in the Air Pollution Control (APC) equipment for the commercial-scale facility.

Front End Materials Handling – Contaminated dredged sediments will be delivered to a waterfront site by barge. This material will be off-loaded by clamshell excavator and conveyed to the processing train. All free carriage water will be pumped directly to a water treatment plant for processing prior to and during sediment off-loading. The contractor responsible for materials management and dewatering will conduct debris separation and dewatering to 55 - 65 percent solids content. The contractor will deliver the dewatered sediment to the kiln site. Dry proprietary modifiers will be blended with the sediment filter cake that will reduce the moisture content to 35 percent or less.

Slagging Rotary Kiln - The rotary kiln thermal processing technology provided by Foster Wheeler has been used to treat a wide variety of contaminated soils, sediments, sludges, and debris. These kilns are routinely operated in slagging mode to ensure that desorption, volatilization and required carbon destruction of organic contaminants in the solids feed is achieved and maximized. The feed materials, feed additives (slag modifiers), fuel(s) and oxygen content are carefully planned and regulated to control

the slagging conditions in the kiln. The internal diameter and length of the kiln are carefully chosen to stay within the proven limits for volumetric heat release, kiln gas velocity (to minimize fly ash carry-over to the secondary combustion chamber (SCC)), solids filling factor, and residence time. Carefully selecting these design features is important to ensure the feed sediment is heated thoroughly, to completely volatilize organic contaminants that are then oxidized in the SCC.

The slagging rotary kiln thermal treatment technology, experience and know-how have been used for more than 25 years by the Foster Wheeler team and its predecessor companies. Their rotary kiln projects in North America date back to 1986 and include 13 designed, 12 built and operated, and 9 currently operating, including several currently operating units that were designed and demonstrated to meet six nines (99.9999+ percent) Destruction and Removal Efficiency (DRE). A partial list of completed rotary kiln thermal treatment projects is provided in Table 3.

TABLE 3. Sample of Relevant Foster Wheeler Rotary Kiln Experience

Client & Location	Rotary Kiln	Start-up	DRE, %	Status
Dow Chemical, Midland, MI	4.4 m ø x 12 m L	2002	99.99+	In operation
Chem Security, Ltd. Treatment Center, Swan Hills, Alberta, Canada (SHTC)	4.4 m ø x 12 m L	1993	99.9999+	In operation
APTUS, Tooele County, UT	4.4 m ø x 12 m L	1991	99.9999+	Owned by Clean Harbors (in operation)
Rollins Environmental Services, Deer Park, TX	4.4 m ø x 12 m L	1988	99.99+	Owned by Clean Harbors (in operation)
Pyrochem, Inc., Coffeyville, KS	3.6 m ø x 10 m L	1986	99.9999+	APTUS-Laidlaw (shut down in 1999)

Feed System -- The dewatered sediments that have been mixed with modifiers are placed in a feed hopper at the front wall of the rotary kiln. A double screw feeder conveyor (redesigned to address challenges raised by the demonstration project) or ram feeder will be used to feed this material through an opening in the stationary front wall of the kiln on a continuous basis. The double screw conveyor creates a seal and restricts the in-leakage of air to the kiln. The heat for processing the sediments is provided by burning natural gas in a low-NOx burner also mounted on the stationary front wall of the rotary kiln. A combustion air fan will provide the proper ratio of air to fuel for efficient combustion.

Foster Wheeler rotary kilns are used routinely to treat widely heterogeneous materials that are often fed in batch mode (drums, boxes, etc.). It is much simpler to handle a single waste stream that will be somewhat homogeneous and fed continuously as is planned for this project.

The operating experience of these kilns demonstrates that the processing of 6-10 tons/hour of sediment modifier mixture is well within their capability; especially considering the feed will be relatively homogeneous in nature and fed continuously to the kiln with a vast majority of the heat release from burning natural gas.

Wet Deslagger -- To handle the slag discharge from the rotary kilns, a wet deslagger is employed. The molten slag falls from the discharge of the kiln and the walls of the SCC into a pool of water where it is quenched and cooled. The design of this slag drop area is extremely important. The proper openings and slopes are critical to the overall operability of the system. This know-how has been gained through numerous applications. The quenched slag is carried from the pool with a drag flight or plate-type conveyor. These wet deslaggers have been used on all of the slagging rotary kilns designed with Foster Wheeler technology and have provided excellent, reliable service thereby demonstrating that the removal of quenched slag will not be an issue with this design. Additional natural gas lances can be mounted at the kiln discharge to assist in melting any slag that may solidify and begin to build up in this area. The cooled, quenched slag is the beneficial use product.

Secondary Combustion Chamber (SCC) -- The SCC must supply additional heat to the process to account for SCC heat losses, air in-leakage, and to heat the water vapor (steam) generated in the wet deslagger to temperatures necessary to obtain the designed DRE for the facility. Low-NOx burners are used in the SCC, as well as in the kiln, to keep the production of thermal NOx at a minimum. A least two burners will be provided in the SCC. They will be arranged to promote turbulence and eliminate dead spaces and/or short circuits within the SCC.

To achieve the required DRE for the thermal processor, proven guidelines combining residence time, temperature, and turbulence, physical arrangement of the SCC, and type and arrangement of the burners must be carefully followed. By following these guidelines, all Foster Wheeler designs have surpassed the DRE requirements, for all organic components present in the feed, including the most difficult to destroy chemicals such as dioxins, furans, and PCBs, whether the DRE requirement is four nines (99.99 percent) or six nines (99.9999 percent). This operating experience demonstrates their capability of exceeding the DRE requirement of the project for any organic components present in contaminated sediment.

Waste Heat Boiler -- After the SCC, the hot flue gases enter a Waste Heat Boiler (WHB). The WHB will have a radiant section, designed with wide passes and slag/ash build-up removal capability, followed by a convection section with soot blowing. An aqueous urea solution will be sprayed into the WHB in the proper temperature zone (about 1800° to 1700°F) to allow selective non-catalytic reduction (SNCR) of most of the NOx in the flue gas to elemental nitrogen.

Flue Gas Cleaning System -- The flue gas cleaning system will use proven components to comply with all applicable state or federal air pollution control standards, including Maximum Achievable Control Technology (MACT) and New Jersey SOTA (State of the Art) requirements, for all regulated pollutants, including:

- Acid gases: SOx, HCl/Cl_2, and other halogenated species,
- Fine particulate including volatile and semi-volatile metals,
- Mercury,
- Lead,
- NOx (as required), and
- Dioxins and Furans

Industry leaders will supply the APC equipment and monitoring instrumentation. Each component will be designed to handle the maximum loading of contaminants and maximum flow rates for the process to ensure that all emission standards are met or exceeded.

The system will be a multi-step process and will provide a dry discharge with no waste water to treat. The treatment steps are as follows:

- The generation of fuel NOx in the system will be low due to the small amount of nitrogen in the feed. Thermal NOx will be minimized by the use of low-NOx burners. Further reduction of NOx occurs by selective non-catalytic reduction (SNCR) in the WHB where urea is injected into the flue gases in the zone where the temperature is about 1800° to 1700°F. At this temperature the urea reacts to reduce the NOx to N_2 without a catalyst. A reduction of 50 to 70 percent of NOx has been demonstrated in Foster Wheeler's systems. The gas is cooled to about 650° F in the WHB as steam is generated.

- The gas is then further quenched, to a temperature of about 375° F, by spraying a lime solution into a spray dryer absorber. The aqueous lime droplets absorb and react with the acid gas components (HCl, SOx, etc.) to form calcium salts (such as $CaCl_2$ and $CaSO_4$) which are dried and removed from the gas stream in a baghouse. A removal efficiency of 99.9% for HCl and 98% for SO_2 has been demonstrated.

- Fine particulate will be collected in the baghouse together with the unreacted lime and salts to achieve maximum achievable control of particulate emissions. Volatile and semi-volatile metals and metal compounds (such as Pb, $PbCl_2$, and PbO) will condense on the powdered lime and salt particles and will also be captured in the baghouse. The vapor pressures of Pb, $PbCl_2$ and PbO at 375° F (which is the baghouse operating temperature) are less than 10^{-8}, 10^{-7} and 10^{-8} mm Hg, respectively. The fine particulates, lime, salts, and condensed compounds will be removed from the flue gas stream at over 99.9% efficiency by the bags in the baghouse. It is surmised that elevated Pb emissions from the demonstration tests were likely due to a damaged bag in the baghouse.

- Powdered activated carbon is also injected into the gas stream ahead of the baghouse to remove dioxins or furans (that may be generated in the WHB) and mercury compounds that may be formed in the system. The baghouse is maintained at a temperature sufficiently above the acid gas dew point to prevent any condensation and consequent plugging of the bags, and corrosion. ADA/Norit Americas expects that a reduction of 90 to 95% of the Hg in the flue gas stream can be achieved in this stage.

- The final step in the gas cleaning system is another partial quench, to a temperature of about 250° F, by spraying water into the gas and then passing the gases through a packed bed

absorber filled with sulfur-impregnated activated carbon to absorb any mercury (Hg) present as vapor. ADA/Norit Americas expects that this Hg removal polishing step is capable of removing an additional 90+% of Hg compounds. An Hg continuous emission monitoring system (CEMS) will be provided before the guard section of the packed bed to signal when the carbon packing needs to be replaced.

Each of these process components has been successfully demonstrated for the application described in numerous projects and can be provided by several reliable equipment suppliers.

Induced Draft Fan, Stack and Continuous Emission Monitoring System (CEMS) -- The entire thermal processing and gas cleaning system operates under slight negative draft pressure provided by the induced draft fan which pulls the flue gas through the system and pushes it up the stack where the cleaned gas is vented to the atmosphere. The negative draft pressure ensures that any system leaks will allow ambient air into the system rather than allowing untreated or partially treated flue gas to escape to the atmosphere. The stack will provide adequate lift to the gases to allow for proper dispersion of the cleaned flue gas into the atmosphere. A proven CEMS will be provided to monitor key stack gases to ensure that the thermal processing and gas cleaning system are operating efficiently and within the constraints of the regulations and operating permit requirements. Independent testing companies will conduct the emission testing and compliance certification.

IV. Cement-Lock® Manufacturing Technology Meets the Evaluation Criteria for Treatment/ Disposal Established in the Feasibility Study and PRAP

As discussed above, the use of Cement-Lock® manufacturing technology supports the RAOs established for the Lower Passaic River Superfund Site including the protection of overall human health and the environment and the achievement of applicable or relevant and appropriate standards (ARARs). Cement-Lock® also meets the additional evaluation criteria set forth in the Feasibility Study and PRAP, including short-term effectiveness, long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, implementability, cost, acceptance and sustainability.

A. Short-Term Effectiveness

Cement-Lock® manufacturing technology would centralize processing and treatment of the Lower Passaic River dredged material into a single location, minimizing handling and transportation, as well reducing the risk of releases. While meeting required performance specifications, this approach reduces potential impacts to the community, including the reduction of noise and levels of traffic, and dust and odors during the handling, during processing and disposal of contaminated sediment. The APC equipment and monitoring instrumentation for lime injection, carbon absorption, NOx capture and stack emissions control have been demonstrated to be fully compliant with all applicable state and federal APC standards.

Specifically, the Cement-Lock® manufacturing technology can simplify the remedy and improve the short-term effectiveness of the remedy as follows:

- The dredged material would be offloaded directly to the manufacturing facility from the barge, eliminating the repeated material handling required by DMM Scenario C (thermal). Tens of thousands of truck trips required to convey material from the processing/dewatering facility to the transfer facility (from where the material will be transported to the treatment facility) are eliminated, together with the associated truck traffic impacts to local highways, communities and air quality.
- Handling, rail transport of filter cake and handling and potential truck trips for transfer from rail to the facility (depending on the incinerator selected) would be eliminated.
- Because Ecomelt®, the end product of the Cement-Lock® manufacturing process, is a replacement for portland cement that would be used locally, truck trips associated with the mining, processing and transport of raw materials for cement manufacturing of an equivalent volume of Ecomelt® for local construction would be eliminated.
- The eliminated truck traffic would sharply reduce overall traffic impacts, noise and greenhouse gas emissions associated with the remedy, locally and off-site.
- The reduced handing of the dredged material could reduce the volatilization of PCB and other COCs and associated risks to workers and the community.
- Process heat from the Cement-Lock® manufacturing process can be captured and used to co-generate electricity to run the facility with a balance available for export to the grid.

B. Long-term Effectiveness and Permanence

The very nature of the higher temperatures involved by the Cement-Lock® manufacturing process, as demonstrated in the WRDA Demonstration Project, can improve the long-term effectiveness and permanence of the remedy, minimizing potential exposure pathways and long-term risks. Specifically,

- The Cement-Lock® manufacturing process uses high temperatures that effectively destroy all organic constituents, including PAHs, Pesticides, PCBs and dioxins/furans;
- The metals that are not volatilized are immobilized within the Ecomelt® matrix. TCLP test results have demonstrated the immobility of metals in Ecomelt®;[2]
- Mercury, lead and other metals volatilized by the high temperature process would be captured by the APC system; and,
- The mass of contaminants transferred from the Lower Passaic River to landfills would be sharply reduced through dissociation and destruction of contaminants. Only residual material recovered from the baghouse of the APC system, containing a small fraction of original contaminant load found in the in situ volume of dredged sediments would require landfilling. Volcano Partners is actively reviewing recycling options that would eliminate the need to landfill even this small fraction of contaminants found in APC residual.

[2] Mensinger, M, 2008. *Op.cit.*

C. Reduction of Toxicity, Mobility, or Volume Through Treatment

The ability to destroy organics and immobilize metals in the course of manufacturing marketable products from dredged material is the strength of this alternative treatment option. Specifically,

- The high temperatures involved in the manufacturing process irreversibly destroy all organic contaminants, achieving 99.9999+ percent DREs for PAHs, Pesticides, PCBs and dioxins;
- Metals are immobilized in the Ecomelt® pozzolanic matrix. TCLP analyses on Ecomelt® meet USEPA standards;
- The material dredged from the Lower Passaic River would be used as a feedstock to produce Ecomelt® for use as a portland cement replacement;
- All sediment recommended to be dredged by the PRAP, regardless of COC concentrations, is acceptable feedstock for the Cement-Lock® process for manufacturing Ecomelt®; and
- Volcano Partners is actively reviewing recycling options that would eliminate the need to landfill even the small fraction of contaminants remaining in APC system residual.

D. Implementability

As discussed in more detail above, after the successful manufacture of Ecomelt® from dredged sediments, including Lower Passaic River sediments during the WRDA Demonstration Project, operational design enhancements were made to the feedstock delivery and APC systems by Foster Wheeler Corporation. The uniqueness of the Cement-Lock® manufacturing process lies in the additives, the mixture ratios and residence times used to manufacture Ecomelt®, rather than in the thermo-chemical processing equipment. All mechanical systems are "off-the-shelf" and in widespread use worldwide. Foster Wheeler's proprietary rotary kiln designs readily scale-up to meet the removal requirements of the Lower Passaic River Superfund Site. Volcano Partners has identified several viable sites in the New York-New Jersey Harbor Estuary and has commenced pre-permitting discussions with state agencies. With some overlap between permitting and final design, the timeline from start to operational readiness is estimated by Foster Wheeler at 24 months. Based on preliminary analysis, the amount of dredged material estimated by the EPA in the PRAP for thermal treatment with beneficial reuse in DMM Scenario C would be sufficient to support the development of a minimum commercial-scale Cement-Lock® manufacturing facility.

E. Cost

Cement-Lock® technology is a cost effective alternative to out-of-state incineration. The FFS estimated $370 per dewatered ton as the unit cost for thermal treatment with beneficial use in DMM Scenario C. The FFS estimated $400 per dewatered ton as the unit cost for out-of-state incineration in DMM Scenario B. While the treatment costs alone are comparable, when transportation costs of $240 per ton to the out-of-state incinerator facilities are applied, the total treatment and transportation cost jumps to $640 per dewatered ton. EPA estimates support a finding that a Cement-Lock® alternative in DMM Scenario C is more cost effective than out-of-state incineration in DMM Scenario B. Without providing a

specific cost estimate, Volcano Partners' preliminary analysis for processing Lower Passaic River sediment confirms that the use of the Cement-Lock® manufacturing process would be a cost-effective alternative to out-of-state incineration. Further, long-term liability costs are sharply reduced or eliminated. As the volume of material requiring placement in a landfill would be limited to baghouse and carbon bed waste, the long-term insurance, monitoring, bonding and other costs associated with landfilling treated material would be nearly eliminated.

F. Acceptance

The Cement-Lock® manufacturing process is recommended by the National Advisory Council for Environmental Policy and Technology (NACEPT) as a technology for environmental justice communities and other vulnerable populations.[3] A Cement-Lock® facility will provide local jobs and support to local economies, two of the concerns consistently raised in CAG and public meetings. Cement-Lock® technology is supported by key community stakeholders, including the Passaic River Coalition. Volcano Partners is committed to developing and implementing a community education and outreach program to keep communities informed and engaged.

G. Sustainability

The Cement-Lock® manufacturing process is consistent with EPA Region 2 Clean and Green Policy that promotes a more sustainable approach to remediation. The Cement-Lock® manufacturing process is the result of the unprecedented 20-year effort by EPA Region 2 and public and private stakeholders to identify and deploy a sustainable, green technology capable of producing a beneficial use product from contaminated dredged sediments. Specifically,

- The Cement-Lock® facility uses natural gas for the manufacturing process and waste heat for cogeneration.
- Energy used in the manufacturing process would be captured through cogeneration to run the manufacturing facility and excess electricity would be exported to the electrical grid;
- The end product of the manufacturing process would be a high quality pozzolanic material that would be beneficially used as a cement admixture to substitute with a portion of portland cement in the production of concrete for construction projects. This process virtually eliminates any need for landfilling of contaminants. Nearly the entire volume of contaminated dredged material would be used in the production of non-hazardous building materials, including sand and Ecomelt®, a pozzolanic cement admixture, for local construction use; and
- Greenhouse gas emissions would be reduced by the elimination of truck transport and by the offset of CO_2 emissions resulting from the beneficial use production of a portland cement replacement and electricity associated with the Cement-Lock® facility. For each ton of Ecomelt® produced, a Cement-Lock® facility eliminates one ton of CO_2 produced by the portland cement industry.

We look forward to working with you and your staff, and the PRPs and other stakeholders, to establish an effective and cost competitive treatment/disposal plan for the Lower Passaic River Superfund Site.

[3] NACEPT, *Technologies for Environmental Justice Communities and Other Vulnerable Populations*, February 15, 2012

We would be happy to provide any additional information you may need regarding the Cement-Lock® manufacturing process, or to meet with you or your staff to answer any questions.

Sincerely,

Al Hendricks

Chairman / Managing Member

(407) 492-9731

www.cement-lock.com

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 01, 2014 5:19 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Casey Hennessey
Casey.hennessey@gmail.com

springfield
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07081

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 9:52 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

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The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Kelly Henry
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Yardley
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19067

215-321-8226

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Saturday, August 09, 2014 6:17 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

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Thank you.

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07945

973-543-7562

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Sunday, August 03, 2014 5:48 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

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Thank you.

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Point pleasant
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Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 5:28 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Matthew Hersh
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Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 12:00 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Dawnee Hicks
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5516896252

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 11, 2014 10:58 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jeanette Hoffman
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Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 10:56 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

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9088320557

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 4:53 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

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Thank you.

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908 766 3431

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 10:48 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

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Thank you.

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9088320557

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 13, 2014 11:41 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

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PASSAIC RIVER COALITION
at Willow Hall

330 Speedwell Avenue, Morristown, NJ 07960
Phone: (973) 532-9830
Fax: (973) 889-9172

20 August 2014

Submitted by email to: PassaicLower8MileComments.Region2@epa.gov

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Re: Passaic River Coalition Comments on the Lower Passaic Cleanup Plan for RM 0 to 8.3

Dear Ms. Yeh:

The Passaic River Coalition (PRC) has been actively involved in the Lower Passaic River area for several decades, working with local municipalities to achieve parks acquisition and improvements, debris removal, and economic improvements. Our efforts have been focused on the east bank from Harrison to Garfield, but we have also worked closely with west bank municipalities, the Passaic Valley Sewerage Commissioners and all affected counties. We have been actively engaged as stakeholders in the Lower Passaic River Superfund site and its various Operable Units since the beginning of the process, and on multiple occasions, most recently 14 November 2012, we have provided extensive comments to the U.S. Environmental Protection Agency (USEPA) National Remedy Review Board (NRRB), regarding the Lower Passaic River Restoration Project.

USEPA has now proposed a selected alternative for the lower 8.3 miles of the river. The Proposed Plan has been summarized by USEPA as "capping with dredging for flooding & navigation with off-site disposal of dredged materials" consisting of the following core elements:

- Removal of 4.3 million cubic yards of contaminated sediment, bank-to-bank, by dredging the river bottom from Newark Bay to the Belleville/Newark border;
- Sediment dewatering locally to prepare the material for transport by rail for further off-site treatment and/or disposal;
- Allowing 5.4 million cubic yards of contaminated sediment to remain and be capped to effectively eliminate the movement of sediment and its availability to contaminate the food chain;
- Capping all dredged areas bank-to-bank to protect against erosion or other physical disturbance, while reducing flooding potential and accommodating and protecting the integrity of the federal navigation channel in the 2.2 mile area of the river closest to Newark Bay; and
- Monitoring of water, air and wildlife during construction to evaluate and reduce potential releases of contaminants to the environment.

The PRC recognizes that USEPA has invested considerable time and effort in getting to this major step, as have the Cooperating Parties Group, members of the Community Advisory Group, and many experts and stakeholders. We are faced with a recognition that 30 years of process in tandem with specific cleanup projects (e.g., 80-120 Lister Avenue Cleanup Project; RM 10.9 Cleanup Project) have both

reduced the contamination in specific areas and spread the contamination across much larger areas than originally existed or recognized. We only need to look at the sediments that have filled the lower navigation channel since its last dredging circa 1983 to recognize the cost of delays. Further delays will exacerbate the remaining problem, but significant issues remain with the proposed plan. We do not want to allow "the ideal" to be the enemy of "the good" but we also recognize that the proposed plan does not promise a completely satisfactory result for several reasons. Our recommendation is that USEPA move forward in a manner that allows the shortcomings of the current approach to be addressed in an adaptive manner over time, but with assurances that the resulting work is truly beneficial.

The following issues are of greatest concern to the PRC, and should be addressed through improvements to the proposed plan, during the design and implementation process, or as parallel efforts. Our comments here are stated in general terms. In the interests of brevity, we will not repeat the detailed technical analysis of our prior comments to the NRRB.

The Lower Passaic River as an Ecosystem

The Lower Passaic River from Dundee Dam to Newark Bay has a long history of industrial, commercial and residential use, disruption by highway development, etc. Still, the Lower Passaic is not a ditch – it remains an important ecosystem and must be addressed as such. The PRC must question the ecological viability of a river that, subsequent to dredging, is armored from bank to bank. What plants will be able to grow in such a substrate? What fish species will be viable given the likely limitations on plant growth? A project that cleans up sediment contamination while destroying the viability of the river as a functioning ecosystem is not an appropriate management approach. The proposed plan should have ecological targets, not just targets for contaminant levels in mobile sediments or fish tissue.

Therefore, the proposed plan should be improved to incorporate ecological restoration in tandem with the sediment cleanup process, so that the river is both cleaner and more ecologically functional and sustainable. The final plan should have specific and aggressive ecological objectives in terms of bank habitat, emergent and submerged aquatic vegetation, areas for fish propagation and protection, and shellfish habitat. Achieving these objectives will likely require a much more sophisticated approach to the dredging and capping process, so that the appropriate substrate for ecosystem development is in place.

The ecological objectives should be closely linked to ecosystem function of the river bank and adjacent upland areas. A river ecosystem is not limited to the submerged area, but depends highly on the riparian area as well. Providing these targets will also provide opportunities for integrated Natural Resource Damage projects regarding the riparian habitat that is outside of any dredging areas.

Sustainable Remedies Are Necessary

The PRC has several concerns regarding the extent to which the proposal plan maximizes sustainable approaches to ecosystem improvements. As a nation, we must be more cognizant of sustainability as a fundamental concept of societal well-being.

1. Relationship to Other Operable Units of the Superfund Site

The proposed plan focuses on the lower 8.3 miles as the reach with the highest contaminant levels. We acknowledge the purpose of this targeting, but we also recognize that the Lower Passaic River is an interconnected whole. Isolation of one reach from the upstream and downstream reaches is not possible. Cleanup of an entire river section is fundamentally different from the vast majority of Superfund sites, which are stable sites with far less interaction beyond their borders. Contaminated sediments will continue to be mobilized by floods, tides and storm surge during the entire design and

implementation process, within the lower 8.3 miles and from both upstream and downstream areas. The inevitable result is cross-contamination and recontamination during and after the project. However, delaying action until approved plans exist for the remaining areas of concern also is problematic, as the entire situation will only deteriorate further.

Therefore, the PRC recommends that USEPA move toward proposal and adoption of cleanup plans for the remaining Operable Units (RM 8.3 to Dundee Dam; upper Newark Bay) so that implementation of these segments overlaps with implementation for the current segment, to the maximum extent possible. We understand from the Cooperating Parties Group that their RI/FS will be completed by the end of 2014, providing information that should, if comprehensive, provide sufficient information on the upstream and downstream Operable Units to serve as the basis for EPA decisions regarding those areas. The RI/FS should also provide useful information to refine the proposal plan for RM 0 to 8.3. The less time that transpires between completion of the initial project and the remaining segments, the better the river will be.

2. Dredged Materials Management

The proposed plan envisions "off-site" disposal of the dredged materials. The PRC has previously objected to the concept of transferring the Passaic River's problem to someone else's backyard. Disposal of these materials in distant landfills is the antithesis of sustainability. We also reject the concept of Contained Aquatic Disposal as a solution, unless used for cleaned sediments – it would move the problem rather than solve it. Rather, the PRC continues to believe strongly that dredged materials should be processed in a manner that allows for beneficial reuse, at locations that are both safe for the public and environment and provide local jobs. Presentations from EPA indicate that the cost of decontamination and beneficial reuse is not significantly different from that of off-site disposal. We note that decontamination facilities should be at a location well removed from residential neighborhoods in the area to avoid environmental justice issues.

3. Permanent Cap Maintenance

A design that requires perpetual maintenance in an uncontrollable environment is not a permanent solution. Unlike many brownfield properties where a cap can be visually inspected at any time and is within a controlled setting, the proposed cap would be within a river that routinely floods (e.g., Hurricane Irene) and is subject to major storm surge (e.g., Hurricane Sandy). There is no means by which the river can be controlled; these are natural events and exert major stress forces on the river bottom and banks. We should never underestimate the ability of natural forces to disrupt artificial structures. Routine visual inspection of the cap will not be feasible, as it would be at least several feet below the surface. These issues are in addition to the problem discussed above, regarding the ecological impacts of using an armored river bottom instead of a more natural substrate.

The PRC concludes that our society lacks the governance mechanisms to ensure perpetual maintenance of a non-visible cap that is subject to major physical stresses due to natural conditions. There is every reason to believe that maintenance will become a low priority in the foreseeable future, with resulting degradation of the cap. The use of a cap should be minimized through improved clean-up options. Where a cap cannot be avoided, however, the project plan should incorporate a mechanism with a permanent source of funding (i.e., a "sinking fund") with a separate corporate structure so that the maintenance system is no longer dependent on the responsible parties and also cannot be interfered with by governmental agencies that might want to divert the funds to other uses.

4. Use of the River

The Lower Passaic River has been used historically for freight movement by barge and small ship, though that traffic has declined a great deal over the years. While the river's industrial past is unlikely to repeat, other uses of the navigation channel are possible as the river recovers, from personal watercraft to larger boats, ferries and the like. We can't know what the future will bring, and therefore some navigability of the river should be maintained so that potential uses may be accommodated. That being said, the most likely boat traffic in the future will be pleasure craft. If a choice must be made between improving the river ecosystem and maintaining a channel for freight traffic, the PRC would choose the former. In addition, we note that any navigation channel in the Lower Passaic is necessarily linked with navigation channels in Newark Bay and must be addressed as a network, likely requiring additional dredging.

Ancillary to the navigation channel are the necessary dock and access facilities. The cleanup design must incorporate provisions for creation and maintenance of docking facilities, boat ramps and other access points. Similar to the ecosystem issues discussed above, from a recreational boating perspective a project that results in a clean but inaccessible river is an unacceptable result.

Worst First

While the reach from RM 0 to 8.3 may have the highest level of contaminants, it is highly unlikely that all areas are equally contaminated. Further, it will be impossible to address all parts of the reach simultaneously, to avoid problems with staging, barge traffic, etc. To the extent feasible while avoiding inefficiencies and recontamination or cross-contamination, the areas at highest risk of affecting human health and ecosystem integrity should be addressed first, to more quickly eliminate the worst problems. These may involve the most contaminated sediments, but also could involve areas with highly mobile sediments. Addressing "worst first" is similar to the approach already taken in the river at the Lister Avenue site and RM 10.9.

The Lower Passaic River as Part of a Broader River System and Economy

A fundamental problem with the Superfund program as a whole is that it does not effectively engage the broader context of issues affecting or affected by the site. It views the issue through the lens of the "contaminated site" without recognizing that, in this instance, the Lower Passaic River is affected by the entire upstream river basin. Sediments and contaminants move down the river continually. As noted in our 2012 comments to the NRRB, the Harbor Estuary Program's focus on a regional sediment management approach is critical to ultimate success of this Superfund project. Unfortunately, complementary actions that could be taken to improve the viability of the Lower Passaic cleanup are not addressed in the project plan. USEPA needs to envision approaches (perhaps in collaboration with other federal agencies) that could be used in this manner. Again, the proposed cleanup plan need not be delayed, as both the cleanup and efforts to reduce sediment movement from upstream area could proceed in parallel.

Likewise, the project should be fully cognizant of the economic context of Lower Passaic River municipalities. A project of this nature should be integrated with economic planning and redevelopment actions so that the region gains the maximum benefit for the expenditures involved. The PRC does not envision increasing the project costs, necessarily, but rather investing time and effort on thinking beyond the confines of the Superfund cleanup itself. The purpose of the cleanup is not just to meet a standard, but to improve the river to the benefit of society. Integration with redevelopment, social objectives and neighborhood improvements can provide significant leverage. To the extent that Natural Resource Damage funds are available, they can be used to facilitate additional improvement

projects that address this need for broader integration. A narrow view of the purpose for this cleanup project will damage the potential benefits unnecessarily.

Integration of Actions

Experience with the RM 10.9 cleanup shows clearly that the number and condition of the bridges over the Lower Passaic River pose a major constraint on the speed (and therefore cost) of implementation. With bridges this old, we should be certain that Murphy's Law will apply – what can go wrong will go wrong – along with the corollary that it will go wrong at the worst possible times. Given the experience with RM 10.9, EPA's anticipated 5 year schedule to remove 4.3 million cubic yards at a cost of $1.7 billion seems overly optimistic.

Rather than hope for the best, USEPA and the owners of these bridges should assume the worst and plan for it. Integration with transportation system improvements will be critical. Targeted bridge improvements might substantially reduce the likelihood of project delays. USEPA and others should consider whether a combination of NJDOT funds and cleanup project funds could be used to achieve cleanup cost reductions. Other Superfund projects have required the construction of access roads and other transportation improvements to make the project possible and cost-effective. A similar argument is appropriate here. We may find that spending more in one area reduces costs even more in another.

Conclusions

Action is certainly needed. The Lower Passaic River communities and public interests have waited far too long for comprehensive action, as beneficial as the initial cleanup projects may have been. The PRC strongly urges USEPA to improve the proposed plan using two general approaches. First, incorporate decision and design improvements that address as many of the issues discussed above as is feasible without extensive delay of project startup. Second, immediately move to design and implementation of cleanup plans for the other segments, further improvements to the project plan within the RM 0 to 8.3 reach that can be incorporated through adaptive management planning, and integration of the Lower Passaic River Superfund Site actions with broader river basin management to reduce the potential for recontamination of the Lower Passaic due to sediment movement from the non-tidal river.

Sincerely,

Laurie Stauhs Howard

Laurie Stauhs Howard
Chair

Yeh, Alice

From: Catherine Kelleher <prckelleher@gmail.com>
Sent: Wednesday, August 20, 2014 1:32 PM
To: Region2 PassaicLower8MileComments
Cc: Laurie Howard
Subject: PRCcomments on Lower Passaic Cleanup Plan for RM 0 to 8.3
Attachments: 08202014131639.pdf

Dear Ms. Yeh,

Attached should be our comments letter dated August 20, 2014.

Thanks

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Sunday, August 10, 2014 6:16 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Adam Hulse
adamhulse@earthlink.net

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 11, 2014 11:38 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Dudley Hulse
doughulse@earthlink.net
7 Edge Road
Alpha
New Jersey
08865

908-454-4770

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Sunday, August 10, 2014 6:17 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Lauren Hulse
laurencroasdale@gmail.com

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 11, 2014 11:40 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Nanette Hulse
nanettehulse@earthlink.net
7 Edge Road
Alpha
New Jersey
08865

908-454-4770

Yeh, Alice

From: Catherine Hunt <cchunt205@yahoo.com>
Sent: Wednesday, August 13, 2014 1:07 AM
To: Region2 PassaicLower8MileComments
Subject: Passaic River

To Whom It May Concern:

This letter is to request that you fully clean up the Passaic River. Please require the polluters of the river to pay for cleaning it up. Please implement:

Alternative 2 is a full bank to bank dredging of the lower 8.3 miles to depths of 20-30' that would totally remove the contaminants and permit boating to return to its pre-1950 levels.
Alternative 2 would permit new docks, boat ramps, and bulkheads to be built. No maintenance is required with Alternative 2.

Thank you for your attention,

Catherine Hunt
cchunt205@yahoo.com

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May 27, 2014

Mr. Walter Mugdan, Director
Emergency and Remedial Response Division
United States Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007-1866

Re: Diamond Alkali Site - Lower Passaic River Study Area
Request for Extension of Public Comment Period on Proposed Plan and Focused Feasibility Study

Dear Mr. Mugdan:

I am writing on behalf of the Cooperating Parties Group (CPG) in response to your letter dated May 6, 2014. While the CPG has separately requested an appeal of EPA's decision regarding the length of the public comment period for the Proposed Plan and Focused Feasibility Study, I wanted to respond to the last two paragraphs in your letter.

While EPA has shared information during the Community Advisory Group (CAG) meetings, that information is intended for consumption by the general public and does not contain the type of data analysis and detail required to fully understand the work the agency has done. The CPG has repeatedly requested such information and has not received timely responses from the agency.

For example, the CPG provided Region 2 with a series of modeling code, input and output files in December 2013. In the letter transmitting same, the CPG requested the Region's latest modeling code used for the FFS. The CPG followed-up on its request in writing on January 3, 2014 but Region 2 did not respond to the request until March 12, 2014. The delay was surprising, since the Region presented its modeling results to the CAG in January 2014 and completed its FFS modeling appendices in February 2014 (according to the date stamps on FFS reports found on our.passaic.org). With respect to the risk assessments, the CPG has identified significant differences between the Ecological Risk Assessments being performed for the 17-mile LPRSA

RI/FS and the 8-mile Proposed Plan. Prior to the release of the Proposed Plan, the CPG was not aware that the Region was considering approaches for the Proposed Plan that were inconsistent with the Problem Formulation Document for the LPRSA RI/FS, which was approved by EPA nearly five years ago. Information on this FFS approach to ecological risk assessment has not been provided and is not set forth in the administrative record file.

In addition to the above examples, the CPG also believes that the administrative record file is incomplete, as evidenced by the numerous Freedom on Information Action (FOIA) requests submitted by the CPG, which request critical data necessary to evaluate the Proposed Plan. This information should have been made available to the public as part of the administrative record. Furthermore, the document repository at the Newark Public Library does not contain the full administrative record file, thereby limiting what information is available to the local community for review.

Very truly yours,

William H. Hyatt, Jr.

cc: Eric Schaaf, ORC
Raymond Basso, ERRD
Alice Yeh, ERRD
Sarah Flanagan, ORC
Patricia Hick, ORC

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William H. Hyatt, Jr.
D 973.848.4045
F 973.848.4001
william.hyatt@klgates.com

June 30, 2014

Mr. Walter Mugdan, Director
Emergency and Remedial Response Division
United States Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007-1866

Re: Diamond Alkali Site – Lower Passaic River Study Area
EPA Statements at Passaic River Institute Event
Montclair University, June 2, 2014

Dear Mr. Mugdan:

I am writing on behalf of the Cooperating Parties Group (CPG) in response to comments made by you and Alice Yeh, EPA remedial project manager, at the Passaic River Institute ("PRI") event on June 2, 2014.

I would like first to thank you for publicly differentiating the CPG's cooperative efforts from the absence of cooperation from Tierra, Maxus, and Occidental (TMO), which have not contributed to the River Mile 10.9 project notwithstanding the Unilateral Administrative Order EPA issued to Occidental or moved forward with the Phase 2 removal of 160,000 cubic yards at Lister Avenue.

The CPG's goal is the successful remediation of the Lower Passaic River and we share the EPA's definition of a successful remedy as one that is protective of human health and the environment.

The CPG agrees with Congressman Pascrell's statement that there is a need to develop a consensus on how to move forward. Our concern is that EPA's proposed remedy, which lacks precedent, scientific justification, and a coherent implementation approach, does not provide the basis for building consensus, particularly as it will not withstand technical review. The proposed remedy is scientifically flawed and does not consider the significant volume of information developed, with regulatory oversight, by the RI/FS. As a consequence of failing to integrate all the available information, the proposed remedy's conceptual model does not accurately reflect the complex processes at work in the Lower Passaic River. More importantly, the proposed remedy fails to achieve an effective reduction in risk and any risk reduction it obtains cannot be sustained.

The scientific methods and analysis used to develop the Sustainable Remedy are more robust than those used in developing the bank-to-bank dredge. Unlike the bank-to-bank dredge, the Sustainable Remedy follows EPA guidance for management of sediment sites and procedures for addressing uncertainty by incorporating adaptive management concepts. It is inaccurate, therefore, as stated by the EPA at the June 2 event, to characterize the Sustainable Remedy as more conceptual in nature than the bank-to-bank dredge. The Sustainable Remedy has been effectively developed over several years and integrates all of the information collected since 2000. It is based on an in-depth analysis of the contaminants, transport mechanisms for the entire 17-mile River, and credible assessments of risks to human health and the environment. As a result, the Sustainable Remedy is an optimal solution that achieves credible risk reduction with a lesser impact on the environment and the community.

The Region's approach for determining sediment contamination levels in the Lower Passaic River is an overly simplistic method that purposely ignores the sedimentological process at work in the River. Its portrayal of sediment in the lower 8 miles of the Passaic River as roughly homogenous is inconsistent with the more detailed examination of the data that is nearing completion as part of the RI/FS. The data demonstrates clear areas of higher contamination that are readily delineated. These areas can be remediated faster as a targeted removal approach rather than engaging in a decades-long bank-to-bank approach. Moreover, the implementation approach described in the FFS is highly conceptual, relying on unrealistic dredging rates and severely underestimating the impacts this approach will have on the local community. The proposed remedy also fails to acknowledge the urban nature of the Lower Passaic, including the abundance and capacity of infrastructure that will severely impact dredging schedules and rates. During its public meetings, several concerned citizens asked how the EPA intends to remove hundreds of times more sediment than were removed during the RM 10.9 project, an effort which took about 10 months, in only 5 years. Their concerns focused on issues such as recontamination and impacts on boaters, commuters (traffic), and business growth.

The EPA seems to have given very little thought to how the dredging will be accomplished. Instead, the EPA alludes to a nearly round-the-clock removal effort that is not achievable in the real world. Rather than proposing a realistic plan, the EPA has simply stated that this crucial element of the viability of the bank-to-bank dredge, as well as community impacts, will be "figured out during the design phase." We urge the EPA to put on the record thorough and thoughtful answers to these very important questions raised by the community.

In addition, the narrow focus of the bank-to-bank dredge in reducing risk related to sediment only leaves unaddressed the broader issues facing the River. By the Region's own

admission, this remedy will not achieve the goal of eliminating fishing bans and will require additional work in other parts of the River. The EPA has chosen to ignore its own guidance on managing uncertainty in complex river systems, which guidance requires the application of adaptive management principles during the decision making process, and has instead pushed forward with a massive remediation program that attempts to manage uncertainty by over simplification of the River processes. The key problem with this approach is that when the EPA's program fails to achieve its goals, no new understanding of the River will have been achieved. In short, the EPA's program is a gamble that is likely to cost billions of dollars and impose decades of disturbances on the communities along the River. In contrast, the adaptive management principles of the Sustainable Remedy guarantee the best outcome because the approach evaluates the progress being made during the remediation process, with the knowledge gained being used to refine the process and improve the outcome.

By also ignoring issues of storm water runoff, discharge from sewage treatment plants, and other critical issues facing the River, it is highly unlikely that the bank-to-bank dredge will make substantial progress toward the fishable and swimmable River that the local communities anticipate as a result of the Proposed Plan. The Sustainable Remedy, on the other hand, will address the entire 17 miles of the River, guarantees the best outcome, will be accomplished quicker than the EPA's approach, and embraces, rather than ignores, the EPA's own guidance on how to manage the Passaic River.

We hope that future presentations by the Region will focus more on an objective discussion of all of the issues facing the Lower Passaic River toward the common goal of successful remediation and less on selling the community on a massive dredge project that is not in its best interest.

Sincerely,

William H. Hyatt, Jr.

cc. Congressman Bill Pascrell, Jr.

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August 7, 2014

Mr. Walter Mugdan, Director
Emergency and Remedial Response Division
United States Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007-1866

Re: Lower Passaic River Study Area

Dear Mr. Mugdan:

I am writing on behalf of the Cooperating Parties Group (CPG) in response to your letter dated June 23, 2014. We appreciate your response to the CPG's letters to Deputy Administrator Bob Perciasepe and Assistant Administrator Mathy Stanislaus dated between February 6 and March 24, 2014 ("CPG Letters"). We also appreciate EPA's recognition of the work that the CPG has accomplished under the RI/FS AOC and RM 10.9 Removal Action AOC, and EPA Headquarters' assurance that it will continue to be closely involved as EPA moves forward with decisions for the site.

Although we will not reiterate the points stated in the CPG Letters, which we continue to maintain, the CPG is compelled to respond to some of the statements of your letter.

First, your letter states that EPA will accept new written comments on the Proposed Plan during the public comment period and the CPG Letters will not be considered comments to the Proposed Plan. The CPG disagrees with this position. The CPG will be submitting detailed comments regarding the Proposed Plan for the administrative record by the August 20, 2014 deadline. However, the CPG Letters should also be a part of the administrative record file for the LPRSA pursuant to 40 C.F.R. Part 300, Subpart I (Administrative Record for Selection of Response Action). In fact, the same is true for all of the CPG's submissions and deliverables to EPA throughout the CPG's work on the LPRSA since the RI/FS AOC was entered in May 2007, as such documents should help form the basis for the selection of a response action for the site.

Second, your letter states that EPA expects to employ an adaptive management approach in regard to any remedial alternative selected during the remedial design and implementation of the remedy. However, this approach is inconsistent with EPA's 2005 Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, which calls for adaptive management in the decision making process. In contrast, the Region is proposing to make a final, massive remedial decision that precludes any interim decisions on how best to approach the remedy.

Finally, the CPG disagrees with EPA's statement that selection of a bank-to-bank remedy and capping will not set a precedent for other records of decision and EPA will continue to make each decision based on its merits, considering site-specific circumstances within the nine-criteria remedy selection framework. Region 2 has taken the exact opposite approach and has not considered site-specific circumstances in the Proposed Plan/FFS. For example, Region 2's exposure assumptions in the FFS Human Health Risk Assessment are not realistic and do not reflect the site-specific data that was developed at great effort and cost during the RI/FS, which results in overstated estimates of current and future risk. Similarly, Region 2's assessment of fish and wildlife risks relies on screening-level type assumptions that has resulted in misleading hazard quotients that overestimate risk. As will be described further in the CPG's comments on the Proposed Plan, such approaches by Region 2 are inconsistent with the NCP, applicable EPA guidance, and the direction Region 2 has provided to the CPG in carrying out the RI/FS.

We hope that EPA will give full and fair consideration to the CPG's comments on the Proposed Plan/FFS and, as your letter indicates, to the potential remedial alternatives that are developed within the RI/FS AOC framework, such that EPA will choose to set aside the Proposed Plan/FFS and await completion of the NCP-compliant RI/FS.

Very truly yours,

William H. Hyatt, Jr.

cc: Sarah P. Flanagan, Region 2 Office of Regional Counsel (via electronic mail)

Yeh, Alice

From: Kluesner, Dave
Sent: Friday, May 09, 2014 7:46 AM
To: Region2 PassaicLower8MileComments; Yeh, Alice; Basso, Ray; Flanagan, Sarah; Hick, Patricia
Subject: Fw: EPA's Proposal to Clean Up the Lower Eight Mile of the Passaic River: Links to fact sheets in English, Spanish and Portuguese

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From: Secretary Ironbound Super Neighbor Council <ironbound.sncc.corrs.sec@gmail.com>
Sent: Thursday, May 8, 2014 10:51:02 PM
To: Kluesner, Dave
Subject: Re: EPA's Proposal to Clean Up the Lower Eight Mile of the Passaic River: Links to fact sheets in English, Spanish and Portuguese

Hi Dave Thanks for the links. You might want to make it a little clearer in the presentation that those found to be responsible for the pollution will have to pay for it. A lot of people who spoke to me got the idea that it was going to be expensive for us the taxpayers.

On Tue, May 6, 2014 at 4:11 PM, Kluesner, Dave <kluesner.dave@epa.gov> wrote:

A century of industrialization and development throughout the Passaic River watershed have left behind toxic muck on the bottom and banks of the Passaic River. From Newark Bay to the Dundee Dam in Garfield, New Jersey, a section of the river referred to as the Lower Passaic River, the sediment is severely contaminated with dioxins, polychlorinated biphenyls (PCBs), mercury, lead and other metals, as well as pesticides and other harmful chemicals. Learn more about the problems by reading the fact sheet:

- The Passaic River's Polluted Past [PDF 1.3 MB, 4 pp] | Português [PDF 4 MB, 2 pp] | Español [PDF 3.9 MB, 2 pp]

On April 11, 2014, the EPA proposed a cleanup plan for the lower eight miles of the river. The proposed plan was released for public review and comment. Of the cleanup alternatives evaluated, the EPA is proposing "Capping with Dredging for Flooding & Navigation" with "Off-Site Disposal of Dredged Materials". The EPA will hold three public meetings during the public comment period that runs through July 21, 2014 to present the EPA's cleanup proposal and the other options that were considered. The EPA is particularly interested in comments on the choice of dredged material disposal options (whether off-site disposal or disposal in a container at the bottom of Newark Bay is preferable) and on whether shallower depths in the lower 2.2 miles of the river than those proposed in Alternative 3 might still accommodate reasonably anticipated future uses of that section of the river. Learn more about the proposal by reading the fact sheet:

- An Overview of EPA's Proposed Cleanup Plan [PDF 1 MB, 4 pp] | Português [PDF 1.7 MB, 2 pp] | Español [PDF 1.7 MB, 2 pp]

The EPA conducted a multi-year "Focused Feasibility Study" of an eight mile section of the Lower Passaic River. The study evaluated three cleanup options to address contaminated sediment in this area of the river, as well as a fourth option of taking no action. Learn more about the options that were evaluated by reading the fact sheet:

- Cleanup Options Overview [PDF 1.6 MB, 2 pp]

The cleanup proposal can be viewed at: Proposed Plan [PDF 2 MB, 46 pp]

David Kluesner

U.S. EPA - Manhattan Office

Public Affairs Division

290 Broadway, NY, NY 10007

work: 212 637-3653

cell: 347 330-9439

www.epa.gov/region2

https://blog.epa.gov/greeningtheapple/

https://twitter.com/EPAregion2

https://www.facebook.com/eparegion2

--

"One from Many"

Community stakeholders partnering for a better quality of life in the Ironbound.

WWW.IronboundSuperNeighborhoodCouncil.org

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 05, 2014 6:47 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jonathan Jaffe
jaffecom@gmail.com
45 Academy St
Newark
NJ
07102

9733150300

Yeh, Alice

From: D J <daj2000@hotmail.com>
Sent: Tuesday, August 05, 2014 3:24 PM
To: Region2 PassaicLower8MileComments
Subject: Public comment on the Lower Passaic River Restoration

Importance: High

Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

Hello Ms Yeh,

Per the description below, this is to express my support for **Alternative 2** of the Lower Passaic River Restoration. Let's have the more permanent solution.

Thank you,

Doug Janecek
7 Van Vleck St, Apt 1
Montclair, NJ 07042

Date: Tue, 5 Aug 2014 13:53:44 -0400
From: dyennior@GMAIL.COM
Subject: [NJ-GATEWAY-NEWS] With Corrections: Public Comment Period ends 8/20/14 on the Lower Passaic River Restoration
To: NJ-GATEWAY-NEWS@LISTS.SIERRACLUB.ORG

Calling all Activists:

The EPA is closing the public comment period on August 20, 2014 regarding the Lower Passaic River Restoration. Being considered are two Alternatives: 2 & 3. The goal is to remove or cap the contaminants in the first 8.3 miles of the Passaic River which contain Dioxin, PCBs, Mercury, Copper and DDT among other toxic pollutants that have rendered the river unsafe. Alternative 2 calls for a total dredging to remove all toxins from industrial pollution. Alternative 3 unfortunately caps the River at its current depth after up to 80 years of no dredging and sets a bad precedent by not holding polluters fully responsible for their actions. <u>We need each person to send an email or fax a letter to the following address ASAP:</u>

Written comments should be sent to:
Alice Yeh, Remedial Project Manager

U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866
Fax: (212) 637-4439
e-mail: PassaicLower8MileComments.Region2@epa.gov

The Passaic River Boat Club, the Gateway Group and the NJ Chapter of the Sierra Club unanimously support Alternative 2.
Alternative 2 is a full bank to bank dredging of the lower 8.3 miles to depths of 20-30' that would totally remove the contaminants and permit boating to return to its pre-1950 levels: passenger ships, yachts, commercial boating, fire and police boats. Alternative 2 would permit new docks, boat ramps, and bulkheads to be built. No maintenance is required with Alternative 2. Alternative 2 holds the polluters fully responsible and is truly a Restoration of the Passaic River. The EPA is rushing a decision that will be FINAL. Therefore it is urgent that each environmentalist submit a comment. **We would ask that each person and/or organization issue a simple statement identifying yourselves and supporting Alternative 2.**

The Lower Passaic River Citizens Advisory Group (CAG), the NJDEP, the USEPA prefer Alternative 3 which sets a huge precedent of not holding polluters responsible for their actions. Alternative 3 dredges **only** the first two miles, ending near the current Covanta Plant and the former Diamond Shamrock Plant which was the source of the Dioxin. The final 6.3 miles would then be dredged to a depth of 2', bank to bank, then capped with rocks and sand. Bank to bank capping has never been done before. Emergency dredging/capping was done at the10.9 mile marker last year at a cost of $25Million. The sand is already washing away at 10.9 and exposing the rocks below, posing a hazard to boating. Alternative 3 would also require regular costly maintenance.

The Alternative 3 Capping results in No Improved Boating, a NO WAKE POLICY and a NO ANCHOR POLICY. The River would be capped after 80 years of silting, leaving the mud flats that prevent boats to reach the shore line, except at high tide. New docks, boat ramps, bulkheads, and shoreline development would be prohibited. The depth would prohibit yachts, passenger and sight seeing boats from bringing fans to Red Bull Stadium, the Gateway Center, NJPAC, Hampton Hotel, and nearby restaurants. The unimproved depth would prohibit the return of commercial shipping to North Newark. Capping leaves the bulk of the contaminated sediment in the River. **Alternative 3 is a huge mistake, waste of money, and squanders our chance to really Restore the Passaic River.**

Anyone with questions can call or email me. Please copy me on any comments to the EPA. Please forward to your list serves and friends.

Thank you for submitting your anticipated letter to the EPA advocating for Alternative 2.

David Yennior

CAG Member

Gateway Group Chair
NJ Sierra Club
Passaic River Issues Coordinator

David Yennior, MA
Sierra Club, NJ Chapter
Gateway Group Chair
Passaic River Issues Coordinator
6 Essex Street #40
Belleville, NJ 07109
973-844-1384
dyennior@gmail.com
http://newjersey.sierraclub.org/Gateway/

- -

To join the Sierra Club, go to: http://action.sierraclub.org/site/PageServer?pagename=Main_Join_or_Give
NJ-Gateway-News List Info & Archives: http://lists.sierraclub.org/archives/NJ-GATEWAY-NEWS.html
NJ Sierra Club Gateway Group Website: http://newjersey.sierraclub.org/gateway/
NJ Chapter Online Events Calendar: http://newjersey.sierraclub.org/nj_calendar.asp
If you wish to Subscribe or Unsubscribe from this list, please visit: http://lists.sierraclub.org/archives/NJ-GATEWAY-NEWS.html
Sign up to receive Sierra Club Insider, the flagship e-newsletter. Sent out twice a month, it features the Club's latest news and activities. Subscribe and view recent editions at http://www.sierraclub.org/insider/

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Alice Yeh,

The Display of events give and shows how the Clean up of the Passaic River will be configured through it's works. Through time and effort this project will be the biggest of them all.

Sincerely,

Name: Bernard Jefferson

Address: 220 Harding Ave Orange, NJ 07103

Date: July 24, 2014

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Alice Yeh,

Tonight's event was extremely informative & enlightening. As a former Newarker/~~resident~~ & presently a resident of Orange I had no idea the EPA was doing anything in this area.

Very glad I came and I learned so much.

Please let me know where I can be of assistance!

Sincerely,

Name: Rose Marie Jefferson

Address: 220 Sunset Ave.
Orange, N.J. 07050

Date: 7/24/14

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 06, 2014 10:13 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

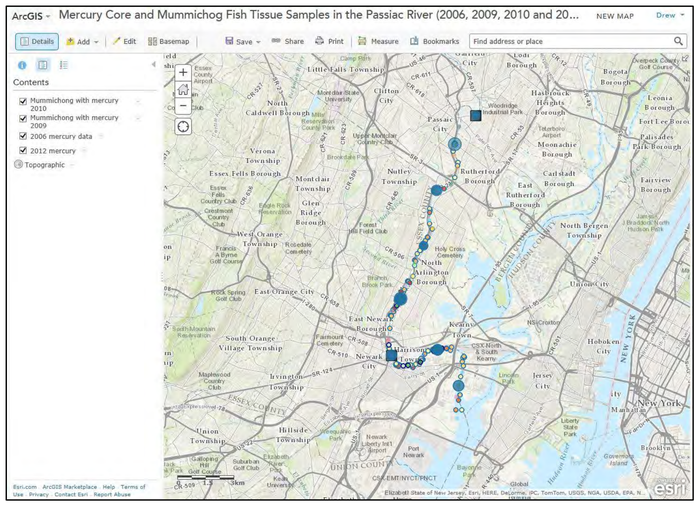
Thank you.

Frank Jones
frankajones@comcast.net
324 Hillcrest Avenue
Blackwood
NJ
08012

856-374-7599

Exploring Open Data Sets for Improved Health of the Lower Passaic River

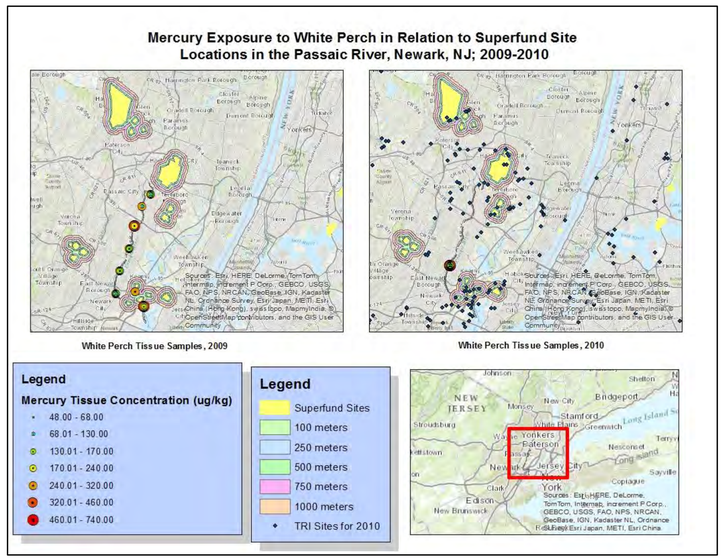
Web Maps Combining Tissue Samples and Core Samples



My map displays Mercury Core Samples and Tissue Samples of Mummichog Fish found in the Passaic River. These samples were taken during the years 2006, 2009, 2010, and 2012.

Map Created By: Christina Ferrara

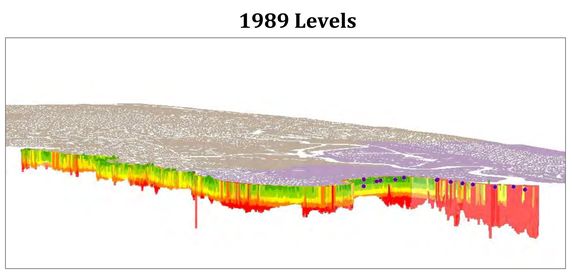
Proximity Analysis of Superfund Footprints and Tissue Samples

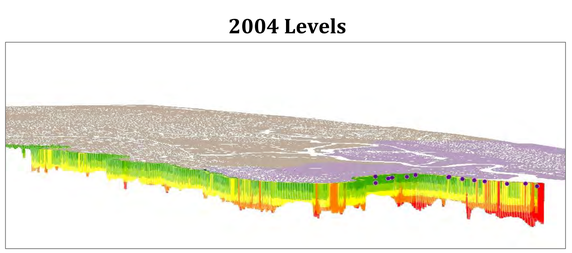


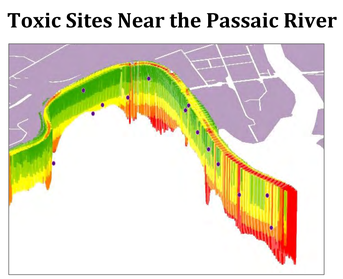
This map displays the concentration of mercury found in tissue samples of white perch fish. This information is then overlayed with the location and distance of superfund sites that may be responsible for the toxic emissions in the Passaic River water.

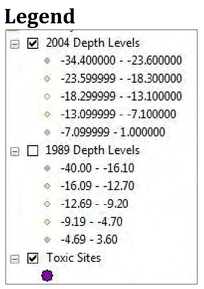
By: Jonathan Giuseppe Bernal

3D Imaging of Bathymetric Changes Between 1989 and 2004





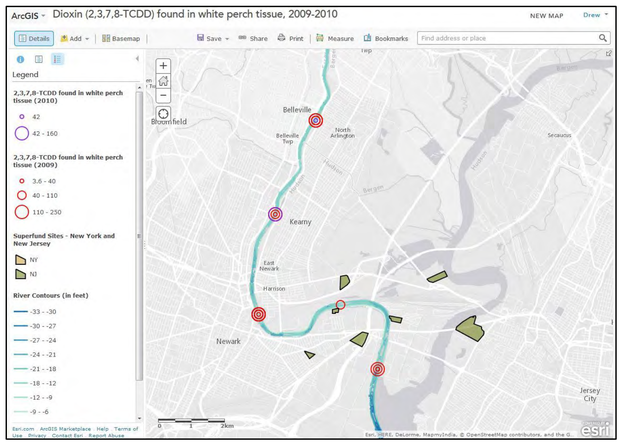


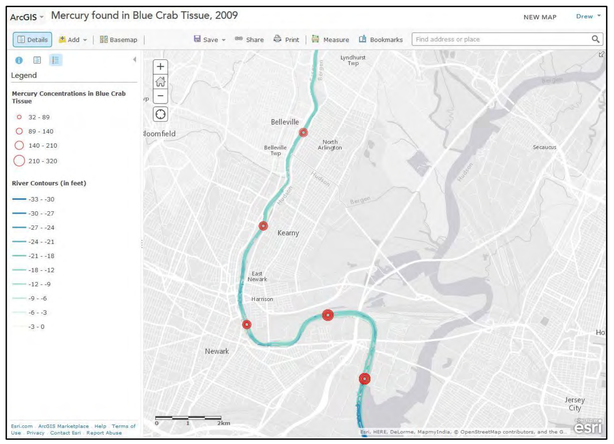


This map displays the bathymetry of the Passaic River. It compares bathymetric changes from 1989 to 2004. As this map shows, the bathymetry of the Passaic River fluctuates over time. Future research might compare the extent of changes up to the present.

By: Jack Duran

Web Maps Combining Tissue Studies and River Contours

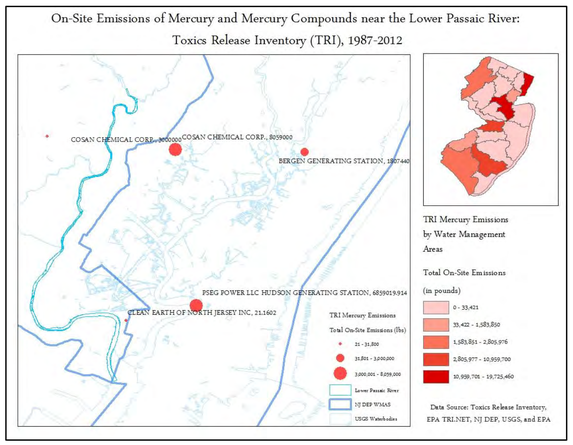




The two web maps to the left illustrate overlays of tissue samples and contours of river depth for the lower Passaic. Clicking on the image link will open up the map in a web browser.

By: Lisa Jordan

Toxics Release Inventory Summaries



The map to the left summarizes TRI on-site emissions for releases of mercury and mercury compounds by New Jersey DEP Water Management Areas. Data for TRI sites nearby the lower Passaic are also mapped according to on-site emissions of mercury and mercury compounds.

By: Lisa Jordan

Data Sources

Spatial analysis of the lower Passiac River relied critically on information posted on the Lower Passaic River Restoration Website: www.ourpassaic.org [downloaded 27 June 2014]. Specifically, the Passaic River Public Digital Library provided comprehensive spatial data sets of bathymetry, core samples, and tissue samples.

Acknowledgements

This project was made possible by participation in ESS 302, Geographic Information Systems, taught at Drew University, and the EPA TRI University Challenge, 2013-2014. The software and hardware used were provided by the Spatial Data Center at Drew University, financed with the help of generous grants from the Andrew Mellon foundation and NASA.

Authors: Jonathan Giuseppe Bernal, Jack Duran, Christina Ferrara, and Lisa Jordan - Drew University

DREW UNIVERSITY

ENVIRONMENTAL STUDIES AND SUSTAINABILITY PROGRAM

LISA JORDAN
SPATIAL DATA CENTER DIRECTOR

June 26, 2014

U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

Dear Alice Yeh,

Last year, and again this year, Drew University was chosen to participate in the EPA – TRI University Challenge. As part of this program, I was introduced to the variety of data resources for the TRI, and the EPA more generally. A key component of the challenge was to integrate TRI data into courses on Geographic Information Systems (GIS). This past May at Franklin School, I had the opportunity to hear a presentation that you gave regarding the proposed plan for the Lower 8 Miles of the Passaic River. Your presentation gave listeners a history of the river and assessment of potential responses to improve the health of the lower Passaic. It was a presentation that my nine year old son, also in attendance, could follow, yet one that also gave me an appreciation of the complexities of the options for cleanup. I was inspired by your presentation to study Passaic further, also in combination with the TRI.

I introduced the materials that you presented to students enrolled in my 2014 summer course on GIS at Drew University. I was able to do this entirely because of the www.ourpassaic.org website, which contributes substantively to the public availability of studies on the Passaic, specifically the distribution of raw data collected on bathymetry, core samples and tissue samples. This gave us the chance to read the reports, and examine the data for ourselves, using GIS. Because my introduction to issues around the Passaic is very recent, our research is entirely exploratory at this point, and I do not have specific comments about the proposed plan or alternatives. However, I did want to contribute a few comments about the project operations.

First, the availability of concise public information both on the web and through public meetings has been excellent. I think this project is a very good model of connecting multiple interested stakeholders in the community and informing them about the process and progress of decisions that need to be made by the EPA.

Second, I very much appreciate the availability of raw data, updated over time, that enable the information in reports to be verified and validated. The data also serve as an excellent educational tool for undergraduate coursework in environmental studies and public health. Again, I think the ourpassaic.org public library provides a good model for other superfund projects, where a very wide educational community is interested in digging into very specific information and findings about specific sites, or areas surrounding sites.

I am also attaching for you the final project exam, completed by students in my small summer course: Jonathan Giuseppe Bernal, Jack Duran, and Christina Ferrara. Our exploratory approach yielded some interesting findings that we hope to explore further, specifically the visualization of

36 MADISON AVENUE | MADISON, NEW JERSEY 07940
(973) 408-3740 | LJORDAN@DREW.EDU | WWW.DREW.EDU/ESS

bathymetry of the Passaic over time, linking bathymetry and core samples, and perhaps exploration of associations between TRI releases, locations, and core sample results. I hope to develop this study further with students in my Advanced GIS course this fall. If you come into contact with other stakeholders interested in geographic studies, or if you have suggestions for future contributions that I or my students could make, I would love your feedback.

Thank you for your time, and for your commitment to improve life in and around the Passaic River.

Sincerely,

Lisa Jordan.

Yeh, Alice

From: Lisa Jordan <ljordan@drew.edu>
Sent: Thursday, June 26, 2014 1:30 PM
To: Region2 PassaicLower8MileComments
Cc: Jack Duran; Christina Ferrara; Giuseppe Bernal
Subject: Comments and Research on the Lower 8 Mile Restoration Project
Attachments: Letter for Alice Yeh on the Proposed Plan for the Lower 8 Miles of the Passaic River - LJordan Drew University.docx; Exploring Open Data Sets for Improved Health of the Lower Passaic River.pdf

Dear Alice Yeh,
Please find my letter with comments about the restoration project, as well as exploratory student research on the lower Passaic River.
Thank you so much for your time.
Sincerely,
Lisa Jordan

Yeh, Alice

From: Freeman, Martin
Sent: Tuesday, June 24, 2014 2:51 PM
To: sandeep@seriecotech.com
Cc: Zachos, George; Boykin, Danla; Yeh, Alice; Kluesner, Dave; DeHart, Nicole
Subject: Passaic River Proposed Plan Comment [Case 0230615525, WI # 81, RPL #14553]

Good Afternoon Mr.Joshi,

Your e-mail submitted on 6/23/13 was forwarded to the Office of the Regional Public Liaison (RPL) for Superfund for response.

Your original e-mail reads as follows:

"Got to know about Passaic River Superfund Site Cleanup through Wall Street Journal article.

In-stream ecological operation can be a better choice for cleaning of river water and sediments. There are some examples in India about the revival of biodiversity in pollution-dead river over a decade.

Government of India has also taken up first of its kind in-stream bioremediation project in 2010. The concept of in-stream pollution treatment may be useful rather than removing the sediments causing hydrological problems and re-dissolution of pollutants in the river water.
Given the opportunity I would like to explain the concept in detail."

Sandeep Joshi
Green Surgeon, Environment Technologist & Impact Analyst
EMAIL_OF_REQUESTOR
sandeep@seriecotech.com

NAME_OF_REQUESTOR
Sandeep Joshi
ORG_OF_REQUESTOR
Shrishti Eco-Research Institute

The Proposed Plan and other site documents are available for review at the following websites http://www.epa.gov/region2/passaicriver and at http://ourpassaic.org.

The EPA is currently in a public comment period for the Proposed Plan for the Lower 8 Miles of the Lower Passaic River. The period ends on August 20, 2014. EPA is accepting e-mail comments at PassaicLower8MileComments.Region2@epa.gov, or written comments at the following address:

Alice Yeh, Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

Comments received during the public comment period will be considered by EPA before making the final cleanup decision for the lower 8 miles. They will be addressed in the Responsiveness Summary, which will be made available with the Record of Decision, the document identifying EPA's selected cleanup plan.

The comment you submitted above will be transmitted as part of this response to RPM Alice Yeh. She can be contacted at 212 – 637 - 4427. Any additional comments you would like to submit should be sent prior to the close of the comment period by either method discussed in this e-mail.

Sincerely yours,

Martin Freeman
Environmental Engineer
Office of the Regional Public Liaison (Formerly Superfund Regional Ombudsman)

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 1:01 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Tara Kali
taraekali6@gmail.com
18 Whitman Drive
New Providence
New Jersey
07974

2012132511

Yeh, Alice

From: KASTANIA48@aol.com
Sent: Tuesday, August 12, 2014 6:57 AM
To: Region2 PassaicLower8MileComments
Subject: (no subject)

Under both state and federal law companies that discharge toxic chemicals into the environment that cause a loss of public use are assessed with Natural Resource Damages. The public fisheries, aquatic ecosystems, wetlands, rivers, and estuaries belong to all of us. When a company contaminates and prevents the use of that resource they have to pay damages.

Rivers should not be Superfund sites they should be places where people can walk along the river bank or kayak.

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 18, 2014 2:00 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jerry Keenan
jkeenan@allianceforaction.com

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 2:08 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Brian Kelley
bkelley014@gmail.com
62 Whitehall Road
Hamilton
NJ
08690

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 11:13 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Joseph Kendzulak
joekendzulak@yahoo.com
203 Hardenburg Lane
East Brunswick
NJ
08816

9083102911

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 06, 2014 12:00 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jeff Kern
Infoactive7@gmail.com
7957 Berkshire Lane
Castle Pines
Co
19041

3033865391

Yeh, Alice

From: communications@prra.org
Sent: Tuesday, May 27, 2014 10:29 AM
To: Region2 PassaicLower8MileComments
Subject: Belleville Meeting

Hi Alice,

I'm just checking to see if you have a date/time/place yet for the June Belleville meeting. I'm with the Passaic River Rowing Association, which rows out of Lyndhurst, and would like to get a group of members to attend so we can all be informed.

Thanks,

Sue Khazoyan
PRRA Communications Chair

ECOSENSE
Anne L. Kruger, Ph.D., Environmental Scientist
Web Site: alkruger@cfl.rr.com
Address: 220 Curacau Drive, Cocoa Beach, FL 32931-3038
Telephone: 321-783-8358

Economics of Dredging and Destroying *Dioxins!*

Comments on EPA's Proposed Plan for
Lower Eight Miles of the Lower Passaic River
Part of the Diamond Alkali Superfund Site
April 2014

Prepared by
Anne L. Kruger, Ph.D., Retired Senior Scientist of the Passaic River Coalition
Former Technical Advisor re the Diamond Alkali Superfund Site
August 2014

On behalf of all who have advocated for a third of a century for cleaning up the Lower Passaic River, especially Ella Filippone, I strongly urge that, at a minimum, EPA's proposal to clean the river by "capping with dredging for flooding & navigation" be implemented. The economic benefits of this project, which will help to "protect people's health and the environment, and benefit riverfront communities", will be greater than its total costs over the coming decades. However, it would be much more beneficial if Alternative 2 (Deep Dredging with Backfill) with DMM Scenario C (Local Decontamination and Beneficial Use) were to be implemented because these actions would permanently remove and **destroy** most of the ***dioxins*** now found in the sediments of the Lower Eight Miles.

Dioxins are unnatural man-made chemical compounds that are some of the most toxic substances known to science. Exposure to ***dioxins*** is a major worldwide public health concern.[1] ***Dioxins*** are 30 polychlorinated organic compounds, which persist in natural environments for many decades because microbes and other biota can't change them chemically, and they don't burn up in incinerators. They include certain PCBs (polychlorinated biphenyls).[2] How to destroy ***dioxins*** has been scientifically demonstrated. Why ***dioxin*** contaminated sediments are a major public health concern, especially in the NY/NJ Harbor Region, is expanded upon in Appendix A, but this concern should reach far beyond this region. Only 0.3% of the waters of New Jersey were found to "fully support fish consumption use", 35% were polluted with PCBs (***dioxins***), and 65% were not assessed.[3] The U.S. Environmental Protection Agency (EPA) developed a Fish Tissue Contaminants Index based on data from concentrations of chemical contaminants found in composites of whole-body fish, lobster and fish fillet samples.[4] Sites in Northeast Coastal Waters where fish were sampled are shown in Figure 1. A "Poor" rating indicates that the health of the fish

[1] World Health Organization, Public Health and Environment. 2010. Preventing Disease through Healthy Environments, Exposure to Dioxins and Dioxin-like Substances: A Major Public Health Concern. WHO Document Production Services, Geneva, Switzerland.

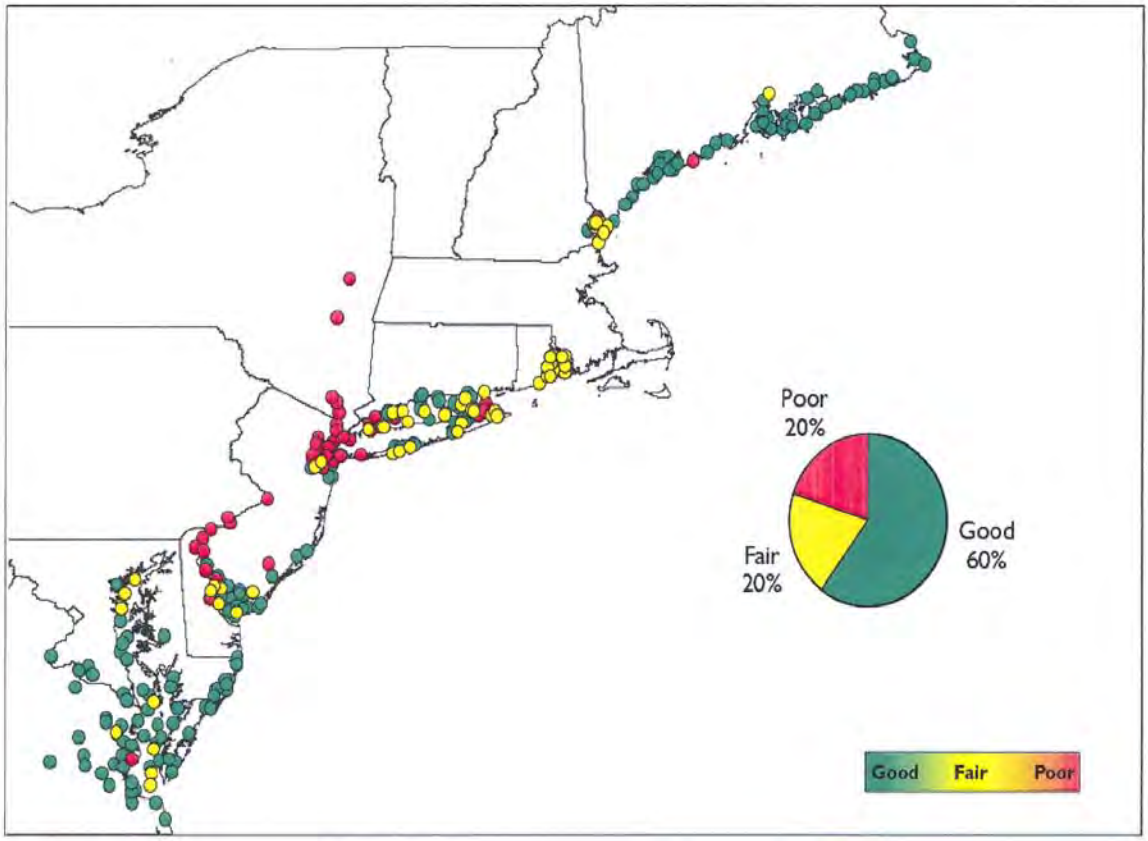
[2] U.S. Environmental Protection Agency, Office of Research and Development. 2001. Dioxin: Summary of the Dioxin Reassessment Science.

[3] N.J. Department of Environmental Protection. 2011. 2010 New Jersey Integrated Water Quality Monitoring and Assessment Report, page 39.

[4] U.S. Environmental Protection Agency, Office of Research and Development/Office of Water. April 2012. National Coastal Condition Report IV, Northeast Coast Coastal Condition, pages 3-10 & 3-11.

was poor and that the fish were probably not safe to eat. "Elevated concentrations of PCBs (***dioxins***) were responsible for the impaired ratings for a large majority of the sites." The impacts that ***dioxin*** pollution has had on the health of people over many past decades may never be known, but ways to reduce or remove the health risks from ***dioxins*** in the future are known.

Figure 1 – Fish Tissue Contaminants Index Data for Northeast Coastal Waters



For over forty years, since being founded in 1969, the Passaic River Coalition has been advocating for the restoration of the Lower Passaic River to navigable and fishable conditions, but not enough has been done except for studying the pollution. The ***dioxin*** contaminated sediments have spread into Newark Bay and beyond. Shipping in the New York/New Jersey Harbor has been endangered by contaminated sediments clogging navigation channels and berths. Regional flooding has spiked in recent years and is only projected to get worse. Unless the Port's "infrastructure" is maintained, there could be serious economic repercussions. Furthermore, public health continues to be endangered by fishing in these waters. Repairing all of these problems requires extensive dredging of contaminated sediments. Deep dredging is the solution to all of these problems! However, most of the Lower Passaic River hasn't been dredged since about 1940 because there was no place to put the contaminated sediments.

Given the chemical nature of PCBs and other ***dioxins***, the most effective actions to take in waters with sediments that are contaminated with ***dioxins*** and other pollutants that persist as a legacy of past technological advancements would be –

- **Dredging** for the "substantial" removal of the waters' sediments to create space for cleaner waters.
- **Destroying** the ***dioxins*** so that the dredged materials can have beneficial uses.

The dredged materials can be decontaminated by using an innovative technology, a thermal treatment process which **destroys** the ***dioxins*** by splitting apart the carbon, hydrogen and chlorine

atoms in these compounds to form more benevolent compounds, such as carbon dioxide, water, and hydrogen chloride. This technology uses a rotary kiln that is fueled by natural gas to melt multi-contaminated sediments. The process is similar to what happens in an active volcano. In a kiln operating at ~2,500°F, a temperature much hotter than used in incinerators, the organic contaminants are disassociated or destroyed, and the non-volatile heavy metals are encapsulated into the siliceous matrix that forms from the sediments to produce a beneficial use product, which can be used as a 30-40% replacement for Portland cement in concrete. Currently used methods of incineration can create air pollution by releasing harmful smoke, which can include ***dioxins***. In a pilot project the thermal "destruction" (Cement-Lock®) process was shown to be "one of the only technologies proven as effective in treating … (dioxins, PCBs and PAHs) detected in the sediment" of the lower eight miles of the Passaic River.[5] I strongly recommend the development of a thermal treatment facility which can **destroy *dioxins*** in this region. This and other methods for dredged material management (DMM) are discussed further in Appendix B.

Let's make this project a model for **dredging** and **destroying *dioxins*** so that coming generations may enjoy such benefits as --

- ☺ ***Saving the food chain*** for healthier and more abundant and diverse fish populations and for healthier people who eat the fish.
- ☺ ***Improving navigability***, especially for commercial ships in the harbor and recreational use in the Lower Passaic River which hasn't been dredged since the 1940s.
- ☺ ***Helping to control flooding*** by creating more space for storm waters to fill which is especially important in the coming years of climate change with sea levels rising and more violent storms like Sandy.
- ☺ ***Protecting water supplies*** by creating more space for fresh water storage.
- ☺ ***Revitalizing the economy*** in so many different ways.

But these actions, **dredging and destroying *dioxins*,** have economic costs. Most of the ***dioxins*** were already in the water sediments before 1979 when the manufacture of PCBs was banned. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or "Superfund") was enacted in 1980 "in the wake of the discovery of toxic waste dumps such as Love Canal and Times Beach in the 1970s".[6] At both these sites ***dioxin*** contamination was the principal problem. The U.S. federal government owns and is responsible for the land beneath many waters where dumping ***dioxins*** was allowed prior to 1979. Therefore, the U.S. federal government should be a Potentially Responsible Party (PRP) in "Superfund" cases involving such waters, and should help pay for their clean-up. The civil works program of the U.S. Army Corps of Engineers (Corps) lists the following mission priorities: Navigation (Deep draft); Ecosystem Restoration; Flood Damage Reduction (Coastal and Riverine).[7] **Dredging and destroying *dioxins*** projects would help to make some U.S. waters more navigable, more fishable, and less floodable, and should be funded. The Corps is part of the U.S. Department of Defense (DOD), which spends more than a third of our tax dollars on war. In FY 2008 the U.S. Government spent over $52 billion for sustaining nuclear weapons.[8] Spending a few billions of these dollars for **dredging and destroying *dioxins*** will save far more American lives than spending them for bullets or atomic bombs.

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[5] Malcolm Pirnie, Inc. 2007. Lower Passaic River Restoration Project, Draft Source Control Early Action Focused Feasibility Study (FFS). Prepared for US Environmental Protection Agency, US Army Corps of Engineers, New Jersey Department of Transportation, June 2007, page 3-17.

[6] U.S. Environmental Protection Agency. 2012. Web-site: www.epa.gov/superfund/about

[7] U.S. Army Corps of Engineers. 2007. Passaic River Basin, New Jersey, Congressional Staff and Stakeholders Briefing, April 5, 2007.

[8] Stephen I. Schwartz and Deepti Choubey, "Nuclear Security Spending".

In cleaning up the Lower Eight Miles of the Passaic River the DOD should pay for dredging the contaminated sediments out of the river that it allowed to be dumped into the river decades ago. Deep dredging would permanently remove most of ***dioxin*** contaminated sediments, and would be most economically beneficial in the future.

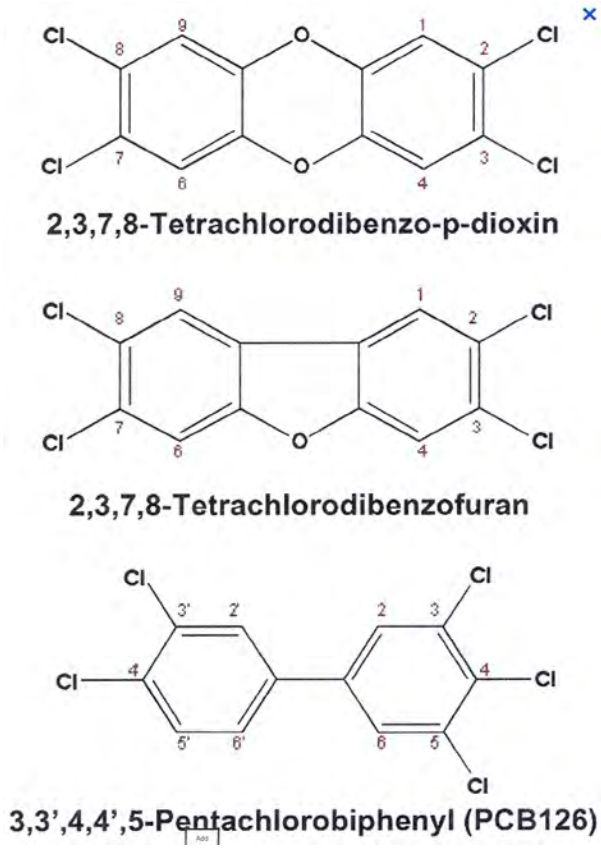
The almost 100 companies that are PRPs because they dumped ***dioxins*** and other pollutants into the river should pay the costs for Dredged Material Management (DMM). DMM Scenario A, Confined Aquatic Disposal (CAD), should be unacceptable to the DOD and not even be considered. As a shareholder in a few of these companies, and as an American, I am confident that in the coming decades there will be many economic benefits from the implementation of a project that.**dredges and destroys *dioxins*** from the **Lower Eight Miles of the Lower Passaic River.**

Appendix A

Dioxin Contaminated Sediments: A Major Public Health Concern

The World Health Organization has declared that exposure to dioxins and dioxin-like substances is a major public health concern.[9] ***Dioxins***, as described by the U.S. Environmental Protection Agency (EPA), are 30 polychlorinated organic compounds with similar chemical structures and similar modes of toxic action. They include CDDs (chlorinated dibenzo-*p*-dioxins), CDFs (chlorinated dibenzofurans), and certain PCBs (polychlorinated biphenyls).[10] Their chemical structures are depicted in Figure A1. The most toxic ***dioxin*** is 2,3,7,8-TCDD (2,3,7,8-tetrachlorodibenzo-*p*-dioxin).

Figure A1 -- Chemical Structures of *Dioxins*



Dioxins are potent animal toxicants which can alter the fundamental growth and development of cells.[11] Toxic effects of human exposure to ***dioxins*** can include developmental and neurodevelopmental effects on fetuses and children, and changes in thyroid and steroid hormones and reproductive function.[12] Children are the population most at risk. ***Dioxins*** are also "likely

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[9] World Health Organization, Public Health and Environment. 2010. Preventing Disease through Healthy Environments, Exposure to Dioxins and Dioxin-like Substances: A Major Public Health Concern. WHO Document Production Services, Geneva, Switzerland.

[10] U.S. Environmental Protection Agency, Office of Research and Development. 2001. Dioxin: Summary of the Dioxin Reassessment Science.

[11] U.S. Environmental Protection Agency, Office of Research and Development. 2001. Dioxin: Summary of the Dioxin Reassessment Science.

[12] World Health Organization, Public Health and Environment. 2010. Preventing Disease through Healthy Environments, Exposure to Dioxins and Dioxin-like Substances: A Major Public Health Concern. WHO Document Production Services, Geneva, Switzerland.

human carcinogens".[13] Human exposure occurs mainly through consumption of meat, dairy products, fish and shellfish food containing contaminated animal fats.[14] Nowhere in the world is one more likely to find such food than by fishing in the Lower Passaic River and Newark Bay, but ***dioxin*** contaminated food can also be bought in grocery stores.

Dioxins persist in natural environments because microbes and other biota can't change them chemically. They are taken up by plants and eaten by animals on which they have harmful effects, and as they go up the food chain they accumulate in fatty tissues and become more and more toxic.

PCBs are man-made substances that were specifically designed to be non-flammable and chemically stable under very hot conditions so they could replace mineral oils that burn, be used for their lubricating and electrical insulating capacities, and in many other ways. PCBs were manufactured for many uses from 1927 until they were banned in 1979 because of their toxicity. They were released into the environment from many sources, and continue to be released from sources such as the disposal of large-scale electrical equipment and waste.[15]

The other ***dioxins***, CDDs and CDFs, have never been manufactured deliberately and have no known uses. They are by-products of industrial processes, including the manufacture of plastics made from polyvinyl chloride (PVC), some herbicides and pesticides that contain chlorine, chlorine bleaching of paper pulp, and smelting. The ***dioxin***, 2,3,7,8-TCDD, was a by-product in the manufacture of Agent Orange, which was made at the Diamond Alkali plant in Newark in the 1960s and used in Vietnam to defoliate plants. This ***dioxin*** is about the most toxic substance known to man. The incineration of municipal and medical wastes at low to moderate temperatures (1,400^{o}F to 1,800^{o}F) and backyard trash burning can create ***dioxins*** (CDDs and CDFs), which are emitted to the air or in ash and then can contaminate soil and aquatic sediments.[16] ***Dioxins*** can also be generated by natural events, such as volcanic eruptions and forest fires.[17]

Dioxins are definitely POPs (Persistent Organic Pollutants). Today, over a third of a century since PCBs were last manufactured, the New Jersey Department of Environmental Protection (NJDEP) is still advising people not to eat fish and shellfish from the Lower Passaic River.[18] Catching and eating crabs from the Newark Bay Region has been banned since 1984. According to a NJDEP study, the estimated lifetime excess risk of cancer from consumption of crabs from the Newark Bay Complex ranges from a low of 0.5% to a high of >100%.[19] In 2011 the NJDEP launched another public awareness campaign regarding its "Blue Claw Crab Alert" in the Newark Bay Region. But

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[13] U.S. Environmental Protection Agency, Office of Research and Development. 2001. Dioxin: Summary of the Dioxin Reassessment Science.

[14] World Health Organization, Public Health and Environment. 2010. Preventing Disease through Healthy Environments, Exposure to Dioxins and Dioxin-like Substances: A Major Public Health Concern. WHO Document Production Services, Geneva, Switzerland.

[15] World Health Organization, Public Health and Environment. 2010. Preventing Disease through Healthy Environments, Exposure to Dioxins and Dioxin-like Substances: A Major Public Health Concern. WHO Document Production Services, Geneva, Switzerland.

[16] World Health Organization, Public Health and Environment. 2010. Preventing Disease through Healthy Environments, Exposure to Dioxins and Dioxin-like Substances: A Major Public Health Concern. WHO Document Production Services, Geneva, Switzerland.

[17] World Health Organization, Public Health and Environment. 2010. Preventing Disease through Healthy Environments, Exposure to Dioxins and Dioxin-like Substances: A Major Public Health Concern. WHO Document Production Services, Geneva, Switzerland.

[18] New Jersey Department of Environmental Protection, Office of Science. 2011. Fish Advisories. <www.state.nj.us/dep/dsr/fishadvisories/ >

[19] New Jersey Department of Environmental Protection, Division of Science, Research and Technology. 2002. Estimate of Cancer Risk to Consumers of Crabs Caught in the Area of the Diamond Alkali Site and other Areas of the Newark Bay Complex from 2,3,7,8-TCDD and 2,3,7,8-TCDD Equivalents.

some people in the Newark Bay Region are still going crabbing and fishing. The impacts that ***dioxin*** pollution has had on the health of people in the Newark Bay Region and beyond over many past decades may never be known, but ways to reduce the health risks from ***dioxins*** in the future are known.

The "Risk Based Remedial Goal" for the ***dioxin*** 2,3,7,8-TCDD in river sediments has been 0.3 parts per trillion (ppt).[20] Near the Diamond Alkali site in the Lower Passaic River sediments, dioxin levels were as high as 5,300,000 ppt.[21] In 2005 and 2007 sediments that had become contaminated with dioxin produced in the 1960s at the Diamond Alkali site and were washed into Newark Bay still had levels over 666 ppt.[22]

The "Risk Based Remedial Goal" for total PCBs in non-residential soils and river sediments has been 14 parts per billion (ppb).[23] In the Lower Passaic River sediments, PCB levels as high as 130,000 ppb have been found.[24] Levels of PCBs exceeded 4,810 ppb in many sediment samples taken from Newark Bay in 2005 and 2007. Levels of PCBs in the surficial sediments of NY/NJ Harbor are shown in Figure A2. Only the areas with the darker blue dots have sediments containing levels of PCBs that might be considered tolerable.

[20] Malcolm Pirnie, Inc. 2007. Lower Passaic River Restoration Project, Draft Source Control Early Action Focused Feasibility Study. Prepared for US Environmental Protection Agency, US Army Corps of Engineers, New Jersey Department of Transportation. June 2007. (FFS). Sections 2.4.1 & 2.4.2, pages 2-11 to 2-14, Tables 2-3 and 2-4.

[21] U.S. Environmental Protection Agency. 2012. Lower Eight Miles of the Lower Passaic River Remedial Investigation and Focused Feasibility Study Summary for Community Advisory Group. Alice Yeh, Project Manager.

[22] Tierra Solutions, Inc. 2008. Phase I and Phase II Field and Data Report, Newark Bay Study Area Remedial Investigation. Phase I and Phase II Sediment Investigation Field and Data Report, Figure 4-13.

[23] Malcolm Pirnie, Inc. 2007. Lower Passaic River Restoration Project, Draft Source Control Early Action Focused Feasibility Study. Prepared for US Environmental Protection Agency, US Army Corps of Engineers, New Jersey Department of Transportation. June 2007. (FFS). Sections 2.4.1 & 2.4.2, pages 2-11 to 2-14, Tables 2-3 and 2-4.

[24] U.S. Environmental Protection Agency. 2012. Lower Eight Miles of the Lower Passaic River Remedial Investigation and Focused Feasibility Study Summary for Community Advisory Group. Alice Yeh, Project Manager.

Figure A2 –Total PCBs (*Dioxins*) in the Surficial Sediments of NY/NJ Harbor

Appendix B
Dredged Material Management (DMM) Alternatives

Through thermal treatment, we can permanently destroy the legacy of contamination resulting from over a century of industrial pollution. Moving contaminated sediment from the riverbed to a CAD in Newark Bay doesn't solve the problem – it only moves it to a new location and is a waste of money. The same can be said for off-site disposal. Disposing of these sediments off-site in a landfill or incinerator will impose large shipping costs and delay the inevitable need to permanently address these toxic POPs, especially the PCBs and other ***dioxins***. This nation, and the world, needs a new way of dealing with our growing issue of ***dioxin*** pollution. The thermal treatment (Cement-Lock) is the solution! Destroy these contaminants forever!

In 1984 the "Diamond Alkali" site, which includes the property at 80 Lister Avenue in Newark as well as the contaminated Lower Passaic River, was declared a Superfund Site. The Diamond Alkali Superfund Site project became part of the Lower Passaic River Restoration Project (LPRRP) in 2000 and studies were extended into Newark Bay.[25] In the LPRRP Draft Focused Feasibility Study (FFS) of 2007, "sediments in the lower eight miles of the river were identified as a major source of contamination to the 17-mile" tidal portion of the river and to Newark Bay.[26] According to the U.S. Army Corps of Engineers (Corps), one of the goals of the LPRRP is to provide a plan that will result in "a significant cost savings to the navigational dredging program related to dredged material management in the NY/NJ Harbor."[27] Thus, the "Phase 1 Removal Action" project, which removed about 40,000 yd^3 of the sediments most highly contaminated with ***dioxins*** from an area of the Lower Passaic River directly next to the land side of the Diamond Alkali site, and the "Lower Eight Miles" project are NY/NJ Harbor dredging projects. The NY/NJ Harbor Region is depicted in Figure A2. The dredged material management (DMM) scenario chosen for this project will greatly influence future DMM in Newark Bay, the harbor and far beyond. DMM alternatives that are being considered for the "Lower Eight Miles" project are evaluated here for use with sediments contaminated with PCBs, other ***dioxins*** and other pollutants.

DMM Scenario A: Confined Aquatic Disposal) (CAD)

If using CAD cells for these highly contaminated sediments is still considered a viable option, then the public should be given answers to the following questions. Given the likelihood of the release of ***dioxins*** and other contaminants from a CAD site by a boat straying from the navigational channel or other type of accident, who is responsible ***in perpetuity*** for preventing such accidents or cleaning them up if they happen? Who would pay the long term costs of monitoring and maintaining the CAD cells? Who owns the water in Newark Bay and the 200 acres of land beneath it? Who is responsible for keeping this land safe and healthy? Who would want all these contaminated sediments to be moved untreated from the Passaic River downstream into Newark Bay? Who would allow CADs to be built so close to berths 4, 6 and 8 at the Port Newark Marine Terminal and the navigational channels from which contaminated sediments need to be dredged soon, but for which there is no DMM facility? Who is responsible for the liabilities associated with a CAD? Has the

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[25] U.S. Army Corps of Engineers, New York District; U.S. Environmental Protection Agency, Region II; New Jersey Department of Transportation, Office of Maritime Resources. April 2003. Project Management Plan, Lower Passaic River, New Jersey, Investigation and Feasibility Study for Remediation and Ecosystem Restoration.

[26] Malcolm Pirnie, Inc. 2007. Lower Passaic River Restoration Project, Draft Source Control Early Action Focused Feasibility Study. Prepared for US Environmental Protection Agency, US Army Corps of Engineers, New Jersey Department of Transportation. June 2007. (FFS). Executive Summary, page i.

[27] U.S. Army Corps of Engineers, New York District. 2011. Lower Passaic River Restoration Project, NJ. Lisa Baron, Chief, Harbor Programs Branch. Web-site: www.nan.usace.army.mil.

whole harbor dredging dilemma been caused because dumping in water has been considered "free," and a "large under-water footprint" is not a consideration for "CAD Disposal" for DMM?

DMM Scenario B: Off-Site Disposal

In the "Phase 1 Removal Action" project material excavated here was "taken off-site, treated and then disposed of in one of a handful of facilities permitted to accept such waste."[28] "Treatment" or sediment processing involved solids separation and dewatering.[29] The dewatered contaminated sediments were shipped by rail to facilities in Oklahoma and Utah. The economic costs of shipping wastes across the country are high, and so are the ecologic costs from greenhouse gas emissions. At the Utah facility the contaminated sediments can be incinerated, but this will not **destroy** the ***dioxins***, which will cause high ecologic costs that lead to high economic costs. In any case this would not be a "Beneficial Use" of these sediments. In addition to our concerns, CERCLA Section 112(b) identifies the statutory preference that "off-site transport and disposal of hazardous substances or contaminated materials without treatment is considered the least favorable remedial alternative when practicable treatment technologies are available." This alternative might be considered outdated in light of modern technology which can permanently destroy ***dioxins***.

DMM Scenario C: Local Decontamination and Beneficial Use

Sediment Washing

Sediments dredged from the Lower Passaic River near the Diamond Alkali site in 2005 were used in the BioGenesis^{SM} sediment washing demonstration project to "produce high-end topsoil", a beneficial use product.[30] "The BioGenesis^{SM} Sediment Decontamination Technology is a physical/chemical process that uses impact forces (cavitation/collision) and chemical forces (oxidation with hydrogen peroxide) to strip contaminants from the surface of sediment particles and suspend them in the water phase where they can be separated from the sediment."[31] The sediments are then mixed with clean organic matter to make manufactured soil. The wash water is piped to the nearest sewage treatment plant. For some sediments dredged from the NY/NJ Harbor Region this treatment may be appropriate, but not for those contaminated with PCBs or other ***dioxins***. The "chemical forces" used do not change these compounds. Some of the PCB/***dioxin*** contaminants would be carried attached to very small particles of dirt in the wash water to the sewage treatment plant where they would contaminate the sludge. The ***dioxins*** would also end up in the manufactured soil where they could do harm.

On September 17, 2012 a bench scale test report became available detailing the results of two soil washing vendors' attempts to wash sediment from the RM10.9 hot spot. Both vendors were unable to treat soils to levels remotely acceptable, achieving decontamination efficiencies of 3.75% and 27.2%. Levels of PCB reduction were also reported to be insufficient and the technology will likely not reach pilot-scale testing for Lower Passaic River sediments.

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[28] U.S. Environmental Protection Agency. 2008. EPA Signs Agreement with Companies to Remove Major Source of Passaic River Contamination, The Lower Passaic River Restoration Project, Part of the Diamond Alkali Superfund Site, June 2008.

[29] Tierra Solutions, Inc. 2008. Phase I Engineering Evaluation/Cost Analysis, CERCLA Non-Time Critical Removal Action – Lower Passaic River Study Area, November 2008, Revision 3. Pages 7-3 to 7-6.

[30] Malcolm Pirnie, Inc. 2007. Lower Passaic River Restoration Project, Draft Source Control Early Action Focused Feasibility Study (FFS). Prepared for US Environmental Protection Agency, US Army Corps of Engineers, New Jersey Department of Transportation, June 2007, pages 3-15 & 3-16. & Appendix H, BioGenesis Sediment Washing Demonstration Project, pages H-15 to H-86.

[31] BioGenesis Washing BGW, LLC. 2009. Demonstration Testing and Full Operation of the BioGenesis^{SM} Sediment Decontamination Process, Keasbey, New Jersey. Page ES-11.

Two disposal options under consideration, sediment washing and thermal treatment, produce byproducts with a beneficial uses. Thermally treated materials can be used to produce cement and washed sediment can be used for landfill cover.[32] In light of the failed bench scale sediment washing, the materials which would be used for a beneficial use are no longer available because they cannot be sufficiently decontaminated. Considering other alternative are capable of achieving decontamination efficiencies over 99.99%, sediment washing should not be considered a viable option for sediments with significant levels of ***dioxins***.

Incineration

Incineration is effective at reducing the mass of solid waste because much of the organic matter burns up and goes into the air as carbon dioxide, water and other compounds. Incinerator feedstock must be able to burn under its own calorific value, but the dredged materials from the NY/NJ Harbor will not burn because they are mostly mineral matter which has no calorific value. Incinerators can produce ***dioxins***, and do produce ash which may contain leachable heavy metals. Disposal of the ash poses both ecologic and economic problems. Consequently, incineration by oxidation at temperatures in the range of 1,400°F to 1,800°F should not even be considered as an option for the decontamination of sediments dredged from the Lower Passaic River and Newark Bay.

"Thermal Treatment"

In the 2007 FFS for the LPRRP various *ex situ* treatment processes to decontaminate the dredged materials were assessed. One of these processes was "thermal destruction" which "uses high temperatures (typically between 1,400°F and 2,200°F) to volatize and combust organic chemicals."[33] Incineration is such a process but was not considered in the FFS. What was evaluated in the FFS as a "thermal destruction" process was the thermal-chemical (Cement-Lock®) process, which operates at higher temperatures in the range of 2,400°F to 2,600°F.[34] The FFS describes vitrification as "a process in which higher temperatures (2,500°F to 3,000°F) are used to destroy organic chemicals by melting the contaminated dredged material to form a glass aggregate product".[35] The vitrification technology was to be considered for further evaluation for the LPRRP. The FFS states that "the thermal treatment process options, thermal destruction and vitrification, meet the criteria of permanently treating the sediments while achieving the highest treatment efficiencies."[36] The vitrification process developed by the Minergy Corporation is being used to treat sewage treatment plant wastewater sludge, and pulp and paper plant wastewater solids. It was considered for treatment of the PCB contaminated sediments dredged from the Lower Fox River in Wisconsin, but these dredged materials are going to a landfill instead because this DMM is cheaper. The thermal "destruction" (Cement-Lock®) process was selected for further study in the LPRRP because "it produces a beneficial use product that offsets a significant portion of the treatment costs, and because it has been shown to achieve a high treatment efficiency for Passaic River sediments based on the results of a pilot demonstration project in which 16.5 tons of Passaic River sediment were treated."[37] The 2007 FFS also states that the thermal-chemical (Cement-Lock®) process "is one of the only technologies proven as effective in treating … (dioxins, PCBs and PAHs) detected

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[32] U.S. Environmental Protection Agency. 2012. Lower Eight Miles of the Lower Passaic River Remedial Investigation and Focused Feasibility Study Summary for Community Advisory Group. Alice Yeh, Project Manager.

[33] Malcolm Pirnie, Inc. 2007. Lower Passaic River Restoration Project, Draft Source Control Early Action Focused Feasibility Study (FFS). Prepared for US Environmental Protection Agency, US Army Corps of Engineers, New Jersey Department of Transportation, June 2007, page 3-17.

[34] *Ibid.*

[35] *Ibid.*

[36] Draft FFS. 2007. Page 4-8.

[37] *Ibid.*

in the sediment" of the lower 8 miles of the Passaic River.[38] Overall, Cement-Lock® is the only DMM alternative that meets the requirements of CERCLA, the Clean Water Act, EPA's RAOs, and the National Contingency Plan's evaluation criteria.

Thermal Treatment

Development of Thermal Treatment Technology

The thermal-chemical (Cement-Lock®) technology uses a rotary kiln that is fueled by natural gas to melt multi-contaminated sediments. The process is similar to what happens in an active volcano. In a rotary kiln operating at ~2,500°F the organic contaminants are disassociated or destroyed, and the non-volatile heavy metals are encapsulated into the siliceous matrix that forms from the sediments to produce Ecomelt®, which can be used as a 30-40% replacement for Portland cement in concrete, a beneficial use product. Rotary kilns have been used to produce Portland cement for more than a hundred years. For over 65 years the Gas Technology Institute (GTI) has been a world leader in the research and development of energy technologies using gas. This technology for remediating contaminated sediments was conceived at GTI in 1994, and developed from bench-scale to pilot-scale in 1994 to 2005. EPA, Region 2, and the US Department of Energy, Brookhaven National Laboratory, have worked with GTI on this project since 1995. In 2000 the NJ Department of Transportation, Office of Maritime Resources, selected this technology "to be evaluated for its applicability to the treatment of sediment dredged from navigational channels."[39]

Pilot-Scale and Demonstration-Scale Testing of Thermal Treatment Technology

ENDESCO Clean Harbors, LLC, a subsidiary of GTI, built a demonstration plant in Bayonne, NJ. Sediments dredged from the Stratus Petroleum site in Newark Bay and then dewatered were used in a pilot test of the Cement-Lock® technology at this plant in 2005.[40] This test led to equipment modifications that needed to be retested.[41] The retesting occurred in November 2006, but was halted early for several reasons. In December 2006 and in May 2007 demonstration-scale tests of longer duration were conducted using more contaminated sediments dredged from the Passaic River near the Diamond Alkali site. The results from these tests show that the Cement-Lock® technology "can achieve high destruction and removal efficiencies for contaminants of concern, specifically dioxins and furans and PCBs" (treatment efficiency of >99.9%).[42] Some of the Ecomelt® produced was mixed with Portland cement to make high quality concrete paving at Montclair State University. GTI and its subsidiary, ENDESCO, learned much from the pilot and demonstration test projects. When we considered the technical problems that occurred during these tests, we concluded that they could be corrected if appropriately addressed as discussed below.

Technologies Involved in the Thermal Treatment of Dredged Materials

Since 2008 GTI and its partners in Volcano Partners, LLC, have brought together several different business entities with their own expertise that would like to cooperate in the development and operation of facilities for the manufacture of a cement extender (Ecomelt®) from contaminated sediments dredged from the NY/NJ Harbor and elsewhere. Information from some of these partners is included in this report. Tetra Tech, a leader in the hazardous waste remediation industry, recently released a "Summary of Project and Design Updates for Cement-Lock Technology Manufacturing

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[38] FFS. Page 3-17.

[39] Endesco Clean Harbors, LLC, prepared by Michael C. Mensinger, Gas Technology Institute. July 2008. Sediment Decontamination Demonstration Program – Cement-Lock® Technology, Final Report: Phase II Demonstration Tests with Stratus Petroleum and Passaic River Sediments. Submitted to: NJ Department of Transportation, Office of Maritime Resources; US Department of Energy, Brookhaven Science Associates, LLC. Page iii.

[40] *Ibid.*

[41] *Op. cit. #22.* Page iv.

[42] *Op. cit. #22.* Pages 103, vii.

Plant".[43] As with most manufacturing businesses, there are at least four different processes that would be involved in the thermal treatment of dredged materials. Each of these processes involves different technologies. Each process requires different types of operational expertise. The technological modifications and expertise that Volcano Partners suggest be used in each of these four processes are evaluated here.

Front End Materials Handling Process -- Debris Removal, De-watering of Dredged Materials

In the test runs the dewatered sediments fed into the rotary kiln should have been drier. This problem and other problems encountered with feed handling are correctable. Tetra Tech helped to design the systems to offload the dredged sediments from barges, to remove debris, and dewater the sediments to 50% solids content, to deliver the dewatered sediments to the treatment factory, and to blend Cement-Lock® technology additives with the sediment to reduce the moisture content to 40% or below.

Manufacturing Process -- Design/Build/Operate Thermal Treatment Factory

The demonstration tests proved that a cement extender (Ecomelt®) can be manufactured from contaminated sediments. The improvements in the design of the system proposed to correct problems encountered in the demonstration tests make sense. Tetra Tech, Foster Wheeler Corporation (FWC), design engineers in rotary kiln technology, and ABB, an industrial leader in cement plant planning, were helping in planning the design, construction and operation of a Cement-Lock® facility using a rotary kiln thermal processing technology. In this system dewatered sediments that have been mixed with feed additives (slag modifiers) are fed through a kiln on a double screw feeder conveyor. The heat for processing the sediments comes from burning natural gas with air. The amount of air and oxygen (O_2) used is controlled by a combustion air fan so that the gas, which is mostly methane (CH_4), is used efficiently to form carbon dioxide (CO_2) and water (H_2O), and so that nitrogen oxide (NO_x) formation is minimal. Air contains about 78% nitrogen (N_2) and 21% oxygen (O_2). As the dredged sediments are rolled through a kiln and heated to high temperatures of ~2,500^{o}F most of the sedimentary material is melted into a molten slag, and the organic matter is converted to gases, especially CO_2 and water. The temperatures used are even hot enough to convert PCBs and other ***dioxins*** to CO_2, water, hydrogen chloride (HCl), and chlorine gas (Cl_2). The molten slag drops from the kiln and the walls of the secondary combustion chamber into a pool of water where it is quenched and cooled. The slag is then conveyed from the pool to a grinder/pulverizer/blender to become Ecomelt®. The rotary kiln thermal treatment technology being proposed by FWC has already been used to treat a variety of heterogeneous waste streams, including contaminated soils, sediments, and sludges. In fact, FWC's rotary kiln projects include the Clean Harbors Aragonite facility in Grantsville, Utah, which has been in operation since 1991, and which has an EPA permit for PCB Disposal.[44] The Destruction and Removal Efficiency (DRE) for PCBs at this plant have at times exceeded 99.999999%. However, this facility produces an ash, which when deposited in a landfill can produce leachable heavy metals such as lead and mercury. The Cement-Lock® facility proposed for this area will be the first in the U.S. and Canada to be designed for the treatment of sediments contaminated with both legacy pollutants and heavy metals.

Waste Management Process -- Air Pollution Control and Monitoring

This thermal treatment process uses lots of energy by burning natural gas with air to heat the rotary kiln system (Ecomelt® generator). Energy wastage would be minimized by using the superheated flue gases to produce steam to generate electricity. The Volcano Partners, including ADA/NORIT Americas JV, proposed building and operating a Cement-Lock® plant with "state-of-the-art" air

[43] Tetra Tech EC, Inc., prepared by Steve McGee. November 30, 2011. Summary of Project and Design Updates for Cement-Lock Technology Manufacturing Plant.

[44] U.S. Environmental Protection Agency. 2011. Web-site: www.epa.gov/hazard/tsd/pcbs/pubs/stordisp.htm

pollution controls. This process forms acidic gases, NO_x (nitrogen oxides), SO_x (sulfur oxides), and HCl (hydrogen chloride), which can cause acid rain if released to the air. Before being emitted the flue gases would be cooled with direct water injection. NO_x emissions would be reduced by selective non-catalytic reduction, which would convert the NO_x to the nitrogen and oxygen gases that fill the air. Injection of lime into the flue gases would convert SO_x and HCl gases to solid particles, which would then be captured in fabric filter bag houses. Mercury (Hg) becomes a gas in this treatment process and must be captured. Absorbing gaseous mercury on impregnated powdered activated solid carbon particles which are caught in filter bags is proposed for mercury removal. Powdered activated carbon would also be used to remove any dioxins or furans that may be formed in the system. The proposed Cement-Lock® treatment process would not produce any waste water. The solid fine particulates caught in bag houses can be effectively managed and might even be useful. The cleaned flue gases will be lifted through a gas stack tall enough to allow for proper dispersion into the atmosphere. The air pollution control systems proposed by the Volcano Partners are designed to be operated so as to exceed mandated air emissions standards.

Disposition of Manufactured Product -- Beneficial Use of Cement Extender (Ecomelt®)

It has been demonstrated that contaminated sediments, even those from the Lower Passaic River, can be melted to make Ecomelt®, mixed with Portland cement, and then used to make high grade concrete. There are many benefits to be gained from using contaminated sediments to make Ecomelt®. The organic contaminants, including PCBs and other ***dioxins***, that adhere to the sediments are destroyed in the Cement-Lock® rotary kiln process. Also this process immobilizes some of the non-volatile heavy metals in the glassy matrix of Ecomelt®. Although some parts of the processes needed in the manufacture of Ecomelt® are more expensive than those in the manufacture of Portland cement, the values to be gained in cleaning up the contamination should offset these costs. U.S. Concrete may help in selling the Ecomelt® product. In any case the production of this product would certainly be a beneficial use of contaminated sediments.

Site for Thermal Treatment Facility

Finding an appropriate site for the development of a thermal treatment facility for DMM of contaminated sediments is critical for implementing this dredging project. The site must be easily accessible by ship, and there should also be good rail and highway facilities nearby. The site must be large enough to accommodate all the necessary facilities. It would be necessary to obtain all the permits needed to develop and operate a thermal treatment facility for DMM and other contaminated sediments at the site. There are sites in the region that meet these criteria. The use of such a site for the decontamination of materials dredged from the Lower Passaic River and Newark Bay should be considered “Local Decon”. Without such a facility within the NY/NJ Harbor area these contaminated dredged materials would have to be shipped elsewhere. Considering such a site as an area of land within the Diamond Alkali Superfund Site might help facilitate the “Lower Eight Miles” dredging project. The site should also become an “active upland dredged material placement site” that is permitted by the Corps to receive contaminated sediment in addition to clean materials dredged from the harbor.

Evaluation of Thermal Treatment for DMM

As in the development of most new technologies, there were problems encountered in the demonstration-scale testing of the Cement-Lock® technology in Bayonne in 2006 and 2007. Since then the Volcano Partners have proposed ways to design and operate facilities for each of the four processes involved in cleaning contaminated dredged materials to produce a product for beneficial use (Ecomelt®). After considering the options available for the management of materials that should be dredged from the Lower Passaic River, Newark Bay, NY/NJ Harbor and elsewhere I find

that the thermal treatment option proposed by the Volcano Partners meets the CERCLA preference for permanent treatment and is both ecologically and economically sensible and sustainable.

Yeh, Alice

From: alkruger@cfl.rr.com
Sent: Wednesday, August 20, 2014 4:29 PM
To: Region2 PassaicLower8MileComments
Subject: Economics of the Dredging and Destruction of Dioxins
Attachments: ECO-1408-Economics of Dredging and Destroying Dioxins.pdf

Best wishes for all you do!
Anne L. Kruger

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 2:39 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Allison R Kuronya
allison_kuronya@yahoo.com
917 Weber Drive
Yardley
Pennsylvania
19067

2673919676

Yeh, Alice

From: Eliza <sales@hardwarepower.net>
Sent: Thursday, June 12, 2014 1:03 AM
To: Region2 PassaicLower8MileComments
Subject: [SPAM] Parts You May Need

< We welcome all wholesalers, retailers, trading companies & even manufacturers to work together to increase your own profits. >

To whom it may concern,

We are pleasure to have an opportunity to introduce ourselves to you, our team specialize in creating molds for different kinds of industrial parts,
especially with **metal products & precision components**. Our factory was found in 1978 and keeps growing rapidly with customers all around the globe.
Selling a varied range of special parts to over 30 countries, we offers a wide range of precision parts to suit many applications covering a wide variety of
industries. Therefore we are hoping to see whether we have a chance to work together to increase the work efficiency.

Talk to us or consult with us and see the difference (send us email at enquiry@hardwarepower.net), thank you so much for your time!

Warm Regards,

Joyce Kwan, Sales Assistance
Caesar Hardware Power, Taiwan.
Competitive Price / Best Quality / On-Time Delivery
Phone: (+886) 2 2908-8335 Fax: (+886) 2 2209-5608
Website: www.hardwarepower.net
Email: enquiry@hardwarepower.net

If you'd like to unsubscribe and stop receiving these emails click here.

STATEMENT OF THE
LABORERS' INTERNATIONAL UNION OF AMERICA (LIUNA) - NEW JERSEY
On the U.S. Environmental Protection Agency (EPA)
Proposed Plan for the Lower 8 Miles of the Lower Passaic River
May 7, 2014 Hearing
Newark, New Jersey

The 20,000 member New Jersey Laborers Union strongly supports the April 2014 EPA focused feasibility study (FFS) on options for cleanup of the contaminated sediments in the lower 8 miles of the Passaic River. Through the years, we have participated in numerous efforts seeking solutions to solve both the contamination issues as well as flooding issues for the Passaic River. We are also very committed, thru our Labor – Management Cooperation and Education Fund (NJLECET) to looking long-term at the positive economic development potential for the communities bordering a "clean" Passaic River.

The New Jersey Laborers Union represents workers in various industries including building and heavy highway construction. Thousands of our members live near the Passaic River Basin in the numerous communities that are adjacent to the river. One of our largest locals, Laborers Local 472, is headquartered on Raymond Boulevard in Newark along the rivers path and Local 472 has over a thousand members living in the adjoining Ironbound section of Newark. They are all affected by the impacts of contamination, and can be part of the solution in ending this serious public issue.

Specifically, of the 4 options presented in the FFS, LIUNA supports **ALTERNATIVE 3 – Capping with Dredging for Flooding and Navigation.** This EPA preferred bank-to-bank option involves removal of approximately 4.3 million cubic yards of contaminated sediment and placement of an engineered cap over the remaining sediment. We believe that this option represents both a comprehensive yet balanced approach and would be very effective in reducing surface sediment contaminants thru permanent removal. It would reduce cancer risks and the movement of contaminated sediment for the protection of human health and the environment.

The residents of this region have waited too long for a good solution. We urge you expedite completion of this evaluation process and to pursue a solution that provides a comprehensive and long-term benefit for the Passaic River and the New Jersey public.

###

The New Jersey Laborers Union is the statewide affiliate of the 550,000 member Laborers' International Union of North America (LIUNA) and represents workers in various industries, including construction, clean energy, environmental remediation, sanitation and recycling, security, and education. The New Jersey Laborers are widely viewed as having been instrumental in helping to lift living standards and workplace safety for employees and for developing innovative cooperative relationships with employers.

Yeh, Alice

From: Kluesner, Dave
Sent: Wednesday, April 16, 2014 2:31 PM
To: Region2 PassaicLower8MileComments
Subject: Statement from the NJ Laborers Union

From: Robert Lewandowski <roblew@njlecet.org>
Date: Tuesday, April 15, 2014 at 1:44 PM
To: Robert Lewandowski <roblew@njlecet.org>
Subject: Statement: LIUNA's Pocino on EPAPassaic River Cleanup

For Immediate Release

April 15, 2014 Contact: Rob Lewandowski
609-731-5396 roblew@njlaborers.org

A statement from Raymond M. Pocino on the EPA Passaic River Cleanup

On Friday, April 11, 2014, the Environmental Protection Agency (EPA) released its $1.7 billion proposed cleanup of the lower eight-miles of the Passaic River. The Laborers International Union of North America (LIUNA) supports the proposed plan which is the largest environmental cleanup in EPA's history. The scale of the EPA proposal is proportional to the damage done and also the opportunities available through comprehensive cleanup.

Objections are predicted, but the time has come for everyone involved in this process to finally come together and begin remediation immediately. The communities surrounding the Passaic River--which are home to many of our members--deserve a river that they can enjoy safely without fear of health risks. We believe this bank-to-bank cleanup of the river's lower 8 miles will deliver environmental and economic benefits to the communities that surround the Passaic River for generations to come.

To see the positive effect of a comprehensive cleanup of our waterways, one need look no further than progress made on the Hudson River. Over the last few decades a river was brought back to life and the communities along its banks saw a similar rebirth. We at LIUNA look forward to being a part of a solution that reclaims the Passaic River for our region. After decades of pollution and neglect, the time has come to clean up the river and lift up the affected communities.

Raymond M. Pocino is Vice President and Eastern Regional Manager for the Laborers' International Union of North America (LIUNA), representing more than 40,000 construction workers in New Jersey, New York City, Long Island, and Delaware. He also serves as a commissioner of the Port Authority of New York and New Jersey and the New Jersey Turnpike Authority.

# # #

Robert Lewandowski
NJ Laborers Union
104 Interchange Plaza, 3rd Floor
Monroe Township, NJ 08831
609-860-9223
609-860-1996 Fax

David Kluesner
U.S. EPA - Manhattan Office
Public Affairs Division
290 Broadway, NY, NY 10007

work: 212 637-3653
cell: 347 330-9439

www.epa.gov/region2
https://blog.epa.gov/greeningtheapple/
https://twitter.com/EPAregion2
https://www.facebook.com/eparegion2

Yeh, Alice

From: La Jeunesse, Richard T. <RLaJeunesse@Graydon.com>
Sent: Wednesday, August 20, 2014 10:31 AM
To: Region2 PassaicLower8MileComments
Cc: Ward, Dennis (Dennis.Ward@kao.com); Hohl, M. Zack
Subject: Comments submitted by Kao USA, Inc. re Lower Passaic FFS and Proposed Plan [IWOV-CN.FID107091]
Attachments: Comments by Kao USA, Inc re Lower Passaic FFS and Proposed Plan.pdf

To: US EPA

Attached please find a PDF file of comments submitted for inclusion in the administrative record on behalf of my client Kao USA Inc. regarding the Superfund Proposed Plan ("Proposed Plan") and the Focused Feasibility Study ("FFS") issued on April 11, 2014 for the Lower Eight Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site.

An additional copy of the comments was also submitted today to EPA fax 212-637-4439.

Thank you.

Richard La Jeunesse

Richard T. La Jeunesse, Esq.
Attorney
1900 Fifth Third Center
511 Walnut Street
Cincinnati, OH 45202
513.629.2702 Direct
513.651.3836 Fax
RLaJeunesse@graydon.com

The preceding information is from the law firm of Graydon Head & Ritchey LLP and is sumitted to the recipient indicated therein. If you believe it has been sent to you in error, do not read it. Please reply to the sender that you have received the message in error, then delete the message. Do not retain a copy. Thank you.

GRAYDON HEAD

LEGAL COUNSEL | SINCE 1871

Richard T. La Jeunesse, Esq.
(513) 621-6464

August 19, 2014

VIA ELECTRONIC MAIL (at PassaicLower8MileComments.Region2@epa.gov)
VIA FACSIMILE (at (212) 637-4439)

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

RE: Comments on behalf of Kao USA Inc. regarding the Superfund Proposed Plan ("Proposed Plan") and the Focused Feasibility Study ("FFS") issued on April 11, 2014 for the Lower Eight Miles of the Lower Passaic River, Part of the Diamond Alkali Superfund Site

To: United States Environmental Protection Agency

We represent Kao USA Inc. in connection with matters related to the 17-mile stretch of the Lower Passaic River and its tributaries from Dundee Dam to Newark Bay (collectively, the "Lower Passaic River Study Area" or the "LPRSA"). Kao USA Inc. ("Kao"), previously known as The Andrew Jergens Company, operated a soap and lotion production facility off Franklin Avenue and Mill Street in Belleville, New Jersey, on the opposite side of Mill Street from the Second River, a tributary of the Passaic River. During its operation of the facility from 1940 until its sale in 1975, Kao did not discharge hazardous substances into the Second River, nor into the Passaic River and, therefore, is not a properly-designated potentially responsible party with respect to these proceedings.

Kao USA Inc. joins in the comments being submitted by the Lower Passaic River Study Area Site Cooperating Parties Group ("CPG"). In addition, this letter serves as a supplemental public comment to the FFS and Proposed Plan submitted individually on behalf of Kao, to be included in the administrative record.

The FFS and the Proposed Plan state that current and former industrial facilities identified as potentially responsible parties ("PRPs") discharged a number of contaminants into the river. *See e.g.* Proposed Plan pp. ES-2 to ES-3 and 1-7 to 1-8 (referencing Figure 1-4); and FFS pp. 1-6 to 1-8. Kao objects to such affirmative statements that all companies currently identified as PRPs discharged contaminants into the Passaic River. To date there has been no judicial or administrative hearing on the culpability of certain marginal, individual PRPs, including Kao, regarding whether such PRP discharged contaminants into the LPRSA. Further, the Proposed Plan and the FFS present no evidence that individual PRPs such as Kao discharged contaminants into the LPRSA. Therefore, asserting that PRPs such as Kao are responsible for the contamination in the LPRSA is inappropriate, and in Kao's particular case, extremely

inaccurate, grossly unfair and inequitable. Statements akin to a determination of guilt or culpability where there have been no findings on the merits violate Kao's right to due process.

The particular factual situation pertaining to Kao's involvement (or rather lack of involvement) with the Passaic is distinguishable from most, if not all other PRPs, prompting us to urge that the Agency reconsider and reject the characterization of Kao as a PRP. A relevant synopsis follows: Kao USA Inc. (then known as The Andrew Jergens Company) was identified as a PRP pursuant to Section 107(a) of CERCLA, 42 U.S.C. § 9607(a) in a letter from the U.S. EPA dated September 15, 2003. The Andrew Jergens Company operated a soap and lotion facility from approximately 1940 until the sale of the site in 1975. The former Andrew Jergens plant was located near Mill Street opposite the Second River, a tributary of the Passaic River. The main building of the plant was separated from the Second River by over 350 feet of grass and fields, a retaining wall, and by Mill Street.

The 1973 Passaic Valley Sewerage Commission ("PVSC") Annual Report states that Jergens was then applying for a discharge permit for its boiler blowdown water into the Second River. The boiler at the former Andrew Jergens facility was a low pressure boiler (55,000 lb/hr) used to heat the facility. No hazardous substances were generated in the boiler. Blowdown is discharged to keep the dissolved solids concentration in the boiler low in order to prevent boiler scale. The source of the dissolved solids, which are not hazardous substances, would have been the feed water, not the boiler. The elevated temperature of any blowdown is not a hazardous substance.

The boiler at the former Andrew Jergens facility in Bellevue, New Jersey did not discharge any hazardous substances as defined in CERCLA § 101, 42 U.S.C. §9601 or otherwise, and Kao's designation as a PRP in this matter is improper.

Throughout the course of the River Investigation and Feasibility Study of the LPRSA and through supplemental internal investigations, Kao has found no evidence of any release of hazardous substances from the former Andrew Jergens facility into the Second River or the Passaic River. Further, the FFS and Proposed Plan do not present any evidence that Kao released hazardous substances from the former Andrew Jergens facility. In fact, evidence in the FFS and Proposed Plan supports Kao's conclusion that no hazardous substances were released from its facility. For example, Proposed Plan p. 4-33 states, "[M]easured contaminant concentrations for nearly all contaminants were similar among the three tributaries, indicating that for most contaminants in the three watersheds, contaminant loads represent the integration of urban surface run-off and non-point sources, and not industry-related point discharges, which might impact one tributary but not all three to the same degree." This supports Kao's conclusion that there is no evidence of any release of hazardous substances from the former Andrew Jergens facility located near the Second River, more than a mile remote from the Passaic River.

Quite simply, Kao should not have been designated as a PRP, yet since 2003 Kao has reluctantly participated and cooperated in extensive, and very expensive investigations and studies of the LPRSA, all without the Agency providing Kao an opportunity to have a fair and

balanced determination on the merits of Kao's improper PRP designation. This reluctant participation was prompted all the more to avoid more draconian unilateral Agency actions threatened against Kao as a PRP. Forcing a marginal PRP, with no connection to the LPRSA, like Kao, to participate in an extensive river investigation and feasibility study and remediation of the LPRSA for over a decade without any opportunity to show its innocence is grossly offensive to the principals of due process and fair proceedings. Further, failing to distinguish truly marginal and de minimis situations, and affirmatively claiming in the FFS and Proposed Plan that such parties discharged a number of contaminants into the Passaic River without presenting any evidence to support such a claim is inappropriate and grossly unjust.

Regardless of the ultimate remedies selected for the lower 8 miles of the Passaic River and the entire LPRSA, Kao asks that it be removed from the list of PRPs and not required to participate in any further studies, investigations, or remediation of the LPRSA.

Thank you for your consideration. Please send all questions and comments to Richard T. La Jeunesse at rlajeunesse@graydon.com and M. Zack Hohl at zhohl@graydon.com.

Respectfully submitted,

Graydon Head & Ritchey, LLP

By: Richard T. La Jeunesse

Richard T. La Jeunesse, Esq.

cc: Dennis R. Ward, Esq., Vice President Regional Executive Officer, Legal and General Counsel, Americas, Kao USA Inc.

5113802.1

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 20, 2014 1:59 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Shirley LaRoche
slaroche_6@msn.com
63 Crest Ave
Hamilton Square
New Jersey
08690

6095880221

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 12, 2014 9:56 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

laura
rytech123@gmail.com
last test

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 01, 2014 11:02 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jill Levey
jillalevey@gmail.com
228 Felton Ave.
Highland Park
NJ
08904

COMMENT CARD

PASSAIC RIVER PROPOSED PLAN

May 21, 2014
Kearny, New Jersey

Commenter Name **Contact Information (Optional)**

Brian Liszewski, Paramus, NJ brianveggieburger@yahoo.com

#2 Deep Dredging With Backfill for cleanup
B Offsite Disposal for disposal.
The decontamination of the lower Passaic River of toxic waste should involve nothing less than methods #2 + B. Offsite disposal should use the most advanced technology known to humankind to destroy and/or neutralize the toxins in the removed sludge.
Ignore the Diamond Shamrock proposal to simply bury the toxins in a pit in Newark Bay. We are sick and tired of government that is a puppet of the major corporations that seem to be the real power in the world. Get rid of the toxins.

Note: If this is a request for information, please give us a way to get in touch with you. Thank you.

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 06, 2014 9:45 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Dan Lockwood
dlockwood924@hotmail.com

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 04, 2014 9:56 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

chance lykins
chancelykins@yahoo.com

Fairless Hills
PA
19030

Yeh, Alice

From: lenlyon38@gmail.com
Sent: Monday, July 21, 2014 2:51 PM
To: Region2 PassaicLower8MileComments
Subject: Passaic Lower 8 mile cleanup

I strongly support option one for the river cleanup, that is remove all sediment contamination. The partial removal (option two) looks to be a temporary solution at best with the contaminants likely to be exposed once again if the cap is not perfectly maintained. Under no circumstances should Occidental chemical Corporation, the corporate successor to diamond Shamrock which deliberately caused this pollution be permitted to get away with a less expensive and untried technology such as bacterial cleanup. Thank you for your consideration. Leonard J Lyon M.D., Hillsdale New Jersey

Sent from my iPhone

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 04, 2014 9:26 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Scot Mackey
scmackey@verizon.net
340 Hickory Lane
Haddonfield
New Jersey
08033

856-216-1392

Yeh, Alice

From: Yeh, Alice
Sent: Thursday, May 08, 2014 9:01 AM
To: Region2 PassaicLower8MileComments
Subject: FW: Message from Newark Public Hearing
Attachments: photo.JPG; ATT00001.txt

-----Original Message-----
From: debbie@nynjbaykeeper.org [mailto:debbie@nynjbaykeeper.org]
Sent: Wednesday, May 07, 2014 8:20 PM
To: Enck, Judith; Plevin, Lisa; Basso, Ray; Yeh, Alice; Janine MacGregor
Subject: Message from Newark Public Hearing

We are Environmental
Justice
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Yeh, Alice

From: Debbie Mans <debbie@nynjbaykeeper.org>
Sent: Wednesday, August 20, 2014 3:15 PM
To: Enck, Judith; Yeh, Alice; Basso, Ray; Plevin, Lisa; Kluesner, Dave; Region2 PassaicLower8MileComments
Cc: Sandra Meola
Subject: NY/NJ Baykeeper Comments
Attachments: ESC Comments Passaic Proposed Plan 2014-2.pdf

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August 20, 2014

Alice Yeh

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RE: EPA Proposed Remedy for the Lower Eight Miles of the Passaic River

Dear Regional Administrator Enck and Ms. Yeh:

I am commenting on behalf of the NY/NJ Baykeeper in regards to the proposed plan for the cleanup of the lower 8 miles of the Passaic River Restoration. Since 1989, Baykeeper has been protecting, preserving and restoring the ecological integrity of the Hudson-Raritan Estuary. Baykeeper is well known for its environmental

advocacy, especially in Northern New Jersey. Therefore, the Passaic River is an important piece of our advocacy work.

NY/NJ Baykeeper supports the Environmental Protection Agency's preferred cleanup remedy for the lower Passaic River which includes bank to bank dredging to remove 4.3 million cubic yards of sediment, with offsite disposal at a licensed facility. Baykeeper does not support the use of CAD cells in Newark Bay as a disposal option. Our concerns are more fully articulated in the attached memo.

Any cleanup that occurs must allow for the restoration of the river as well, including mudflats, wetlands and other near shore habitat, plus public access, including waterfront parks, boat ramps and docks.

We greatly appreciate the opportunity to utilize the Technical Assistance Grant (TAG) in reviewing the proposed plan and drafting specific technical comments. Please see the attachment memo, prepared by our consultant Environmental Stewardship Concepts, LLC, for comments specifically on

1. The CAD facility
2. Effectiveness of the Cooperating Parties Group's plan as an alternative to EPA proposals
3. Adaptive Management as applied to this site
4. The efficacy of a fish exchange for fisherpersons on the lower Passaic River
5. Bioremediation as an option for cleaning up sediment in situ

On behalf of Baykeeper, I hope to see an immediate cleanup in order to return the River rightfully back to the community and hold polluters responsible for the careless damage they have caused for decades. We thank the Environmental Protection Agency for its attention to this abused Superfund site.

Sincerely,

Deborah A. Mans

Baykeeper and Executive Director

NY/NJ Baykeeper

CAG Co-Chair

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August 20, 2014

Passaic River Proposed Plan Remedy Comments
Environmental Stewardship Concepts, LLC
On behalf of the New York/New Jersey Baykeeper

Introduction

The Proposed Plan for the Lower Eight Miles of the Lower Passaic River indicates that EPA's preferred alternative consists of bank-to-bank dredging with an engineered cap over the entirety of the lower 8.3 miles. The river would be dredged bank-to-bank to remove the surface contaminated sediment and so that the cap does not cause flooding by being above the original grading. The engineered cap would consist of two feet of sand, using stone for erosion prevention, where needed. The dredging depth is one of the topics on which EPA specifically requests comments.

Deep dredging of the lowest segment (about 2 miles) is an option that would remove all the contamination and open the navigational channel for greater access.

The other topic on which EPA specifically requests comment is the disposal/fate of the dredged contaminated sediment after removal. Two options are contemplated: 1) construction of a Confined Aquatic Disposal (CAD) facility in Newark Bay or 2) removal to a remote site and like disposal.

The New York/New Jersey Baykeeper requested analysis and comment on the following specific topics:

1. The CAD facility
2. Effectiveness of the Cooperating Parties Group's plan as an alternative to EPA proposals
3. Adaptive Management as applied to this site
4. The efficacy of a fish exchange for fisherpersons on the lower Passaic River
5. Bioremediation as an option for cleaning up sediment *in situ*

These five topics are presented below, followed by General Site Observations and Proposed Plan Comments. The Site Observations section contains observations relative to the site conditions before, during, and after remediation. Appendix A demonstrates the possible dewatering sites available for use along the Passaic River and Newark Bay. The Proposed Plan Comments section is based on EPA's "Lower Eight Miles of the Lower Passiac River Proposed Plan (April 2014)" and comments on the alternative chosen by EPA as the best cleanup remedy.

Confined Aquatic Disposal

The State of New Jersey, the Passaic River Federal Trustees, the NY/NJ Baykeeper, and many members of the Passaic community all disapprove of the use of a CAD in Newark Bay. Although CADs are touted as a low cost method for isolation of contaminants, the proposed CAD for Newark Bay will not ensure an efficient or appropriate cleanup. A CAD, which will need to be maintained in perpetuity, is not a complete cleanup for the Diamond Alkali Superfund Site; it is a method for leaving contaminants in place in the same estuarine/river system. It is essential that the EPA consider the negative long term ecological and economic impacts of placing a CAD in Newark Bay.

Ecological Impacts

One of the most concerning issues with the Passaic River CAD is the scale. At a total of 80 acres, the footprint of the Passaic River CAD would be larger than any other CAD site in the U.S. For reference, the New Bedford Harbor CAD in Massachusetts has a footprint of only 8.3 acres. Studies suggest that construction of the Passaic River CAD will take about five years - this five year period will disrupt the subtidal habitats that provide food, refuge, and spawning grounds for many aquatic species within Newark Bay, including over 100 species of fish (NY-NJ HEP 2012). These species are important ecologically, commercially and recreationally. Dredging of sediment from the bay bottom to create the CAD would increase suspended sediment and deposition levels for immobile eggs and fish in early life stages. It would also reduce dissolved oxygen levels, mask pheromones used by migratory fish, and smother immobile benthic macroinvertebrates (EPA 2014b).

Newark Bay is made up of intertidal and subtidal shallow waters that are home to many groundfish, such as winter flounder. Much of the bay is designated by NOAA as Essential Fish Habitat (EPA 2014b). Essential Fish Habitat is defined by NOAA as “the habitat necessary for managed fish to complete their lifecycle, thus contributing to a fishery that can be harvested sustainably” (NOAA). Many native fish populations are under intense pressure and run the risk of extirpation in Newark Bay. Several species in Newark Bay have special status, such as the Atlantic sturgeon, which is a federally listed endangered species. The shallow mudflats are also home to algae, crabs, clams and other invertebrates that serve as prey for fish like striped bass and bluefish (NY-NJ HEP 2012).

Due to years of contamination of the Passaic River, the Newark Bay ecosystem is already particularly susceptible to the negative impacts of construction in the bay. Eelgrass beds and oyster reefs in the bay are almost entirely gone. American shad

populations are at historic lows (NY-NJ HEP 2012) and under a multi-agency effort to rebuild the populations. River herring and shad are also under federal and state jurisdictions and the Mid-Atlantic Fishery Management Council recently initiated an effort to coordinate federal and state agencies in order to increase those populations (MAFMC). Impairment from site-related contamination in Newark Bay has been documented in Atlantic tomcods, killifish, mummichogs, and many other aquatic species. A scientific study from the late 1990s and early 2000s on PCBs in anadromous fish of the Hudson River showed that juvenile Atlantic tomcod in Newark Bay were highly contaminated with PCBs, PCDDs, and PCDFs, compared to tomcods from seven different sites in the Hudson. The Newark Bay tomcods had PCDD levels over 19 times higher than the tomcods sampled in the Hudson River (Yuan 2006). A 2010 study on the health of killifish in Newark Bay showed that these fish suffered from morphological changes indicative of impaired reproductive health and endocrine disruption. Both male and female killifish exhibited decreased gonad weight and inhibited gonad development. The study concluded that “Similar effects on the reproductive development in less resilient species may limit their ability to repopulate the NY-NJ Harbor Estuary and similarly contaminated water systems” (Bugel 2010).

Long-term construction of a CAD in the bay is likely to lead to the decline of sensitive aquatic populations. The loss of native species in Newark Bay also means a loss of ecosystem services such as nourishment, clean water, protection from floods and erosion, and recreational opportunities (NY-NJ HEP 2012). The severe decline in the Eastern oyster population, for example, has widespread negative impacts on water quality in the bay. While oyster populations were historically depleted purely due to overfishing, Eastern oyster populations in Newark Bay today are at record lows in part due to the presence of toxic contaminants. As filter-feeders, oysters remove excess nutrients, algae, and pollutants from the water. An adult oyster can filter up to 50 gallons of water per day. Studies have shown that PCB exposure in sexually immature oysters impairs both lipid metabolism and reproductive success (Chu 2003).

Human Health Impacts

Recreational opportunities on the Lower Passaic River and in Newark Bay are also severely limited. The New Jersey Department of Environmental Protection fish and crab consumption advisories state that no species of fish or crab from the Lower Passaic River and the entire Newark Bay region should be eaten due to contamination (EPA 2014b). There is also a commercial fishing ban on striped bass (NJ Division of Fish and Wildlife 2012). The resuspension of contaminated sediments in the water during CAD construction and "filling" is a risk to human health as well. Not only will the resuspended contaminants come into contact with fish and wildlife, but people using the bay by boat are put at higher risk of coming into contact with toxic contaminants.

Construction Issues

While preliminary studies estimate that construction of the CAD cell will take about five years, it is very likely that construction could take much longer. The possible technical delays that the construction team may run into is one issue, while a more immediate concern is the seasonal dredging restrictions in Newark Bay for the migration of diadromous fish. These restrictions can change from year to year and are dependent upon the reproductive success of fish populations, so it is nearly impossible to predict what seasonal restrictions may be put in place years ahead of time.

Constructing the CAD will be largely inefficient. Rather than one large CAD cell, the site will actually be made up of multiple CAD cells, each of which will be fifty feet deep. The excavated clay from these cells will then be disposed of in an ocean disposal area offshore (EPA 2014b). This disposal process is not only inefficient, but it risks depositing contaminated sediment further offshore in the ocean, where mobilization of contaminated sediments will take place more quickly than in the bay.

Moving the excavated clay offshore, as well as general construction activities, will increase traffic in Newark Bay. The CAD sites considered by the EPA in the Passaic River Focused Feasibility Study are near major container terminals in the Newark Bay. The Port Newark Container Terminal (PNCT), located in Port Newark on the west side of the bay, occupies 259 acres. In 2011, the PNCT secured a long-term lease agreement to occupy the space through at least 2030. Before the year 2030, the PNCT will invest $500 million into expansion of the port. Already the PNCT handles over 600,000 containers annually, and this number will increase as the port expansion occurs (PNCT 2014). Increased traffic to and from the CAD site could interfere with port commercial traffic, as well as increasing the chances for boat accidents (EPA 2014b).

Even after the CAD cell construction is complete, significant recontamination risks remain. The Passaic River Proposed Plan expressly states that even with sheet pile walls on all sides and a silt curtain across the entrance channel, “some of the dissolved-phase contamination could still escape during dredged material disposal” (EPA 2014b, p. 35). In the document *Recommendations for the Diamond Alkali Superfund Site*, the National Remedy Review Board states that recontamination could occur through resuspension from the cleanup itself or through the transport of contaminants from Newark Bay. The Board points out that recontamination could inhibit the EPA’s goal of attaining and maintaining five parts per trillion of dioxin in Newark Bay sediment over time (NRRB 2014). In addition, the Proposed Plan does not account for monitoring leakage from the CAD cell over a long-term scale. The issue with Newark Bay in particular is that the bay is already so polluted that contaminants leaking out of the CAD cell would almost impossible to discern from contaminants that are already present in

Newark Bay waters. The Proposed Plan repeatedly mentions that the CAD will require monitoring in perpetuity, but no definitive monitoring measures are proposed or explained.

The cost for the Passaic CAD is estimated to be $1 billion. The cost for off-site disposal is estimated to be $1.7 billion (EPA 2014a). While EPA Headquarters advocates for the CAD because of the decreased cleanup cost, the negative consequences of using the CAD will come in the form of extra funds spent in the future, as the CAD requires a review every five years and maintenance in perpetuity. In the long run, the cost for off-site disposal of contaminated sediments may very well be cheaper than the cost of maintaining the CAD cell.

CAD versus Off-Site Disposal

While the CERCLA process requires five-year reviews of the CAD, it is likely that more frequent reviews will need to be conducted to verify that no leakage is occurring. Off-site maintenance, on the other hand, is done by permitted facilities and has a finite end date for cleanup. An off-site disposal facility could incinerate up to ten percent of contaminated sediment, whereas a CAD does not treat any contaminants. A CAD would also severely impact the sensitive ecosystem that is Newark Bay, whereas off-site disposal would not have long-term impacts on the bay (EPA 2014a). Construction of the CAD would require five years or more of increased boat traffic in the bay, whereas removing the dredged material by truck and by rail would increase road and rail traffic for a much shorter period of time.

Additionally, the risks of climate change pose more threats to a CAD than to off-site disposal. Climate change will bring more frequent and intense rainstorms, and thus flooding, to New Jersey. In the estuary, this flooding will increase water pollution from runoff and combined sewer overflows. Coastal storms and hurricanes may cause severe damage to the coastline, as well as destroying wetlands, which provide protection for the estuary and bay (NY-NJ HEP 2012). These disruptions to the Newark Bay ecosystem increase the risk for malfunctioning of the CAD.

Other CAD Sites

While it is important to examine the successes and failures of other CADs, it is also important to note that the Passaic CAD cannot be compared to other CADs in terms of size and contaminant concentration. The 80-acre footprint of the Passaic CAD is twice as large as the Puget Sound CAD and almost ten times as large as the New Bedford Harbor CAD. Additionally, the concentration of contaminants and the volume of dredged material for the Passaic Superfund site are both higher than at most other CAD sites. The Puget Sound CAD contains sediments with much lower contaminant concentrations

than in the Passaic, and in New Bedford, only the least contaminated sediment was accepted for the CAD (Passaic River Federal Trustees 2014).

The Passaic River Proposed Plan cites the New Bedford Harbor in Massachusetts as a CAD that has been "constructed and maintained in a protective manner" (EPA 2014b, p. 39), yet there are no available data thus far to prove that the CAD is protective. Furthermore, the first CADs at New Bedford Harbor were only completed in 2004 and 2008. These CADs are still relatively new, and sufficient time has not yet passed to determine the ultimate success of these CADs.

One of the points raised at the forum on Confined Aquatic Disposal (CAD) cells at the NJIT Forum was that CAD cells are widely used and have been for quite some years. As reference for this statement, a paper by Palermo and Bosworth (2008) is cited as documenting 29 CAD/CDF facilities that are successful in confining contaminated materials.

The paper by Palermo and Bosworth does indeed list 29 facilities, all of which are described as Confined Disposal Facilities(CDF); the distinction between CAD and CDF is not subtle. A CAD is an in-water facility that has been excavated into clay, rock, etc. and is intended to create little vertical profile above the bottom. A CDF is a shore-side facility, often using berms or existing features as part of the containment. Palermo and Bosworth (2008) state: "A CDF is an engineered structure consisting of dikes or other structures that extend above any adjacent water surface and enclose a disposal area for containment of dredged material, isolating the dredged material from adjacent waters or land."

Table 1 of Palermo and Bosworth (2008) lists 29 structures that include:

- One that is in the planning stages; construction not started
- Ten are inland waterways in freshwater lakes
- Several are upland and not at the shoreline
- The marine or estuarine CDFs are almost all at the shoreline
- Only three seem to be not at the shore or on shore

While the paper makes a strong case for the effectiveness of CDF's, as described in the definition, little information is provided regarding offshore CAD's. No CADs are discussed with the design characteristics of the CAD that would have to be constructed in Newark Bay for disposal of these highly contaminated sediments. In short, the Palermo and Bosworth (2008) paper is not a good source of specific information with which to authorize a massive CAD in Newark Bay.

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CPG Sustainable Remedy Proposal

Background

The Sustainable Remedy proposal put forth by the Passaic Cooperating Parties Group (CPG) addresses hot spots of contamination along the entire 17 miles of the Lower Passaic River. About 25 highly contaminated areas along the river will be targeted and dredged. The Sustainable Remedy is estimated to take about five years, and CPG has projected it will reduce risk from surface sediment by 70-80%. Completion of targeted dredging would be followed by a review of the results and using adaptive management (CPG 2013). While the Sustainable Remedy plan would operate on a much shorter time scale than other proposed remedial options, and may reduce the cost due to the reduced cleanup time, there are a number of major issues with this particular form of remediation. The CPG has not yet released a final document detailing the proposed remedy for public review. Therefore, the following comments are based upon a limited amount of information released by the CPG.

Hot Spot Approach

The Sustainable Remedy approach aims to remove sediment from only the most contaminated areas within the Lower Passaic River. This method will remove only the highest concentrations from the ecosystem (>500 ppt of 2,3,7,8-TCDD), but there will still be contamination left in place that will continue to cycle through the environment and its organisms for years to come. The CPG touts the Sustainable Remedy approach as a holistic approach that addresses both human and environmental health.

Additional Sources of Contamination

The Sustainable Remedy only addresses contaminated sediment in the riverbed, while other areas of contamination are not addressed. For example, the wooden bulking on either side of much of the Lower Passaic is infused with a variety of contaminants. Wood can hold in contaminants such as PCBs for years, all the while slowly releasing contaminants back into the water. Furthermore, the Lower Passaic will also require shoreline restoration. The Sustainable Remedy plan accounts for mudflats and nearshore areas, but it does not account for the extensive shorelines of the Passaic that will require extensive cleanup, as would occur in a bank-to-bank cleanup.

Modeling COPC Concentrations

Like any model, the model for the Sustainable Remedy plan is based upon assumptions. However, without specifics, these assumptions on which the model is based cannot be analyzed to determine if they are faulty. In addition, CPG claims that the model uses more data than that used by EPA to estimate contaminant concentrations in each area of the river (CPG 2013). If CPG has collected additional data outside of that collected/used by EPA, it needs to be made available for review to

evaluate whether it meets data collection criteria and is accurate in order to be used in this model.

Watershed Restoration

The CPG has also noted the necessity for efforts to control ongoing sources of pollution. Source control is undoubtedly important to sustaining the cleanup levels, however, it is not the largest objective relative to CPG's efforts, which should be focused on the best cleanup for the sediments currently contaminated.

Adaptive Management

The Sustainable Remedy proposal relies heavily upon an adaptive management approach for cleaning up river sediment. While adaptive management can be an appropriate option for contaminant remediation, it does not necessarily apply to this particular project. Significant alterations to the Passaic River Proposed Plan would be needed in order for the Passaic cleanup project to achieve its goal of using an adaptive management framework (see also our Adaptive Management comments). Adaptive management operates on the basis that restoration decisions will be modified over time in response to how the ecosystem is responding. In the case of the Passaic, it is already obvious that the condition of the ecosystem will not improve unless all contaminants are removed. Adaptive management will not prove to be useful when the outcomes of the Sustainable Remedy cleanup are already apparent before the process has even begun.

Fisheries Restoration

The Sustainable Remedy includes fisheries restoration as one facet of the project. However, no amount of "fisheries restoration" will make fish from the Lower Passaic safe for human consumption without removing the contaminants. A program that would "remove invasive species that drive this risk, such as carp, and replace them with more desirable native species like striped bass that are less affected by any sediment contamination that would remain after implementation" should not be the focus of CPG's efforts, and requires a massive scale effort beyond that of CPG's capacity. Further, the proposed fish exchange program, where contaminated wild caught fish from the Passaic can be traded in for aquaponics raised striped bass, obscures the necessity for a full and complete cleanup by CPG (see also our Fish Exchange comments).

References

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Adaptive Management

Introduction

Adaptive management is a process in which the management decisions involving the restoration and/or maintenance of an ecological system are modified over time in response to how those decisions affect the system. This type of management is most useful in projects with high uncertainty that make it difficult to select a more traditional management framework. This type of uncertainty is often seen at Superfund sites because of the unknown or uncertain distribution of contaminants, large scale and time frame. These uncertainties could range from the frequency and magnitude of major storm events to the interactions among trophic levels, and ultimately affect the potential success of any remediation project. This situation can be particularly true when managing major cleanup operations, which may rely on the interactions between a number of remediation procedures and technologies.

The proposed plan for the Lower Eight Miles of the Lower Passaic River indicates the intention to use an adaptive management framework with the preferred remedial alternative of Capping with Dredging for Flooding and Navigation. No matter the final remedy, sediment removal, treatment, capping, etc. will require coordinating multiple procedures and could include new methods. This situation is well-suited for use of an adaptive management approach.

Conditions for Using Adaptive Management

According to the Department of the Interior's Adaptive Management Applications Guide (Williams & Brown, 2012), there are five primary conditions that a site should meet to be considered an appropriate candidate for adaptive management. These conditions are:

1. Management action is needed
2. Decisions are based on clear measurable objectives
3. A range of management options exist
4. Monitoring will be conducted and can reduce uncertainty
5. Managers and stakeholders must commit to adaptive management

These conditions are explained below.

First, managers must determine that some type of management action is necessary in spite of substantial uncertainty. The Lower Passaic River meets the threshold whereby, in doing nothing, the risk to human health and the environment is greater than the risk posed by acting on a management plan with uncertain consequences. The high levels of contamination in fish and crab tissues present a significant risk to both human consumers and animals. The contaminants of concern (COCs) in sediments throughout

the river must be addressed despite uncertainty in how the proposed management alternatives will affect the river system.

Second, there must be clear and measurable objectives around which to base management decisions. Without these goals and metrics, it can be difficult to determine if the actions taken are effectively improving the conditions of a site. The Lower Passaic River meets this condition also: in the Proposed Plan, preliminary remediation goals (PRGs) are given for various COCs. These PRGs take into account how sediment concentrations affect fish and crab tissue concentrations, as well as the human cancer risk of consuming different numbers of fish and crab meals per year. These PRGs provide the basis for clear objectives that can be measured via sediment and animal tissue concentrations to present a clear picture of the remediation's effectiveness.

Third, there must be a range of possible management alternatives from which to choose and the flexibility to change management approaches if the initial alternative proves to be less effective than anticipated. New alternatives can also be considered. It is this condition that distinguishes adaptive management from other management frameworks, and the use of adaptive management is counter-indicated if there is not a clear willingness to discontinue ineffectual management alternatives. The Lower Passaic River meets this condition in theory: the focused feasibility study (FFS) and proposed plan provide numerous potential management actions through combining three separate scenarios for managing the dredged materials with four separate remedial alternatives. However, the plan addresses the possibility of remedial actions being modified thusly: "Any remedy modifications will be made and documented in accordance with the CERCLA process, through an Explanation of Significant Differences or an Amendment to the ROD [Record of Decision]" (US EPA, 2014). While this provision technically allows for flexibility, neither an ESD or ROD amendment is appropriate for allowing modifications during the remedial process. The process of formally changing the ROD is not responsive enough to fully enter into the spirit of an adaptive management framework. Language will need to be inserted in the ROD to allow methodological or procedural modifications based on monitoring data or other information.

Fourth, there must be types of monitoring conducted during the remedial process that can reduce the level of uncertainty. The intent of the adaptive management framework is to use knowledge gained during the management action to better inform future decisions and adjustments in management. This modification is impossible without some type of monitoring that can provide information on the response of the site to the remedial actions. The Lower Passaic River does meet this condition: the Proposed Plan indicates that the preferred alternative includes long-term monitoring of COC

concentrations in fish, sediment, and the water column. This information would allow site managers to determine if COC concentrations are behaving as modeled, and when certain goals have been achieved. Water column monitoring allows for modifications of in-water activities to reduce the input of contaminants.

Fifth, there must be an active and sustained commitment by the stakeholders to the principles of adaptive management and the complex role they play in remediating sites. Many large remediation projects require decades to complete, and the stakeholders must be able and willing to invest time and resources over the full course of the project. The Lower Passaic River meets this condition: there are a number of community advocacy groups, a coalition of parties responsible for the cleanup, and extensive involvement of both state and federal environmental regulators to ensure the adaptive management framework is used over the life of the remediation project.

Because the Lower Passaic River meets these five conditions, adaptive management is an appropriate management framework within which to carry out remediation of the river. This conclusion is particularly true due to the proposed use of dredging in the remedial alternatives. According to the National Research Council (2007), the size, long time-frame, and complexity of Superfund dredging projects demand the flexibility that adaptive management can offer. However, the typical Superfund process, in which a single remedial alternative is selected from those identified in the feasibility study and rarely modified significantly, remains largely incompatible with the spirit of adaptive management. In order for the Lower Passaic River remediation project to achieve its stated goal of using an adaptive management framework, significant alterations to the proposed plan are needed. The Hudson River PCB remediation offers a simple example of modifications in the operational changes to reduce airborne PCBs and to increase the rate of sediment removal to shorten the project duration.

<u>Using Adaptive Management in the Lower Passaic River Remediation</u>

Adaptive management is typically depicted as a cyclical process consisting of six primary steps in which monitoring provides the feedback necessary to initiate each iteration of the cycle (NRC, 2005). The six steps are presented below with comments on how well the Lower Passaic River Proposed Plan integrates each step.

Step 1: Assessing the Problem

The first step in adaptive management is to assess the problem. This includes establishing measurable goals and the metrics to measure progress towards those goals, as well as assessing any predictive models or forecasts to anticipate site-response to remedial actions (NRC, 2007). Within the Superfund process, this may begin in the early stages during the preliminary assessment (PA) and site investigation

(SI), but is primarily accomplished during the remedial investigation (RI) and feasibility study (FS). On the Lower Passaic River, field investigations and monitoring have been conducted since the 1990s, and conceptual modeling has been used to predict how COCs may move through the river system in each of the remedial alternatives. Management goals have also been set via the remedial area objectives and PRGs. However, not all of the necessary information has been collected to consider the problem fully assessed. The Proposed Plan admits the need for a fish migration study to help minimize the impact of remedial actions on migratory fish. In order for this step to be complete, all relevant information should be collected prior to finalizing a plan for remediation.

Step 2: Designing a Management Plan

The second step in adaptive management is to design a management plan. This step includes comparing and selecting remedial actions. This includes selecting indicator values which may trigger changes in the selected remediation plan. The remedial alternatives are compared based on likelihood of meeting management goals, cost, short- and long-term effectiveness, implementability, community acceptance, and other factors (US EPA, 2014). Adaptive management plans from this step can be either passive or active. In active adaptive management, multiple competing remedial alternatives are implemented in order to compare their actual effects on the resources being managed (NRC, 2005). This type of experimental design ideally leads to a better understanding of the impacts of the various alternatives, but is typically impractical for remediation projects of the size and scope of most Superfund projects. Passive adaptive management is more typical of the Superfund process, and involves selecting a single remedial alternative that is determined to be the most appropriate for the site.

Once a remedial alternative has been selected, it is important to determine what indicator values should trigger a change in the management action. In other words, if the preferred alternative does not perform as anticipated, there should be a clear and specific plan for modifying the management plan or using one of the other identified alternatives.

In the Proposed Plan for the Lower Passaic River, the various remedial alternatives from the FFS have been compared and evaluated, and the preferred alternative has been selected. Although this process is appropriate within a passive adaptive management framework, there must be some discussion of what criteria must be met for the preferred alternative to be modified or dismissed. Unfortunately, the proposed plan does not address this vital component of the adaptive management process other than to state that remedy modifications will be handled in standard CERCLA fashion via

a change to the ROD. This general statement is entirely too vague to qualify as a good-faith effort in applying adaptive management to the site.

The preferred alternative involves dredging a 300-foot wide navigational channel out of the contaminated sediment, dredging to a 2.5 foot depth outside of the navigational channel, disposing of that sediment off-site, and covering the remainder of the contaminated sediment with an engineered cap. This alternative would require monitoring and maintenance of the cap in perpetuity to ensure that it is containing the contamination, and relies on the compliance of the general public with directives to protect the cap, such as not anchoring boats on the cap material. In addition, navigational channels must be periodically dredged to remain serviceable, and it is difficult to imagine a scenario in which the navigational channel is dredged without disturbing the cap. However, no provision is made in the proposed plan for the failure of the cap to contain the contamination, and there are no criteria listed that would trigger a significant modification to this management plan. Without this information, the Proposed Plan cannot be considered to be fully engaged in the principle of adaptive management.

Step 3: Implementing the Plan

The third step in the adaptive management process is simply to implement the plan as designed in Step 2. This includes making modifications to the plan according to the specific criteria agreed upon prior to implementation, with appropriate documentation and engagement with the stakeholders. Although the Lower Passaic River has not yet begun this step in the process, there may be difficulties during this process due to the issues outlined above.

Step 4: Monitoring

The fourth step in adaptive management is to monitor for quantifiable data that will indicate if the plan is being effective at achieving the remedial objectives. This monitoring should be designed in such a way as to assess whether the actions taken at the site were in compliance with the plan, whether the plan is meeting the remedial objectives, and whether the conceptual site model is using the correct parameters and relationships between variables. In the Lower Passaic River proposed plan, the primary monitoring parameters are COC concentrations in the water column, sediment, and fish and crab tissue. These are sufficient to determine progress towards the remedial objectives and to compare to the model, but it is unclear if they can be used to determine the level of compliance with the management plan without a more detailed plan.

Step 5: Evaluating Results Obtained from Monitoring
Once monitoring data have been collected, those results are compared to the models from Step 1 of the management process. The difference between the modeled outcomes and the results of the monitoring can provide greater insight into the dynamics of a complex system and reduce the level of uncertainty in making management decisions. This step is key in the utility of the adaptive management framework because it allows new information to create a better understanding of the remediation site and refine management decisions. Unfortunately, the Superfund process is not designed to provide an expedient and agile method of evaluating and responding to new information. The five-year review process can be used as a platform for performing this type of evaluation, but more informal, short-term evaluations may be more effective at identifying potential problems or faulty information in the models. The Lower Passaic River proposed plan does not identify how often or by what indicators monitoring data will be evaluated against conceptual or quantitative models. Without this information, it is unclear how an adaptive management strategy will be employed for this site.

Step 6: Adjusting the Management Plan in Response to the Monitoring Results
Once the new monitoring data has been evaluated and integrated into the site model, adjustments must be made to the management plan to account for any significant improvements in understanding. This involves updating models to reflect the new information, reviewing the remedial objectives to determine if they are still reasonable, and updating any management actions as appropriate. Under the current Superfund process, this would be accomplished during the five-year review. However, the Lower Passaic proposed plan does not give a thorough explanation of how the management plan can be modified without modifying the ROD. The process of updating remedies through modification of the ROD can be lengthy and does not reflect the intended goal of adaptive management, which is to provide a flexible framework for coping with uncertainty.

Once Step 6 is complete, the cycle continues back to Step 1 for another round of problem assessment. This allows the stakeholders to determine if the new information gathered in the previous cycle has illuminated additional aspects of the remediation site, or altered the understanding of a previous problem. With each iteration of the adaptive management cycle, uncertainty is reduced and management actions are refined to better target the problem. With its large scale and high levels of complexity and uncertainty, the Lower Passaic River is an excellent candidate for adaptive management. However, the current proposed plan advocates for an adaptive management approach without fully engaging in each step of the process. Without a very clear strategy for how management actions may be modified, including

contingencies for the possible failure of the preferred alternative, the proposed plan is simply an attempt at management, not adaptive management.

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Fish Exchange

Introduction

The Lower Passaic River Focused Feasibility Study Area consists of eight miles of the Passaic River and is part of the Diamond Alkali Superfund Site in northeastern New Jersey. Contamination of the Passaic River goes back over 150 years, and chemicals of concern include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), dioxins, pesticides, mercury, lead and other metals. Many of these contaminants are capable of biomagnification in the river's ecosystem, and humans who eat fish or seafood from the river are at risk of consuming dangerous levels of these chemicals (EPA 2014).

Of the various responsible parties that have contributed to the contamination over the years, there are almost 70 companies that are being held financially responsible for cleaning up the Lower Passaic, collectively known as the Lower Passaic River Study Area Cooperating Parties Group (CPG). The CPG has proposed that the best method for reducing the human exposures to the contaminants in the river is to institute an exchange program in which anglers fishing the river could exchange their contaminated catch for uncontaminated fish raised in aquaculture facilities nearby. Although this method was largely dismissed by both community activists and officials (Fallon 2013), and was not included in the Environmental Protection Agency's (EPA) Proposed Plan (2014), the CPG's continued insistence upon its consideration justifies further exploration into the concept and its potential applications for the Lower Passaic.

Fish Exchange Concept

The CPG has proposed a one-year pilot program to install and operate an aquaponics system within the City of Newark, administered by faculty from Rutgers University and operated by otherwise unemployed veterans. In this system, hybrid striped bass would be raised in indoor tanks and their waste products recycled to provide nitrate-rich water for vegetable gardens. The plants would then filter the water so it could be returned to the fish tanks and start the cycle over. This would provide a source of fresh fish and vegetables to local communities, provide job training for veterans, and could potentially serve as an educational opportunity for local school children (CPG 2013 and Jaffe 2014).

However, the primary purpose of this pilot program is to explore the possibility of mitigating human exposures to the Passaic River's contaminants by allowing anglers to exchange fish caught in the polluted river for those raised in the aquaponics system. Because consumption of contaminated fish and crabs is the primary source of human exposure to contaminants, the CPG contends that such an exchange program would more quickly and effectively reduce human exposures than a complete river remediation

project. Unfortunately, there is very limited information available on this type of program ever being used at a contaminated site, and it is extremely difficult to assess its potential for success in reducing human exposures. However, in reviewing the information provided by the CPG about the plan, a number of potential challenges become apparent.

Potential Challenges

The CPG's aquaponics experiment is intended to be a one-year pilot program rather than a full-scale launch, and so the omission of some details on how a fully-funded program would operate is to be expected. However, there are several concerns that are not being addressed in the design of the pilot program. These have the potential to be significant obstacles not only to the success of a full implementation of the exchange program, but to the success of the pilot program as well.

The first step in implementing a new community program is to determine if there is demand for such a program in the community. The CPG does not present the results of any surveys to determine if anglers would be interested in exchanging fish they worked to catch for farmed fish. The plan neither addresses the languages that signage and educational materials would be published in, nor does it indicate what metrics would be used to determine if the community is actively using the exchange program, or how significantly human exposure is being reduced.

If it can be determined that the community would be interested in the fish exchange program, the next step would be to assess the extent of the demand and what facilities are needed to supply enough fish for the exchanges. The CPG originally submitted a request for a zoning variance that would allow them to build the aquaponics facility at Metropolitan Baptist Church in Newark, but later withdrew the application, commenting that the building would have required too much renovation. It is currently unclear what alternative facility the CPG is considering (Fallon 2014). The CPG does not indicate how many fish will be produced by their project in comparison to how many fish are routinely caught and eaten by local fishermen. Although this is a pilot program, there should be a sense of how many aquaponics facilities would be needed for a full implementation of this plan.

Another concern is that only one variety of fish—a striped bass hybrid—is to be produced by the aquaponics pilot project (CPG 2013). This is a concern because it is unlikely that everyone in the local community will prefer eating this hybrid fish over the other options available in the Passaic River. The CPG's own research indicates that at least 25 percent of the fish consumed out of the Passaic River are carp (Fallon 2013), and media interviews with locals indicate that many people in the area target the

Passaic's crabs, despite a ban on crabbing in the river (Fallon 2013). If contaminated fish and crabs are consumed because they are preferred to the one species of fish on offer for exchange, there is no reduction of human exposure and the project will fail to meet its goals.

Another challenge that the CPG's plan fails to address is the simple logistics of such an ambitious exchange program. In order for the program to be utilized, it must not be cumbersome for local fishermen to exchange their catches for uncontaminated fish. It is not feasible to require low-income fishermen, who may or may not have reliable transportation, to haul their entire catch to a single central point for exchange. The alternative is to set up a number of exchange points convenient to the Passaic River where fishermen can exchange their contaminated catches without significant travel. However, fishing and crabbing are both activities that often occur outside normal business hours, and such exchange points would need to be staffed throughout the day, seven days per week to be genuinely effective.

Conclusion

The CPG's fish exchange pilot program does not adequately reduce human exposures to the toxic chemicals in the Passaic River. Any success from the program is largely dependent on how the program is implemented and what other measures are taken to remediate contamination in the river system. The CPG's position that the fish exchange program would reduce human exposures more quickly and effectively than a complete remediation of the river is not supported by any scientific literature, surveys, or previous experiences at other contaminated sites. The pilot project may provide some information on the potential of such a program, but should not be included as part of any formal remediation plan as its value is questionable and wholly unquantified.

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Bioremediation

Background

Bioremediation uses living organisms to remove or neutralize contaminants in soil, sediment or water, including groundwater, and may be applied *in situ* or *ex situ*. *In situ* treatment involves addressing the contaminated material on-site, while *ex situ* treatment is the removal of the contaminated material for treatment elsewhere. Bioremediation can involve plants, composting, fungi, bacteria cultures, and various other methods of using living organisms. The use of plants to remove contaminants is known as phytoremediation. In the case of the contaminated sediments in the Passaic River, the challenges include chlorinated organics (PCBs, dioxins) and metals at a depth of at least 15 feet and the contamination layer may extend another 15 feet or more. The Passaic River is estuarine with a tidal range of about 6 feet; 8 miles of river bottom are proposed for remediation in the current phase, with another 8 miles upriver needing remediation eventually. Treating this volume and mass of contaminated material in place is a logistical and biological challenge that has not been accomplished or even attempted previously, to our knowledge.

Bioremediation of groundwater using bacterial metabolism is a standard practice in environmental remediation. The basic process works well on such contaminants as TCE, PCE, benzene and a variety of organic solvents. A sample of the contaminated groundwater is cultured in the lab to isolate and identify the bacteria that are present and able to break down the chemical(s). Next, the best nutritional substrate is identified to allow bacterial growth in field conditions, allowing the bacteria to flourish and metabolize the contaminants. Nutrient materials (e.g. glucose, lactose, molasses) are injected into the groundwater and the contaminant levels monitored.

Bioremediation Using Bacteria

One of the premier bioremediation companies currently at work is BioTech Restorations[1], a North Carolina-based company that has extensive work experience on the east coast. BioTech specializes in the cleanup of organic contaminants such as PCBs, dioxins, DDT and toxaphane. BioTech provides remedial solutions specifically formulated for the soil matrix at each site and its unique chemistry. To remediate a site, BioTech uses what they call a “Factor,” a simple protein that treats indigenous bacteria in contaminated soil. The Factor helps the bacteria to secrete enzymes that break down the contaminants. When applied to soil, the Factor is applied using common farming equipment, and then the soil is turned and irrigated with water every several days. Over a period of several weeks, contaminant levels can be reduced by 90%. Some of

[1] Disclaimer: Environmental Stewardship Concepts, LLC worked with BioTech Restorations on the first draft of the QAPP for the Housatonic River cleanup. ESC completed the project in May 2014 and is no longer under contract to BioTech Restorations.

BioTech's most well known remediation projects include the former New England Log Homes factory site in Great Barrington, Massachusetts and the Hercules Chemical Plant in Brunswick, Georgia (BioTech Restorations).

Although the Log Homes factory site is different from the Passaic in that the contaminants of concern at the Log Homes site were mainly dioxins and it was not a river site, the Log Homes site can be used as a comparison for possible bioremediation options for the Passaic. Geographically, the Log Homes site and the Passaic Superfund site are in similar areas of the northeast that experience essentially the same weather patterns. These weather patterns dictate a particular work schedule for soil remediation, and the schedule used at the Log Homes site in Great Barrington could also apply to ex situ remediation of sediments from the Passaic River. In addition, the Log Homes factory site is along the banks of the Housatonic River. While the Housatonic is not a tidal river like the Passaic, the two sites do share some biologic and geologic factors that make the soil matrices similar.

Despite successful bioremediation projects at terrestrial sites, it is important to note that bioremediation of soil has not yet been applied *in situ* to a riverbed. Thus, any bioremediation plans for the Passaic must take into account the tidal nature of the Passaic River as well as the difference between riverine/estuarine and terrestrial sediments.

In Situ Bioremediation

While the *in situ* bioremediation pilot study for the Passaic proposed by Dr. John Pardue, Maxus Energy, and Tierra Solutions could cut down remediation costs by eliminating the need for dredging, a number of challenges remain. The main issue is that *in situ* remediation in an estuarine river has not yet been performed, and there are no available data on which to base any assumptions for the study. Furthermore, the theories behind the pilot study are based on Dr. Pardue's bioremediation work with groundwater, which is quite different from the freshwater and brackish water of the Passaic. Although *in situ* bioremediation could very well be successful in the Passaic River, the present risks associated with this particular method seem to outweigh the possible benefits.

Several major implementation challenges need to be addressed:

1- Identification, isolation and culture of a bacterial strain that will dechlorinate dioxins and PCBs.
2- Delivery of the bacteria or nutrients to stimulate bacterial growth
3- Increasing the rate of breakdown of dioxins and PCBs to a level sufficiently high to remediate a site.

A bacterial strain that can dechlorinate PCBs has been identified and cultured by Dr. Bedard at Rensselaer Polytechnic Institute in NY (Bedard 2007), but this bacterial strain has never been applied in field conditions. The problem that Bedard indicated was that the bacterium is an obligate anaerobe and the lowest level of oxygen will poison the culture and eliminate any breakdown action.

Phytoremediation

Bioremediation research has shown that wetland plants can be successful at removing contaminants from wetland soils. Certain plants can remove stored elements from sediment pools and release them in an atmospheric form through tissue leaching and litter fall (Czako 2006). The marsh grass *Spartina* (*Spartina alterniflora*) is likely able to uptake PCBs and other contaminants from contaminated sediment (Mrozek 1982). *Spartina* is a hardy, fast-growing grass that can thrive in most wetland habitats. Studies have shown that *Spartina* does have the ability to take up, translocate and accumulate PCBs from contaminated sediments (Mrozek 1982). However, there is not yet enough published research to consider the use of *Spartina*, or any other single wetland plant for that matter, as a standalone remediation option. Phytoremediation could be one viable option when used in conjunction with other more drastic remediation options, such as ex situ soil remediation.

Future Direction

While bioremediation is still an emerging technology, there are already several success stories from around the country. The contaminated sediments in the Passaic River could benefit from certain bioremediation methods, although it is important to consider options outside of bioremediation as well. At present, the most applicable option for remediating the sediments of the Passaic seems to be the methods pioneered by the team at BioTech Restorations. Their work on dioxin remediation at the Log Homes factory site, while not a perfect model, could be used to help design a bioremediation plan for sediments in the Passaic River. Sediments dredged from the river would be moved to a terrestrial location, treated to remove the dioxins and PCBs, and then once cleaned, made available for beneficial use

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General Site Observations and Proposed Plan Comments

Site Observations

Because of the proximity of residential areas to the Passaic, ESC expects that the community will want to insist that EPA implement a monitoring program during the remediation. A good example would be a monitoring program at least as rigorous as the one on the upper Hudson River PCB removal action under CERCLA that addresses both environmental conditions and quality-of-life measures. Environmental measures address both air and water quality, whereas quality-of-life measures on the upper Hudson include noise, odor, river traffic and light.

Shoreline restoration may be assumed or expected in several remediation options, but in truth, shoreline restoration/remediation needs to be made a part of any remediation plan for the Passaic River. Either by foot or by boat, a tour of the river front will reveal that the fine sediments, which are the organic matrix that binds PCBs and other toxic organic chemicals, deposit on the shoreline and have built up a layer of sediment that is likely contaminated.

In addition to the shoreline remediation, the shore zone, including the mid and upper intertidal zone, will have to be restored following sediment removal and replacement. The restoration needs to consider both structural demands of the shore zone, i.e. keeping structures in place, erosion control and prevention etc., but also providing habitat and substrate for biota that reside there now or that will be expected to re-establish following remediation. The restoration effort will also require re-vegetation in areas that are not altered by human activities in such a way as to prevent or control vegetation. An examination of the shore of the Passaic reveals that marsh grass (*Spartina alterniflora*) and wood shrubs currently inhabit the shore and will have to be replaced.

An examination of the lower Passaic also reveals numerous and extensive bulkheading and old pilings of wood that will certainly have absorbed toxic chemicals and that now need to be removed as part of the remedial activities. These wooden structures have been sinks for the deposition of chemicals and represent sources of chemicals that are and will continue to re-contaminate the Passaic. If not removed, these wooden structures will undermine the success of any remediation plan.

Appendix A demonstrates the possible dewatering sites available that are large enough for use along the Passaic River and Newark Bay.

Proposed Plan Comments

The contaminants of concern (COCs) at the site include dioxins/furans, PCBs, mercury, DDT, copper, Dieldrin, polyaromatic hydrocarbons, and lead. The capping will only consist of two feet of sand and are not substantial enough for storm events and will present challenges in maintaining the navigational channel in the 2.2 miles closest to Newark Bay. Additionally, capping must account for the issues the tide presents in that there is flow from both directions and a changing salt wedge where heavy rains will present a greater freshwater influx.

The Plan proposes dredging 4.3 million cubic yards for the purposes of re-grading the sediment surface before capping, but not in the context of testing sediment and dredging until clean. The intent of the dredging may be different, however, the act of dredging is not and dredge-until-clean is the most effective and permanent cleanup available. Even that which is dredged for the purposes of flooding prevention could be treated by in-situ methods rather than transported off-site to incinerators and landfills

EPA has considered treatment as a component of dredged material management but believes that additional treatment of all the sediment in the Focused Feasibility Study Area is not practicable. They believe it would not be cost effective given the high volume of sediment and the number of COCs that would need to be addressed. However, the current chosen remedy will require that institutional controls remain in place in the form of fish and crab consumption advisories until such time as concentrations drop and NJDEP can “relax” the advisories, but may never be able to remove them entirely. The chosen remedy requires costly long-term monitoring and maintenance of the engineered cap and costly long-term monitoring of fish and sediment. The long-term costs of the current remedy are high, both financially and with regards to ecological and human health. A more permanent cleanup that involves more dredging and in-situ treatment will cut out long-term costs, both financially and with regards to ecological and human health.

Appendix A

Figure 1 details three possible options for sediment dewatering sites on the Passaic River. Photos taken in the field were georeferenced with Google Earth imagery to create Figure 1. A photo of each site is also attached for review (Figures 2-4).

The sites are as follows:
Figure 2. Site 1 –Possible previous sediment/fill Lot near Piles Creek & South of Newark Bay
Figure 3. Site 2 – Vacant Lot off Distribution Avenue located on Kearny Point
Figure 4. Site 3 – Vacant/construction lot near abandoned building and off Lister Ave.

Figure 1. Possible options for sediment dewatering sites

Figure 2. Site 1: Possible previous sediment/fill Lot near Piles Creek & South of Newark Bay

Figure 3. Site 2: Vacant Lot off Distribution Avenue located on Kearny Point

Figure 4. Site 3: Vacant/construction lot near abandoned building and off Lister Ave

Yeh, Alice

From: Debbie Mans <debbie@nynjbaykeeper.org>
Sent: Wednesday, August 20, 2014 5:09 PM
To: Region2 PassaicLower8MileComments
Cc: Yeh, Alice; Enck, Judith; Kluesner, Dave; Basso, Ray; Ana Baptista; doug@forumfg.com; Molly Greenberg; Sandra Meola; Plevin, Lisa
Subject: Re: CAG Comments on Proposed Plan
Attachments: Passaic CAG Final Comments 8 20 14.pdf

All
Just to confirm the previously attached document was the final set of comments from the CAG, despite being labeled "draft." Reformatted version in PDF attached. Thanks, Debbie
ps. I could not get the DR watermark to come off...

_____
Debbie Mans, Executive Director & Baykeeper
NY/NJ Baykeeper
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On Wed, Aug 20, 2014 at 2:27 PM, Debbie Mans <debbie@nynjbaykeeper.org> wrote:

> Dear Administrator Enck, Alice, Dave, Ray, and Lisa:
> Attached please find the comments of the CAG on the proposed plan to cleanup the lower 8 miles of the Passaic River. Thank you, Debbie and Ana
>
> _____
> Debbie Mans, Executive Director & Baykeeper
> NY/NJ Baykeeper
> 52 W. Front St.
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Judith A. Enck, Regional Administrator
US Environmental Protection Agency
290 Broadway
NY, NY

August 20, 2014

Dear Administrator Enck,

We are writing on behalf of the Passaic River Community Advisory Group for the Lower Passaic River Restoration Project. Since our formation in 2009, we have carefully studied the technical approaches, concerns and issues related to the clean up of the Passaic River broadly. Our group has representation from and engaged with a broad cross section of stakeholders that care about the future of this river. We have also benefited from past and current technical assistance grants and technical assistance support contracts to examine critical areas of technical expertise. Throughout this process, we have remained committed to our core values we developed as group and have stayed focus on a full review of all the possible avenues to achieve a clean and healthy river.

In 2010, The CAG identified a series of community values that provide a detailed understanding of the breadth of concerns of the many communities along the Passaic River and the great importance that a restored Passaic can play in our lives. These values are included as part of our comments on the Proposed Plan. While all are important for EPA to consider in making and implementing the final decision, we repeat here the specific values on Environmental Protection and Restoration, which are perhaps most directly relevant to the decision at hand:

- Make all decisions in light of a long-term goal to eventually return the river to a fishable, swimmable condition
- Restore the Passaic to a living river and a viable natural resource, with coordinated short and long-term efforts to conduct wetlands, habitat, and wildlife restoration
- Place a high priority on locating natural resource restoration activities in the local communities that have been directly affected by the long-term pollution of the river
- Protect against cross contamination to air, groundwater, and other environmental media
- Clean sediments to a level that supports the above conditions and limits the potential for recontamination.

While we believe that any remedy short of complete removal of contamination will fall short of these values, we do understand the tradeoffs necessary to implement a project of this scope. There are significant concerns about future interaction with a cap from economic, recreation, and riverfront development perspectives. We generally believe that many of these concerns can be overcome, but only with EPA's commitment to continue to work with all communities along the River to ensure that the cleaned River connects people to the water, provides environmental diversity, and supports the wide range of benefits that communities can expect from a healthy waterway.

It is important to note that not everyone in the community believes that the challenges and uncertainties associated with capping are acceptable, including several members of the CAG. The concerns of dissenting CAG members are articulated in the comments of the New Jersey Sierra Club and Harvey Morginstin of the Passaic River Boat Club which were sent to EPA under separate cover, and which the CAG recognizes as a minority opinion within our membership.

The attached comments and concerns reflect the general consensus of opinions across all the CAG members at this time based on careful deliberation and review. These questions focus on the potential impacts to the community, and other issues of community concern. We understand that many of the issues most important to the community will be decided during the design phase. EPA has committed to the community to continue its robust community involvement program through that phase of the project and we look forward to that ongoing interaction.

With the full understanding of the many concerns and recommendations detailed in the attached comments, The CAG generally supports the US EPA's proposed cleanup plan for the lower eight miles of the Passaic River. This proposal calls for Alternative #3 which includes bank-to-bank dredging to remove 4.3 million cubic yards of sediment, followed by the installation of an engineered cap and off-site disposal of the dredged materials in a certified landfill.

Sincerely,

Ana Baptista, Co-Chair Debbie Mans, Co-Chair

Comments and Questions in Response to the Proposed Plan for the Lower Eight Miles of the Lower Passaic River Superfund Site

Passaic River Superfund Site Community Advisory Group August 2014

The CAG generally supports the US EPA's proposed cleanup plan for the lower eight miles of the Passaic River. This proposal calls for Alternative #3 which includes bank-to-bank dredging to remove 4.3 million cubic yards of sediment, followed by the installation of an engineered cap and off-site disposal of the dredged materials in a certified landfill.

In 2010, The CAG identified a series of community values that provide a detailed understanding of the breadth of concerns of the many communities along the Passaic River and the great importance that a restored Passaic can play in our lives. These values are a key component of the CAG's overall guidance to EPA and are included in this submittal.

While we believe that any remedy short of complete removal of contamination will fall short of these values, we do understand the tradeoffs necessary to implement a project of this scope. There are significant concerns about future interactions with a cap from economic, recreation, and riverfront development perspectives. We believe that many of these concerns can be overcome, but only with EPA's commitment to continue to work with all communities along the River to ensure that the cleaned River connects people to the water, provides environmental diversity, and supports the wide range of benefits that communities can expect from a healthy waterway as are articulated in the Community Values.

The attached comments and concerns reflect the general consensus of opinions across the CAG members at this time based on careful deliberation and review. The comments and areas of community concern are organized according to key topics in the decision itself. The CAG understands that many of the issues most important to the community will be decided during the design phase. EPA has committed to the community to continue its robust community involvement program through that phase of the project and we look forward to that ongoing interaction. There are many community concerns outlined below that the CAG will hope to discuss and address throughout the design and into remedial action phases. The CAG looks forward to regular reporting and the opportunity to provide community input as appropriate, and in sufficient time to help influence the final decisions on the key community concerns articulated below.

DR

CAD and CDF Disposal

The CAG supports off-site disposal of contaminated sediments and does not wish to see a CAD cell in Newark Bay or the development of new on site or near site thermal treatment facilities. The CAG does not believe there is a sufficient history of reliable data about the effectiveness of CAD cells, and does not wish to see any remedy that further contributes to the cumulative environmental harm in the greater Newark area. FFS Appendix F discusses a confined disposal facility (CDF) alternative (p. 3-26). A CDF is an enclosed disposal facility; in this case, dredged sediments would be placed in an enclosed area along a shoreline and would be used to create new dry land.

- The CAG would like to know whether the EPA may still decide to build a CDF at this site. The CAG would oppose the development of such a CDF.

Navigation Channel

The CAG supports the navigational dredging of the river to the largest extent possible. What happens to the navigational channel will affect the potential use of the river in perpetuity, thus it is important to the cities of Newark, Harrison, and Kearny to consider the economic impacts. The limited dredging of only 2.2 miles is a relatively short stretch of the commercial portion of the River. The City of Newark who sits as a representative on the CAG has expressed support for a more extensive dredging of the navigational channel throughout the entire lower eight miles to support future anticipate industrial and commercial riverfront development in the northern reaches of the waterfront. Additionally you should consider the following:

- EPA must produce a thorough and accurate economic analysis to support the extent of the dredging upriver and this data should be presented and explained to local communities.
- EPA needs to plan for and explain how maintenance dredging will be performed for the navigational channel with the cap in place and how the coordination and hand-off of responsibilities will work between EPA, CPG, and the Army Corps.
- Does EPA expect these new dredged materials to be clean? EPA must plan for contingencies for removing contaminated material during dredging.

Reasonably Anticipated Future Use And Natural Resource Restoration

The CAG strongly recommends that the issue of natural resource restoration and future uses be taken into account during the design phase of the cleanup. All possible coordination should be conducted to ensure that future restoration projects are not precluded unnecessarily due to cap design and placement. Future development along the river, including waterfront parks, is a critical component in community and river recovery. Reasonably anticipated future use of the river was not covered extensively by EPA and should be a key issue in all future activities. The design needs to take into account reasonable future uses and provide the flexibility for local communities to design and build reasonable waterfront facilities that one would expect on a healthy and vibrant waterway.

- EPA needs to explain and plan for the integration of restoration (including USACOE work) to ensure that possible future projects are not prevented by the cap and associated institutional controls.

- EPA must consider current and potential future public access (docks, boat ramps, lifts, moorings, etc.) into remedial design.
- A restored river means more desire for use and access. EPA must plan for how the cap can be reasonably modified, moved or penetrated for expected and reasonable future uses on the waterfront, and the processes that local governments and landowners would need to perform to ensure the safety and the integrity of the cap.
- EPA needs to plan for and explain how the remedy deals with the soft edges/littoral zone of the river.
- EPA needs to plan for and explain how dilapidated bulkheads will be treated during the bank-to-bank dredging.
- EPA needs to plan for and explain the specific measures that must be taken in shallow areas to prevent erosion from wind, waves, prop wash and other forces.

Long-Term Monitoring and Maintenance

As EPA is leaving the majority of contamination in place, the long-term maintenance of the cap ultimately determines the actual effectiveness of the remedy. The 30 year monitoring period assumed in the FFS is wholly insufficient given that this remedy must work in perpetuity.

- EPA should prepare a much more robust analysis and plan with regard to how they will ensure the cap will remain protective and effective in perpetuity, including the financial, legal, and practical requirements and responsibilities for carrying out all monitoring and maintenance.
- EPA should prepare a cost estimate for the proposed cleanup that uses a monitoring and maintenance period much longer than 30 years, as well as a "no discounting" scenario, to more accurately reflect the length of time that monitoring and maintenance will be needed. Such a cost estimate is consistent with EPA guidance and would allow a more accurate comparison with the site's other cleanup options.
- EPA should prepare a detailed plan and process for long-term coordination with local governments, boat clubs, and other relevant parties to make sure people have the information they need to plan for new activities over time as the maintenance plan moves ahead.

Use of Local Workforce, Local Procurement

The CAG would like to continue the good record of access to jobs by local workers, and expand access to procurement opportunities to local companies.

- The CAG supports the implementation of an expanded Superfund Jobs training program (Super JTI) during this phase of the cleanup process.
- EPA should encourage to the extent possible local contracting, hiring and procurement during the lower eight miles cleanup project.
- EPA or the CPG should establish a website similar to the Hudsonworks Marketplace (http://www.hudsonworks.net) to encourage local contracting and procurement for the project.

Adaptive Management

The CAG seeks to understand how this term “adaptive management” will be applied in the cleanup process. We understand the any major changes to the remedy will require an amended ROD, however there may be changes significant to the community that do not trigger a ROD amendment, and the CAG would like the opportunity to understand these changes as they are proposed.

- The CAG would like more information on how EPA specifically plans to use adaptive management strategies and who will have decision authority.
- In the coming months, the CAG would like to have a presentation on how EPA incorporated adaptive management techniques during the Hudson River cleanup process.

Bank-To-Bank vs. Hot Spot Removal

The CAG strongly supports a comprehensive approach, not a hot spot removal or Alternative 4 type of option.

Boating

The boating community is important to the current and future life of the River and adjacent communities. Currently, 10 high school rowing teams and 2 adult rowing clubs utilize the River, amounting to upwards of 700 rowers on the River at any given time. Access and ability to use the river in all phases of the cleanup process and as a priority outcome of the clean up itself are important. Significant restrictions on boat use following remediation significantly negate the value of restoring the river.

- It is important that the project coordinate with crew teams and boating clubs on barge schedules to help both ensure safety during routine practice (which can occur up to 7 days a week) and minimize impacts on major boating events, a detailed plan should be developed for this purpose.
- EPA should consider using the fish window as an opportunity for boating clubs to coordinate their more intensive activities.
- Permanent no wake zones would prevent much of the boating that a healthy river should provide and should be avoided to the maximum extent possible.
- Widespread restrictions on anchoring also need to be avoided. Boats need to anchor.
- It is important that the design minimize impacts to rowing shells from the use of armor stone and other possibly harmful materials. Where possible, consideration should be given to increasing the water depths of the River. Input from the boating community should be sought in designing any final smoothing layer. The armor stone can ruin a shell, and significant stone was left at the surface of RM10.9 creating a boating hazard.

Sediment Processing Facility

The CAG would like to know more details regarding plans for the 26- to 40-acre processing facility after cleanup is completed. The siting and operation of this facility will have a major impact on the community. Significant coordination with the target community will be very important to ensure the health and safety of surrounding areas.

- What criteria will be used in siting the facility? It is important that community values and concerns be taken into account.

- Locations with direct rail access to the facility are highly desirous to minimize truck traffic.
- Regarding Table 3-3 in Appendix G of the FFS, community members would like to request that EPA identify the two sites with rail access located less than two miles from the Diamond Alkali plant, and the two sites with rail access located two to five miles from the plant, given that these four sites may be top candidates for the sediment processing facility.
- The CAG would like to request that EPA build a sediment processing facility that is enclosed within a building that is designed to minimize the impacts (such as noise, vibration, dust and odors) on nearby communities and residents.
- The CAG recommends that this facility be completely decommissioned following completion of the project and not accept and process sediments from other cleanup projects. If the facility should be sold or used for another purpose, the community would like to be informed of that intended use.

Flooding, Sedimentation, and Scouring

The CAG wants to ensure that the remedy will not exacerbate future flooding.

- We understand the details of this will be worked out during design and the CAG would like a full report on the considerations and implications of flooding and scouring at the appropriate time. Some of the questions that should be addressed include:
  - What is the projected sedimentation rate over time of the River once the cap is in place?
  - We assume this will be higher for the navigational channel, to what degree?
  - How will ongoing sedimentation contribute to flooding?
  - What are the likely impacts to the cap from significant flooding events?

Off-site Incineration

We understand that RCRA requirements will require some fraction of the dredged material be incinerated prior to disposal. The CAG understand this incineration will be conducted at the off-site disposal facility and no local incineration will be conducted.

- The CAG reiterates its opposition to any local incineration and would ask to be notified immediately should that become a possibility.
- Please provide information to the CAG identifying the contaminants and triggers that will drive the amount of material requiring incineration at the off-site disposal facility.

Bridges

The CAG would like to see all possible efforts made to improve and coordinate the operations and traffic on the 15 affected bridges well before the remedial design is complete. This will require a great deal of time and energy to achieve and much of this is outside of the purview of EPA and the Superfund program.

- The project should evaluate actual traffic and community impacts because of bridge movement, including the actual data from the RM 10.9 removal action.
- EPA needs to carefully assess the repair and maintenance needs of each bridge in being

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able to support the projected openings required of the project and identify cost and time requirements to achieve these repairs. EPA needs to produce a detailed plan as to how these bridge repairs can be conducted and financed in time for the project to begin.

- EPA needs to produce a plan and process to assess fair distribution of cost to additional bridge operations throughout the life of the project, so that local governments are not bearing undo costs to meet project requirements.
- EPA must produce a plan to coordinate bridge openings to keep the overall impacts on traffic as modest as possible, particularly during peak hours.

Impact on River Traffic

The CAG recognizes that significant impact on the river and river traffic during construction is unavoidable, however there are already rumors that the entire river will be shut down for the duration of dredging and capping. This has certainly not be the case for other major sediment projects, and the CAG would like more insight into how these decisions will be made.

- How large a work area is anticipated at any given time?
- Will work be done in channels to allow boats to pass or will it be necessary to close the river bank to bank during any given section?
- Are options other than barging materials being considered?
- How will barge schedules be determined?
- How will the fish window impact construction?

Quality of Life Impacts During Construction

Light, noise, traffic, closing areas of the river and other activities will all cause significant quality of life impacts on local communities during construction. While we recognize these impacts are unavoidable, they can be mitigated through proper planning and interaction with communities ahead of time. The CAG requests that the EPA develop comprehensive Quality of Life Performance Standards such as those implemented at the Hudson River site in coordination with the CAG. The CAG would like to be involved in developing clear guidance and protocols for minimizing impacts during the remediation phase and beyond. The CAG recommends that the EPA and CPG parties consult with the CAG at minimum quarterly prior to the beginning of the clean up and then on a monthly basis during the clean up phase of the project during regular monthly CAG meetings.

- Please explain the plans for mitigating quality of life impacts on local communities and interacting with local communities to provide needed information throughout the project.
- Please provide more clarity on the length and intensity of the construction period as that information becomes available.
- Traffic is a key component of any major project, what will be done to limit truck traffic on area roadways?
- How will sand be delivered to the site, are barge and rail under consideration?

Cleanup of the Phase 2 Removal Location, and Sampling of the Upper 9 Miles

The discussion of this area has been on hold for some time. It is imperative that this area be

completed commensurate with the lower eight mile cleanup.

- The CAG would like to see discussion of this Phase 2 removal area accelerated.
- What are the results of the CPG sampling and modeling of the upper nine miles of the river? How will this work be coordinated with the lower 8 activities? The CAG would like to get a presentation on the status and results of this sampling in the near future.

Dioxin

There is a relatively small amount of dioxin by volume.

- Does dioxin require different disposal?
- Will it be possible to determine the amount of dioxin being removed from given areas of the river?

Additional Design Questions That Will Require Community Input

- Selection of final dredging technology
- Materials used in the cap layers

Communication and Information

This is a highly complex and long-term project. Regular communication will be critical for the community to understand activities, impacts, and progress, and manage interaction with key activities over time.

Community Values in the Cleanup and Restoration of the Passaic River
Passaic River Superfund Site Community Advisory Group 2010

The following values were developed by the Passaic River Community Advisory Group to represent the consensus ideals of the Passaic River community. These values are intended to guide federal agencies and other stakeholders in making sustainable decisions and taking responsible action regarding all aspects of the cleanup, restoration, and stewardship of the Passaic River.

Protection of Public Health

- Design all decisions and activities to protect the health and safety of residents, visitors, and workers

Environmental Protection and Restoration

- Make all decisions in light of a long-term goal to eventually return the river to a fishable, swimmable condition
- Restore the Passaic to a living river and a viable natural resource, with coordinated short and long-term efforts to conduct wetlands, habitat, and wildlife restoration
- Place a high priority on locating natural resource restoration activities in the local communities that have been directly affected by the long-term pollution of the river
- Protect against cross contamination to air, groundwater, and other environmental media

- Clean sediments to a level that supports the above conditions and limits the potential for recontamination

Economic Benefits

- Plan and manage activities in order to protect ongoing commercial uses of the river
- Create living wage jobs for local residents to the maximum extent possible
- Engage local businesses in cleanup, restoration, and long-term stewardship activities to the maximum extent possible
- Incentivize and support environmentally sustainable development of waterfront properties
- Recognize the long-term economic value of creating recreational, park, and open space along the river as part of the cleanup and restoration process
- Strike an appropriate balance between sustainable business and river restoration
- Design all new development and redevelopment with the river in mind, creating connections to the river, presenting a useful and attractive front to the river, and taking into account river views and uses.

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Community Values in the Cleanup and Restoration of the Passaic River (continued)
Passaic River Superfund Site Community Advisory Group 2010

Community Benefits

- Enhance area aesthetics through river beautification and litter removal
- Protect local culture and heritage
- Preserve and memorialize the decisions and information regarding the CAG in order to take into account, reflect, and help to communicate the history of the community and the river
- Enhance and maintain the positive perception of the local community
- Provide positive physical and societal connections between people and the river
- Engage in ecological education for local residents, and particularly for youth
- Recognize the importance of environmental justice in all decisions and activities

Recreational Opportunities

- Develop greenways, parkland, recreational opportunities, open space, and natural areas along and connected to the river
- Create convenient, attractive, sustainable, and safe public access for both passive and active recreation along and on the river, including non-motorized boating

Cleanup Process Effectiveness

- Ensure positive stewardship of the cleanup process by supporting community information, interest, and involvement, and listening to their concerns
- Ensure transparency and effective communication of all cleanup information and openness in information exchange
- Work in partnership with all stakeholders, including the community, to address issues and solve problems
- Expedite and prioritize cleanup decisions and action to realize near-term results for river restoration, access, and use
- Consider the full range of alternatives for cleanup and restoration, maintaining a strong overall focus on the long-term goals for river restoration

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Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, July 31, 2014 4:52 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Gus Margary
gusmargary@hotmail.com
184 Hamilton Pl.
East Windsor
New Jersey
08520

6096476230

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 04, 2014 11:23 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Clark Martin
cwm918@aol.com
918 Roelofs Rd
Yardley
PA
19067

215.493.3865

Yeh, Alice

From: Yeh, Alice
Sent: Thursday, July 17, 2014 10:46 AM
To: Nereid Secretary
Cc: Kluesner, Dave; Sheila O'Shea; Region2 PassaicLower8MileComments
Subject: RE: Questions about rowing impact

Thank you for your inquiry about the Proposed Plan for the lower eight miles of the Lower Passaic River. Since the public comment period is currently open (until August 20, 2014), I am forwarding your e-mail to the official comment box at PassaicLower8MileComments.Region2@epa.gov, so that it can be addressed in the responsiveness summary section of the Record of Decision.

EPA has not yet made a decision on the final cleanup plan. The answers to your questions depend on the nature of that plan. Your questions and others will be discussed during the design phase of the project, which will include extensive consultations with the communities affected by the cleanup.

Alice Yeh
Project Manager
212-637-4427

From: Nereid Secretary [mailto:nereidsec@hotmail.com]
Sent: Wednesday, July 16, 2014 2:23 PM
To: Yeh, Alice
Cc: Kluesner, Dave; Sheila O'Shea
Subject: Questions about rowing impact

Dear Ms Yeh:

I serve on the Nereid Boat Club board as vice president and have been a member of the club since 2006. I am writing at the behest of the board to ask a few informational questions regarding the proposed Lower Passaic Cleanup:

1) Do you anticipate any disruption of on-water activities, such as rowing, above RM 8.3?
2) Would the project entail regular motor boat/barge traffic above RM 8.3? Is it likely that sediment processing stations would be located above RM 8.3? Or that boats would be docked north of RM 8.3?
3) What will be done to contain contaminated water and sediment to prevent its movement with the tide?

In general, Nereid members strongly favor efforts to clean up the river but we would be grateful if you can assure us that rowing can continue unimpeded north of the site without any threat to the safety of the rowers, a large percentage of whom are high school aged or younger.

Many thanks in advance for your reply.

Erin Martin

Nereid Vice President
1 646 552 9566

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 8:34 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Patricia Martin
patricia_kuhl@hotmail.com

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 10:31 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Steve Martin
hirestevemartin@yahoo.com
21 salem dr
whippany
nj
07981

9732061309

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 9:32 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Maria Masucci
Mmas915@aol.com
338 West Passaic Ave
Bloomfield
NJ
07003

973-893-0329

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 8:23 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Dominick Mazzagetti
dmazzagetti@embarqmail.com
4 Kuehn Court
Flemington
New Jersey
08822

908 752-3853

Yeh, Alice

From: Tanya McCabe <tanyagmy@yahoo.com>
Sent: Tuesday, August 12, 2014 12:49 PM
To: Region2 PassaicLower8MileComments
Subject: Alternatives

Surely it's a no brainer, alternate 2, which will bring the river back to recreational use while removing forever the toxins. Anything less would be a waste of everyone's money, namely the polluter. Make this river an advantage for Newark residents and all those in the vacinity.

Tanya McCabe
Blairstown, NJ 07825
908-362-5499

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 3:57 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

John McKeegan
john_mckeegan@hotmail.com
1 Boyne Highlands Court
Skillman
NJ
08558

609-571-8510

KENNETH J. LUCIANIN
Commissioner

THOMAS J. TUCCI
Commissioner

"Protecting Public Health and the Environment"
600 Wilson Avenue
Newark, New Jersey 07105
P (973) 344-1800
www.nj.gov/pvsc

MICHAEL DeFRANCISCI
Executive Director

GREGORY A. TRAMONTOZZI
General Counsel
Acting Clerk

Ms. Alice Yeh
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway
New York, New York 10007-1866

Re: Lower Eight Miles of the Lower Passaic River Remedial Investigation and Focused Feasibility Study

The Passaic Valley Sewerage Commission ("PVSC") respectfully submits the comments below to the United States Environmental Protection Agency ("USEPA") for the Lower Eight Miles of the Lower Passaic River Remedial Investigation and Focused Feasibility Study ("RI/FFS").

PVSC was established by the New Jersey State Legislature in 1902, making it one of the oldest environmental agencies in the United States. PVSC began operation of its Newark Bay Treatment Plant in 1924 as a means to alleviate pollution in the Passaic River and its tributaries. Major expansions, upgrades and renovations throughout the twentieth century have made the PVSC one of the largest wastewater treatment plants in the country. PVSC currently serves more than 1.4 million residents in parts of the 48 municipalities of Bergen, Essex, Hudson, Union and Passaic Counties which comprise the Passaic Valley Sewerage District.

General Comments

The time permitted to submit comments was inadequate for a task of such a complex technical and scientific nature. As stated, PVSC represents more than 1.4 million people who reside in the Passaic Valley Sewerage District – residents who will actually be affected by this proposed cleanup – and is the only public entity other than the regulatory agencies to have regularly participated in the Passaic River Superfund process. PVSC understands the need for the process to move forward. The RI/FFS, however, was over six thousand (6000) pages long. Accordingly, the comment period should have reflected the complexity of the matter.

While USEPA has held a number of public meetings, none of the meetings presented an opportunity for interaction with the actual authors of the technical reports. PVSC requested such a meeting with USEPA in order to ask questions and gain insight and information

from USEPA on the modeling and data interpretation that was not available in the report documents. USEPA declined the request. As a result, PVSC was required to digest the information in the reports without the benefit of assistance by USEPA. It is PVSC's opinion that many of the questions and comments could have been answered through such a meeting. Although PVSC did attend the public meetings held by USEPA, PVSC did not believe it would have been appropriate to dominate such meetings with detailed technical questioning, thus preventing a wider range of public comments from being heard.

PVSC's interest in the RI/FFS and the proposed remedy is not academic. In 2005, the State of New Jersey sued companies involved in the discharge of dioxin to the Lower Passaic River ("LPR"). Those companies promptly initiated a third-party action against approximately 300 third-party defendants, including approximately 70 public entities that lawfully discharge into the waters of northern New Jersey. Nevertheless, participating public entities found themselves paying over $6,000,000 in public funds to settle the suit.

The entities that were the defendants in the State litigation are the same entities that USEPA has designated as primary responsible parties in this matter. Accordingly, the public entities that were third-party defendants in the State litigation can expect to be joined in any federal action. The possibility of the public paying part of the costs of the present cleanup was only briefly mentioned in one public meeting, in response to a question posed by an audience member. This possibility should have been stated clearly and discussed in all of the public meetings. Even if the cost estimates provided by USEPA for its preferred remedy are reasonably accurate, those costs dwarf the settlement value obtained by the State of New Jersey in its litigation. Thus, the anticipated financial burden caused by forced participation in a federal action will have a heavy economic impact on the rate-paying public.

Due to the time constraints of the comment period, PVSC's specific comments address primarily the modeling approaches used by USEPA to make decisions about the preferred remedy. PVSC reserves the right to provide additional comments on any matters contained in the RI/FFS, including, but not limited to, consideration of alternative remedies, proposed disposal alternatives and/or estimated cleanup costs.

Technical Comments

PVSC has reviewed the assessments contained within FFS, with emphasis on the overarching questions: are the technical analyses based on sound principles, do they use well-constructed and tested models, and do they fully utilize available information with a clear expression of uncertainty? PVSC's review addresses primarily those parts of the assessment that deal with: (1) the relative importance of historic versus current pollutant loading as drivers of current and anticipated human health and ecosystem impacts; (2) the spatial heterogeneity and therefore the spatial extent of the proposed remedy; and (3) the relative importance of specific chemical pollutants and pollutant classes in driving current and anticipated human health and ecosystem impacts.

Overall, PVSC finds that the technical analysis supporting the FFS is based on sound scientific and engineering methods. PVSC concurs with USEPA's findings that: (1)

historical loadings of chlorinated dioxins and furans, especially 2,3,7,8-TCDD, are the dominant driver of past, current, and future risks to humans and wildlife in the Passaic River; (2) that current loadings, including CSO discharges, are minimal sources of chemical contaminants to the river relative to the well-documented large historical industrial discharges; and (3) removal of contaminated sediments and subsequent capping is the only practical and effective remedy.

PVSC's determination that the FFS is based on sound methods results from its underlying confidence in the assessment strategy that is based on the well-characterized and peer reviewed CARP contaminant transport model. Engaging many of the same individuals and firms that earlier developed the CARP model for the NY/NJ Harbor system provided a strong foundation to this LPR assessment. PVSC notes that the model was modified and tailored to the Passaic River following comments from an external expert peer review panel. In the FFS, USEPA concludes that the magnitude and spatial extent of preferred remedy is the only alternative remedy considered that will meet the risk reduction goals. Figure 6-3 in Appendix B (III) is a key consideration to this conclusion, and our review focus on those factors that most strongly influence the model results shown in that figure. To gain a better understanding of USEPA's analysis and, therefore, to be in a position to opine as to validity of USEPA's preferred remedy, PVSC asks USEPA to articulate the impact that each of four key issues had in reaching this determination. As detailed below, these are:

1. Parameterization of the sediment resuspension algorithm and its impact on the subsequent results;
2. The approach used to estimate the upstream total suspended solids (TSS) boundary condition;
3. Remedial action forecasts;
4. Long-term contaminant trajectories.

In addition to these key issues, PVSC has additional specific comments, which are detailed in the attached table.

<u>Key Issues Requiring Additional Clarification</u>

1. Resuspension Parameterization

PVSC has a number of concerns with USEPA's approach to resuspension parameterization, as well as with the results. The lower Passaic risk analysis is almost exclusively driven by historically deposited and remobilized chlorinated dioxins/furans and, to a much lesser extent, PCBs. Modeling exchange of solids and chemical contaminants across the sediment-water interface is very likely the single most important component of the contaminant model, driving the evaluation of alternative remedies. PVSC notes that the sediment consolidation model presented in Appendix BII (and Attachment A of that appendix) does not appear to fit the vertical profiles of bulk density and critical shear stress measured in the consolidation cores. Likewise, the critical shear stress

measurements are not consistent with the curve fits. Is the consolidation model (equation 2-17) appropriate to describe vertical variation of sediment bulk density in the LPR?

Consolidation parameters used to model parent bed erosion were modified to improve TSS and infilling predictions during calibration of the sediment transport model. However, Figures 3 and 4 in Appendix BII again indicate general lack of fit in bulk density, critical shear stress and erosion rates. What is the explanation for this lack of fit?

Borrowman et al. (2006) suggest that the simplified erosion equation (equation 3 in Attachment A) be used when the physical properties of sediment do not vary significantly with core depth. On the other hand, USEPA applied this same equation in data analysis because they could not determine what the relationship was between erosion and physical properties; thus choosing to ignore the potential impact of the considerable vertical variation in physical properties within most of the cores. PVSC is concerned that and questions whether this approach may have resulted in the loss of useful information gathered from erosion testing of field-collected sediment cores.

EPA indicates (page 3-21) that the "high degree of small-scale variability indicates that spatial interpolation of erosion parameters from the analysis of the field cores is not appropriate". However, the "replicate cores" having erosion rates that differ by an order of magnitude also differ in terms of bulk sediment properties (grain size being the most common difference), with some of the difference in erosion rates related to the presence of gas bubbles and/or leaves in one of the replicates. Again, this causes us to question whether USEPA's analysis of sediment resuspension data was appropriate and thorough.

Furthermore, the variability of the Sedflume experimental results led USEPA to specify average bed properties and erosion characteristics across large regions of the river, further reducing spatial variability of computed erosion and deposition. Additional factors that influence erosion and deposition were not included in the model. PVSC suggests that USEPA explicitly consider the implications of these caveats to applying the sediment transport model to contaminant transport and fate, and associated remediation predictions. Apparently, USEPA considers the model to be reliable at the scale of river mile averages.

The conceptual model posits that contaminants (especially TCDD) enter the LPR primarily from localized scour of older, highly-contaminated sediments. However, if the sediment transport model is not expected to yield accurate resuspension fluxes at the grid scale or below, how can USEPA be confident that the model is capable of simulating localized scour and the associated remobilization of sediment contaminants? This concern is related to the high spatial variability of contaminants and physical properties in LPR sediments.

Finally, why was no sensitivity analysis conducted in the contaminant fate and transport model for the resuspension parameters that were varied in the sediment transport model? Aren't contaminant concentration predictions sensitive to these parameters varied in the sediment transport model?

2. Upstream TSS Boundary Condition

The rating curve approach used by USEPA to estimate the upstream TSS boundary condition appears to introduce considerable uncertainty and the potential for model error, especially at flow rates higher than the range of data used to develop the rating curve. For example, the sediment loads at Dundee Dam in the April 1, 2010 event were extrapolated to flows (300 cms) significantly higher than data (flow < 200 cms) used for boundary condition regression. PVSC considers the reliability of these boundary condition extrapolations to be highly uncertain. Probably no simple regression model (rating curve) could predict the sediment load behavior suggested by USEPA on page 4-5 of Appendix BII. This discussion illustrates the difficulty of confirming a sediment transport model without reliable solids boundary conditions, and the importance of collecting reliable data – especially for large flow events.

If the Dundee Dam boundary condition did account for watershed loadings (it does not), how would that change the model results? For example, in the upper Hudson River the upstream TSS concentrations were about three (3) times higher on the rising limb of the flood hydrograph. Although all rivers are probably unique in this regard, wouldn't the sediment transport model for the LPR require recalibration if such TSS boundary condition hysteresis was taking place? Isn't this an issue that has implications for the accuracy of model forecasts?

For sensitivity analysis of the sediment transport model, parameter values were either increased or decreased by 20% of their base values. PVSC believes that a 20% perturbation of the upstream TSS boundary condition is unreasonably conservative at high flow rates. PVSC believes that 100% might be more realistic for a high flow scenario. PVSC suggests USEPA consider a larger perturbation of this parameter in the sensitivity analysis.

In addition, why was no sensitivity analysis conducted in the contaminant fate and transport model for the upstream suspended solids boundary condition varied in the sediment transport model? Again, aren't contaminant concentration predictions sensitive to the boundary conditions varied in the sediment transport model?

In the fact sheet "Cleaning Up the Lower Passaic River: An Overview of USEPA's Proposal for the Lower Eight Miles," USEPA states its intention to conduct monitoring of water, air and wildlife to "evaluate whether the cleanup activities are being managed most efficiently to reduce potential releases of contaminants to the environment". To this list, PVSC suggests adding TSS/ABS monitoring at Dundee Dam. Such monitoring could significantly improve sediment transport and contaminant transport and fate modeling in the future by reducing errors in the specification of upstream (freshwater) boundary conditions. As demonstrated by the sediment transport solids tracer simulations, supply of solids mainly from this boundary plays an important role in determining sediment burial rates in the LPR.

3. Remedial Action Forecasts

PVSC is concerned that several aspects of the remedial action forecasts are under-developed, considering that these forecasts are arguably the most important result of the modeling project. For example, the sediment capping tracer simulation yields some interesting results that seem to endorse USEPA's "remediate downstream first" approach that has been criticized by many. How would these results change if a hydrograph other than 1998 (in which the highest flow was ~250 cms, not particularly extreme) was used, or the simulation was longer (e.g., 10 years)?

The Deep Dredge simulation seems to address the issue of whether the sediment transport model predicts sediment infilling rates that are similar to the historical four (4) inches per year after maintenance dredging ended in LPR. Figure 6-15 shows more widespread positive bed elevation change for the Deep Dredging compared to the No Action scenario. However, positive bed elevation changes on the order of 10-25 cm/yr (4-10 in/yr) appear mostly confined to River Mile ("RM") 7 to 8. If more suspended solids came over Dundee Dam (see issue #2 above), would the dredged channel fill in faster?

EPA evaluated uncertainty propagated through the models by calculating the residuals between model results and data as median relative errors, and applied these to forecast predictions as scale factors to estimate uncertainty bounds. These uncertainty values, which were passed to the risk assessment, represent a lower bound on the uncertainty in the RM 0 to 8.3 prediction averages. The lower-bound nature of the prediction uncertainties determined in this manner should be reiterated when they are later applied. For example, USEPA places much emphasis on whether uncertainty bounds overlap for the remedial alternative predictions. It bears repeating in Section 6.6 of Appendix BIII that uncertainty bounds, which are based upon mean relative errors, are in fact conservative or "lower bound" estimates. In reality, wouldn't the uncertainty bounds tend to grow larger over time in the simulations, due to propagation of errors in things like the trend in surface sediment concentrations?

Since the contaminant fate and transport model predicts roughly twice the response (our estimate) to a 30% to 50% increase in the magnitude of a high-flow event, the consequences of extreme high flows should be given more careful consideration by USEPA when evaluating remedial alternatives. For example, the sensitivity of the contaminant fate and transport model to a large storm was assessed by running a simulation of a 100-year storm. USEPA began the simulation at the completion of the Deep Dredging remedial alternative to allow "a comparison of the impact of an extreme flow with all of the alternatives in place". While this makes sense in terms of comparing the alternatives, a 100 year storm is equally likely to occur at any time during remediation. What would happen if such an event occurred during active remediation?

Another issue of concern in terms of long-term outcomes is seal level rise. Sea level is projected to rise from 7 to 12 inches by the 2050s (low estimate projection) or 19 to 29 inches (high estimate) in the Lower Hudson Valley and Long Island. Has this change in

the open boundary condition been factored into any long-term remedial action scenarios? If not, shouldn't it be? How will sea level rise affect the results presented in this report? Since the model forecasts end before reaching the Proposed Remediation Goal (PRG), the prediction curves were extrapolated by eye. In doing so, it appears that full capping and deep dredging predictions essentially "recycle" the same TCDD concentration trajectories from 2025-2039 and 2040-2054. Are the same trajectories expected from 2055-2069? When do the sediment TCDD concentrations decline to the PRG, 0.0071 μg/Kg? How is this prediction impacted by the timing of large events, or by the uncertainty of model predictions?

4. Long-Term Contaminant Trajectories

The modeled long-term rates of change in TCDD (and PCB) concentrations in surficial sediment and in the water column appear to differ, to varying degrees, from the data available for confirmation. Since these concentration changes are the metric by which the relative effectiveness of the remedial alternatives will be judged, questions about the accuracy of these predictions are especially important.

The contaminant transport model predicts TCDD concentrations in surficial sediment to decline at a rate corresponding to a half-life of approximately 25-35 years (if the upward concentration "step" resulting from Hurricane Irene flows are ignored). Does USEPA believe this prediction is accurate, given the apparent lack of significant decline in surficial sediment TCDD concentrations observed over the time period from 1995 to 2010? In other words, how does USEPA reconcile the apparent contradiction between these predictions and observations? This is an important issue since the decline in surficial sediment TCDD concentrations has been a significant point of contention between USEPA and other interested parties, both in terms of data interpretation and effectiveness of natural recovery as a component of remediation alternatives.

In the corresponding water column predictions, elevated TCDD water column concentrations are sustained for a considerable period of time, from 2011 and well into 2012. A few of the data match these predictions, but another "clump" of data are an order-of-magnitude lower in concentration. Thus, the data may actually be suggesting two different responses. What can explain the order-of-magnitude difference in water column TCDD concentrations in this time period?

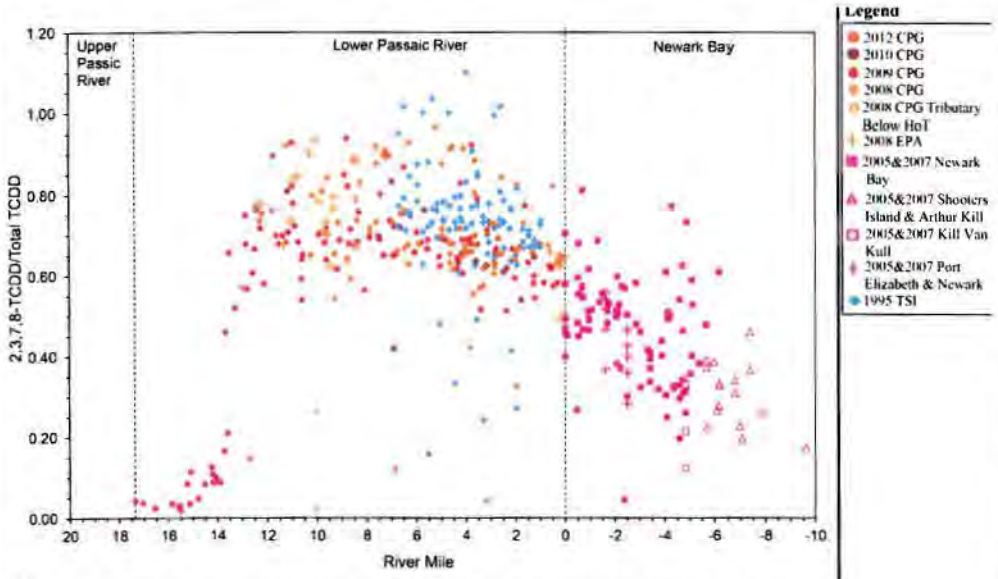
The contaminant fate and transport model also overpredicts the water column PCB concentrations in the same time period (2011-2012). Does the lack of fit evident for water column TCDD and PCB predictions suggest that the model predictions contain a consistent error for hydrophobic organic contaminants? Does USEPA plan to address this error, and how can this be accomplished?

As stated above, consistent overprediction of water column concentrations of TCDD and PCBs in RM 0-8 and 1-7 (but not RM 8-17, nor the Newark Bay segments) though much of 2011 and 2012 is a concern. Could this overprediction indicate too much contaminant

flux from the LPR sediments, leading to overly rapid depletion of contaminants in the surface sediment? Specifically, what is the relationship between elevated water column concentrations of these contaminants, which indicates transport out of the LPR, to the rate of sediment contaminant concentration decline? This report presents no mass balance diagnostics to help understand the magnitude of these contaminant fluxes. Such diagnostics were presented for the sediment transport model in Appendix BII (e.g., Figure 4-55); can these be generated for TCDD and PCBs in the contaminant fate and transport modeling report (Appendix BIII)?

Water column TCDD concentration predictions are clearly biased high in comparison to data. Only 35.9% of the TCDD data for the FFS Study Area falls within the ± 5x prediction envelope (Figure 4-51). In assessing this disparity, USEPA appears to be questioning the model's response to high flows "resulting in erosion in a small number of cells to a depth that exposes fairly elevated contaminant concentrations to the water column", even though this has been suggested by the Agency as the source of much of the ongoing TCDD "recontamination" of the LPR. USEPA should clarify whether there is too much of this elevated contaminant erosion occurring in the model, or if the phenomenon is incorrect?

Detailed Comments from PVSC

Remedial Investigation Report	
page	*comment*
4-1	This chapter presents the nature and extent of contamination in the FFS Study Area based on the available chemical data in sediment, tissue, and water. Given the large number of potential contaminants of concern, the contaminants are grouped into five chemical classes: dioxins, PCBs, pesticides, metals, and PAHs. While the RI focuses on the FFS Study Area sediments, contamination throughout the Lower Passaic River and its boundary areas (Newark Bay, the Upper Passaic River, minor tributaries) is examined, as needed, to put the observations of the FFS Study Area in context. Has USEPA or its contractors created a searchable, relational database containing the results of the sampling programs in the Passaic River? If so, can it be made available to PVSC and other interested parties?
4-6 and 4-7	The distribution and variability in Total TCDD concentrations closely mimics that of 2,3,7,8-TCDD (Figures 4-5a and 4-5b), which is expected given that in the Lower Passaic River, 2,3,7,8-TCDD typically represents about 70 percent of the Total TCDD mass. The 2,3,7,8-TCDD to Total TCDD ratio of 0.7 has been used as a diagnostic tracer for sediments from the Lower Passaic River. The 2,3,7,8-TCDD to Total TCDD ratio behaves somewhat differently from the concentrations of 2,3,7,8-TCDD and Total TCDD, showing an even steeper gradient in the RM12 to RM17.4 portion of the river (Figure 4-6).  Notes: 1. The ratios for the 2008 CPG data were not plotted because a correction factor was not developed for Total TCDD to address the low bias in the results. 2. By definition, the ratio cannot exceed 1.0. However, due to older analytical uncertainty, some samples have ratios greater than 1. **2,3,7,8-TCDD to Total TCDD Ratio (0-6 inches) *vs.* River Mile** — **Figure 4-6a** *Lower Eight Miles of the Lower Passaic River* — 2014

Remedial Investigation Report	
page	*comment*
	PVSC requests a copy of the spreadsheet and data from which Figure 4-6a was created. Although PVSC understands that the data are available in Ourpassaic.org in the Digital Library, they are contained in a series of spreadsheets for each sampling event. It would be a laborious and costly effort to extract the data from each individual spreadsheet to recreate Figure 4-6a. The PVSC is a public agency funded solely by local ratepayer funds. In these harsh economic times, PVSC believes that spending ratepayer funds to recreate work that was already done for USEPA is an unwise use of scarce resources that can be otherwise used for environmental improvements.

Focused Feasibility Study Report	
page	*comment*
4-4	**Sediment Removal** The FFS conceptual development of alternatives assumed that dredging would occur using a mechanical dredge fitted with an environmental clamshell bucket although costs for hydraulic dredging were also estimated.
4-6	**Sediment Capping** Containment alternatives involve leaving a portion of the contaminated sediment in place and isolating these materials from the environment through the use of an engineered cap.
4-30	**Alternative 2: Deep Dredging with Backfill** Deep Dredging with Backfill evaluates a bank-to-bank remedy that would involve dredging the contaminated fine-grained sediments throughout the FFS Study Area (9.7 million cy) to varying depths followed by placement of two feet of backfill material over the dredged area. This alternative is intended to remove the contaminated sediment inventory causing the current and potential future risks in the FFS Study Area. This alternative would accommodate continued use of the federally-authorized navigation channel, since the contaminated sediment inventory is coincident with the authorized navigation channel.
4-38	**Alternative 3: Capping with Dredging for Flooding and Navigation** Capping with Dredging for Flooding and Navigation evaluates a bank-to-bank remedy that would place an engineered cap (or backfill where appropriate, as described below) bank-to-bank over the FFS Study Area. Before cap placement, enough fine-grained sediment (4.3 million cy) would be dredged so that the cap could be placed without causing additional flooding and to accommodate continued use of the federally-authorized navigation channel between RM0 and RM2.2.

Focused Feasibility Study Report	
page	*comment*

Comments regarding the navigation channel in relationship to the remedial alternatives:

The Passaic Valley Sewerage Commission (PVSC) is an active user of the navigation channel fronting its dock at RM 0.5. The PVSC receives cargos of liquid sewage sludge delivered by barge and motor vessel tanker. PVSC's cargo volume for the last five years is tabulated below:

Year	Arriving Vessels	Annual Cargo Tonnage
2009	141	760,331
2010	96	540,041
2011	113	567,496
2012	136	425,550 *
2013	243	666,515

** Cargo reduced due to Superstorm Sandy*

The receipt of sludge for treatment is an important revenue stream for the PVSC. As a government agency dependent on user fees from its ratepayers, vessel-delivered sludge reduces the cost of wastewater treatment. This cost reduction benefits the PVSC users and also the government entities whose sludge is processed at the PVSC. PVSC therefore strongly supports the dredging and maintenance of the navigation channel in the lower Passaic River.

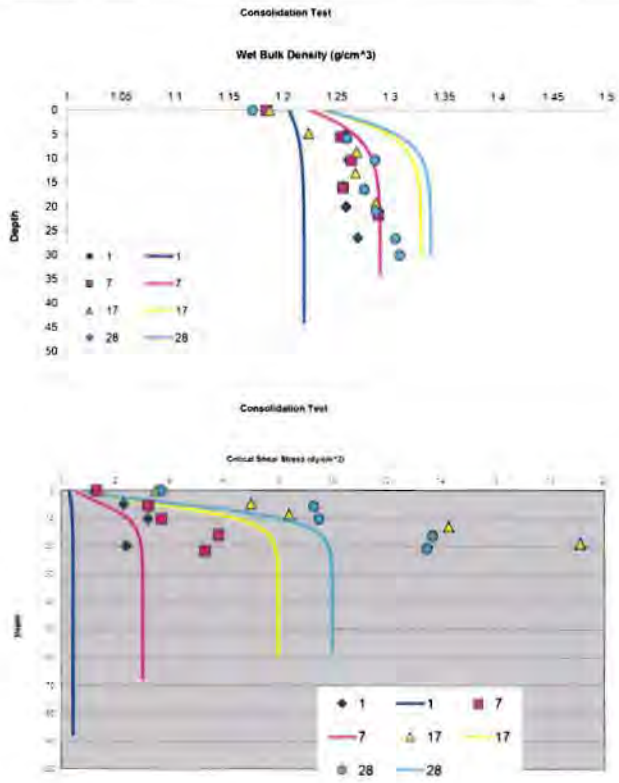
PVSC asks the following questions relative to matters raised in the RI/FFS:

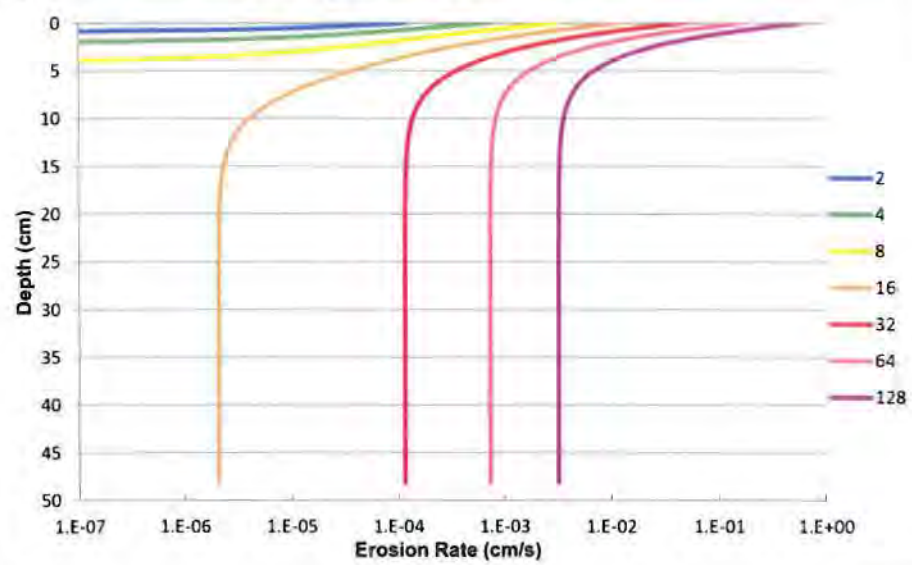
1. Describe the proposed dredging activities in the area between the dredged federal channel and the docks along the river from RM 0 to 1.
    a. What is the proposed depth between the existing dock and channel?
    b. What type of capping is proposed between the dock and the channel?
2. PVSC dredged its dock at RM 0.5 in 2010. The southern portion of this dredged area began filling with newly deposited sediments within two years.
    a. Will USEPA model the behavior of the proposed deepened channel and the area between the channel and the shore to predict sediment infilling rates?
    b. Will the rate of sediment deposition increase after the proposed dredging activities?
    c. If so, who will pay for the additional maintenance dredging needed at the docks?
3. If there is a cap, who will measure and restore it after maintenance dredging activities?

Focused Feasibility Study Report	
page	*comment*
	4. How will the dredging activities impact the use of the docks during construction? 5. Who will pay for reinforcing the dock structure if the proposed dredging depth for a cap is greater than the depth the dock was designed for?

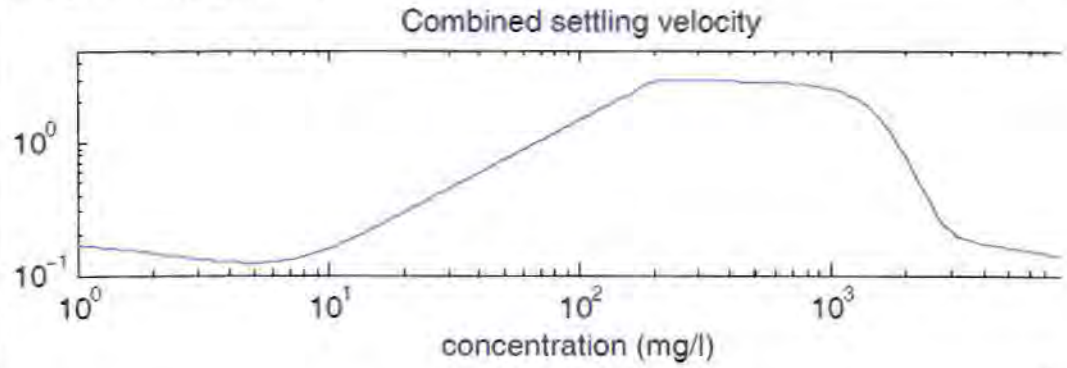
Appendix BII: Lower Passaic River Sediment Transport Model. Attachment A, Analysis of Datasets to Evaluate Sediment Erosion Properties	
page	*Comment*
A-2 and A-3	"… a particular concern was that the Sedflume field core results were inconsistent with consolidation test results. Specifically, erosion rates derived from Sedflume tests performed on what were presumed to be undisturbed, well-consolidated field cores were higher than those that were derived from consolidation experiments for consolidation times longer than seven days. Additionally, critical shear stresses derived from Sedflume field cores were lower than those evaluated for consolidation times longer than seven days from consolidation cores." "No explanation for the inconsistency between the field cores and consolidation tests was identified." Review of Borroman et al. (2006, Erodibility Study of Passaic River Sediments Using USACE Sedflume) provides considerable insight regarding the divergence in resuspension rates and critical shear stresses measured in Sedflume field cores and laboratory consolidation cores. The inconsistency noted above may be a consequence of USEPA' s approach to analyzing the Sedflume field cores (more on this below) which chooses to ignore the roles of grain size, organic content, gas bubbles, and leaves, twigs and other debris in individual core tests, as well as data limitations due to the way physical properties were measured in the test cores. Results of the Sedflume tests on field cores demonstrate that physical properties (bulk density, organic content and grain size) each correlate to measured resuspension rates and critical shear stresses, although the relationships may be complex and not fully understood. Alternatively, it may be that insufficient measurements were made in highly stratified cores to accurately determine the vertical variation of physical properties. Additionally, unexpected variability in resuspension rates and critical shear stresses was often related to observations of other artifacts (gas bubbles, leaves, twigs, fractures) in the field cores. The "state of the science" as reflected in the experimental work of Borroman et al. appears better able to measure variability in cohesive sediment resuspension properties than it is to quantitatively explain it.

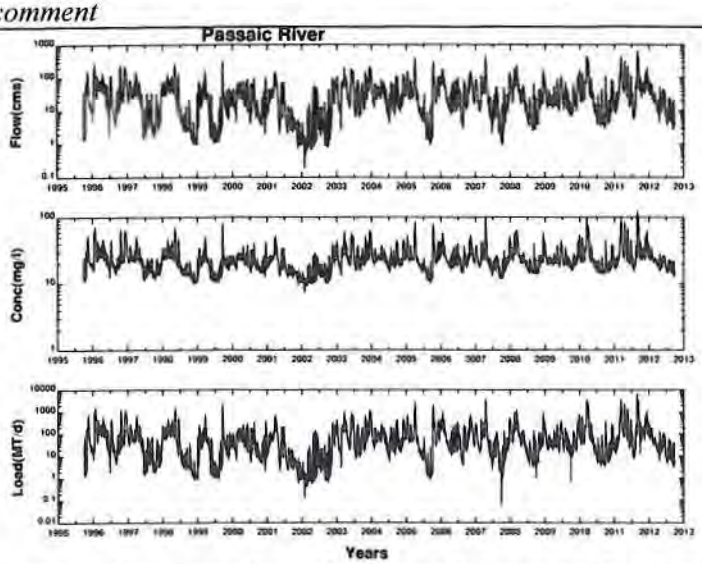
Appendix BII: Lower Passaic River Sediment Transport Model. Attachment A, Analysis of Datasets to Evaluate Sediment Erosion Properties	
page	*Comment*
	In comparison, the cores tested in consolidation experiments were quite uniform in physical properties and lacked the high degree of stratification and other artifacts that complicated the interpretation of the field core data. Simply the fact that the sediment in the consolidation cores was consistently fine grained and cohesive, as opposed to the mixed grain sizes encountered in the majority of field cores, could explain why erosion rates were higher in field cores as opposed to laboratory consolidation cores.
A-4	Equation 2 is a rearrangement of equation 1. However, since equation 2 is used to calculate critical shear stress, shouldn't "E" in this equation be E_{crit} (threshold erosion rate)? $E = A\tau^n\rho^m$ $\tau_c = (E/A\,\rho^m)^{1/n}$
A-5	The consolidation model does not appear to fit the vertical profiles of bulk density and critical shear stress measured in the consolidation cores (Figure 2). For example, the bulk densities measured at different times in these experiments do not vary nearly as much as the consolidation model curve fits. In fact, the amount of consolidation that was measured appears fairly minimal in comparison to the lack of fit with the consolidation model. Likewise, the critical shear stress measurements are not consistent with the curve fits. Measured critical shear stresses increase with depth much more than the model curves.

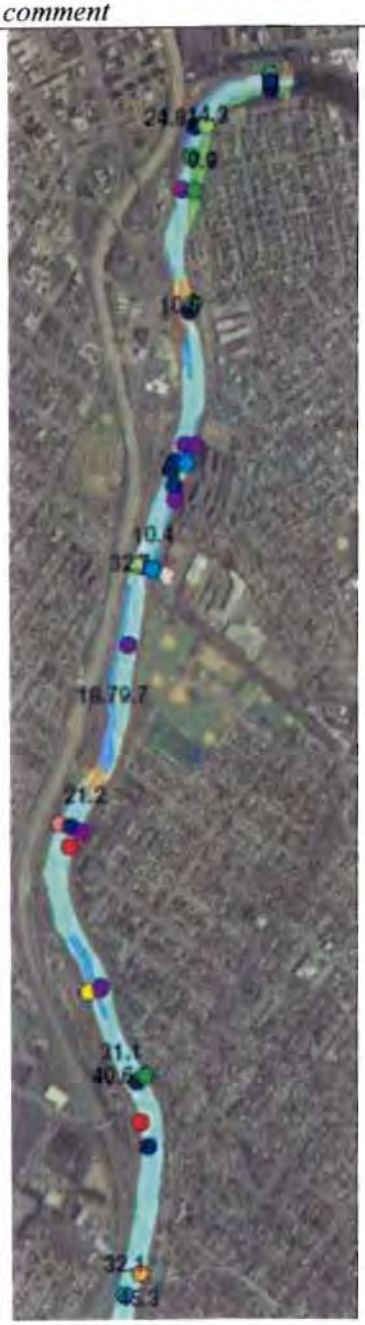
Appendix BII: Lower Passaic River Sediment Transport Model. Attachment A, Analysis of Datasets to Evaluate Sediment Erosion Properties	
page	*Comment*
	 Figure 2. Critical Shear and Bulk Density from Consolidation Data Analysis for Newly Deposited Sediment What is the explanation for these lacks of fit? Do they suggest that the consolidation model or the parameter optimization is erroneous?
A-6	Consolidation parameters used to model parent bed erosion were modified to improve TSS and infilling predictions. However, Figures 3 and 4 again indicate general lack of fit in bulk density, critical shear stress and erosion rates. So again, what is the explanation for this lack of fit?
A-7	It is unfortunate that USEPA's attempt to develop a comprehensive set of erosion properties from the Sedflume (field) data set was not successful. Have other researchers in this field been consulted for suggestions of alternative approaches of data analysis or model parameterization? I assume so, but it would be useful to document such alternatives.
A-8	"However, variation of erosion rate with density cannot always be uniquely determined in the field due to natural variation in other sediment properties (e.g. mineralogy, organic content, and particle size). Therefore, effects of density in combination with these other factors affecting erodibility were subsumed into the constant A. The equation to be used in subsequent Sedflume analyses was thus simplified to a power-law relationship: $E = A\tau^n$

Appendix BII: Lower Passaic River Sediment Transport Model. Attachment A, Analysis of Datasets to Evaluate Sediment Erosion Properties	
page	*Comment*
	Note how this differs from the rationale offered for this simplification in Borrowman et al. 2006: "Density and other properties do not vary significantly with depth in some natural sediment cores. In these cases, a best-fit curve can be developed between erosion rate and shear stress without using the bulk properties. A simplified version of Equation 4 can be developed that does not include bulk density or other bulk properties by setting m=0 in Equation 4: $E = A\tau^n$ The distinction may be important: Borrowman et al. suggest that the simplified erosion equation (above) be used when the physical properties of sediment do not vary significantly with core depth. On the other hand, USEPA uses this equation because they cannot determine what the relationship is between erosion and physical properties, so they choose to ignore it even though there is considerable vertical variation in physical properties within most of the cores. This may explain why USEPA's heroic attempt to parameterize the resuspension properties of cohesive sediments throughout the LPR via specifying 4 representative erodibility groups (page A-14 and Table 4) failed. However, it was certainly a reasonable approach to a very complex problem.
Figure 4	The upper graph in this figure is a plot of erosion rate vs. sediment depth (in the parent bed?). What consolidation time does this correspond to? 28 days? Do sediments in the parent bed consolidate? 

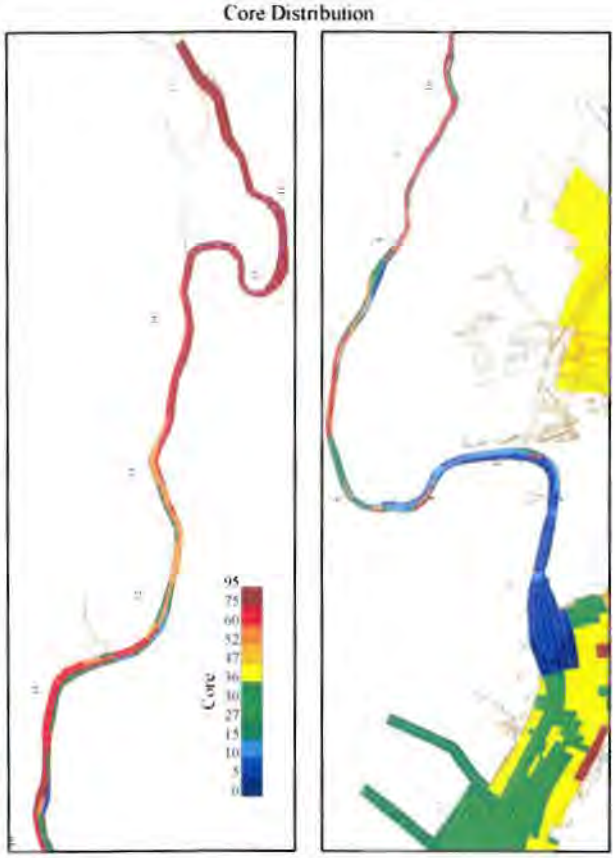
Data Evaluation Report #6, Biota Analysis	
page	*comment*
1-2	Check punctuation in parenthetical at bottom of page: "…pesticides (including the sum of Dichlorodiphenyltrichloroethane (DDT) and its metabolites, referred to here as "Total DDx", Total Chlordane and Dieldrin)" Obviously, chlordane and dieldrin are not metabolites of DDT.
3-13	Reference to Figure 3-1, which is missing from the report.
3-21	Agree with comments about narrow ranges of sediment contaminant concentrations being used to calculate BSAFs. Regression model approach used here appears far superior.
3-19 through 3-28	Please explicitly indicate the concentration units for each of these equations.
Table 3-1	The table indicates that contaminant concentrations measured in the 0-6 inch sediment samples were used in the regression, BSAF and BAF calculations. This appears to be consistent with how the contaminant fate and transport modeling results are expressed (good). However, shouldn't this agreement be documented in the text of the report?
Table 3-3	The regression models for TCDD in blue crab and white perch are reasonable linear with sediment concentration. This seems reasonable for the case of blue crab, which are less mobile and epibenthic, but less so for white perch, which are both omnivorous and migratory based on their life history.

Appendix BII: Lower Passaic River Sediment Transport Model	
page	*comment*
2-11	Is the consolidation model (equation 2-17) appropriate to describe vertical variation of sediment bulk density in the lower Passaic River? As mentioned in comments for "Sediment Erosion Properties" report, the vertical profiles of bulk density and critical shear stress (Figure 3-35) demonstrate disagreement between model and data.
2-15 and 16	Cohesive sediment settling velocity 0.2 mm/s increases to 3 mm/s during tidal resuspension (Figure 2-4).  This calibration seems generally consistent with several prior sediment transport modeling applications: Fine floc settling velocity of 1 mm/s (Burban 1990) and 0.1-1 mm/s (Lick, saltwater). Resuspended aggregate settling velocity 0.5 mm/s (Stokes), 1.4 mm/s (lower Fox River 50 im).
2-18	Would be helpful here to state that 250, 1000 and 4100 um are particle sizes for the 3 non-cohesive sediment state variables.
3-1	Suspended solids data used to define freshwater boundary condition on Passaic River was measured at Little Falls, approximately 12 miles upstream of the Dundee Dam boundary. Is it safe to assume conservative transport of suspended solids over this distance?
3-2	Figures 3-2 through 3-6:

Appendix BII: Lower Passaic River Sediment Transport Model	
page	*comment*
	 I assume these are plots of computed concentration/loading. Please show the data in timeseries plots as well as the computed concentrations.
3-16	"The particle sizes correlate strongly to morphologic regions in the river." More discussion may be warranted to justify this statement. Figures 3-26 through 3-29 suggest sediment samples with wide ranges of average grain size within each of the 6 morphological regions. Although there are examples of this in each view of the river, Figure 3-29 provides the best example:

Appendix BII: Lower Passaic River Sediment Transport Model	
page	*comment*
	 Within the "mostly smooth channel" geomorphic area (light blue in the figure), it appears there are sediment samples having practically every clay + silt percentage.
3-18	"Replicate coring at each of the 14 sites varied in separation from about 1 (3.28 ft) to 10 m (32.8 ft)."

Appendix BII: Lower Passaic River Sediment Transport Model	
page	*comment*
	Not sure I would consider such cores to be "replicates", although PVSC agrees that these data reveal substantial variability in physical properties, erosion rates, and critical shear stresses over short distance scales.
3-18 and 3-19	"Sea Engineering, Inc. (SEI) conducted a Sedflume analysis on four consolidation cores created from a single surficial sediment sample from the LPR. The primary goal of this work was to characterize the consolidation characteristics of sediment. Surface sediment was collected at the location of Malcolm Pirnie's high resolution core at RM2.2, which has been identified as a depositional area for fine material. The material was mixed together (i.e. composited), slurried into a fluid mud, and poured into four laboratory Sedflume cores." Is it reasonable to assume that sediment reconstituted from the RM2.2 core is representative of cohesive sediment throughout the model domain? Particle D50s measured in these reconstituted cores were all in the range of 21 to 28 ìm. I think this may be substantially finer than median grain sizes in most "cohesive" sediment samples from the LPR?
3-19	"the variation of erosion rate with density cannot always be determined in the field due to natural variation in other sediment properties (e.g. mineralogy, organic content, and particle size). Therefore, the density effects and other factors affecting erodibility were subsumed into the constant A, which varies vertically in the sediment, thereby incorporating the effect of vertical density variations." As mentioned in comments for "Sediment Erosion Properties" report, this approach is not consistent with the data analysis suggested by of Borroman et al. (2006).
3-21	"This high degree of small-scale variability indicates that spatial interpolation of erosion parameters from the analysis of the field cores is not appropriate." It should also be pointed out that the "replicate cores" having erosion rates that differ by an order of magnitude also differ in terms of bulk sediment properties (grain size being the most common difference), with some of the difference in erosion rates related to the presence of gas bubbles and/or leaves in one of the replicates.
3-21	"Erosion rates derived from the Sedflume tests performed with relatively undisturbed, well-consolidated field cores tended to be higher than erosion rates from the consolidation experiment for consolidation times greater than seven day, and critical shear stresses derived from the field cores were lower than those derived from consolidation times longer than seven days." These results may be consistent with differences in the properties of the field and laboratory cores, as addressed in our comments for the "Sediment Erosion Properties" report.

Appendix BII: Lower Passaic River Sediment Transport Model	
page	*comment*
3-22	PVSC has already commented on (what appear to be) the poor fits of data for time varying vertical structure of critical shear stresses and erosion rates.
3-23	"The erosion properties derived from the consolidation experiment were used to calculate erosion rates for the parent bed in cohesive areas of the model domain, based on the erosion rates for the depositional layers (in g/cm^2/s) vertical density profile for the parent bed." Did USEPA use a generalized or global density profile, or profiles based on measurements in cores from a specific spatial region? This is not clear.
3-26	"Spatial variations in grainsize distributions will result in spatial variations in erosion rates due to differences in bed coarsening. The spatial distribution of core assignments is shown in Figure 3-37."  What does the legend in the "core assignments" Figure 3-37 (core distribution= 0, 5, 10, 15, 27, 30…) refer to? PVSC couldn't find an explanation for this legend. Are these used in the current sediment transport model parameterization?
4-2	"The averages of TSS data as estimated from ABS data reported within each sigma level are plotted as a red line, with shading around the line to show the 90

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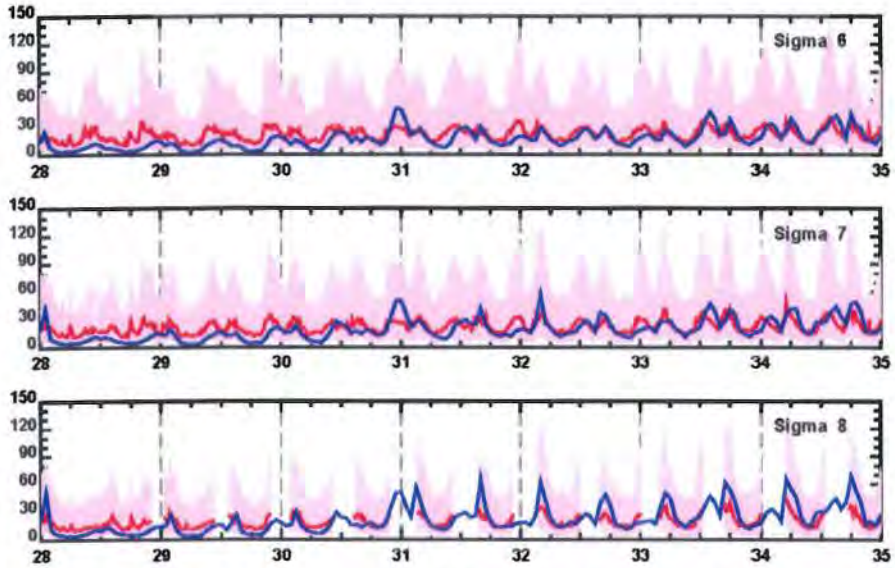
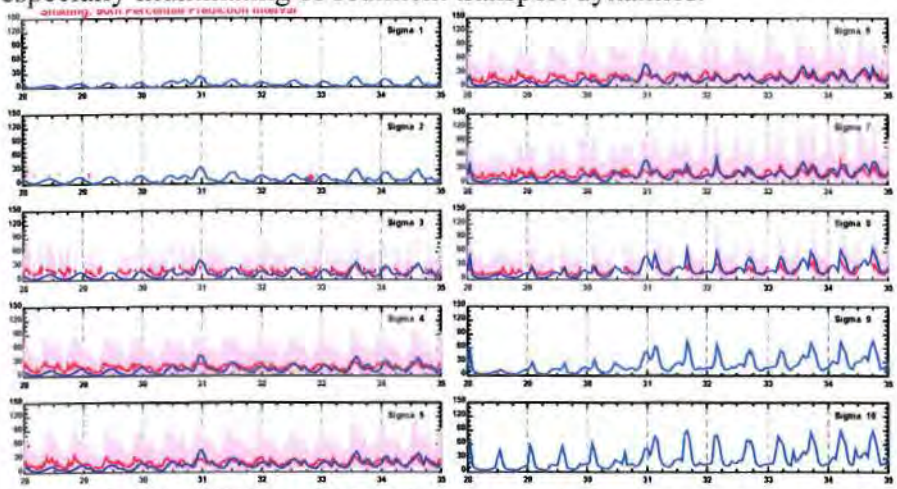
	percentile prediction interval. The prediction interval reflects both the scatter in the regression of TSS to ABS and the extrapolation of the regression outside the range of ABS readings included in the regression for each mooring location."  There is a surprising amount of variability in the prediction intervals for TSS values extrapolated from ABS. Would it be possible to plot the TSS concentration data on these graphs? This would help to visually distinguish the average TSS (red) from the prediction interval (pink), and help to interpret the goodness of model fit.
4-3	RM 1.4: "The model predictions agree with observations. The phase of tidal fluctuations in TSS is generally very well predicted. This phase behavior is especially illuminating of sediment transport dynamics."  The model fit of TSS at RM1.4 is quite good. Is correct representation of tidal phase a result of calibrating critical shear stress for resuspension?

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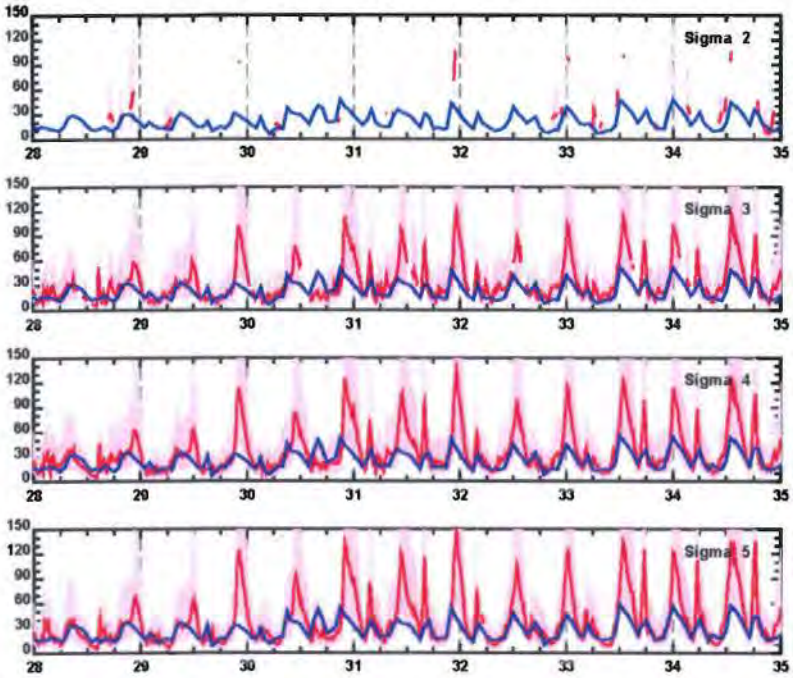
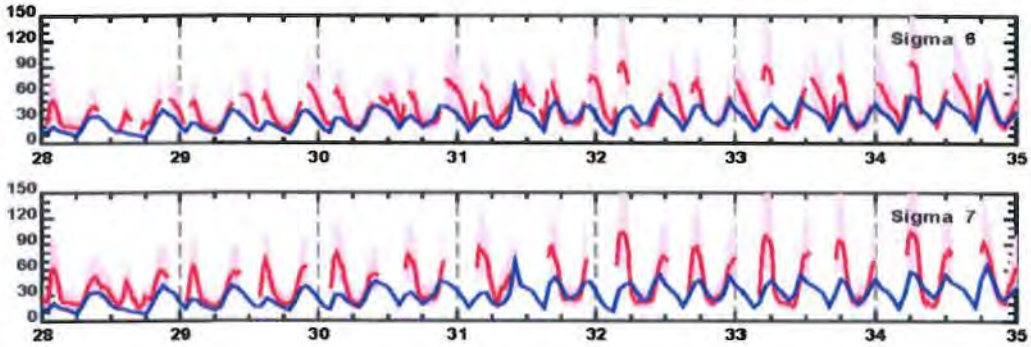
4-3	RM 4.2: "At this location simulated TSS concentrations are generally less than TSS concentrations estimated from ABS measurements, although the simulated values fall within the lower range of the TSS-ABS prediction interval."  Model predictions are considerably lower than ABS/TSS at this location. Is this due to the magnitude of the resuspension flux during each ebb tide?
4-4	RM 6.7: "there is generally good agreement between predicted and observed TSS, both in magnitude and phase. The model tends to under-predict peak TSS values in the lower part of the water column, but not as much as at RM 4.2. "  TSS peaks are consistently underpredicted in sigma layers 6 and 7 at RM 6.7 (Figure 4-3).
	RM 10.2 and 13.5: "In both the model predictions and the data, the general levels of TSS are greatly reduced compared to those at RM 4.2 and RM 6.7. Within this context, the model again agrees well in the predicted phase of TSS,

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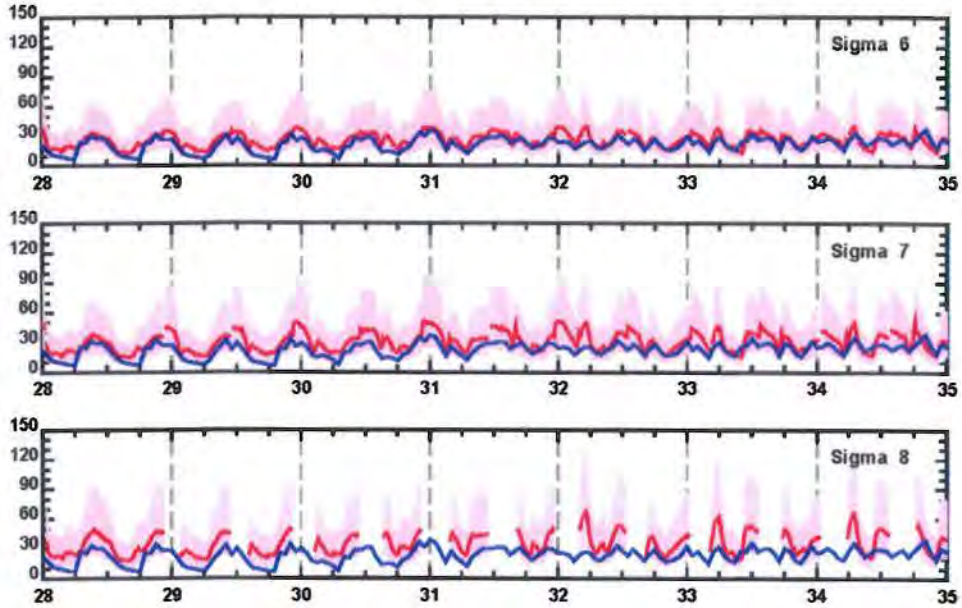
	and with the magnitude of the concentrations at RM10.2, but over-predicts tidal peaks in TSS at RM 13.5."  TSS is consistently underpredicted in sigma layers 7 and 8 at RM 10.2 (Figure 4-4)
	RM13.5: "the model again agrees well in the predicted phase of TSS… but over-predicts tidal peaks in TSS at RM 13.5."

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	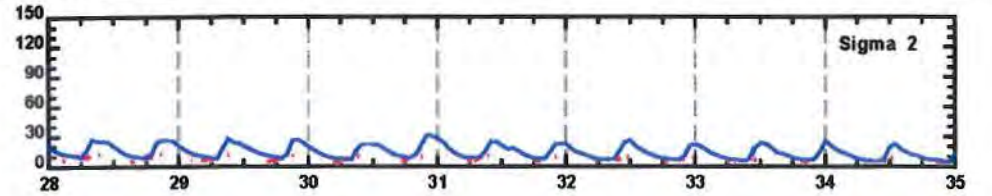 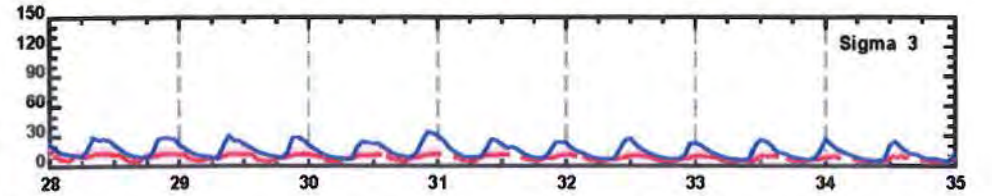 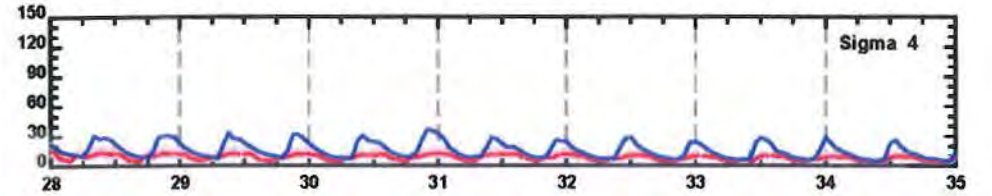 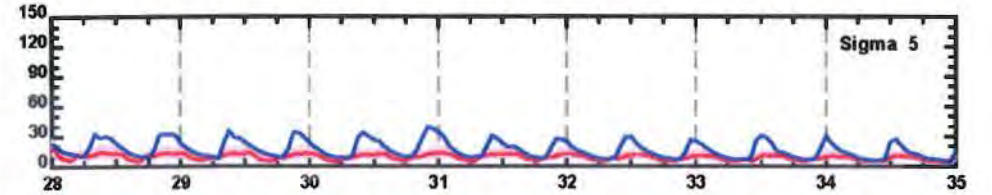 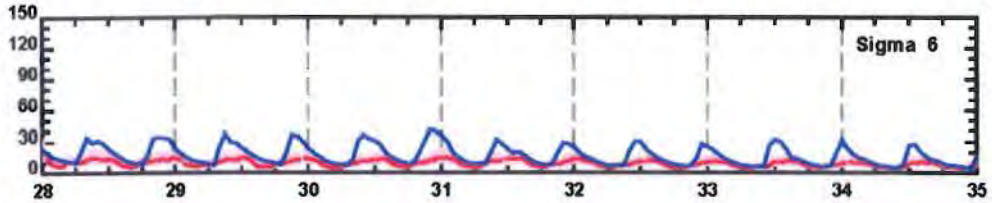 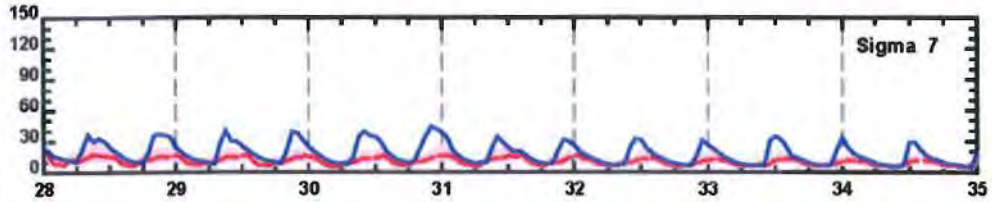 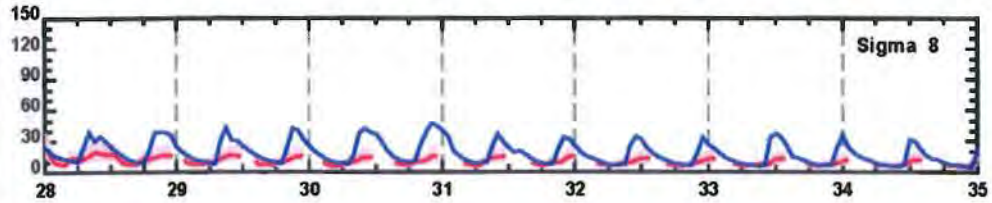 At RM 13.5 the tidal peaks in TSS are overpredicted in all sigma layers.
4-5	"The highest river flow during the PWCM program occurred on April 1, 2010, when flow reached 300 cms (~10500 cfs), approximately a 5-year event. This

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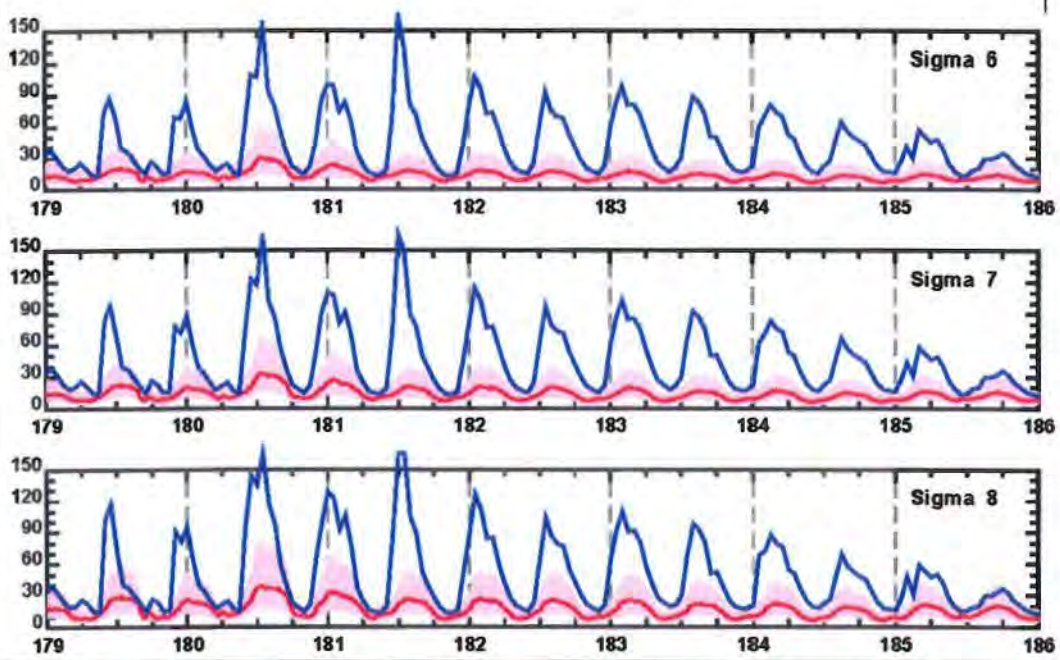
	flow followed an even larger flood on March 16, 2010, which took place before the moorings were in place for the spring monitoring period. Figures 4-8, trough 4-12 show time series of predicted and observed TSS from RM 1.4, 4.2, 6.7 10.2, and 13.5, respectively, from March 29 to April 4, 2010. There are several important points to be made from these figures. First, the model clearly over-predicts the magnitude of peak TSS throughout the river during this event, but again the phase is well-predicted. The magnitude is most likely over-predicted because the procedure used to estimate sediment loads over Dundee Dam does not account for flow history, assigning the same representative sediment load to each flow regardless of antecedent conditions. In reality, it is likely that the March 16 flood scoured much of the sediment available for erosion in the watershed upstream of Dundee Dam, leading to much lower actual loads during the April 1 flood than those estimated by the model and thus to the lower observed TSS magnitudes in Figure 4-8 through 4-12." Since the sediment loads at Dundee Dam in this event were extrapolated to flows (300 cms) significantly higher than data (flow < 200 cms) used for boundary condition regression, the reliability of these boundary condition extrapolations is highly uncertain. Regardless of that, no regression model could predict the sediment load behavior suggested above by USEPA. This discussion illustrates the difficulty of confirming a model without reliable boundary conditions, and the importance of collecting reliable data – especially for large flow events.
	RM 4.9 (Figure 4.2): 

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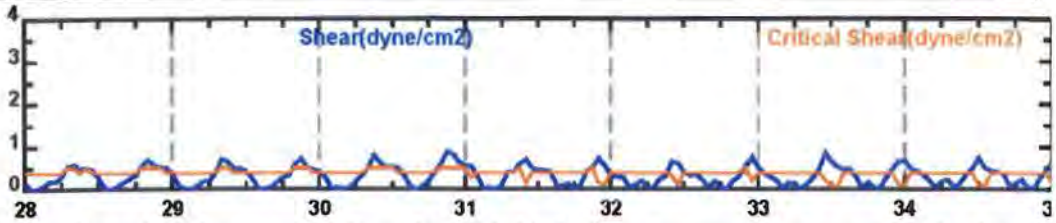
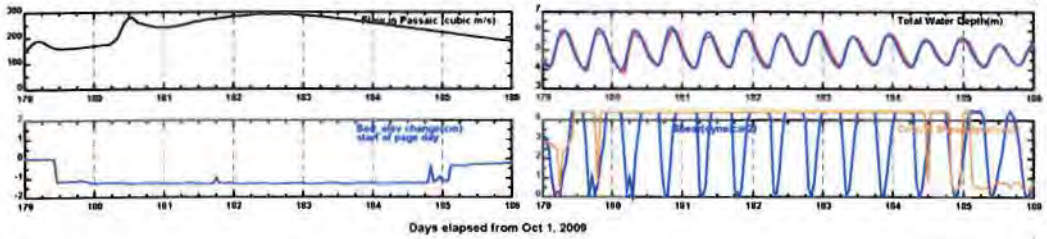
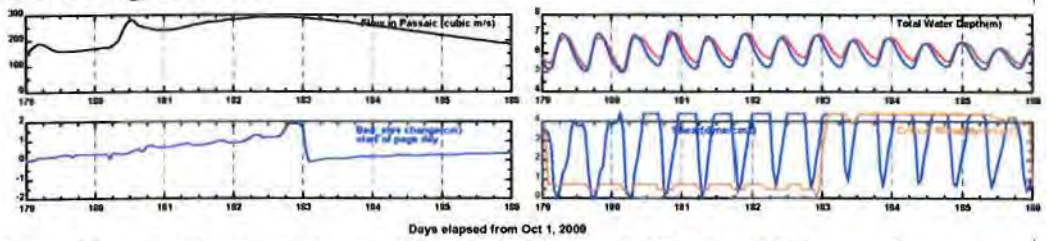
	 Does the coincidence of TSS peaks with high shear stresses suggest error in the magnitude of the resuspension flux instead of the Dundee Dam loading?
4-5 and 4-6	"TSS patterns in the bottom two sigma levels are much more complex due to short-lived disequilibria between applied stress and critical stress, resulting in sporadic resuspension episodes, but there are no data available for comparison to these predictions. The pattern of ebb dominance is even more apparent further up-river, where it is accompanied by complex patterns of predicted erosion and deposition during the flow event. Interestingly, bed elevations are predicted to return almost to normal by the end of the week." The pattern of bed elevation changes during this event (Figures 4-8 through 4-12) are complex, varying both spatially and temporally (deposition -> erosion -> deposition). RM 6.7 (Figure 4-10) shows (-) bed elevation change on day 179, (+) bed elevation change on day 185, apparently related to changes in critical shear stresses? Are the abrupt changes in critical shear stress a response to sediment being removed and/or redeposited to the bed?  RM 10.2 (Figure 4-11) shows gradual (+) bed elevation change up to day 183, when rapid (-) change occurs, coincident with big jump in critical shear stress. This looks like resuspension event because TSS predictions are extremely high in lower sigma levels?  Something similar is evident at RM 13.5 (Figure 4-12). In addition to the general overprediction of TSS (presumably due to error at the boundary condition), a big jump in TSS predictions in sigma layers 5, 6, 7 etc. occurs on

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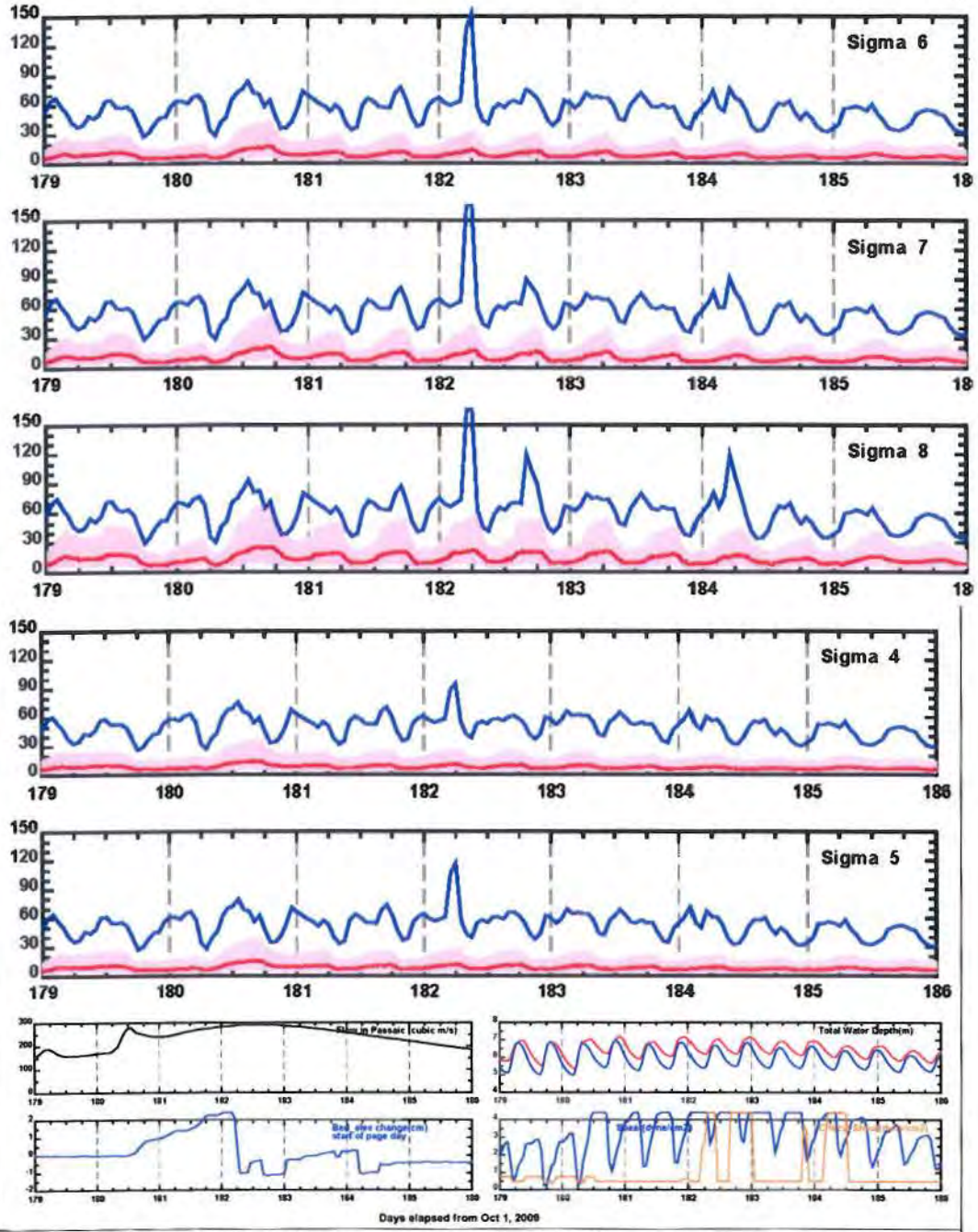
	day 182 that is not seen in the data. This jump coincides with an abrupt drop in bed elevation. Why? 
4-6	June low flow: "This period was characterized by flows at or below long-term median levels, with typical spring tides. Figure 4-13 shows relatively low TSS concentrations in the upper water column, with both the magnitude and phase of predictions agreeing well with the data. Near the bottom, the model under-

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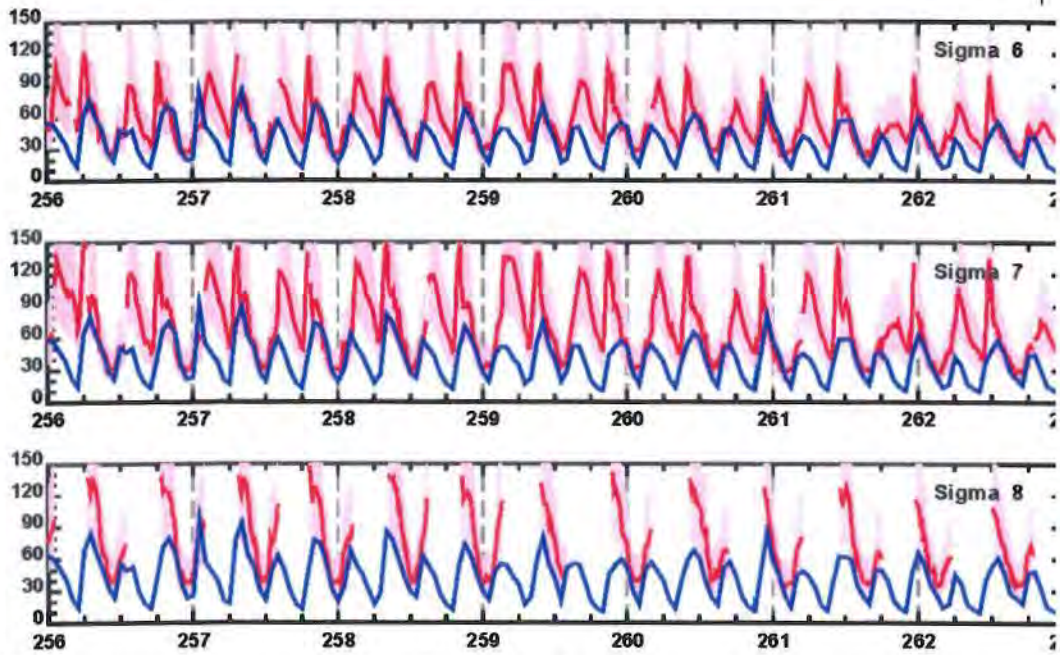
	predicts the observed large semi-diurnal TSS fluctuations, but again there is relatively good phase agreement."  The model clearly underpredicts TSS in the lower sigma layers, especially at RM 6.7.
4-9	Regarding summary #3: "The model over-prediction during the high river flow event of late March – early April 2010 likely reflected the fact that the model loading function does not account for scour history in the watershed above Dundee Dam. Differences between predicted tidal TSS magnitude and observations likely reflect difficulties with predicting the delicate balance between erosion and deposition of the thin floc layer at the sediment surface. However, the fact that the model correctly predicted turbidity maximum spatial and temporal dynamics indicates that it transported the pool of mobile particles that is the source of the turbidity maximum correctly, though it may have over-estimated the size of that pool." Does the observation that TSS is overpredicted more near the bottom of the water column indicate errors in erosion or deposition? It appears that the model is predicting that more than the floc layer is being eroded and/or deposited at specific times and places in the river.
4-11	March 2010 high-flow (16,000 cfs): Why not plot model/data time series comparisons of TSS like in previous figures (4-8 through 4-14)? It would be useful to see the TSS timeseries for this event plotted in the same manner as previous figures (4-8 through 4-14) even if observations are generally lacking.
	Figure 4-20: It would be useful to distinguish LPR data from NB.

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	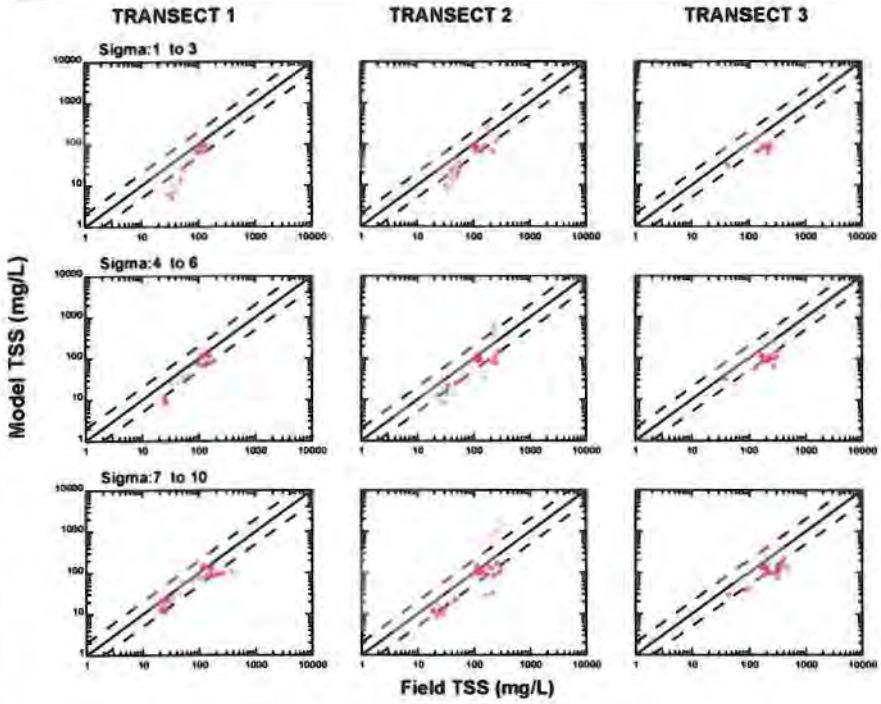
4-12	"The upstream boundary loading in the model is based on very limited data set and is generalized. Under high flows, there is no provision for differing loads during the rising or falling limb of the flow, nor is there any provision for different sediment loads during different storms. The uncertainty in the amount of upstream loadings as well as composition can be a contributing factor to the differences between simulated TSS and the OBS data." It is discouraging how often the issue of upstream boundary conditions tends to undermine the credibility of a model like this! There should have been one or more transmissometers deployed at Dundee Dam. If the Dundee Dam boundary condition did account for watershed loadings (it doesn't) how would that change the model results? For example, in the Hudson River the upstream TSS concentrations were about 3 times higher on the rising limb of the hydrograph. Although all rivers are probably unique in this regard, wouldn't the sediment transport model require recalibration if such hysteresis was taking place? Isn't this a forecasting issue?
4-13 and 4-14	"The expectation is that the bed elevation changes computed by the model should be less variable than actual bed elevation changes, because of factors related to scale, sediment heterogeneity, and factors not represented in the model." "In this application, the variability of the Sedflume experimental results led to specification of average bed properties and erosion characteristics across large

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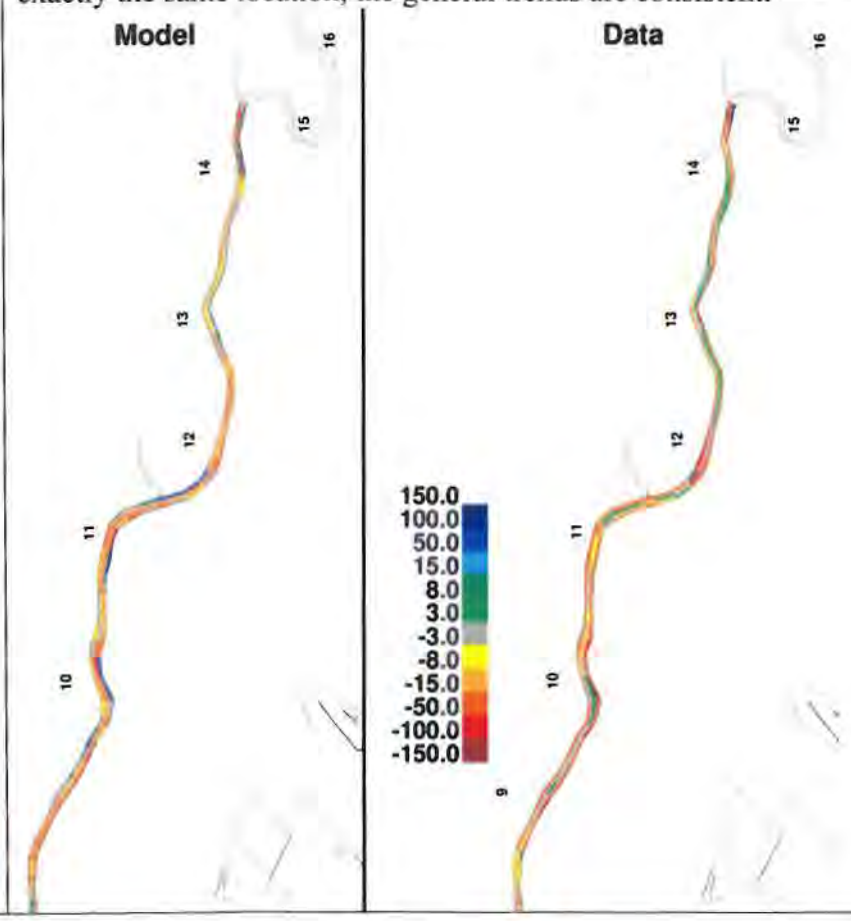
	regions of the river, further reducing spatial variability of computed erosion and deposition. It is important to recognize that there are some additional factors that influence erosion and deposition that are not included in the model." It may be important to consider the implications of these caveats to applying the sediment transport model to contaminant transport and fate, and associated remediation predictions. Apparently, USEPA considers the model to be reliable at the scale of river mile averages. The conceptual model posits that contaminants (especially TCDD) enter the LPR primarily from localized scour of older, highly-contaminated sediments. So if the sediment transport model is not expected to yield accurate resuspension fluxes at the grid scale or below, should PVSC be confident that the model is capable of simulating localized scour and the associated remobilization of sediment contaminants? This concern is related to the high spatial variability of contaminants and physical properties in LPR sediments.
4-15	Figure 4-29: "In the section of the river upstream of RM8.3 (Figure 4-29) both the data and model results show net erosion over the majority of the river, interspersed with smaller pockets of net deposition. Although not always in exactly the same location, the general trends are consistent." 

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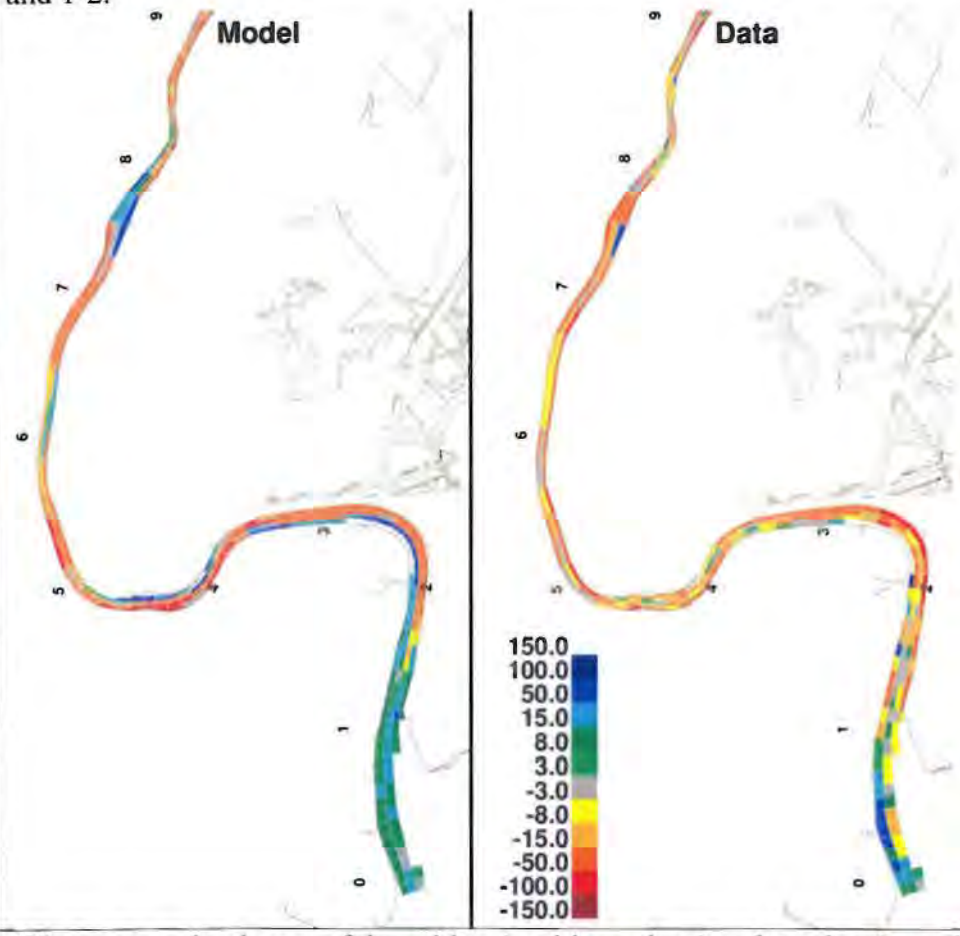
	This interpretation is difficult to discern visually. The patterns of erosion and deposition are complex, and the predicted pattern and magnitude of bed elevation changes is not consistent with the data in many cells.
	Figure 4-30: Same comment. Significant differences are observed at RM 0-1 and 1-2. 
4-15 and 4-16	"The areas and volumes of deposition (positive values) and erosion (negative values) are summarized by 1-mile reaches on Figures 4-31 and 4-32." The aggregation of grid cell results and the bar graph format make it easier to compare bathymetric changes to the model. Interesting to note that mile averaging (2-mile, actually) was also used to smooth the sediment contaminant data in the biota analysis. "The areas of erosion and deposition simulated by the model agree with the data in the majority of the reaches in both spatial patterns and magnitude." Results indicate generally good agreement: erosion>>deposition. Deposition lack of fit in a few segments is apparently due to data problems (incomplete bathymetric survey coverage).

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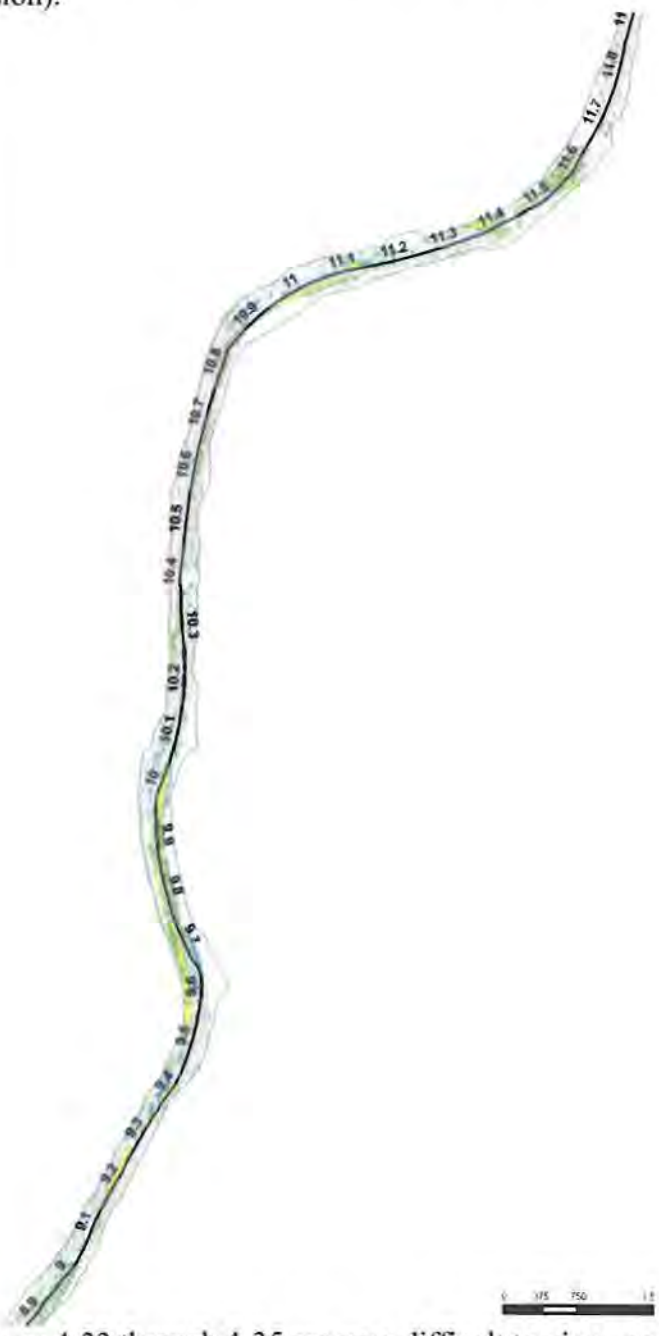
4-16	"Figures 4-33 to 4-38 show the changes in surface sediment bed elevations between 2007 and 2010, calculated by subtracting the 2007 sediment surface elevation from the 2010 sediment surface elevation (negative values represent erosion)."  Figures 4-33 through 4-35 are very difficult to view, poor choice of pastel colors?
	"Between RM9 and RM7.8 (Figure 4-40), both the model results and data indicate a transition from net erosion to net deposition."

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	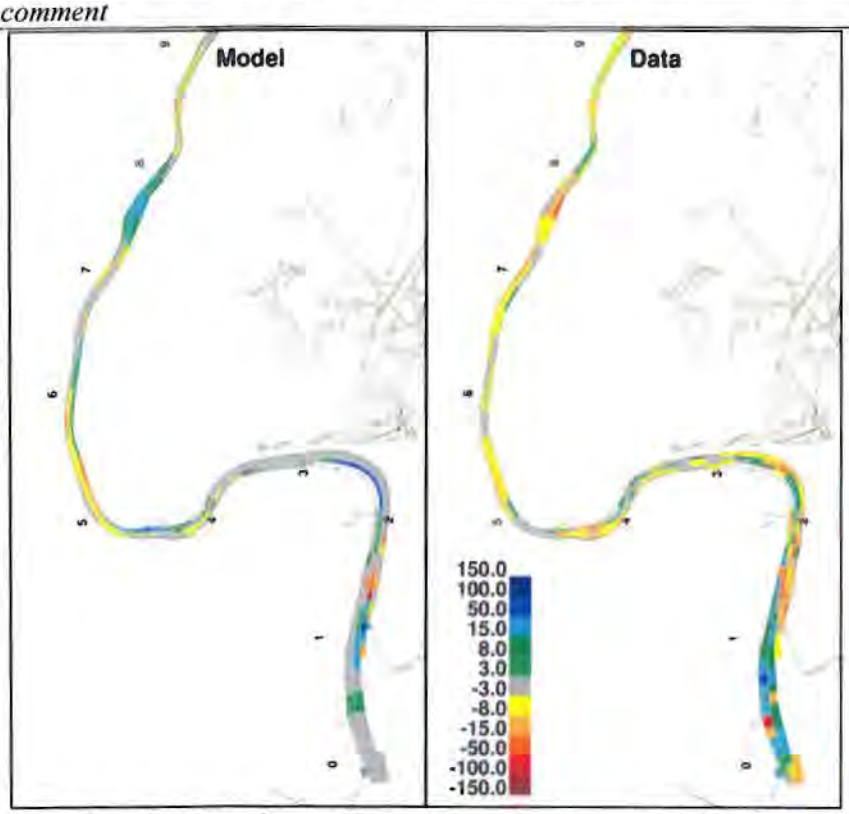 There is at least moderate disagreement between model and data in terms of erosion and deposition patterns in Figure 4-40. The model predicts substantial (+) change in bed elevation between RM7 and 8, while the data shows (–) change. Specifically, the model predicts 6-18" of (+) change in cells near RM 7.5 where river widens. Downstream from RM 4, the model predicts bed elevation changes in relatively fewer cells than were measured in the bathymetry.
4-18	"The areas of net erosion and deposition between 2007 and 2010 are presented on Figure 4-41, with the same y-axis scale used for the 2010-2011 period (Figure 4-31). The comparison of simulated areas of erosion and that derived from the data are in reasonable agreement for the vast majority of the 1-mile reaches. The data indicate the area of erosion is greater than the area of deposition for all but the most-downstream reach of the river. This pattern is reflected in the model results, with the exception of a few reaches (RM10-RM9 and RM8-RM6) where localized deposition shifts the balance." Again, evidence for general model confirmation at large spatial scales but not at scale of model grid.
4-22	Cumulative sediment fluxes (Figures 4-47 through 4-53): "During periods of low flow, most notably between mid 2001 and 2002, the cumulative water column sediment flux decreases, signaling a net upstream transport during those times due to estuarine circulation. Those periods also show a net deposition of solids transported upstream due to estuarine circulation."

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	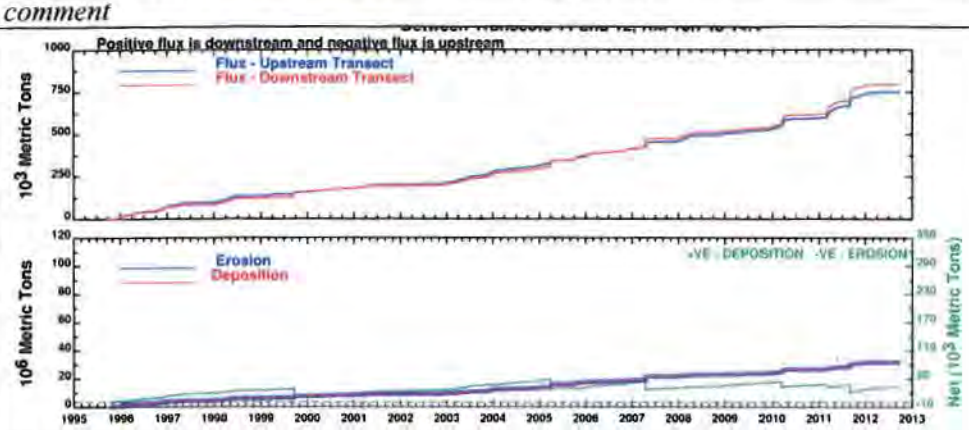 This cumulative water column sediment flux decrease is not readily apparent from these figures. Is there some other way this can be illustrated?
4-26	4.5.3.2 Water Year 1998, High-flow Fluxes: "The gross erosion and deposition terms increased by roughly 30 to 40%, but with more of an increase in gross deposition compared to gross resuspension, resulting in a doubling of the net non-cohesive deposition (from 2 to 4 MT per day) and an increase in the net cohesive solids by more than a factor of 2.5". 4.5.3.3 Water Year 1998, Low-flow Fluxes: "Interestingly, the low flow period turns out to be a period of net resuspension (46 and 1 MT per day for non-cohesive and cohesive solids respectively). This is in contrast to the high flow period during which net deposition occurred (46 and 1 MT per day for non-cohesive and cohesive solids respectively). This somewhat counter-intuitive result is largely a reflection of the nearly 4-fold higher upstream loading rate that occurs during the higher flow conditions (185 MT per day) in comparison to low flow conditions". As opposed to the previous flux analysis (Sections 4.5.2-4.5.3.1), these results are provocative and seemingly counter-intuitive: greater increase in deposition than erosion at high flow, and net resuspension under low flow? The explanations offered for these results, based on supply of solids and trapping efficiency, seem plausible. Has something comparable been seen in other sediment transport modeling studies?
4-28	"The interaction of these processes creates complex and potentially confusing patterns, as shown in Figures 4-58-4-61." Indeed. "It is noted that the model results, even in the river-dominated upstream transects, do not exhibit the typical hysteresis in solids loading versus river flow, because the boundary conditions do not include such a feature." I'm not sure how this statement fits in the discussion here?

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4-29	"...transport behavior of the LPR lags behind its riverine forcing by several days" What does this mean? Is this a significant factor related to the modeling objectives?
5-2	"Following USEPA guidance (2009) parameter values were either increased or decreased by a fixed amount of their base values. In this case a value was changed by 20% of its base value, although it is noted that USEPA, 2009 cites 10% as the common value for parameter variation." 20% perturbation of the upstream TSS boundary condition seems way too conservative at high flow rates. I would guess 100 – 200% is more realistic for a high flow scenario.
5-3	"Consistency between the assigned upstream boundary TSS-flow relationship and TSS estimated from OBS measurements recorded in the PWCM program indicate that the assigned TSS boundary conditions provide a reasonable characterization of TSS loading at Dundee Dam." What consistency does this refer to? Does this refer to the agreement between boundary condition TSS and the ABS measurements at RM 13.5?
5-4	"uncertainty associated with the downstream tidal boundaries is quite tolerable because of the minimal impact of these inputs on the FFS study area". In retrospect, would it have been more effective to reallocate resources devoted to characterizing the downstream boundary, and instead beefed up the sampling effort at Dundee Dam?
5-5	"The response of the model to changes in the critical shear stress for cohesive solids indicate that the model results are consistent with expectations. The assignment of the value used in the calibration is constrained by the comparisons between simulated water column TSS and concentrations estimated from the PWCM ABS data, particularly the phasing of intratidal concentration variations." So, tuning of critical shear stress was how the tidal phase of TSS predictions was calibrated?
5-6	"Vertical gradients in TSS, estimated from ABS data, provide an important constraint on the cohesive solids settling velocity because calculated vertical gradients in water column solids are sensitive to changes in settling velocity." So this is how the cohesive settling velocities (Figure 2-4) were calibrated? Some of the model predictions seem to be "off" in terms of the vertical gradients in TSS, does this indicate probable error in the setting rate?
5-9	"an approach discussed in USEPA's 2005 Contaminated Sediment Remediation Guidance for Hazardous Waste Sites, which relies on consideration of residuals

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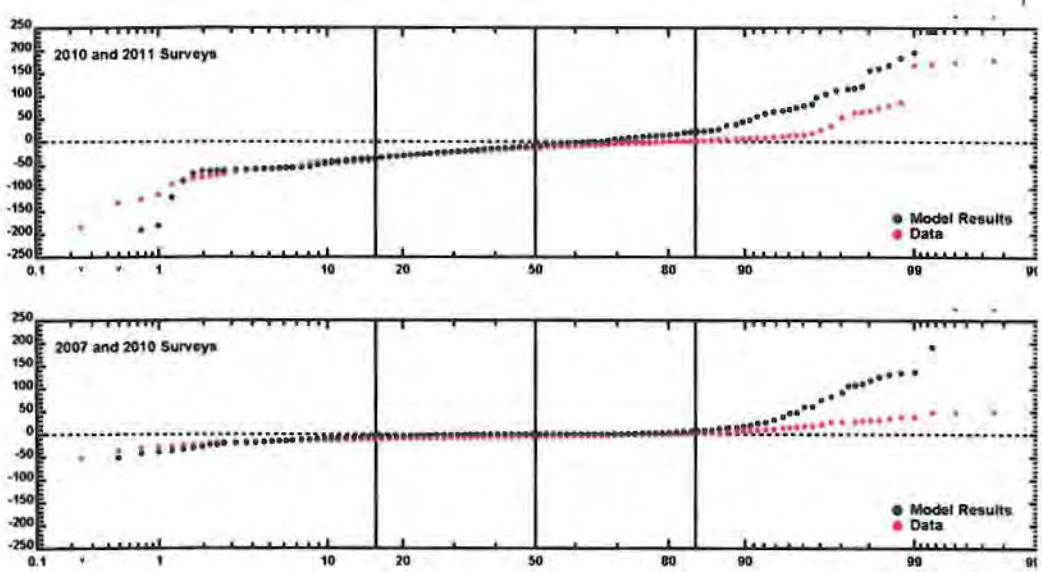
	between model results and data (Connolly and Tonelli, 1985) was adopted. The uncertainty propagated through the models is being evaluated using this approach with the exposure concentrations generated by the fate and transport model and passed to the risk assessment." Cannot argue with the approach of characterizing model error using residuals, but median relative errors (Tables 5-1 and 5-2) seem more like bias estimates than uncertainties.
5-10	Table 5-1. Median Relative Errors for 2009 PWCM Estimate TSS Concentrations Median relative errors for 2009 TSS (3-44%) are actually pretty good! Table 5-2. Median Relative Errors for Bed Elevation Changes As expected (based on lack of grid-scale resuspension parameters, etc.) median relative errors for bed elevation changes are larger (60-101%).
	"Figure 5-5 summarizes the cumulative frequency distributions of bed elevation changes for three time periods. The agreement between the model and data is more consistent on this basis, with better agreement for the multibeam data sets than for the single beam data."  These comparisons of bed elevation changes via cumulative frequency distributions may be slightly misleading because the rank order of the model results and data don't necessarily correspond to the same grid locations, or even grid locations in the same reach of the river. The distribution of results agree well within the second and third quartiles (multibeam data), although model

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	predictions generate more extreme (>90%) positive bed elevation changes and <1% negative changes in comparison to data.
6-3	"The empirical mass balance (EMB) analysis (Appendix C) produces one average estimate of the contribution of these various sources, while the sediment transport model shows spatial variations. The EMB estimates 48% of the deposition from resuspended LPR sediment, 32% from solids passing over Dundee Dam, almost 14% from Newark Bay, slightly less than 6% from tributaries and less than 0.5% from CSOs. These tracer simulation results averaged over RM2-12 (the appropriate spatial extent to compare to the EMB) indicate a higher proportion (39%) of the total mass accumulation from silts input at Dundee Dam and a lower fraction (33%) of the accumulation from resuspended LPR sediment. Interesting to note that sediment transport model tracer simulations suggest more cohesive solids deposition from Dundee Dam (39% vs. 32%) and less mass accumulation from resuspended sediments (33% vs. 48%) than EMB results.
6-4	"The FFS includes consideration of a bank-to-bank cap over the FFS Study Area… The results of this simulation indicate that solids eroded from the RM8.3 - RM12 reach represent between 5 and 10 percent (average ~7%) of the solids deposited on top of the RM0 - RM8.3 cap, at the end of this one-year simulation... Newark Bay and Hackensack River silt accounts for 31% of all of the silt accumulation on top of the RM0 - RM8.3 cap." The sediment capping tracer simulation yields some interesting results that seem to endorse USEPA's "remediate downstream first" approach that has been criticized by many. How would these results change if a hydrograph other than 1998 was used (highest flow in 1998 was ~250 cms, not particularly extreme) or the simulation was longer (e.g., 10 years)?
6-5	"A third sediment tracer simulation was performed to evaluate the progression of a remedy from upstream to downstream… classes)… More fine-grained sediments from an unremediated FFS Study Area accumulated on top of the RM8.3-12 cap than accumulated on top of the FFS Study Area cap from an unremediated RM8.3-12 area". Again, the sediment tracer simulations yield some interesting results. However, they don't directly address the consistency of the forecasting predictions with the previously-cited infilling rate of 4 inches/yr following cessation of navigation dredging.
6-7	"A dredging-loss rate of 3% was specified, based on data from the 2005 Environmental Dredging and Decontamination Pilot Study (LBG 2012) and data from other sediment sites."

Appendix BII: Lower Passaic River Sediment Transport Model	
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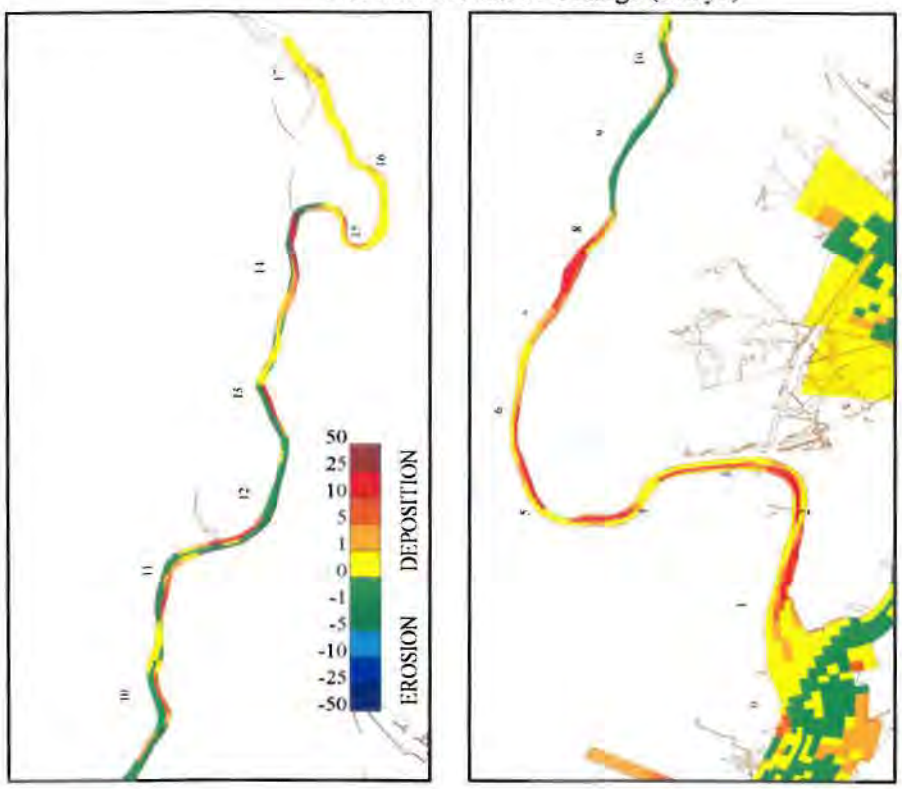
	The assumed 3% dredging loss rate seems generally comparable to the 1-6% loss of PCBs in Hudson River. Losses were assumed to increase with flow rate in the Hudson; is there any reason to expect something similar in the LPR? "Losses during dredging were simulated in the model split equally between the surface and bottom water column layers. These are the two points in the dredging operation where the greatest losses are expected." Are the results of these remediation scenarios at all sensitive to this vertical distribution?
6-9 and 6-10	"Maps showing the spatial patterns of bed elevation changes in each grid cell for the four alternatives are presented on Figures 6-14 through 6-17." The Deep Dredge simulation seems to address the issue of whether the sediment transport model predicts sediment infilling rates for the deep dredging remedial alternative are similar to the previously-cited (way back on page 1-1) 4 inches per year after maintenance dredging ended in lower Passaic River. Figure 6-15 shows more widespread positive bed elevation change for Deep Dredging compared to No Action. However, positive bed elevation changes on the order of 10-25 cm/yr (4-10 in/yr) appear mostly confined to the RM 7 to 8 stretch: Net Bed Elevation Change (cm/yr) 

Appendix BII: Lower Passaic River Sediment Transport Model	
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	"the rate of infilling is limited by the supply of solids from freshwater inputs and Newark Bay." If more suspended solids came over Dundee Dam, would the dredged channel fill in faster?

Appendix A (Data Evaluation Reports), Data Evaluation Report No. 2: Boundary Conditions	
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3-1	"The Upper Passaic River drainage basin (810 square miles) enters the Lower Passaic River at Dundee Dam (RM17.4)." Can any estimate be made for the magnitude of solids loading expected from this watershed based on unit loadings?

Appendix BIII: Lower Passaic River Contaminant Fate and Transport Model	
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3-9 and 3-10	"The head of tide dissolved and particulate contaminant concentrations used in the LPR RCATOX model are tabulated in Table 3-3…For the projection runs the time history for the period of time from October 1, 1995 through September 30, 2010 is repeated in a cycle from October 1, 2012 through September 30, 2059." The head of tide contaminant concentrations are constant dissolved and particulate concentrations (Table 3-3). These concentrations are not varied over the duration of 50 year projection runs. Wouldn't they be expected to decline over that time? At least for TCDD, the current boundary condition may be so low that further reduction in the future would have no effect. Would this be the case for the other COPCs and COPECs?
3-25	"Once average initial contaminant concentrations (for all five sediment layers) were assigned to each geomorphic region, the LPR model grid was laid over the geomorphic regions. As presented in Figure 3-11, multiple geomorphic regions typically fall within each model grid cell. Isn't it problematic for a sediment transport model grid cell to represent more than one geomorphic region? Presumably a geomorphic region reflects a predominant balance in terms of energy, sediment supply, tidal effects, etc. If the model discretization doesn't align with the geomorphology, then how can the model simulate how these same balances affect sediments and contaminants? Moreover, there are many more model cells than there are geomorphic regions, so why couldn't the model grid be aligned to better map these regions? Characteristic initial contaminant concentrations for each grid cell were derived by taking a spatially weighted average of the contaminant concentrations assigned to each geomorphic region present in the grid cell. This process was repeated separately for each of the five sediment layers. Figure 3-12 shows the final interpolated 2,3,7,8-TCDD concentrations for the top six inches of sediment for each geomorphic region within the LPR." Figure 3-12 shows fairly widespread occurrences where the color coding of sediment data does not match the color of the grid cell in which they falls. Why?
4-5	"The sediment X-Y scatter comparison for the FOC data (Figure 4-8) shows a great deal of scatter. This scatter is the result of a number of factors. There is considerable heterogeneity of the FOC in the sediment data… due to the relatively high KPOC of the COPCs and COPECs modeled, doubling the sediment FOC did not significantly affect the fraction of the contaminant sorbed to the organic carbon, and therefore did not impact the computed contaminant fate and transport."

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	Given the amount of scatter in the x-y plots of organic carbon states (Figures 4-6 through 4-8) it is indeed fortunate that partitioning in the contaminant model is insensitive to organic carbon phase concentrations!
4-6 and 4-7	"The RCATOX model surface sediment initial conditions were developed using data that were mostly from the depth interval of 0.0 - 0.5 ft. The initial condition was first assigned as a uniform concentration over this surface sediment layer. After running the model initially for the period through 2008, the sediments developed a gradient over the top 15 cm (~6 in). This gradient is controlled mainly by the rate of particle mixing within the bed. As the model develops this gradient from lower concentrations at the surface of the sediments to higher concentrations in the bulk of the sediment it results in an artificially rapid decline in surface sediment concentrations. To compensate for this initial condition data resolution artifact, the model was then restarted from 1995 with the same average concentration but with the vertical distribution computed by the model after running through 2008." How much were the surface contaminant concentrations reduced? Was this done uniformly (spatially? between contaminants?)? Was there any high-resolution sediment data available to constrain this? The 2005 high-resolution core data was not sufficiently resolved to reveal any contaminant trends within the top few cm. Maybe other highly-resolved cores were analyzed for contaminants?
4-10	"(TCDD) concentrations simulated through 2010 have tended to decrease throughout the LPR and Newark Bay relative to the initial conditions. The data collected over this time period show do not show a significant trend with similar median concentrations in 1995 and 2008 through 2012. Given the variability in the data, however, the model results and data are still in reasonable agreement in most areas. In the final two calibration years 2011 and 2012 the model shows an increase due to some relatively high flows. In these final two years the 2011 CPG River Mile 10.9 Data, 2012 CPG River Mile 10.9 Data, and the 2012 CPG Low Resolution Coring Supplemental data show just how variable the data can be at small scales. The model does a fairly good job of going through the middle of the range of the data, but cannot reproduce the observed sub-grid scale variability. It is important to note that, with the exception of the 1995 RI Sampling Program, the various sampling programs were not designed to collect data that were spatially representative of the sediment bed."

Appendix BIII: Lower Passaic River Contaminant Fate and Transport Model	
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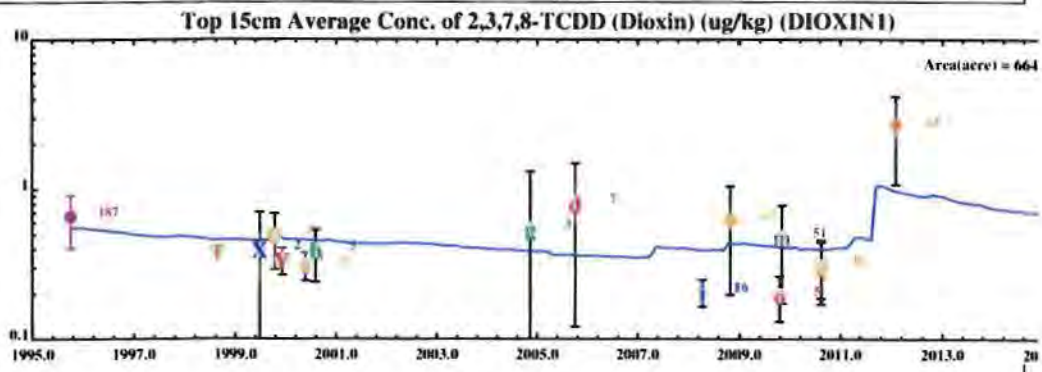
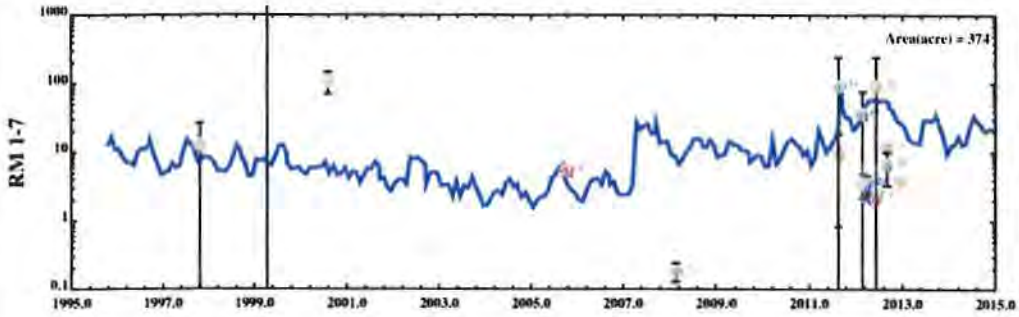
	 The contaminant transport model predicts TCDD concentrations in surficial sediment to decline at a rate corresponding to a half life of approximately 25-35 years (if the upward concentration "step" resulting from Hurricane Irene flows are ignored) . Does USEPA believe this prediction is accurate, given the apparent lack of significant decline in surficial sediment TCDD concentrations observed over the time period from 1995 to 2010? In other words, how does USEPA reconcile the apparent contradiction between these predictions and observations? This is a fairly important issue, since the decline in surficial sediment TCDD concentrations has been a significant point of contention between USEPA and CPG, both in terms of data interpretation and effectiveness of natural recovery as a component of remediation alternatives.
4-12 and 4-13	"For a number of reaches and sampling events, the model falls within the 95% confidence limits of the mean of the data, but the model over predicts total water column concentrations measured during a number of the CWCM sampling events particularly within the Study Area. This is related to the response of the model to the high flows in 2007, 2010, and 2011, and particularly Hurricane Irene in 2011. The high flows result in erosion in a small number of cells to a depth that exposes fairly elevated contaminant concentrations to the water column, and the model computed water column concentrations do not recover as quickly as the data suggests." 

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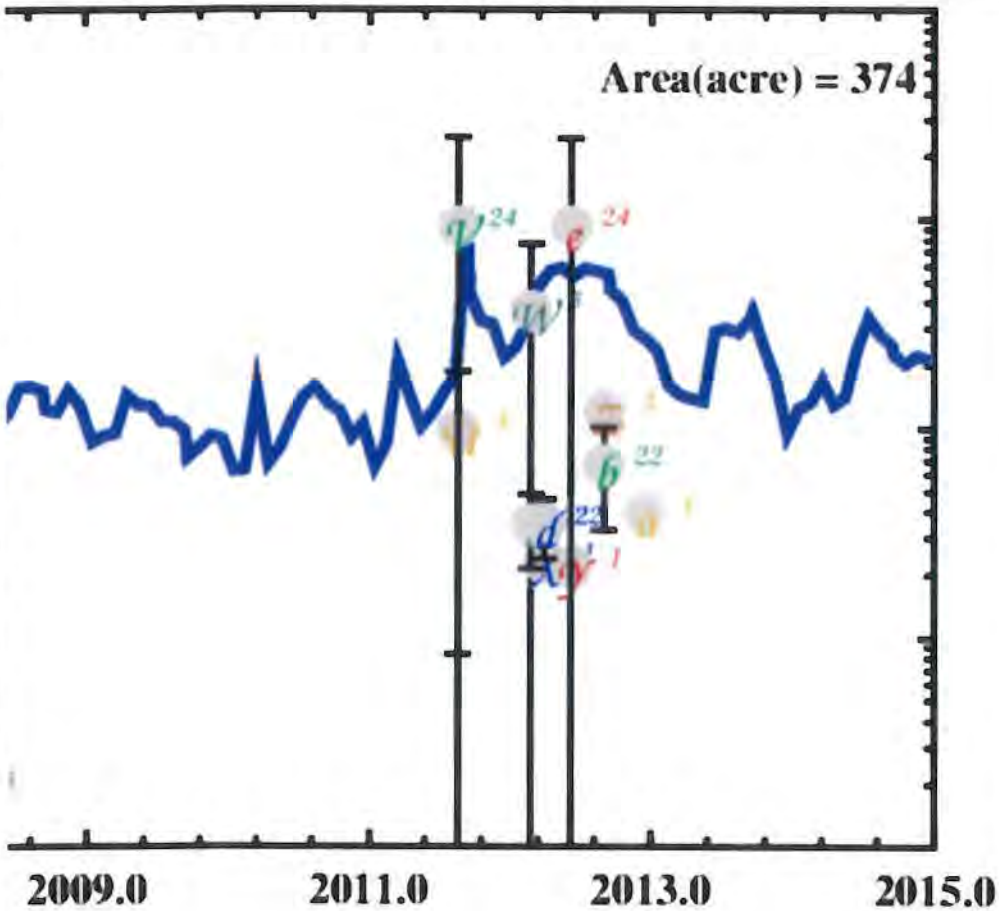

It is quite difficult to see what is going on in Figure 4-34, especially the post-Hurricane Irene time interval near the end of the plot. Irene hit LPR with sustained high flows at the end of August 2011; does that correspond to the first data point plotted after 2011.0? The elevated TCDD water column concentrations are sustained for a considerable period of time – well into the following year. A few of the data match these predictions, but another "clump" are an order-of-magnitude lower in concentration. So actually, the data are suggesting two different responses: what can explain the order-of-magnitude difference in concentrations in this time period?

"The tetrachlorobiphenyl model results match the 2008 LPR data quite well (Figures 4-36 and 4-37). The model results fall well with the 95% confidence limits of the mean of the data."

Appendix BIII: Lower Passaic River Contaminant Fate and Transport Model	
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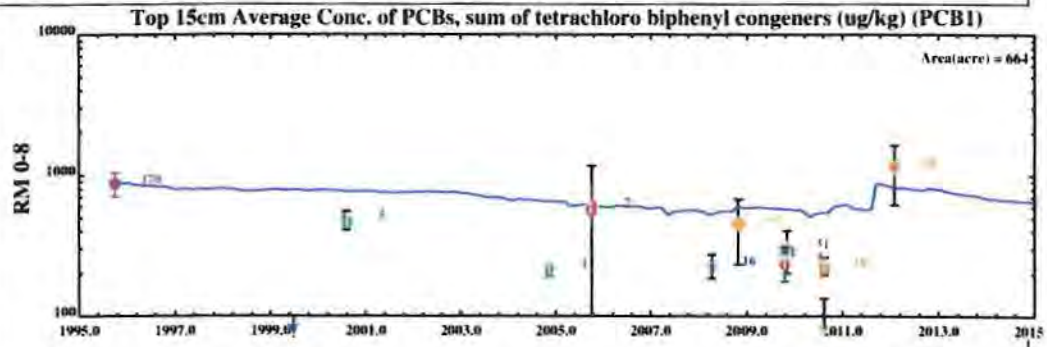
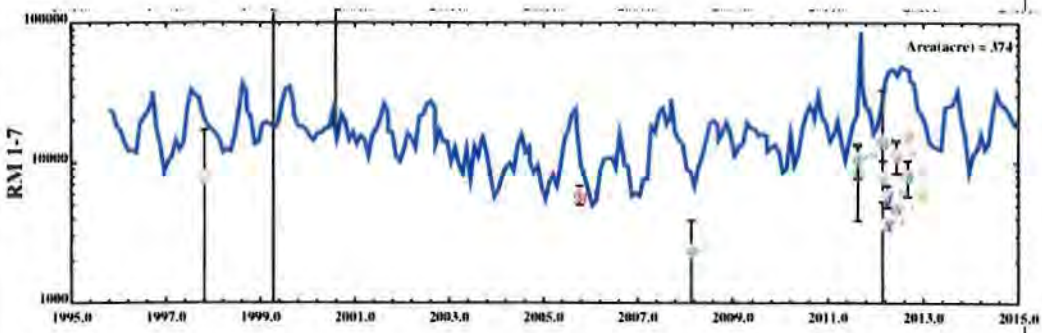
	 "Similar to the TCDD results the model tends to over predict observed concentrations of tetrachlorobiphenyl in the water column. The over estimate of water column concentrations is again related to the response of the model to the high flows in the 2007 through 2011 time period."  Model also over-predicts the water column PCB4 concentrations in 2011-2012, so the lack of fit evident for water column TCDD predictions is a consistent error for hydrophobic organic contaminants?
4-14 and 4-15	"Data and model results were plotted on X-Y scatter plots for a point by point comparison. Each sediment sample was paired with the corresponding 30-day average model result for the cell where the sample was collected, and each water column sample was paired with the corresponding 1 hour average model result for the cell where the sample was collected. Figures 4-50 through 4-55 show surface sediment (15 cm or ~6 in), and water column results for 2,3,7,8-TCDD, tetrachlorobiphenyl and mercury, respectively." "for 2,3,7,8-TCDD, the cross-plots of the surface sediment model results with the data indicate that reasonable agreement has been achieved by the model. Both the model and data vary over about a 5 order of magnitude range and overall 67.5% of the calculated 2,3,7,8-TCDD concentrations (Figure 4-50) are within a factor of +/- 5x of the measurements. For the FFS Study Area, 81.6% of the data falls within the +/- 5x envelope."

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	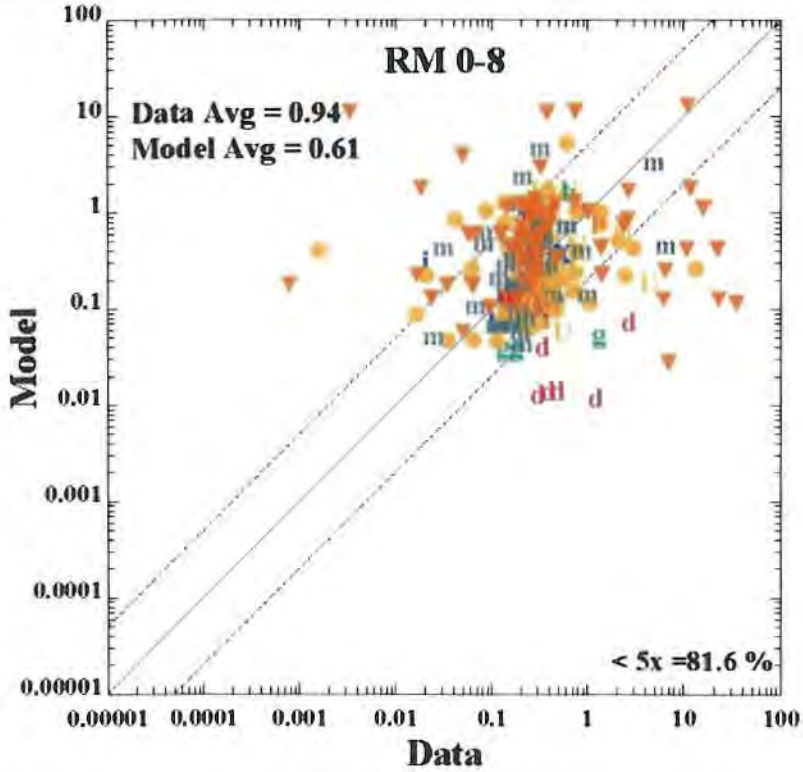 According to this comparison, the sediment TCDD predictions are unbiased and the range of predictions roughly match the data. There doesn't seem to be much correlation, though.
4-15	"The water column 2,3,7,8-TCDD model results do not compare as favorably with the data. The concentration in the water column is overpredicted for most of the water column datasets, particularly the later datasets south of RM8.3. For the FFS Study Area, 35.9% of the data falls within the +/- 5x envelope." (Figure 4-51):

Appendix BIII: Lower Passaic River Contaminant Fate and Transport Model	
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	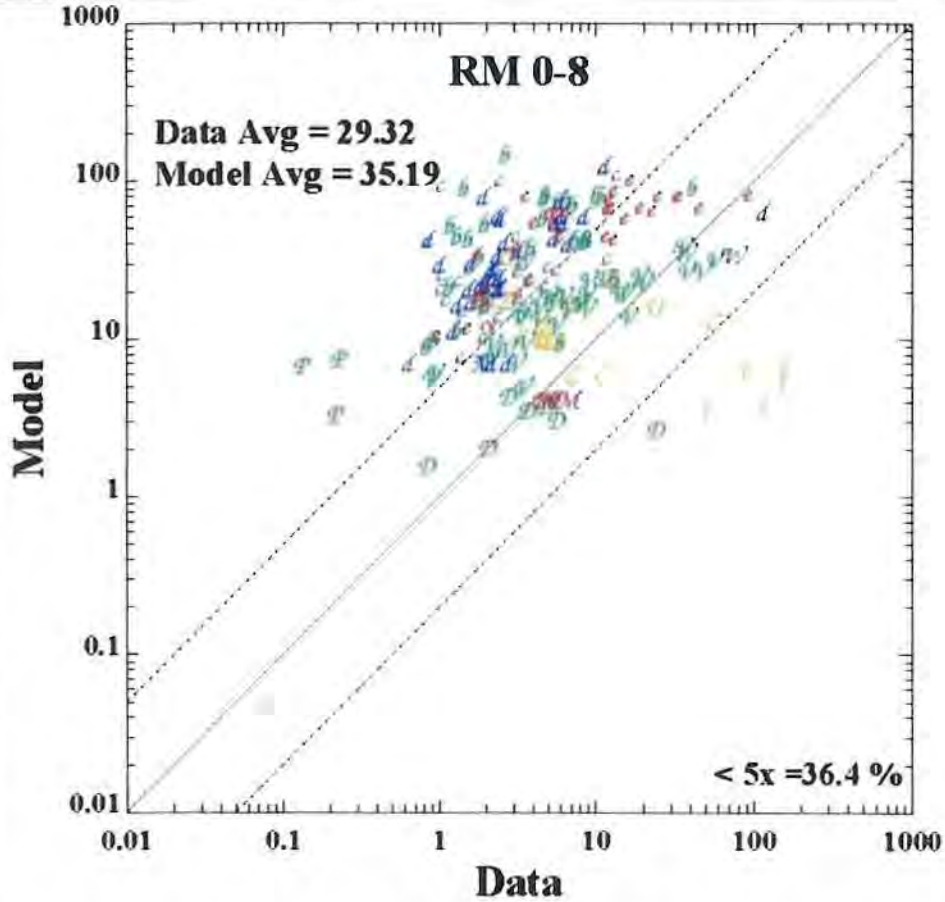 Water column TCDD concentration predictions are clearly biased high in comparison to data.
4-18	"The uncertainty propagated through the models is being evaluated using this approach with the exposure concentrations generated by the fate and transport model and passed to the risk assessment. The uncertainty values computed represent a lower bound on the uncertainty in the RM 0 to 8.3 averages passed to the risk assessment." The lower-bound nature of the prediction uncertainties determined in this manner should be reiterated when they are later applied. "Median relative error values were computed for the predicted water column POC, DOC, sediment FOC, sediment COPC/COPEC, and water column COPC/COPEC data. The resulting computed median relative error values are presented in Table 4-2."

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Name	River Mile 0-8					
	Sediment Top 15cm			Water Column		
	N	Percent of Samples w/in factor of 5	Median Relative Error	N	Percent of Samples w/in factor of 5	Median Relative Error
2378-TCDD	304	81.6	35	198	35.9	525
Di-CB	235	78.7	110	191	41.9	292
Tri-CB	235	77.9	64	191	48.7	270
Tetra-CB	235	80.4	67	191	45	279
Penta-CB	235	87.2	27	191	42.4	296
Hexa-CB	235	85.5	20	191	52.4	200
Mono-CB	235	79.1	83	191	20.4	588
Hepta-CB	230	85.7	20	191	46.1	247
Octa-CB	230	86.1	7	191	38.7	311
Nona-CB	230	83.5	42	191	33	305
Deca-CB	222	84.7	51	197	69	137

TCDD prediction error statistics are comparable to other hydrophobic organic contaminants, although water column median relative error is higher than almost all others.

4-19 "The water column model calculations tend to overpredict the response of the water column to the high flow events between 2007 and 2011 (except for mercury, where model results compared well with data), in particular, the rate of decline in water column concentrations suggested by the CWCM data collected between 2011 and 2012. This result is related to the response of the model to high flows resulting in erosion in a small number of cells to a depth that exposes fairly elevated contaminant concentrations to the water column."

It sounds as though USEPA is questioning this phenomenon, even though this has been suggested by the Agency as the source of much of the TCDD "recontamination" of the LPR? According to the conceptual site model (Section 6 of the Remedial Investigation Report):

"Daily tidal action resuspends and redeposits the contaminated surface sediments, while occasional scouring during high flow events uncovers and resuspends deeper, more highly contaminated sediments. As a result, contaminant concentrations in the surface sediments (approximately the top two feet) are declining extremely slowly in recent years."

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	EPA should clarify whether there is maybe too much of this elevated contaminant erosion taking place in the model, or that the phenomenon is incorrect?
5-1	"The four model sensitivity runs that were performed were: the upstream boundary condition, partition coefficients, depth of particle mixing, and rate of particle mixing. In addition the sensitivity of the model to a one in one hundred year storm after completion of deep dredging was also simulated." Why were no sensitivity analyses performed for parameters varied in the sediment transport model (settling/resuspension) or the upstream suspended solids boundary condition? Aren't contaminant concentrations sensitive to those parameters too? The 2013 Peer Review of the FFS models also requested USEPA to include the upstream suspended solids boundary condition in the sensitivity analysis for the Contaminant Fate and Transport Model. In their response to the peer review comments, USEPA agreed to conduct such an analysis. However, no results of such analysis are presented in the revised Contaminant Fate and Transport Model report and no explanation was offered for this omission. This prompts a general comment regarding USEPA's responses to the Peer Review comments. PVSC reviewed the comments and responses in some detail, and found numerous instances where (1) USEPA agreed to perform additional analyses and/or present additional results and explanations, then failed to do so, or (2) rebutted significant comments, especially those related to sediment transport and contaminant bioturbation/mixing processes as well as grid size issues. These responses concern PVSC because they could give the impression that USEPA was disinterested in constructively responding to some of the Peer Review comments. Notwithstanding the previous comments, PVSC believes that the Modeling Peer Review led to significant improvements in both the Sediment Transport and Contaminant Fate and Transport models.
5-6	"The sensitivity of the model to large storms was assessed by running a simulation of a one in one hundred year storm." What storm? I assume Hurricane Irene but this isn't defined. Better documentation of this sensitivity analysis is needed. "The time period chosen was starting October 1, 2029 and running through the subsequent 3 years." Figure 5-16 shows 2020 as the start date. Is October 1, 2029 where the storm is simulated?

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	"This time period follows the completion of the Deep Dredging remedial alternative, which is the longest duration of the simulated remedies. Beginning the simulation at this point allows a comparison of the impact of an extreme flow with all of the alternatives in place." This makes sense in terms of comparing the alternatives. However, a 100 year storm is equally likely to occur during remediation. What would that do? "The sensitivity was simulated in the hydrodynamic and sediment transport (Appendix BII) and the results were used as an input to the organic carbon and contaminant fate and transport models." There is no discussion of a 100 year storm in the Sediment Transport Report, so it is difficult to relate the 2 models' simulations of this event. Assuming this refers to Hurricane Irene, that period was part of the confirmation simulation and was the largest of several events that were bounded by multibeam bathymetry surveys in 2010 and 2011. No ABS/TSS data was collected for this event, and the model predictions of TSS were not displayed or discussed. "The response in the sediments of RM0-8.3 is nearly two times greater than the other high flow periods." What response is USEPA referring to, and how is it 2 times bigger than other high flow periods? What are the other high flow periods? Assuming this refers to floods in March and September of 2011, the 100 year storm flow was 30% to 50% larger than these events. For the model to predict twice the response (?) to a 30% to 50% increase in the event magnitude, suggests that the consequences of extreme high flows should be given more careful consideration by USEPA when evaluating remedial alternatives.
5-7	"The sensitivities also show that erosion predicted by the sediment transport model along with the specification of elevated concentrations at depth in the bed can be an equalizing factor which tends to reset the surface sediment concentrations and reduce the differences between the simulations using different parameters for bed processes." Not sure how the sensitivity analyses demonstrate this – the discussion is under-developed.
6-1	"The hydrographs (and other tidal forcing) for the period October 1995 – October 2010 (water years 1996-2010) were repeated in 15-year cycles to simulate conditions into the future to October 2059, which is 30 years after remedy- related construction is completed. (Although the calibration simulations included a 17- year period from 1995-2012, the hydrodynamic transport from only the first 15 years was used, to avoid repeating the 90-year return frequency flow associated with Hurricane Irene in the repeating cycle.)"

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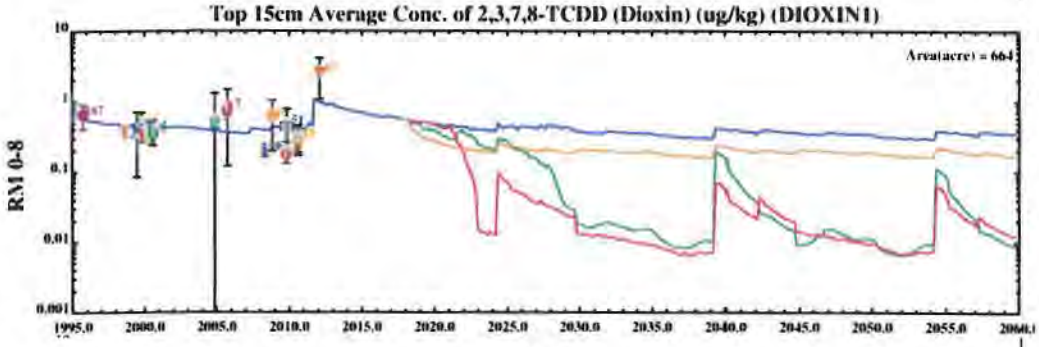
	Does this mean that the largest storm in the remedial alternative simulations is the 20-year flood that occurred on March 16, 2010? Or was Tropical Storm Floyd in 1999 larger? According to the New York State Department of Environmental Conservation (http://www.dec.ny.gov/energy/45202.html), sea level is projected to rise from 7 to 12 inches by the 2050s (not accounting for rapid melt of land-based ice) or 19 to 29 inches (accounting for rapid ice melt) in the Lower Hudson Valley and Long Island. Has this change in the open boundary condition been factored into the long-term remedial action scenarios? If not, then how will sea level rise affect the results presented in this report?
6-6	"The results show a reduction in the variability in concentrations simulated within the FFS Study Area for the Deep Dredging, Full Capping, and Focused Capping alternatives compared to the variability in the No Action simulation, due to a reduction in erosion of contaminated sediment from within the FFS Study Area (Note that the results are plotted on a log scale, so that while the Deep Dredging and Full Capping lines appear more variable visually...)." Maybe it would be helpful to plot the results shown in Figure 6-3 on arithmetic scale too, in order for this to be apparent?
6-7 and 6-9	"The effect of cycling the 15-year hydrograph is evident in the results throughout the system, although to a lesser extent in the eastern shoals of Newark Bay. The effect of the April 2007 and March 2010 high flows (both over 15,000 cfs at Little Falls) is evident as they are repeated in years 2024 and 2027, 2039 and 2042, as the 15-year hydrograph is cycled."  "The temporal variations in reach average concentrations, shown on Figures 6-3 through 6-7 are in response to erosion and deposition of contaminated and new cleaner solids." So, to be clear: TCDD concentrations rise following major floods because erosion reexposes high sediment concentrations, which are then slowly buried by cleaner sediment?

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6-8	"In 2059, simulated concentrations have declined to 0.35 ug/Kg for No Action, 0.18 ug/Kg for Focused Capping, 0.012 ug/Kg for Full Capping and to 0.09 ug/Kg for the Deep Dredging. Comparing the Deep Dredging and Full Capping results at the end of the simulation, the relationship between the channel and shoals is reversed." Comment: Sediment PRG is 0.0071 ng/g (ug/Kg). Since the model forecasts end before reaching the PRG, PVSC must extrapolate the prediction curves by eye. Looks like full capping and deep dredging predictions essentially "recycle" the same concentration trajectories from 2025-2039 and 2040-2054; are the same trajectories expected from 2055-2069? When do the concentrations get down to 0.0071 ug/Kg? How is this prediction impacted by the timing of large events, or by the uncertainty of model predictions?
6-15 and 6-16	"The median relative error uncertainty values computed in section 4.5 were applied to the FFS study Area reach average top-15 cm (~6 in) sediment concentrations for the four modeled alternatives. These results are presented in Figures 6-47 through 6-49 for 2,3,7,8-TCDD, tetrachlorobiphenyl, and mercury respectively. The solid lines are the same area weighted full reach averages presented in section 6.3 on the top panels of Figures 6-3, 6-15, and 6-27. The dashed lines represent the uncertainty bounds based on the median relative error analysis. The 2,3,7,8-TCDD area weighted average concentrations for the Focused Capping alternative are lower than the No Action results for the entire period after completion of the remedy (Figure 6-47); however, the lower uncertainty bound for No Action overlaps the upper uncertainty bound for the Focused Capping. In the case of the Full Capping and Deep Dredging results the area weighed averages and uncertainty bounds overlap each other for the period after completion of the Deep Dredging remedy, and these results only overlap the results for the No Action and Focused Capping alternatives for limited periods of time."

Appendix BIII: Lower Passaic River Contaminant Fate and Transport Model	
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	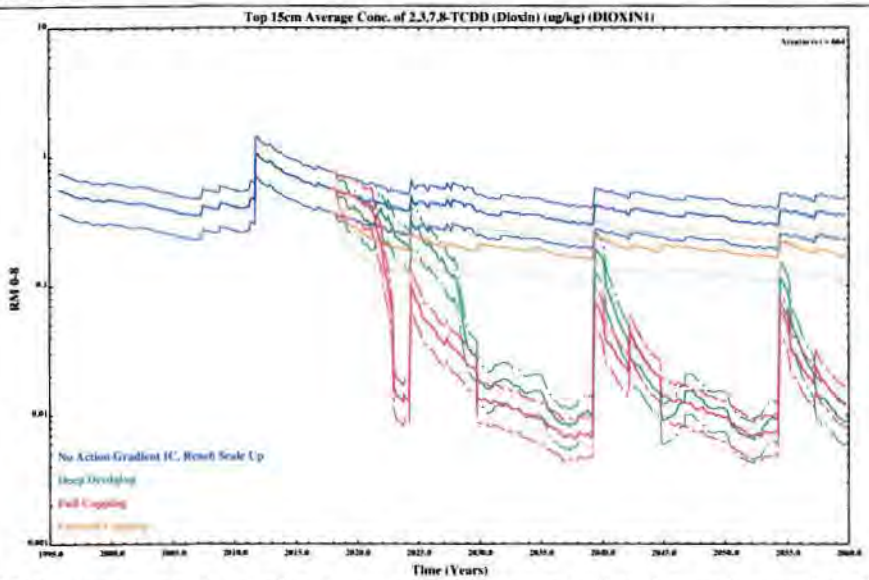 EPA places much emphasis on whether uncertainty bounds overlap for the remedial alternative predictions. It bears repeating that uncertainty bounds, which are based upon mean relative errors, are in fact conservative or "lower bound" estimates. In reality, wouldn't the uncertainty bounds tend to grow larger over time in the simulations, due to propagation of errors in things like the trend in surface sediment concentrations?

Appendix BIII: Lower Passaic River Contaminant Fate and Transport Model, Attachment G: Revisions to CARP Loads	
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2807	**Reevaluation of External Contaminant Loadings** *CSOs* CARP reported measured CSO effluent contaminant concentration data for both dissolved and particulate contaminant phases simultaneously. CSO loading contaminant concentrations in the CARP models were specified as median total contaminant (i.e., dissolved phase plus particulate phase) based on the CARP data for both phases. As part of the Lower Passaic River Remedial Investigation and Feasability Study (RI/FS) and supporting the development of the Lower Passaic River Conceptual Site Model (CSM), particulate phase contaminant concentration data were collected for CSO effluents. While these two data sets are not directly comparable (i.e., both phases vs. particulate phase only), examining them together provides an understanding of the reasonableness of each of the data sets. The two data sets agree reasonably well and the median concentrations developed as CARP model inputs for both phases, fall within the range of, but above the fiftieth percentile, as expected, of log probability distributions of the RI/FS CSM data for particulate phase only. Accordingly, no adjustments were made to CSO inputs for CARP model application in support of the FFS. Appendix 2 shows

Appendix BIII: Lower Passaic River Contaminant Fate and Transport Model, Attachment G: Revisions to CARP Loads	
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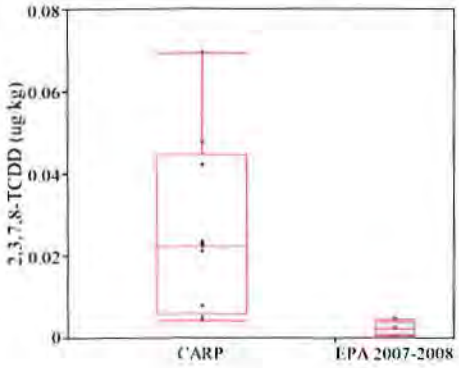
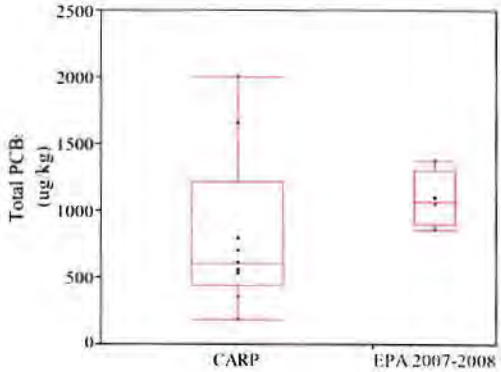
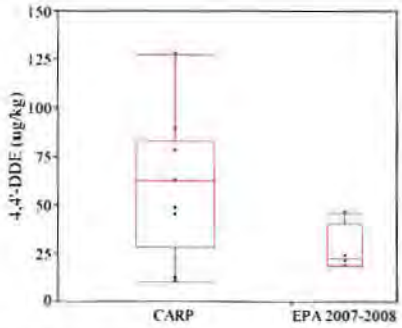
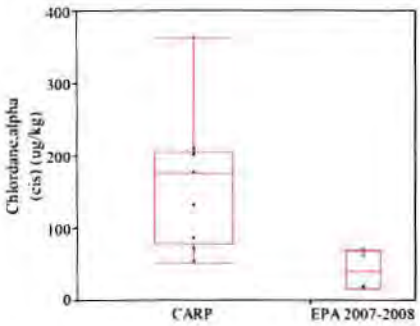
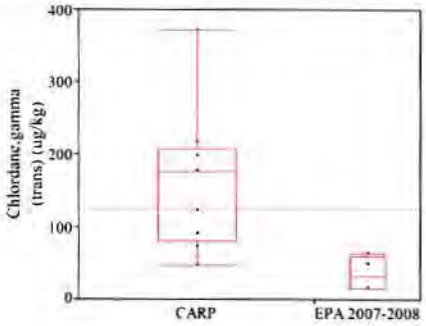
	the comparisons between the CARP model inputs for dissolved plus particulate phases and the RI/FS CSM data for particulate phase only. EPA's decision to not adjust CSO input loadings to reflect the Malcom Pirnie data collected for CSM development was apparently made because CSO and SWO discharges constitute only minimal loads of contaminants to the surface sediments of the Lower Passaic River, and thus the adjustment would have no discernible impact on the predictions of the contaminant fate and transport model. This is discussed further in Appendix A, Data Evaluation Report No. 2. While understandable from the perspective of engineering expedience, PVSC cannot agree with this decision because the data collected by Malcolm Pirnie to develop the CSM is far more representative of CSO/SWO discharges to the Passaic River. This issue is addressed in another comment (see: Appendix A (Data Evaluation Reports), Data Evaluation Report No. 2: Boundary Conditions, pages 6-9 and 6-10).

Appendix A (Data Evaluation Reports), Data Evaluation Report No. 2: Boundary Conditions	
page	*comment*
6-9 and 6-10	The 2001 to 2004 CARP CSO/SWO data were visually compared to the 2007 to 2008 USEPA/Malcolm Pirnie, Inc. CSO/SWO data using box-and-whisker plots for the different contaminants to assess the similarity of the results from the two programs (refer to Figures 6-6 and 6-7). In CSO samples, for all contaminants except Total PCB, the mean concentrations reported in the 2007 to 2008 USEPA/Malcolm Pirnie, Inc. samples were lower than the corresponding concentration reported in the CARP program (Figure 6-5).     

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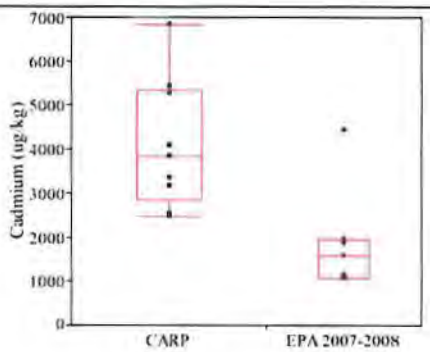

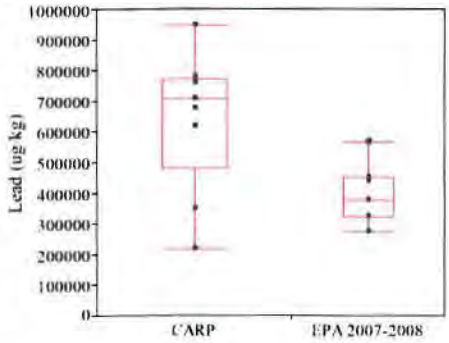

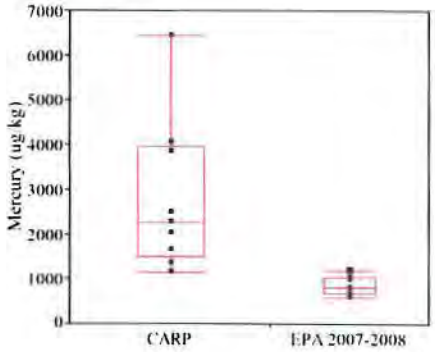

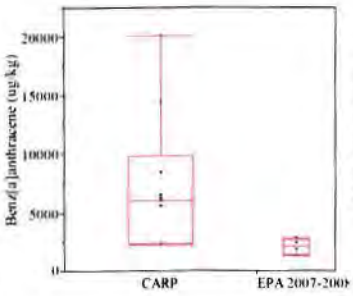

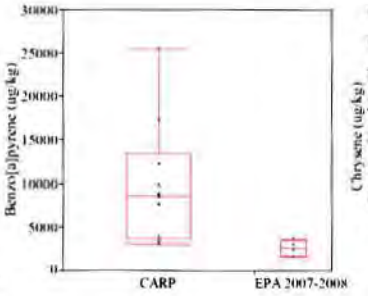

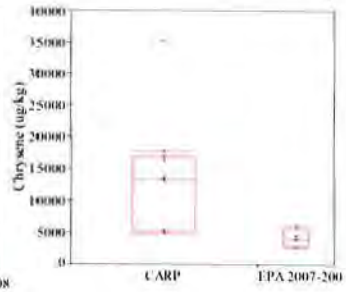

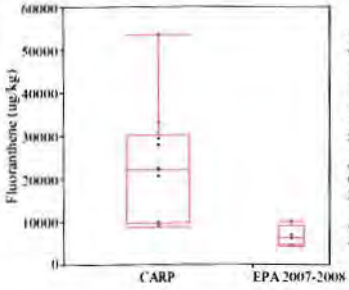

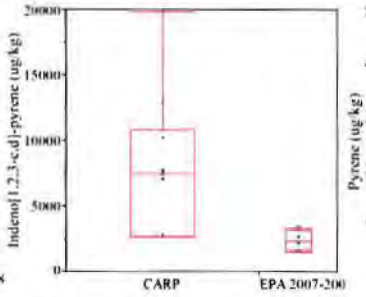

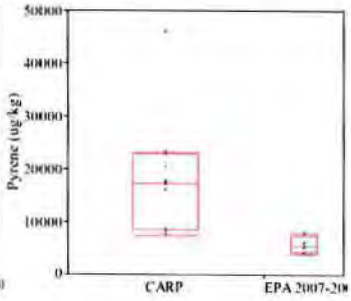

It is obvious from visual inspection of the box-and-whisker plots that lower concentrations of almost all toxic chemicals (PCBs being the sole exception) were measured in CSO samples collected for CSM development by USEPA/Malcolm Pirnie, Inc. in 2007 to 2008, compared to CSO samples collected for CARP in 2001 to 2004, which included primarily data from

Appendix A (Data Evaluation Reports), Data Evaluation Report No. 2: Boundary Conditions	
page	*comment*
	CSOs discharging to other portions of the Harbor; 75 percent of the CARP CSO samples were collected from CSOs discharging to Newark Bay and the Hackensack River. A statistical test [Tukey-Kramer Honestly Significant Difference (HSD)] was then performed on the two CSO/SWO datasets to determine if the mean concentrations were significantly different. (Results of the Tukey-Kramer HSD test are provided in Attachment A of Data Evaluation Report No. 4). Based on this statistical test, the mean contaminant concentrations reported in the 2007 to 2008 USEPA/Malcolm Pirnie, Inc. and CARP datasets are not significantly different at the 95th percentile, except for chlordane and the metals. However, for 2,3,7,8-TCDD and PAH compounds in CSO samples, the mean concentrations are significantly different at the 90th percentile. The statistical test confirmed that 2,3,7,8-TCDD and PAH compounds in CSO samples were significantly different (lower) in the 2007 to 2008 USEPA/Malcolm Pirnie, Inc. dataset. The results show that for the SWO results, the USEPA/Malcolm Pirnie, Inc. and the CARP data are in reasonably good agreement, especially considering the uncertainties introduced by the conversion of the CARP data to a concentration per unit mass of suspended solids. The CSO data do not show the same level of agreement between the two programs. For nearly all contaminants, the CARP data are notably and sometimes statistically significantly higher. EPA admits that CSO contaminant concentrations are higher in the CARP data than in data collected in 2007-08 to support the RI/FS and the CSM for this project. It is PVSC's recommendation that CSO contaminant loadings be recalculated using the 2007-08 data to be most representative, because CSO contaminant loadings calculated from CARP contaminant concentrations (which included data collected mostly from CSOs in locations other than the Passaic River) appear to be biased high. This may reflect differences in media (whole water versus suspended solids) being measured or analytical differences, such as in the determination of TSS. The comparison is particularly sensitive to this parameter, since all concentrations are divided by it. Alternatively, the difference may reflect the inclusion of non-Passaic River CSO discharges, which may have different contaminant burdens relative to the Lower Passaic River. Only one of the four CSOs sampled under CARP actually discharges to the Lower Passaic River. This analysis by USEPA indicates that the contaminant concentrations in CSO samples from the 2007-08 USEPA/Malcolm Pirnie, Inc. dataset are more

Appendix A (Data Evaluation Reports), Data Evaluation Report No. 2: Boundary Conditions	
page	*comment*
	representative of inputs to the lower Passaic River than data from the CARP. This reinforces our argument that the loading of contaminants from the CSOs must be based on the 2007-08 data. Nonetheless, the upper-bound concentrations suggested by the CARP data are typically only about 2 to 3 times greater than those for the USEPA/Malcolm Pirnie, Inc. results. Conversely, this same information indicates that CSO contaminant concentrations (and therefore loadings) based on the CARP data are 2 to 3 times higher than measured in the 2007-08 data. In nearly all instances, these concentrations would still not be sufficient to exceed the estimated threshold for a potentially significant load originating with the CSOs and SWOs of 25 times the concentration of recently-deposited Lower Passaic River sediments. While the USEPA/Malcolm Pirnie, Inc. results are more representative (they represent nearly 3,000 acres of Lower Passaic River sewer-shed versus only approximately 800 acres for CARP) and were collected more recently, … EPA again indicates the superiority of the 2007-08 USEPA/Malcolm Pirnie, Inc. dataset on the basis of both spatial and temporal representativeness. …the conclusions regarding the importance of CSO and SWO discharges remain the same with either data set. CSO and SWO discharges constitute only minimal loads of contaminants to the surface sediments of the Lower Passaic River. In terms of accuracy of contaminant loadings, this argument is irrelevant. As previously commented by PVSC, USEPA's position is based on engineering expedience. Based on USEPA's own analysis (as presented above) it is technically incorrect. Therefore, PVSC requests USEPA to recalculate CSO contaminant loads using the 2007-08 concentration data.

Cleaning Up the Lower Passaic River: An Overview of USEPA's Proposal for the Lower Eight Miles	
page	*comment*
2	Long Term Monitoring & Maintenance: During construction, monitoring of water, air and wildlife would be conducted to evaluate whether the cleanup activities are being managed most efficiently to reduce potential releases of contaminants to the environment. In instances in which water or air quality standards are exceeded, the related construction activity would be evaluated and additional protective measures would be implemented. During and after construction, enhanced community outreach would be conducted regarding New Jersey's fish and crab consumption advisories to improve awareness and compliance. After project completion, frequent monitoring of fish and sediment would be conducted to determine progress toward meeting cleanup goals. To this list, PVSC suggests that adding TSS/ ABS monitoring at Dundee Dam could significantly improve sediment transport and contaminant transport and fate modeling in the future, by reducing errors in the specification of upstream (freshwater) boundary conditions. As demonstrated by the sediment transport solids tracer simulations, supply of solids mainly from this boundary plays an important role in determining burial rates in the LPR. Is this correct?

We appreciate the opportunity to provide comments on this important project and look forward to USEPA's responses. PVSC also remains ready to meet with USEPA at its convenience to further discuss any issues raised herein or in additional comments.

Sincerely,

PASSAIC VALLEY SEWERAGE COMMISSION

Bridget M. McKenna
Chief Operating Officer

c: Kenneth J. Lucianin, Commissioner
Thomas J. Tucci, Commissioner
Michael DeFrancisci, Executive Director, PVSC
Gregory A. Tramontozzi, Esq., General Counsel, PVSC
Michael D. Witt, Esq., Special Counsel, PVSC

Yeh, Alice

From: McKenna, Bridget <BMcKenna@pvsc.nj.gov>
Sent: Wednesday, August 20, 2014 3:02 PM
To: Region2 PassaicLower8MileComments
Cc: Yeh, Alice; DeFrancisci, Michael; Tramontozzi, Gregory; mwitt@chasanlaw.com
Subject: PVSC's Comments on the Passaic River Lower 8 Mile RI/FFs
Attachments: 08-20-2014 PVSC Comments on Lower 8 Passaic River RI FFS.pdf

Hi Alice,
Attached please find PVSC's Comments on the USEPA's RI/FFS Study for the Lower Eight Miles of the Passaic River. The original is being placed in the mail this afternoon.
Thanks,
Bridget

Bridget M. McKenna
Chief Operating Officer
Passaic Valley Sewerage Commission
600 Wilson Avenue
Newark, New Jersey 07105
Phone: (973) 817-5976
Fax: (973) 817-5709
Email: bmckenna@pvsc.nj.gov

Yeh, Alice

From: McNally, John M <MCNALLY.JOHN@cleanharbors.com>
Sent: Thursday, May 22, 2014 4:22 PM
To: Region2 PassaicLower8MileComments
Subject: Question
Attachments: removed.txt

Alice,

I attended the meeting last night and enjoyed your presentation. Can you tell me what contaminants are in the portion of the sediment that require thermal treatment? I have seen estimates of 7-10% of the sediment will require incineration? What is driving this to require incineration?

Any insight will help.

Thank you.

Safety Starts with Me: Live It 3-6-5

John McNally
Project Services Business Development Manager
Clean Harbors Environmental Services
41 Tompkins Point Road
Newark, NJ 07114
Mobile: 201.538.0109
Fax: 973.643.6050
Email: mcnally.john@cleanharbors.com
Web: www.cleanharbors.com

Yeh, Alice

From: Robert McPherson <dprblue@gmail.com>
Sent: Monday, August 11, 2014 2:04 PM
To: Region2 PassaicLower8MileComments
Subject: Comment on the Lower Passaic River Restoration

I am greatly concerned the restoration proposed for the Lower Passaic River will not allow full use of the river. This river was the key to the industrial and economic life of the area. The area is blighted and needs the boost a fully restored river can provide. As an environmental justice issue the poor and minority populations demand and deserve a full bank to bank dredging. Please do the right thing and decide in a full bank to bank restoration.
Thank you for your concern.
Bob McPherson

Yeh, Alice

From: Sandra Meola <sandra@nynjbaykeeper.org>
Sent: Monday, July 28, 2014 4:48 PM
To: Region2 PassaicLower8MileComments
Cc: Molly Greenberg; Ana Baptista; debbie@nynjbaykeeper.org
Attachments: Passaic River Sign on Letter as of 7.28.14.pdf

Good afternoon,

Please find the attached letter signed by 40 organizations in support of the EPA's proposed cleanup plan for the lower Passaic River. We are eager to see an effective cleanup that will reclaim the River for our communities.

Thank you,

Sandra Meola
Communications and Outreach Associate
NY/NJ Baykeeper
52 West Front Street
Keyport, NJ 07735
732-888-9870 ext. 7
201-336-4647 cell
732-888-9873 Fax
www.nynjbaykeeper.org

Follow us at:

American Friends Service Committee ● American Littoral Society ● Clean Ocean Action ● Clean Water Action ● Coalition for Healthy Ports ● Cornucopia Network of New Jersey ● Environment New Jersey ● Food and Water Watch ● Friends of Riverbank Park ● Greater Newark Conservancy ● Great Swamp Watershed Association ● Greenfaith ● Hackensack Riverkeeper ● Housing and Community Development Network of NJ ● Hudson Riverkeeper ● Ironbound Community Corporation ● Ironbound Super Neighborhood Council ● La Casa de Don Pedro ● Metropolitan Waterfront Alliance ● National Lawyers Guild of Rutgers School of Law Newark ● National Resources Defense Council ●Newark HUD Tenants Coalition ● New Community Corporation ● New Jersey Community Capital ● New Jersey Communities United ● New Jersey Highlands Coalition ● New Jersey Work Environmental Council ● New Jersey Working Families Alliance ● New Labor ● NJ Environmental Justice Alliance ● New York City Environmental Justice Alliance ● NY/NJ Baykeeper ● SEIU 32BJ ● Sierra Club NJ Chapter ● Sisters of Charity ● SPARK ● Teamsters Local 469 ● The Trust for Public Land ● Unified Vailsburg Services Organization ● Urban League of Essex County

July 28, 2014

Dear EPA Administrator McCarthy:

Please accept this letter from the signed organizations supporting the Environmental Protection Agency's proposed cleanup plan for the lower Passaic River.

In an effort to remediate the highly toxic Passaic River, on April 11th, the EPA released its Focused Feasibility Study and proposed cleanup plan for the lower eight miles of the River.

The EPA's preferred cleanup method consists of bank-to-bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two-foot cap and off-site disposal of contaminated sediment. This cleanup and disposal method will be beneficial with respect to long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health. We believe this plan will result in a clean and healthy river.

This bank-to-bank cleanup will deliver environmental and economic benefits to the communities surrounding the River for generations to come.

We are eager to be a part of the solution that reclaims the Passaic River for our region. Together, we support EPA's proposed cleanup plan and call on the polluters to pay for a full clean up that OUR communities deserve and demand!

Thank you.

Sincerely,

American Friends Service Committee, Amy Gottlieb
American Littoral Society, Tim Dillingham
Clean Ocean Action, Cindy Zipf, Executive Director
Clean Water Action NJ, David Pringle, Campaign Director
Coalition for Healthy Ports, Amy Goldsmith
Cornucopia Network of New Jersey, Fredrick Chichester
Environment New Jersey, Doug O'Malley
Food and Water Watch, Jim Walsh
Friends of Riverfront Park, Nancy Zak
Greater Newark Conservatory, Robin Dougherty
Great Swamp Watershed Association, Sally Rubin
Greenfaith, Rev. Fletcher Harper
Hackensack Riverkeeper, Bill Sheehan
Housing and Community Development Network of NJ, Staci Berger, President
Hudson Riverkeeper Paul Gallay, President
Ironbound Community Corporation, Joseph Della Fave
Ironbound Super Neighborhood Council, Lenny Thomas
La Casa de Don Pedro, Ray Ocasio
Metropolitan Waterfront Alliance, Roland Lewis, President and CEO
National Lawyers Guild of Rutgers School of Law Newark, Victor Monterrosa
National Resources Defense Council, Lawrence Levine, Senior Attorney
Newark HUD Tenants Coalition, Bill Good
New Community Corporation, Richard Rohrman
New Jersey Community Capital, Wayne Meyer
New Jersey Communities United, Trina Scordo
New Jersey Environmental Justice Alliance, Dr. Nicky Sheats
New Jersey Highlands Coalition, Julia Somers
New Jersey Work Environmental Council, Rick Engler
New Jersey Working Families Alliance, Analilia Mejia
New Labor, Marien Casillas Pabellion
New York City Environmental Justice Alliance, Eddie Bautista
NY/NJ Baykeeper, Debbie Mans, Executive Director
SEIU 32BJ
Sierra Club NJ Chapter, Jeff Tittel, Chapter Director, Dave Yennior, Barbara Conovor
The Sisters of Charity
SPARK, Nancy Zak
Teamsters Local 469, Christina Montorio
The Trust for Public Land, Marc Matsil, New York State Director and Anthony Cucchi, State Director NJ and PA
Unified Vailsburg Services Organization, Mike Farley
Urban League of Essex County, Vivian Cox Fraser

el 7 mayo de 2014

Favor de recibir esta carta, firmada por las organizaciones y residentes que apoyan el plan presentada por la Agencia de Protección Ambiental (EPA) para la limpieza del segmento más bajo del Río Passiac. El 11 de abril, como parte de sus esfuerzos para remediar el tóxico Río Passaic, la EPA lanzó su Estudio Enfocado sobre la Viabilidad, así como su propuesta para la limpieza de los 13 kilómetros más bajos del río.

Para la EPA, el método preferido para la limpieza consiste en dragar de una orilla a la otra, una distancia de 3.9 millones de metros cúbicos en los 13.4 kilómetros más bajos del río, y tapar el fondo con una capa de 0.61 metros de profundidad. Los sedimentos contaminados serán transportados a un sitio lejos de la comunidad. La limpieza y el método de desechar de los sedimentos tóxicos serán benéficos con respecto a la eficaz de largo plazo. Reducirán el nivel de toxicidad y los impactos ecológicos y el riesgo a la salud humana. Creemos que este plan resultará en un río sano.

Una limpieza de orilla a orilla traerá beneficios ambientales y económicos a las comunidades ubicadas cerca al río para las generaciones venideras.

Estamos anciosos por ser parte de la solución para recuperar el Río Passaic para nuestra región. Juntos, apoyamos la propuesta de la EPA para la limpieza y hacemos un llamamiento para que los que contaminaron el río paguen para una limpieza completa, consecuente con lo que NUESTRAS comunidades merecen y exigen!

Gracias.

Atentamente,

(Letra de Molde)	(Firma)
Migdalia Velez	Migdalia Velez
Carmen Paz	Carmen Paz
[illegible]	MARIN Z-ORNEIRA
EMILY MALDONADO	MALDONADO
LUIZ F FILHO	[illegible]
Lidiana De Jesus	Lidiana De Jesus
Evelyn Figueroa	Evelyn Figueroa
TEODORO PORTILLA	Teodoro Portilla

May 7, 2014

Please accept this letter from the signed organizations and residents supporting the Environmental Protection Agency's proposed cleanup plan for the lower Passaic River. In an effort to remediate the highly toxic Passaic River, on April 11th, the EPA released its Focused Feasibility Study and proposed cleanup plan for the lower eight miles of the River.

The EPA's preferred cleanup method consists of bank-to-bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two-foot cap and off-site disposal of contaminated sediment. This cleanup and disposal method will be beneficial with respect to long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health. We believe this plan will result in a clean and healthy river.

This bank-to-bank cleanup will deliver environmental and economic benefits to the communities surrounding the River for generations to come.

We are eager to be a part of the solution that reclaims the Passaic River for our region. Together, we support EPA's proposed cleanup plan and call on the polluters to pay for a full clean up that OUR communities deserve and demand!

Thank you.

Sincerely,

(Print)	(Sign)
Michelle C. Smith	
Karla Zanner	
GABriel Torres	
Marcela Poma	
Carmen Figueroa	Carmen Figueroa
Jessica Ramos	Jessica Ramos
Dalismary Carrazana	D. Carrazana
Liliam Silva	Liliam Silva
Paul Taylor	Paul Taylor
ELIZABETH BASTEIRO	Elizabeth Bastiro
Deize Vaz	DEIZE VAZ
Monzerrate Rosa	Monzerrate Rosa

12

May 7, 2014

Please accept this letter from the signed organizations and residents supporting the Environmental Protection Agency's proposed cleanup plan for the lower Passaic River. In an effort to remediate the highly toxic Passaic River, on April 11th, the EPA released its Focused Feasibility Study and proposed cleanup plan for the lower eight miles of the River.

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We are eager to be a part of the solution that reclaims the Passaic River for our region. Together, we support EPA's proposed cleanup plan and call on the polluters to pay for a full clean up that OUR communities deserve and demand!

Thank you.

Sincerely,

(Print)	(Sign)
Angie Cunico	Angie Cunico
Chris Cunico	
Constance Gill	
Natalie Dowd	Natalie Dowd
Bonnie J. Pugel	Bonnie J. Pugel
Silvia Helou	
Eli Avizov	
Alex Valdez	
Rosemarie Miles	Rosemarie Miles
Roxanna Workfeld	Roxanna Workfeld
Mutombo Workfeld	
Richard A. Whitten	Richard A. Whitten
Luther Eatman	

13

el 7 mayo de 2014

Favor de recibir esta carta, firmada por las organizaciones y residentes que apoyan el plan presentada por la Agencia de Protección Ambiental (EPA) para la limpieza del segmento más bajo del Río Passiac. El 11 de abril, como parte de sus esfuerzos para remediar el tóxico Río Passaic, la EPA lanzó su Estudio Enfocado sobre la Viabilidad, así como su propuesta para la limpieza de los 13 kilómetros más bajos del río.

Para la EPA, el método preferido para la limpieza consiste en dragar de una orilla a la otra, una distancia de 3.9 millones de metros cúbicos en los 13.4 kilómetros más bajos del río, y tapar el fondo con una capa de 0.61 metros de profundidad. Los sedimentos contaminados serán transportados a un sitio lejos de la comunidad. La limpieza y el método de desechar de los sedimentos tóxicos serán benéficos con respecto a la eficaz de largo plazo. Reducirán el nivel de toxicidad y los impactos ecológicos y el riesgo a la salud humana. Creemos que este plan resultará en un río sano.

Una limpieza de orilla a orilla traerá beneficios ambientales y económicos a las comunidades ubicadas cerca al río para las generaciones venideras.

Estamos anciosos por ser parte de la solución para recuperar el Río Passaic para nuestra región. Juntos, apoyamos la propuesta de la EPA para la limpieza y hacemos un llamamiento para que los que contaminaron el río paguen para una limpieza completa, consecuente con lo que NUESTRAS comunidades merecen y exigen!

Gracias.

Atentamente,

(Letra de Molde)	(Firma)
SUSAN A CAUFIELD	
DOUGLAS L. ROSOSTOL	
	ROBERT O'CONNELL
Joe Olivev	
Denise Rourke Miller	
Alice L. Deupree	
Gary Russ	
Richard Baird	

May 7, 2014

Please accept this letter from the signed organizations and residents supporting the Environmental Protection Agency's proposed cleanup plan for the lower Passaic River. In an effort to remediate the highly toxic Passaic River, on April 11th, the EPA released its Focused Feasibility Study and proposed cleanup plan for the lower eight miles of the River.

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Thank you.

Sincerely,

(Print)	(Sign)
Steven Greenstein	
DANILA ALVES	
Sara	
MARCO LEONARDO	
Gabriel Leonardo	Gabriel
Maristela Leonardo	
Maria Lenir Leite	MLL
Leonardo Cruz	Leonardo Cruz
GLADYS EVARISTO	
Vanda Ribeiro	
Ana Cruz	
Johanna Rios	Johanna Rios
Kenneth Hardy	

13

DOROTHY MILES

Helen Dos Santos

Francis dos Santos

Dorothy Miles

el 7 mayo de 2014

Favor de recibir esta carta, firmada por las organizaciones y residentes que apoyan el plan presentada por la Agencia de Protección Ambiental (EPA) para la limpieza del segmento más bajo del Río Passiac. El 11 de abril, como parte de sus esfuerzos para remediar el tóxico Río Passaic, la EPA lanzó su Estudio Enfocado sobre la Viabilidad, así como su propuesta para la limpieza de los 13 kilómetros más bajos del río.

Para la EPA, el método preferido para la limpieza consiste en dragar de una orilla a la otra, una distancia de 3.9 millones de metros cúbicos en los 13.4 kilómetros más bajos del río, y tapar el fondo con una capa de 0.61 metros de profundidad. Los sedimentos contaminados serán transportados a un sitio lejos de la comunidad. La limpieza y el método de desechar de los sedimentos tóxicos serán benéficos con respecto a la eficaz de largo plazo. Reducirán el nivel de toxicidad y los impactos ecológicos y el riesgo a la salud humana. Creemos que este plan resultará en un río sano.

Una limpieza de orilla a orilla traerá beneficios ambientales y económicos a las comunidades ubicadas cerca al río para las generaciones venideras.

Estamos anciosos por ser parte de la solución para recuperar el Río Passaic para nuestra región. Juntos, apoyamos la propuesta de la EPA para la limpieza y hacemos un llamamiento para que los que contaminaron el río paguen para una limpieza completa, consecuente con lo que NUESTRAS comunidades merecen y exigen!

Gracias.

Atentamente,

(Letra de Molde)	**(Firma)**
Miriam A. Lima	Miriam A. Lima.
P. Birotte	P. Birotte
Sandra Archade	Sandra Archado
Marta Pereira	[illegible]
ISABEL AMORIM	Isabel Amorim
MARLENE LOPES	Marlene Lopes
Jacqueline Rivas	[illegible]
Michelle E. Zayas	Michelle E. Zayas
Rosalyn Pardo	Rosalyn Pardo

9

Devonne Lowry	Devonne Lowry
[illegible]	Patricia L. Macieira
S Mohammed	Sacha Mohammed
Melanie Bosch	Melanie Bosch
Lisa DeFusco	Lisa DeFusco
Abigail [illegible]	Abigail Kanz
Maibis Vieto	Maibis Puente
Jessica Raab	Jessica Raab
Ana Rios	[illegible]
Hilda Solano	Hilda Solano
Maribel Martinez	Maribel Martinez
13 Danielle DeFusco	Danielle DeFusco
Eleanor Hanso	E Afonso

el 7 mayo de 2014

Favor de recibir esta carta, firmada por las organizaciones y residentes que apoyan el plan presentada por la Agencia de Protección Ambiental (EPA) para la limpieza del segmento más bajo del Río Passiac. El 11 de abril, como parte de sus esfuerzos para remediar el tóxico Río Passaic, la EPA lanzó su Estudio Enfocado sobre la Viabilidad, así como su propuesta para la limpieza de los 13 kilómetros más bajos del río.

Para la EPA, el método preferido para la limpieza consiste en dragar de una orilla a la otra, una distancia de 3.9 millones de metros cúbicos en los 13.4 kilómetros más bajos del río, y tapar el fondo con una capa de 0.61 metros de profundidad. Los sedimentos contaminados serán transportados a un sitio lejos de la comunidad. La limpieza y el método de desechar de los sedimentos tóxicos serán benéficos con respecto a la eficaz de largo plazo. Reducirán el nivel de toxicidad y los impactos ecológicos y el riesgo a la salud humana. Creemos que este plan resultará en un río sano.

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Atentamente,

(Letra de Molde)	**(Firma)**
ELBA CAMPOS	Elba Campos
Manuela Romero	Manuela Romero
Rosa Garcia	Rosa Garcia
Martha Alvarez	
Jeaneth Rosales	Jeaneth Rosales
Walter Torres	
Ana Cedillo	Ana Cedillo

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(Letra de Molde)	(Firma)
Wagles Alexandre Valentim	
LAUREN ABRANTES	
Juan Apara	
Sandra Rueda	Sandra Rueda
Esmeralda Da Costa	ESMERALDA DA COSTA
	Manny Ramos Jr.
DINA Santos	Dina Santos
Lucy Sanches	
Dênia Alves	Dênia Alves
Isabel Araujo	
Franciele Monteiro	

May 7, 2014

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The EPA's preferred cleanup method consists of bank-to-bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two-foot cap and off-site disposal of contaminated sediment. This cleanup and disposal method will be beneficial with respect to long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health. We believe this plan will result in a clean and healthy river.

This bank-to-bank cleanup will deliver environmental and economic benefits to the communities surrounding the River for generations to come.

We are eager to be a part of the solution that reclaims the Passaic River for our region. Together, we support EPA's proposed cleanup plan and call on the polluters to pay for a full clean up that OUR communities deserve and demand!

Thank you.

Sincerely,

(Print)	(Sign)
Rose Marie Ruivo	Rose Marie Ruivo
Annette Grant	Annette Grant
Davonte GRANT	Davonte Grant
Latoya Napier	Latoya Napier
Lidith FIGUEROA	Lidith Figueroa
LUIS BARRERA	[illegible]
SUSAN ARCELAY	[illegible]
[illegible]	[illegible]
Cynthia Earley	Cynthia EARLEY
Antonio Rodrigues	[illegible]
Sofia MALICIA	[illegible]
William Chappel	WILLIAM CHAPPEL

12

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Thank you.

Sincerely,

Tom Beirne

Kristine Beirne

Elsanor Sharn

3

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Thank you.

Sincerely,

Courtney DeCorey
Brianna Gerry
Brad Kerder
Dania Trelusma
Colleen Devany
Julianna Rodriguez
[illegible]
Gisela Cinho
Julie Dunn
Angelica Lettini

Thomas Moore

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Thank you.

Sincerely,

Victoria Pacheco

Adin Stanzit

Emily Beglan

Alexandra Binenstock

Emily Sikboda

Catherine Yerke

Nat Finglin-Jarrett

Sasha Lopez

8

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Thank you.

Sincerely,

Hendra Simmoms	Taylor Morris
Freedland Thompson	
Rebecca Cruz	
Maria Hamer	
Kristen Sulewski	
Samantha Casaro	
Christina Puntiel	
Kathryn Ward	
Catlyn Koehler	
Lizelle Policarpio	
Conchetta Aiossurity	
Christina Sunuangco	

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Thank you.

Sincerely,

Brianna Drew
Shannan McCarthy
Domenica Padron
Alexandra James
Sawyer Phillips
Lena Bucciarossi
Emily Horan
Olga Rodriguez
Alison Hrennach
Ciara Ryan
[illegible]
Abigail Mannelli
Deanna Allen
Teryn Muiño
Sabrina Garcia
Marriana Nussenbaum
Tahiana Esilus
Stephanie Casimyr

18

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Thank you.

Sincerely,

Karen Martinez
Carolyn Rodrigo
Brittany Sulski
[illegible]
Bridget J. Daffey
[illegible]
Jessica Campos
Meridel Asuncion
Anna Anday
Julia Silva
Catherine Blakore
Shamen R. [illegible]

Annie Gilligan
[illegible]
Jaskerian Kaur
Diana Oliveira

16

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Sincerely,

Tina Wasielewski
BRIANN JONES
Angelee Roque
Rupinder Kaur
Adriana Zamora
Candice Zurie
Christina Rego
Carrisa Battagliatti
Francesca Egri
Shavonne Watlington
SilverAnn Ortiz

11

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Thank you.

Sincerely,

Sydney Martinez

Kathy Castro

Wahanga

Kristin Salazar

Cristina Jean Campos

Kimberly Matta

Caitlin Lagnadia

Kimberly Yip

Arienne Saldamando

Amanda Moreira

10

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Thank you.

Sincerely,

Mauricy M Banks
Natalie Camargo
Lorrana Rodriguez
Elizabeth Valente
Noah Dwyer
Crystal Lyn
Dakota Hudak

7

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Thank you.

Sincerely,

Amani Flowers

Catherine B. Hasson

Megan Piesta

Valerie Vargas

Julia Velez

Regina DeRosa

Stephanie Ayo

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Sincerely,

Olga Chavez
Alicia Thomas
Jeannette Pierre
Kate Arellano
Ariana Carr
Natalia [illegible]
Nanka [illegible]
Kira Derezynski
Ariana Bolourchi
Ashley Romanoff

10

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Thank you.

Sincerely,

Mellee Farker

Megan Spar

Barnes Stewart

Mia Wright

Brianna M. Lopez

Helena Flores

Ashley Ann Thomas

Jessica Soriano

Ingrid Veloso

Kristin Carpenter

10

Friends, Supporters and Allies of the Passaic River!

Half a century has passed since workers were ordered to dump dioxin and other harmful, cancer causing contaminants into the Passaic River in Newark, NJ. This began a long history of polluters avoiding responsibility and accountability for the murder of the river, and their efforts continue to this day.

In an effort to remediate the contaminated river, on April 11th, the Environmental Protection Agency released its Focused Feasibility Study (FFS) cleanup plan for the lower eight miles of the Passaic River.

The EPA's preferred cleanup method consists of bank to bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two foot cap.

With the release of this cleanup plan, it is time we fight off lawyers and lobbyists for the polluters that are hell bent on stopping the full clean-up that OUR communities deserve and demand!

Support the EPA's Focused Feasibility Study (FFS) and proposed COMPLETE bank to bank Passaic River cleanup with off-site disposal. This cleanup and disposal method will be beneficial in long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health.

We the Citizens Support the EPAs Passaic River Bank to Bank Cleanup Plan with Off-site Disposal

Return the River to its Citizens!!!

Name	Email	Signature
Leonard Hines		Leonard Hines
Gwen Moten	gwenmoten@aol.com	
Héctor Sánchez	hsanchez@[illegible]	
Terrence Batchelor		Terrence Batchelor
Claudia Gottlieb	claudia garzesi2@aol.com	
Jeff Vicente	jeff@heliflights.us	
Ada Nunez	nunez@ada nunezlaw	
America Peña	Pena803@hotmail.com	
Patricia Robinson	Probinson@ulohc.org	
Endeles Meadows	endeleam@hotmail	
John Mora	chano1452@aol.com	
Jairo Sot		
Sonia Colepaiodo	12 Sidwell St. Newark 07103	
Catarina Costa		

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Name	Email	Signature
GLENICE HOOK-CAETANO		G. Hook-Caetano
Marisol Santana	Marsol_Sam@yahoo.com	[illegible]
Yvette Thompson	vetster29@yahoo.com	[illegible]
Jennifer Owens	way[illegible]@gmail.com	[illegible]
Judi DiFabio	tjdifabio@me.com	[illegible]
Robert M. Ricks	Robert.M.Ricks@gmail.com	Robert M Ricks
Israel Torres	24 Parkhurst Nwk	[illegible]
VINCENT DERICO	124 Thomas St	[illegible]
Vivian Moreno	Vivian.Ao.91@gmail	[illegible]
Lynette Laskla	lynette.laskla@yahoo.com	[illegible]
JULIANA Monteiro	juricardi.jRn@gmail.com	[illegible]
Yukihiro Fujita	hirosfujita@gmail.com	[illegible]
Yaneliz Cabrera		Yaneliz Cabrera
Joaneliz A.		Joaneliz Agosto

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Name	Email	Signature
Katrina Billings	billings.billings(katrina17@gmail	Katrina Billings
Jennifer Gautreaux	Jennifer.Jennifer.Gautreaux@gmail.com	Jennifer S. Gautreaux
Jasmine Bejaoui	Jasmine_Bejaoui@aol.com	Jasmine Y. Bejaoui
Eric Williamson	bigg5200@optonline	Eric Williamson
Josette Hardman	marie_hardman@hotmail.com	J Hardman
Isiah Cabrera		299 7th Ave
Luis Rivera	rivera.luis924@gmail.com	Luis Rivera
Naila Qasim	naila.qasim09@gmail.com	N. Qasim
Gaetano Larrieri		
	Novorschah@aol.com	Gaetano Larrieri
Tenisha		
Ariyan		
Jazmya		
Mike Glasco	Mglasco@highstreet.com	

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Name	Email	Signature
Amanda [illegible]	missmisa@mane7@hd.com	

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Half a century has passed since workers were ordered to dump dioxin and other harmful, cancer causing contaminants into the Passaic River in Newark, NJ. This began a long history of polluters avoiding responsibility and accountability for the murder of the river, and their efforts continue to this day.

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The EPA's preferred cleanup method consists of bank to bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two foot cap.

With the release of this cleanup plan, it is time we fight off lawyers and lobbyists for the polluters that are hell bent on stopping the full clean-up that OUR communities deserve and demand!

Support the EPA's Focused Feasibility Study (FFS) and proposed COMPLETE bank to bank Passaic River cleanup with off-site disposal. This cleanup and disposal method will be beneficial in long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health.

We the Citizens Support the EPAs Passaic River Bank to Bank Cleanup Plan with Off-site Disposal

Return the River to its Citizens!!!

Name	Email	Signature
Pedro Pereira	1150 Cambridge Ln Bridgewater NJ 08807	Pe R
R		

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Name	Email	Signature
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Byron Gilliam		
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John Bachmann	JOBACHMANN@gmail.com	
Oscar Hess		Oscar Hess
Carter Cutsfield		Carter Cutsfield
Lucas Hanson		Lucas Hanson
Kelley Forsyth	yokelley@verizon.net	
Robert Winther		Robert Winther
Sally Ellyson	sellyson@comcast.net	Sally Ellyson
Sarah Gang		Sarah Gang

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Name	Email	Signature
Cindi Steiner	steinczyk@gmail.com	[illegible]
Sonja Hood	sonja.hood@yahoo.com	[illegible]

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Name	Email	Signature
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Zofia Monczka	jsrstm@comcast.net	
Desiree Watson	Dezzy1089@gmail.com	
Onisha Sebastien	sebastienonisha@yahoo	

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Name	Email	Signature
KARLA ORTIZ	KARLA ORTIZ [illegible] @ Hotmail.com	
Mikaela Montiel	mikaela0609 @gmail .com	
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14

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Name	Email	Signature
Michell Hernández	michellhernandez@gmail.com	[illegible]
Juba McDaniel	juba71829@gmail.com	[illegible]
Gina Meola	gmbmeola@optonline.net	[illegible]

3

Yeh, Alice

From: Sandra Meola <sandra@nynjbaykeeper.org>
Sent: Thursday, August 14, 2014 4:25 PM
To: Region2 PassaicLower8MileComments
Cc: debbie@nynjbaykeeper.org
Subject: Passaic River Clean Up Comments
Attachments: Signatures Group 2.pdf; Signatures Group 1.pdf; Signatures Group 3.pdf

Good afternoon Alice,

I've attached a total of 345 signatures in support of EPA's preferred cleanup plan for the lower Passaic River.

Thank you for your attention to this matter.

Sandra Meola
Communications and Outreach Associate
NY/NJ Baykeeper
52 West Front Street
Keyport, NJ 07735
732-888-9870 ext. 7
201-336-4647 cell
732-888-9873 Fax
www.nynjbaykeeper.org

Follow us at:

Yeh, Alice

From: Casey Moran <cmoran@colgate.edu>
Sent: Thursday, August 14, 2014 8:17 AM
To: Region2 PassaicLower8MileComments
Subject: River clean up

I will keep this short but this is in support of the current plan to clean up the lower 8 miles of the Passaic River. The plan put forth by the business group might have some merit and should be possibly considered for the northern 9 miles of the lower Passaic, possibly in conjunction with the current clean up. If it works we will have an clean river, and a cheap and effective biological alternate for future projects.

Best,
Casey

PUBLIC ACCESS *FROM* THE WATER

Harvey Morginstin, PE, Retired
Bloomfield, NJ April 24, 2014

Abstract: Public access to the water should be expanded to include the public's right of access ***from*** the water to the land. This will provide benefits to the people on the shore as well as the water.

> *"Mankind has always looked to the sea with trepidation and awe. The sight of open water is mesmerizing and activity on the water be it waves or sailing ships, heightens our interest. We leave this view with sadness hoping to return again and again."*

The general tendency of mankind has been to provide public access from the land to the water. Even Roman law set aside the waters edge for use by the general public. This exists to this day in the form of riparian rights. Great architectural detail of design for walkways and public waterfront parks are common. Manhattan is a case in point, with ample waterfront walkways and bike paths along the Hudson and East rivers for the public. Chicago, Boston and Pittsburgh have extensive walkways on the waterfront.

What is generally missing from the achievements of public access is access ***from*** the water ***to*** the land. All too often waterfront developers and city planners seem to think that waterfront "access" is merely a finely paved pedestrian walkway lined with paving blocks and landscaping with a great variety of colorful flowers. Certainly there are also many commercial uses of waterfront property such as ferry terminals and very private, exclusive and expensive marinas. Public access via commercial ferries is a terrific addition to the transportation system. But there is also a need for private vessels to also be accommodated. It should be just as convenient to take your boat to a waterfront site as it is to drive there in your car. Just imagine the public's reaction if all public travel was only allowed by mass transportation. Yet that is the general situation when water travel is concerned.

Public access ***to*** and ***from*** the water for private vessels of all sizes requires careful city planning in order to expand the outlook beyond the water's edge to the water itself.

The addition of public floating docks and walkways from the docks to the shore will provide both a means and justification for the transient boater to visit the local area by water and not travel there by car. Thus sufficient dock space will be needed for such visitors, visiting by boat. For high usage areas these new floating docks could be equipped with parking meters that accept credit cards. If the meters were placed 20 feet apart, then a 60-foot vessel would have to pay at 3 meters. Kayaks could be brought ashore and secured to suitably designed racks.

Any small boat, sailboat, cabin cruiser, canoe or kayak should have a place to safely land, tie up and allow the passengers to come ashore. This requires many floating docks and access gangways from the dock to the land. Very few such facilities exist in our major cities. The limited numbers of commercial yacht basins are insufficient and costly.

Local and area residents, young and old, will certainly enjoy fishing from these docks. Therefore the end of the dock should be equipped with suitable features to accommodate fishing needs. Benches and tables for the general public's use should also be supplied.

The economic benefits to the local municipality that has implemented a boater friendly waterfront redevelopment plan will be substantial. Boaters from around the metropolitan area will now have the necessary facilities to visit the local area and bring a fresh infusion of spenders.

Allowing boaters to come by boat and safely tie up at a municipal marina would provide boating visitors with the opportunity to enjoy local entertainment venues such as sporting events, theater and area restaurants.

Many floating docks are needed along the shorelines of our towns and cities so as to be in walking distance of city and town public gathering places.

Floating docks should have several different heights above the water and also an area with a sloping surface to the water. The design should accommodate kayaks, canoes, small boats and larger vessels. Docks should be ADA compliant and have adequate lighting. Security monitoring can be achieved by closed circuit TV. Dock areas with high usage could be supplemented with paid uniformed marina attendants. This would be a great summer job opportunity for the student population.

The public enjoys parks and water walkways. To gaze out over the water is very soothing to the spirit. And having the added benefit of watching recreational boat traffic cruise on the waterway increases the interests of onlookers.

The Walkway on both sides of the Hudson River is examples of non-access from the water to the land. There are many locations where floating docks for small boats up to even 30 foot could be safely tied up and yet be away from most wave action. This would be an added source of revenue for areas that have nearby restaurants and even a movie.

An excellent example of what should be done is the "Barge" Meadowlands facility just north of the Route 3 Bridge on the Hackensack River and the New Brunswick, NJ floating docks.

Looking at the waterfront improvement to bring the public to the water is only half the design; the finishing touch is to have a design that allows those already on the water to have access to the land.

The Passaic River Boat Club

Founded 2006

www.PassaicRiverBoatClub.com

Bringing Recreational Boating Back to the Passaic River

56 Hyde Road
Bloomfield, NJ 07003

July 31, 2014

Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

RE: Passaic River Superfund Clean-up

I have attended meetings of the LPRRP for many years and when they were merged into the CAG I became an active participant. My primary interest is in the restoration of power boating to the Passaic River which includes the building of public docks and boat ramps. I carry a large jug of fresh water on my small boat to wash my hands if I happen to get them wet with Passaic River water and it's not the salt that worries me.

The Superfund discussion has been discussed and debated for too long. It's time for action needed to restore this river so that it is safe for boaters of any type over the long range. If you're going to do something, it should be done right the first time. Half way measures will result is future costs and loss of confidence in the organization making a bad decision.

Last summer we lost a good friend of the river, Ella Filippone of the Passaic River Coalition. She was a strong advocate for meaningful resolution to this issue and not yet another "study" to be placed on a shelf with all the other studies or half way measures that just put the problem to future generations.

The members of the PRBC although desirous of returning boating to the Passaic River as a group do not feel qualified to comment on the proposed USEPA plan for Decision 3 and off river disposal.

The following are my thoughts after careful analysis of the proposals and attendance at the NJIT all day event to discuss the issues. as well as meetings with the Participating Parties (PP).

Implementation of Decision 3 is a half way measure and long range mistake. Offsite disposal is a misuse of the funds provided by the PP's.

The most economical and best plan for the recovery of the Passaic River and future use is Plan #2 and the use of CAD in Newark Bay.

Clean-up

Plan #2 deep dredging bank to bank will remove almost all the contaminants in the lower 8 miles and set the stage for the continuation of this removal for the remainder of the 17 mile tidal river.

The proposed cap for plan #3 is detrimental to future boating activities on the river.

Anchoring

This cap will restrict the anchoring of boats. All boaters are required to take boat handling courses and learn that anchoring in a channel is not permitted. Some fishermen however still do this which sometimes results in serious accidents. However, anchors are allowed near the shore line and in a swift channel in an emergency an anchor will be thrown out to stop a boat from drifting into a more dangerous position. In short anchors will be used in the river, cap or no cap. If the design of the cap precludes anchoring then the only way to implement this is to seriously restrict boats that carry anchors. Thus, this "improvement' to the river actually is a negative one for the boating community.

Speed

Most power boats operate very efficiently when up on a plane instead of plowing through the water which uses a lot of gas for a slower speed. High speed actually yields a lower wave behind the boat than mid speed. Large boats always have high waves behind which increase with speed as they do not get up on the plane. If this wave action from boats of various sizes will cause degradation of the cap planned for Plan #3 then a slow no wake determination would be designated for the entire lower 8 miles of the river. This slow zone would insure that no recreational private power boat would enter the Passaic River for a visit to Newark and that existing power boats used for fishing would most probably relocate.

Improvements

There are many locations of the river that could have the waterfront developed by the addition of floating docks and boat ramps. The Soccer Stadium management is contemplation having a high speed air boat travel from Manhattan to the stadium. Minish Park was designed to have a dock facility and a walkway over Route 21 to the NJPAC. Additional floating docks could be installed at the Newark Ball Park and north of the Jackson Street Bridge to complement the recent orange dock at Riverbank Park. The cap installed would preclude these future enhancements to the river and the installation of piles through the cap would not be permitted, nor would the cap allowed to be modified to install a new boat ramp. Plan #2 would not impact future improvement to the riverbank to help bring the public to the water.

Cap History

The 20,000 CYDS removed from mile 10.9 were replaced with a cap. The cap consists of a membrane, sand and large sharp rocks. The rocks were supposedly covered with sand. However in a short time the sand was washed away by the tidal and normal flow of the river exposing the sharp rocks and the membrane. This happened despite the expensive and numerous studies of the river flow. The result is a ban by the boating community on travel in the area as these rocks could easily destroy very expensive craft. Plans to mark the dangerous site and implement repairs were not followed thru and the situation persists and no doubt will get worse.

Installing a cap on a bank to bank restoration, from the above description, will result in a dangerous condition for boaters in the lower 8 miles of the river. USEPA must learn from this experience and not repeat and expand a very poor plan. The present mud flats exposed at low tide are a common sight and accepted as normal. Having jagged rocks and membranes exposed would be an eyesore and a constant reminder that the wrong fix was implemented by the EPA. Plan # 2 does not require a cap.

CAD

The meetings I attended at the CAG resulted in an understanding of the community members and environment group members desire to not have contaminants removed from the river and then deposited in Newark Bay as this could possibly someday cause another problem and is aesthetically an intuitive bad idea. However, the session and information from the experts at NJIT has changed my opinion that the best way to dispose of the contaminants is a CAD cell in Newark Bay. The info at the meeting was that

these type cells have been used without any migration of the material for many years and are indeed safe. They are located in shallow areas and thus not subject to intrusion by large ship traffic. Further they greatly reduce the impact on the community by eliminating the handling of the dredge material, construction of a new processing facility, and possibly truck and then train transportation. Plus disposal at a western location simply moves the problem to another state that may or may not have a future issue with this material. The economics are also a factor that should be considered. Using option #2 and CAD disposal makes option #2 about the same as option #3 and remote disposal.

At the meeting I recalled and commented that a CAD in the bayou area of Louisiana is used to hold crude oil for the US Strategic Oil Reserve. The CAD is located in a pure salt cavern carved out using hot water. My thoughts are that if crude oil does not escape from this salt CAD, then certainly material such as silt and rocks made up of similar constituents as clay will not escape from clay lined CAD.

Time

The estimates for completion time does not include the time for planning this work, Certainly CAD disposal will reduce the planning time and eliminate facility design and build time. The differential in shallow versus deep dredging time is not a major factor as the major time restriction is the movement of the barges and handling the waste in disposal. Granted deep dredging would take longer, but the extra barges would use the same window of opportunity to move past the bridges.

Construction time estimates and cost estimates are notorious for being underestimated.

NJ Boat Ramp at Nutley

Even before the start of the LPRRP I have been trying to have the boat ramp at Nutley, Passaic River mile #10.4 restored to 24/7 use. USEPA was requested to remove a minimum of 200 CYD's of material at the ramp in conjunction with the 40,000 CYDS removed from Mile # 3 and also years later requested to remove this same material when the work at Mile #10.9 was undertaken. The ramp and its mud and rocks at low tide remain as they were found by me over 50 years ago. Removal of this 200 CYD's at the ramp would allow for repair of the ramp and installation of floating docks.

I fully understand that funds for boat ramp improvements are not in the scope of superfund site improvement except if it involves channel dredging for commercial uses. If I figure out a way to have the 16' wide ramp used for commercial purpose, expect another letter.

Sincerely,

Harvey Morginstin, PE-Ret.
Passaic River Boat Club, Secretary

The Passaic River Boat Club

Founded 2006

www.PassaicRiverBoatClub.com

Bringing Recreational Boating Back to the Passaic River

56 Hyde Road
Bloomfield, NJ 07003

August 15, 2014

Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

RE: Passaic River Superfund Clean-up ***the goal is a clean river.***

This letter is a follow-up to my original submission of July 31, 2014.

This means a river that could be used for both safely swimming and fishing/crabbing. Recreational boating for power, sail and human powered boats should be able to use the river with no concern for infection or disease with boat ramps and boat docks at many convenient locations on both banks.

All the proposals of the EPA do not address these goals and are either detrimental to the goals or partial measures prone to failure.

I understand that the EPA is charged with the correction of the toxic deposits in the river and not the pollution caused by CSO's and runoff, but with all the US and State agencies involved in the clean-up, the overall health of the river should be the priority.

Test boring show that contaminants are six (6) feet or more below the river bottom.

Therefore the correct solution to eliminate the toxicity is to remove six feet or more of material, bank to bank for the entire 17 tidal miles. No cap need be designed and installed requiring maintenance forever and subsequent restrictions on boating.

The river will restore the banks over time, but all the boat ramps on the river should be extended at their exiting slopes to the new bottom.

The removed material should be excavated by clam shell and then ground up on a barge containing a generator, stone crusher and large pumps. The ground up material

would then be sent via slurry in a pipe placed in the center bottom of the river to a CAD in Newark Bay. A barge inside the CAD area containing dewatering equipment would receive the slurry and discharge clean water back to the river.

This would eliminate the many required bridge openings, trucks, trains and land based processing facility required in the other options. The same equipment that would be installed on a land based site to process the removed material would be used only on barges and would be available to be moved to other sites after the work is completed instead of being dismantled.

The final step is to install tertiary treatment for all the sewage plants feeding the river and address runoff water using established solutions for the entire river.

Sincerely,

Harvey Morginstin, PE-Ret.
Passaic River Boat Club, Secretary

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 11, 2014 8:30 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Christine Mortensen
msschris@hotmail.com
140 Cayuga Ave.
Rockaway
NJ
07866

9736273402

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 11, 2014 8:31 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

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Thank you.

David Mortensen
dmortnj@hotmail.com
140 Cayuga Ave.
Rockaway
NJ
07866

9736273402

Yeh, Alice

From: Erik Muller <2erikmuller@gmail.com>
Sent: Monday, August 18, 2014 3:11 PM
To: Region2 PassaicLower8MileComments
Subject: Comments on the proposed Lower 8 Mile Plan for the Passaic River

Ms. Yeh,

With regards to the proposed remedial action for the lower 8 miles of the Passaic River, my preference is to implement a modified Alternative 3 for the lower Passaic River (RM0 to RM8.3) by increasing the planned dredge depth outside the navigation channels by 1 foot from what is envisioned under Alternative 3.

The Focused Feasibility Study (FFS) envisions Alternate 3 entailing the dredging of the areas outside the channel to the extent necessary to accommodate the planned cap. The planned cap is generally anticipated to consist of well graded sand about 2 ft thick. The FFS estimates that it will take 1 to 5 years before the previous silty nature of the riverbed to become re-established. During this reestablishment period, contaminated sediments from above and below the lower Passaic will settle on the engineered cap. It was noted in the FFS that the sediments coming from above the Dundee Dam (RM17.4) were considered contaminated with many of the same contaminants of concern for the lower river. The Proposed Plan assumes that the contaminated sediments from above Dundee Dam, those from between RM 8.3 and Dundee Dam, and, presumably, from those areas of the lower Passaic that had not yet been dredged and capped, will settle over the remediated areas and will have contaminant concentrations less than the sediments above Dundee Dam. The problem is that the new sediments will be still relatively contaminated.

If an additional foot of sediment can be dredged from the river, the relatively contaminated sediments that settle down in the next few years will be covered in turn with less contaminated sediments as the river becomes cleaner through remedial action and natural processes, creating a natural barrier to the relatively more contaminated sediments immediately below. Another benefit is that the extra thickness of sediment on top of the sand cap provides some additional protection to the cap from major flood events.

Sincerely,

Erik Muller
Rutherford, NJ

Yeh, Alice

From: Nadeau, Steven C. <SNadeau@honigman.com>
Sent: Thursday, August 21, 2014 1:29 AM
To: Yeh, Alice
Cc: Enck, Judith; Stanislaus, Mathy; Breen, Barry; Woolford, James; Johnson, Barnes; Ells, Steve; Mugdan, Walter; Feldt, Lisa
Subject: SWMG Comments on the Proposed Plan for the Passaic River
Attachments: SMWG Comments on Passaic River Focused Proposed Remedy 8 20 14 draft 9am(15484158_2)(15492657_1).DOCX; Cover Letter to Passiac River Comments(15487227_1) (3) DOCX.DOCX

Dear Ms. Yeh,
Attached are the Sediment Management Work Group's (SMWG) cover letter and SMWG Comments on the Proposed Plan for the Lower Passaic River. Please place these comments in the Administrative Record for the Site.
Thank you,
Steven C. Nadeau

SMWG

Steven C. Nadeau, Coordinating Director
Sediment Management Work Group
660 Woodward Avenue
2290 First National Building
Detroit, MI 48226-3506
Telephone Number: (313) 465-7492
Fax Number: (313) 465-7493
Cell Phone Number: (313) 587-3260
snadeau@honigman.com
www.smwg.org

This e-mail may contain confidential or privileged information. If you are not the intended recipient, please delete it and notify the sender of the error.

Steven C. Nadeau
Coordinating Director
(313) 465-7978
Fax: (313) 465-8000
snadeau@honigman.com

Via E-Mail and U.S. Mail

August 20, 2014

Alice Yeh
Remedial Project Manager
United States Environmental Protection Agency, Region II
290 Broadway
New York, NY 10007-1866

Re: Sediment Management Work Group Comments On Proposed Plan For The Lower Eight Miles Of The Lower Passaic River Part Of The Diamond Alkali Superfund Site (the "Proposed Plan")

Dear Ms. Yeh:

The Sediment Management Work Group ("SMWG") is an ad hoc group of a diverse cross-section of industry (auto, aerospace, chemical, paper, paint, pharmaceutical and utilities, among others), port authorities and government parties actively involved in the evaluation and management of contaminated sediments on a nationwide basis. The SMWG has long advocated a national policy addressing contaminated sediment issues that is founded on sound science and risk-based evaluation of contaminated sediment management options. U.S. EPA's 2005 *Contaminated Sediment Guidance for Hazardous Waste Sites* ("Guidance") was an important first step in that direction. The next key step is uniform and consistent application of the Guidance. The SMWG, as part of the next step, is monitoring whether and how the Guidance is being applied at contaminated sediment sites around the country.

The SMWG previously submitted comments to the National Remedy Review Board ("NRRB") on the Lower Passaic River Restoration Project Draft Source control Early Action Focused Feasibility Study ("FFS") in 2007. The Proposed Plan is similar to the FFS in that neither document provides a meaningful evaluation of a full range of remedial alternatives, which is contrary to the National Contingency Plan ("NCP"). Moreover, like the FFS, the Proposed Plan does not comport with the *11 Risk Management Principles for Contaminated Sediment Sites* (U.S. EPA 2002a) nor the Sediment Guidance. The Proposed Plan's inconsistency with the NCP and national sediment policy, as embodied in the Sediment Guidance, concerns the SMWG because these regulations and policies are in place to ensure that site investigations are appropriately scoped, and that the evaluation and selection of remedial

alternatives are risk-reduction focused and effectively protect human health and the environment, all in a consistent manner at all contaminated sediment sites.

In this instance, SMWG is very concerned with the direction that the Lower Passaic River Proposed Plan appears to be heading. As proposed by U.S. EPA, this would be the largest sediment removal project in the United States, with an estimated removal of 4,300,000 cubic yards of material. As U.S. EPA notes in the Proposed Plan, 3% of all contaminated sediment dredged would be released back into the waterway, would require thousands of bridge closings, would increase truck traffic in numerous communities, and would expend $1 billion to $2.5 billion of funds to implement a flawed clean-up plan that fails to provide any material sustainable risk reduction. Consequently, the SMWG recommends that the Proposed Plan be withdrawn.

The following summarizes our primary concerns with the failure of the Agency's Proposed Plan to follow its own Guidance as well as concerns raised by other governmental experts. Greater detail is included in the body of this document.

1. As a threshold issue, the Proposed Plan is premature and is inconsistent with CERCLA process and the NCP because it the Agency's site characterization is inadequate. It substantially relies on old and incomplete data, despite the availability of significantly more recent detailed data that is now available from the Cooperating Parties Group (CPG) Remedial Investigation work that cost over $100 million. Moreover, the CPG's RI/FS will be submitted to the Agency in the near future and it should form the basis of the Agency's evaluation of remedial alternatives and selection of a remedy.

2. U.S EPA's National Contaminated Sediment Policy is embodied in the Sediment Guidance which is intended to be applied nationally in a consistent manner to minimize risks associated with sediment cleanups. Failure to adhere to the Sediment Guidance not only creates uncertainty by undermining national consistency in sediment remedy decisions, but also threatens to create unnecessary risks that the Sediment Guidance is designed to avoid. The Proposed Plan, unfortunately, is inconsistent with the Sediment Guidance.

3. The Proposed Plan significantly deviates from the NCP, the Sediment Guidance and the Eleven Sediment Management Principles in a number of ways including the fact that the FFS and Proposed Plan fail to adequately identify and factor in substantial ongoing sources in the River, as is required by the Sediment Guidance and U.S. EPA's national policy. Thus, recontamination is likely to occur.

4. EPA is basing many decisions on a transport model that has not been peered reviewed, applies unsupported input factors and is not fully suitable to the site. EPA's own internal experts (NRRB/CSTAG) have raised this concern to the Region, however to date the Agency has failed to make substantive changes to support the remedy.

5. The clean-up goals and risk criteria are based on a conservative screening level Risk Assessment and the Agency has failed to conduct a site-specific Baseline Risk Assessment as required by the NCP and U.S. EPA's own Superfund Guidance.

6. The Proposed Plan inadequately develops and inappropriately evaluates the potential remedial alternatives in contravention of the NCP, the CERCLA RI/FS process and the Sediment Guidance.

   - The FFS and Proposed Plan fail to properly evaluate the potential adverse impact on remedy effectiveness posed by the risks resulting from the inevitable resuspension and release of Chemicals of Concern which occur during all dredging projects.

   - Based on experience from the interim dredging actions previously implemented (the Lister Avenue and River Mile 10.9 dredging projects), numerous bridges and submerged utilities would negatively impact the implementability of the Proposed Plan remedy and should be evaluated prior to selection of a remedy.

   - The existence of numerous bridges and submerged utilities would dramatically adversely impact the implementability of the Proposed Plan remedy and this impact should be evaluated prior to selection of a remedy. In addition, because of the age of the bridges, the likelihood of malfunctions and failures are high. This was evidenced by the substantial bridge malfunctions which shut down the River Mile 10.9 dredging project numerous times and the significant disruption of the heavy metropolitan area's vehicle traffic. Such malfunctions in a full scale multi-year dredging project would result in major disruption of water and land transport and traffic, not to mention the significant delays in completing the dredging.

   - Submerged debris and obstructions were not appropriately evaluated as part of the Proposed Plan's implementation.

- The Proposed Plan's geotechnical assessment of issues relating to bridge abutments, bulkheads and slope stability, among others, is incomplete and unreliable.

- The Proposed Plan fails to evaluate the comparative net risk reduction potential of the alternatives, pursuant to Section 7.4 of the Sediment Guidance.

- The Proposed Plan inappropriately rejects the use of a confined aquatic disposal ("CAD") facility for disposal of the massive proposed dredging volume. Despite its potential unpopularity, a CAD would result in a significant cost savings (estimated to be $700 million).

- The Proposed Plan inappropriately includes navigational dredging beyond the scope of CERCLA that increases the potential cost of the project by an estimated $850 million.

- The Proposed Plan inappropriately attempts to set cleanup standards below anthropogenic background, contrary to CERCLA, the NCP, the Sediment Guidance and long-established U.S. EPA policy.

- U.S. EPA failed to propose a phased or adaptive management approach, even though a site with such complex circumstances as the LPRSA is considered conducive to those approaches.

- An analysis of the Proposed Plan under the NCP's Nine Remedy Selection Criteria results in the conclusion that the Proposed Plan is inconsistent with those requirements and should be withdrawn in favor of the soon to be completed LPRSA RI/FS. In particular, the shortcomings of the Proposed Plan include failure to meet the following NCP criteria: overall protection of human health and the environment, long-term and short-term effectiveness, implementability and cost effectiveness.

In conclusion, rather than following the CERCLA RI/FS process and despite the availability of the LPRSA RI/FS in a few months, U.S. EPA proposes to disregard this $100 million dollar effort in apparent unfounded need for speed. A review of the Proposed Plan against the NCP Remedy Selection Criteria and the Sediment Guidance clearly reveals that it fails to comply with the basic requirements of these documents. In light of the imminent release of the RI/FS and the Proposed Plan's significant inconsistencies with CERCLA, the NCP, and National Sediment Policy, as embodied in the Sediment Guidance, the Proposed Plan should be

withdrawn and the Site should follow the CERCLA RI/FS process at this time. This should involve evaluating remedial alternatives and selecting the appropriate remedy for the Site following receipt and review by the Agency of the RI/FS.

The Agency should also consider the CPG's Conceptual Sustainable Remedy because it appears to hold great promise in being fully consistent with the NCP and Sediment Guidance. Moreover it is a potentially workable approach, utilizing sustainable and adaptive management principles to address this complex site.

* * *

The SMWG would be pleased to answer any questions about its comments on the draft FFS. For further information, please feel free to contact the SMWG's Coordinating Director, Steven C. Nadeau, c/o Honigman Miller Schwartz and Cohn LLP, 2290 First National Building, 660 Woodward Avenue, Detroit, MI 48226, (313) 465-7492, snadeau@honigman.com.

Sincerely,

Steven C. Nadeau

Steven C. Nadeau, Coordinating Director
Sediment Management Work Group

Enclosure

c.
Judith Enck, U.S. EPA Region 2 Administrator
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Sediment Management Work Group
Comments On The United States Environmental Protection Agency's
Proposed Plan For The Lower Eight Miles Of The Lower Passaic River
Part Of The Diamond Alkali Superfund Site

U.S. EPA Region II
August 20, 2014

I. Introduction

The Sediment Management Work Group ("SMWG")[1] appreciates the opportunity to provide comments to the United States Environmental Protection Agency ("U.S. EPA") on the Proposed Plan For The Lower Eight Miles Of The Lower Passaic River Restoration Part Of The Diamond Alkali Superfund Site ("Proposed Plan") dated April 2014, which addresses an eight mile reach in the lower section of the River ("the site" or "FFS Area"). The SMWG has long advocated a national policy addressing contaminated sediment issues that is founded on sound science and risk-based evaluation of contaminated sediment management options. Accordingly, the SMWG has strongly supported the substance of and consistent application of the U.S. EPA's 2005 *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (U.S. EPA 2005) (the "Sediment Guidance") to all sediment sites nationally. The SMWG recognizes that the management of sites involving contaminated sediments frequently involves unique and complex scientific and technical issues, including assessment methodologies and evaluation of risk and risk reduction options. The SMWG believes that the Sediment Guidance was an important first step in that direction. In addition, the findings, conclusions and recommendations of the NAS Report, "Sediment Dredging at Superfund Megasites: Assessing the Effectiveness" (NAS 2007) should be factored into the evaluation of options for the Passaic River. As an active participant in the national discussions on sediment management issues, the SMWG welcomes the opportunity to offer comments on the Proposed Plan.

The SMWG previously submitted comments to the National Remedy Review Board on the Lower Passaic River Restoration Project Draft Source control Early Action Focused Feasibility Study ("FFS") in 2007. The Proposed Plan is similar to the FFS in that neither document provides a meaningful evaluation of a full range of remedial alternatives, which is contrary to the National Contingency Plan ("NCP"). Moreover, like the FFS, the Proposed Plan does not comport with the *11 Risk Management Principles for Contaminated Sediment Sites* (U.S. EPA 2002a) nor the Sediment Guidance. The Proposed Plan's inconsistency with the NCP and national sediment policy, as embodied in the Sediment Guidance, concerns the SMWG because these regulations and policies are in place to ensure that site investigations are appropriately scoped, and that the evaluation and selection of remedial alternatives are risk-reduction focused and effectively protect human health and the environment, all in a consistent manner at all contaminated sediment sites.

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[1] The Sediment Management Work Group is an ad hoc group of a diverse cross-section of industry (auto, aerospace, chemical, paper, paint, pharmaceutical, utilities), port authorities and government parties actively involved in the evaluation and management of contaminated sediments. (See Exhibit "A" for a list of its Members.)

The SMWG is fully cognizant that the Lower Passaic River is a highly complex urban waterbody with multiple sources of impacts – both historical and ongoing – that presents unique and complicated challenges. Moreover, the SMWG recognizes U.S. EPA's attempt to navigate the intersection of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") with the Clean Water Act ("CWA"); however, there are certain fundamental principles of the remediation process that have not been followed in arriving at the Proposed Plan. These principles are in place to ensure that a site is fully understood, that the remedy selected is effective, implementable, sustainable, cost-effective, and most importantly, that the remedy selected protects human health and the environment. The NCP requires no less.

II. Executive Summary

The SMWG has been in the forefront of the national arena of contaminated sediment remediation for over 15 years. When the SMWG becomes aware of a guidance document, policy statement, technical issue or proposed remedy relating to contaminated sediment sites which is of national interest and/or concern, it typically submits comments. Those comments have been positive and critical, depending on the substance of the issue or the nature of the proposed remedy in question.

In this instance, SMWG is very concerned with the direction that the Lower Passaic River Proposed Plan appears to be heading. As proposed by U.S. EPA, this would be the largest sediment removal project in the United States, with an estimated removal of 4,300,000 cubic yards of material. As U.S. EPA notes in the Proposed Plan, 3% of all contaminated sediment dredged would be released back into the waterway, would require thousands of bridge closings, would increase truck traffic in numerous communities, and would expend $1 billion to $2.5 billion of funds to implement a flawed clean-up plan that fails to provide any material sustainable risk reduction. Consequently, the SMWG recommends that the Proposed Plan be withdrawn.

The following summarizes our primary concerns with the failure of the Agency's Proposed Plan to follow its own Guidance as well as concerns raised by other governmental experts. Greater detail is included in the body of this document.

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undermining national consistency in sediment remedy decisions, but also threatens to create unnecessary risks that the Sediment Guidance is designed to avoid. The Proposed Plan, unfortunately, is inconsistent with the Sediment Guidance.

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project would result in major disruption of water and land transport and traffic, not to mention the significant delays in completing the dredging.

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- An analysis of the Proposed Plan under the NCP's Nine Remedy Selection Criteria results in the conclusion that the Proposed Plan is inconsistent with those requirements and should be withdrawn in favor of the soon to be completed LPRSA RI/FS. In particular, the shortcomings of the Proposed Plan include failure to meet the following NCP criteria: overall protection of human health and the environment, long-term and short-term effectiveness, implementability and cost effectiveness.

In conclusion, rather than following the CERCLA RI/FS process and despite the availability of the LPRSA RI/FS in a few months, U.S. EPA proposes to disregard this $100 million dollar effort in apparent unfounded need for speed. A review of the Proposed Plan against the NCP Remedy Selection Criteria and the Sediment Guidance clearly reveals that it

fails to comply with the basic requirements of these documents. In light of the imminent release of the LPRSA RI/FS and the Proposed Plan's significant inconsistencies with CERCLA, the NCP, and National Sediment Policy, as embodied in the Sediment Guidance, the Proposed Plan should be withdrawn and the Site should follow the CERCLA RI/FS process at this time. This should involve evaluating remedial alternatives and selecting the appropriate remedy for the Site following receipt and review by the Agency of the LPRSA RI/FS.

The Agency should also consider the CPG's Conceptual Sustainable Remedy because it appears to hold great promise in being fully consistent with the NCP and Sediment Guidance. Moreover it is a potentially workable approach, utilizing sustainable and adaptive management principles to address this complex site.

III. Threshold Issue – The Proposed Plan Is Premature And Is Inconsistent With The CERCLA Process And The National Contingency Plan. It Should Be Deferred In Favor Of The Remedial Investigation/Feasibility Study For The Entire Lower Passaic River Area That Is Nearly Complete.

As an initial matter, SMWG notes that the Proposed Plan is based primarily on the FFS, which was largely conducted prior to 2007 and is focused on only a portion of the Diamond Alkali Superfund Site. We understand that the Cooperating Parties Group ("CPG"), consisting of some 60 companies who are working cooperatively with U.S. EPA under three settlement agreements, has undertaken and nearly completed a comprehensive Remedial Investigation/Feasibility Study (the "LPRSA RI/FS") for the entire 17 mile stretch of the Lower Passaic River below the Dundee Dam, including the eight miles that are the subject of the Proposed Plan. The LPRSA RI/FS has been conducted under the supervision and direction of U.S. EPA at a cost of well over $100 million. Whatever perceived benefit there was in 2007 with proceeding with the FFS for the lower eight miles no longer exists now that the LPRSA RI/FS is nearly complete. It would be inconsistent with the policies of CERCLA, the NCP and the Sediment Guidance to proceed with the Proposed Plan's partial site remedy before completion of the LPRSA RI/FS, which covers the entire site. At this site, the substantial additional site data collected by the CPG, its evaluation of site risks and potential remedies in the RI/FS to be submitted later this year, should be completed and evaluated by U.S. EPA prior to selection of <u>any</u> remedy.

In addition, the NRRB and CSTAG, in their joint Recommendations for the Diamond Alkali Superfund Site, Lower Eight Miles of the Lower Passaic River (Focused Feasibility Study Area) (U.S. EPA 2014, the "Joint Comments") observed that the Region has failed to explain how the Proposed Plan will be consistent with the remedy to be selected in the future for the entire LPRSA. "The Boards recommend that the decision documents clearly explain its rationale for concluding that the proposed FFS remedy would be consistent with the remedy to be selected in the future for the entire river." Joint Comments at p. 7. The requirement that an interip remedy be consistent with the final remedy is, of course, one of the basic tentes of CERCLA (Section 104(a)(2)) and the NCP (40 C.F.R. 300.430(a)(ii)(3)).

Therefore, the SMWG urges the Region to withdraw the Proposed Plan and defer selection of a remedy until the RI/FS for the <u>entire</u> Site is fully reviewed and evaluated.

IV. U.S. EPA's National Contaminated Sediment Policy, As Embodied In The Sediment Guidance, Must be Applied Nationally In A Consistent Manner as a Matter of U.S. EPA Policy

The Sediment Guidance embodies national policy on contaminated sediment and should be followed at all contaminated sediment sites. The Sediment Guidance was issued for use "by federal and state project managers considering remedial response actions or non-time-critical removal actions" under CERCLA (p. 1-1). It was developed over a period of eight years (1998-2005) and was the subject of comments by the U.S. EPA Regions and the public. The Sediment Guidance provides a risk management decision-making framework to assist with selecting appropriate remedies.

There are at least eight key overarching remedy selection principles in the Sediment Guidance applicable to this site:

- Confirmation that the site is ready for remediation by controlling sources to the greatest extent practicable before commencing remediation (p. 2-20, 7-17)

- The focus of remediation should be on risk reduction, not mass removal. (p. 7-1, 7-16). Likewise, the focus should be on contaminated sediment that is bioavailable and bioaccessible. (p. 7-3)

- A <u>realistic</u>, site-specific evaluation of the potential effectiveness of each sediment management option, including dredging, capping, and monitored natural recovery, should be incorporated into the selection of remedies at a site (p. 7-3). At large and/or complex sites, consideration of the use of combinations of remedies may be appropriate (p. 7-3).

- The Sediment Guidance expressly reiterates and applies the NCP's Nine Remedy Evaluation Criteria (p. 7-2, 7-7 to 7-13) (Highlight Box 7-3). Of particular, relevance at this site are the inconsistencies in the Proposed Plan with the NCP Criteria of protectiveness, short-term and long-term effectiveness, implementability and cost-effectiveness.

- Specifically, the remedy must comply with the provisions of CERCLA and the NCP on cost effectiveness by comparing and contrasting the costs and benefits of the various remedial alternatives as part of the risk management decision-making framework (p. 7-1).

- An appropriate evaluation should be conducted of the expected comparative net risk reduction of the various sediment management options, including a realistic evaluation of their respective advantages and site-specific limitations, especially their risk of remedy potential. For example, at this site, risks that inevitably will result from resuspension and release of COCs during the contemplated dredging of an estimated 4.3 million cubic yards of contaminated sediment, much of which is not currently bioavailable or bioaccessible. (p. 7-13, 7-14).

- Adaptive management concepts, which recognize the need for reconsideration of the original remedy chosen where new data and/or results of pilots or the initial implementation of the remedy suggest the appropriateness of revising the original approach, should be applied (p. 2-22, 3-1, 7-16).

In essence, these principles all focus on risk reduction, which the Sediment Guidance reinforces by indicating that contaminated sediment that is not bioavailable or bioaccessible and that is reasonably stable does not necessarily contribute to site risks (p. 7-3). These principles, if applied appropriately, will lead to protective remedies that are also cost-effective as required by CERCLA and the NCP.

In its *National Consistency in Superfund Remedy Selection* (U.S. EPA 1996), EPA emphasized the "critical importance of maintaining appropriate national consistency in the remedy selection process." (p. 2). In this context, appropriate consistency means "applying decision-making processes recommended in national policies and guidance using the criteria they lay out, and exercising the built-in flexibility as appropriate to address site-specific circumstances." (p.2).

V. The Proposed Plan Significantly Deviates From the NCP and U.S. EPA's National Contaminated Sediment Policy

The Proposed Plan deviates from NCP and the Sediment Guidance in a number of critical areas. The SMWG's comments highlight some, but not all, of the many areas where the Proposed Plan deviates from the basic tenets of CERCLA, as detailed in the NCP, as well as U.S. EPA's national contaminated sediment policy as embodied in the Sediment Guidance.

A. <u>The Agency's Site Characterization Is Inadequate And Fails To Comply With The NCP and Sediment Guidance</u>.

Sediment site characterization activities are intended to provide the information necessary to permit competent remedial alternatives to be developed, evaluated, and selected. Site characterization is performed through the Remedial Investigation ("RI").

In contrast to the sound policy set forth in detail in the Sediment Guidance, the detailed information from the nearly-completed RI being conducted by the CPG obviously has not been utilized in the remedy evaluation. We understand that hundreds of sediment cores and thousands of data points for sediment, surface water and biota in the LPRSA have been collected since 2007, yet the Region has not incorporated all of that data into its Proposed Plan. In fact, we understand that U.S. EPA has failed to take into account the data from at least 8 different data collection programs under the LPRSA RI/FS. All of the data necessary to optimize the evaluation of remedial alternatives should have been fully utilized.

Because so much of the critical data collected under the LPRSA RI/FS apparently have not been fully considered, the Proposed Plan largely relies on incomplete and often outdated data to characterize the site, and to develop and screen the remedial alternatives. This is inconsistent with the analyses and decision-making required by the Sediment Guidance. The significance of the missing information can be illustrated through a few examples where additional information

is required to develop and screen sound remedial alternatives. These examples are discussed below.

1. Failure To Identify Ongoing Sources Is In Contravention Of The Sediment Management Principles, The Sediment Guidance And U.S. EPA's CERCLA Policy.

Early control of sources has long been a U.S. EPA priority at contaminated sediment sites. In its *Contaminated Sediment Management Strategy* (1998), the U.S. EPA stated that "before initiating any remediation, active or natural, it is important that point and nonpoint sources of contamination be identified and controlled." (emphasis added) This strategy identified specific point sources as potential contaminant sources, including "municipal treatment plants, combined sewer overflows ("CSOs"), storm water discharges from municipal and industrial facilities, direct industrial discharges of process waste, runoff and leachate from hazardous and solid waste sites, agricultural runoff, runoff from mining operations, runoff from industrial manufacturing and storage sites, atmospheric deposition of contaminants, and contaminated groundwater discharges to surface water."

The need to control sources early is emphasized in the Sediment Guidance (as well as in the *11 Risk Management Principles,* U.S. EPA 2002a). The Sediment Guidance provides:

> "Identifying and controlling contaminant sources typically is critical to the effectiveness of any Superfund sediment cleanup. Source control generally is defined for the purposes of this guidance as those efforts are taken to eliminate or reduce, to the extent practicable, the release of contaminants from direct and indirect continuing sources to the water body under investigation." (p. 2-20)

The Sediment Guidance continues by reiterating that "significant upland sources (including ground water, NAPL, or upgradient water releases) should be controlled to the greatest extent possible before sediment cleanup." (p. 2-21) The Sediment Guidance calls for these potential continuing sources to be identified (see Highlight 2-2) and for a source control strategy to be developed before sediment cleanup begins.

While the Proposed Plan references "source control," it fails to identify sources with any specificity or propose measures to control them. The Proposed Plan does not provide an inventory of upland sources, as the Sediment Guidance requires, even though the FFS acknowledges, in passing, that combined sewer overflows, storm water discharges, permitted discharges, and contaminated groundwater discharges all exist within the lower eight miles of the Passaic River. Of equal concern is the virtual certainty that ongoing, uncontrolled sources upstream of the lower eight miles of the Passaic River will recontaminate the downstream section of the River once the Proposed Plan has been completed.

The NRRB and CSTAG recognized the likelihood of recontamination in their Joint Comments (U.S. EPA 2014): "the Boards note that recontamination could prevent the attainment and maintenance of the 5 ppt of dioxin in sediment over time; potential sources of

recontamination include, but are not limited to, resuspension caused by the cleanup itself and transport from the yet-to-be remediated parts of the LPR and Newark Bay." Joint Comments at p. 6.

We are aware that the site *Pathways Analysis Report* ("PAR") (Battelle 2005) reported that 32 COPCs and 56 COPECs exceeded screening level risk values in the Passaic River sediments, based on historical data. Yet, the very limited source information contained in the FFS and its Conceptual Site Model ("CSM") addressed only seven of these contaminants and contaminant classes. Even if one accepted the implausible conclusion that analyses of CSO discharges in other waterways were somehow representative of the discharges into the FFS Area, the potential for recontamination by these other 25 COPCs and 49 COPECs would remain unaddressed, contrary to the Sediment Guidance. In fact, Shear et al. (1996), Huntley et al. (1997), and Iannuzzi et al. (1997) published site-specific data showing that the CSO discharges are likely to recontaminate the FFS Area quickly if <u>any</u> of the remedies proposed were constructed.

Moreover, the threat of recontamination is not just theoretical. Recontamination following remediation has been observed at other sediment sites. Nadeau and Skaggs in their "Analysis of Recontamination of Completed Sediment Remedial Projects" in the Proceedings of the Fourth International Conference on Remediation of Contaminated Sediments (2007) analyzed twenty sediment sites that had become recontaminated after remediation and reported that more than 50% of these sites had become recontaminated from CSO and public storm water sources.

The Sediment Guidance advises site managers to factor the potential for recontamination into the remedy selection process, such as by including source control measures (p. 2-21, Highlight 4-5, Highlight 5-4, Highlight 6-11). The Sediment Guidance also emphasizes that phasing of remedy construction may be useful when the effectiveness of source control is in doubt (p. 2-22). The Sediment Guidance concludes, "By knowing the effectiveness of source control prior to implementing sediment cleanups, the risk of having to revisit recontaminated areas is greatly reduced." (p. 2-22) Unfortunately, the Proposed Plan does none of these things, contrary to the Sediment Guidance.

An evaluation of ongoing source loading and potential for sediment recontamination should be conducted before any early action is considered. Where, as here, recontamination is likely, a plan for controlling or reducing sources should be developed.

2. Failure To Characterize The Site Adequately Is Inconsistent With CERCLA, the NCP And The Sediment Guidance.

Sediment site characterization activities in an RI should provide the information necessary to permit effective remedial alternatives to be developed, evaluated, and selected. The Sediment Guidance emphasizes the importance of thorough site characterization. Site characterization includes collecting data to develop a conceptual site model, conducting risk assessments, understanding sediment and contaminant fate and transport, and identifying sources (Section 2.1). These data necessarily form the basis of the feasibility study, which then informs the remedial decision (Sections 3, and 7). Thus, the key to informed decision-making at

contaminated sediment sites is thorough site characterization and developing a good understanding of what is driving the risk at the site via development of a conceptual site model.

In contrast to the policy set forth in the Sediment Guidance, we understand that much of the information generated as part of the LPRSA RI under the Agency's watchful eye, was not a part of the Agency's decision-making process. As a result, a significant amount of the available data necessary to appropriately develop a feasibility study inappropriately were either not considered by the Agency, or were inappropriately disregarded. These data will be evaluated and presented later this year in the LPRSA RI/FS evaluation of the remedial alternatives. Moreover, collection or evaluation of these data during design is not a substitute for collection and incorporation of these data into the remedy evaluation phase.[2]

3. Failure To Utilize Peer-Reviewed Sediment Fate And Transport Models Suitable To The Site Is Inconsistent With The Sediment Guidance And In Direct Disregard Of The NRRB/CSTAG Comments To The Region.

The Sediment Guidance emphasizes the importance of assessing the fate and transport of sediment and contaminants at sediment sites (Section 2.8) because information on sediment and contaminant fate and transport is valuable for assessing the exposure and risk associated with the contaminants and for evaluating the protectiveness of remedial alternatives (p. 2-23, 2-32). Proper modeling is required to assess sediment and contaminant fate and transport, (p. 2-25). At large or complex sites, the Sediment Guidance emphasizes the importance of using mathematical modeling:

> "Mathematical modeling generally is recommended for large or complex sites, especially where it is necessary to predict contaminant transport and fate over extended periods of time to evaluate relative differences among possible remedial approaches." (p. 2-36)

Neither the Proposed Plan nor its supporting documents follows this Sediment Guidance provision. Instead they use what the FFS describes as the "Empirical Mass Balance Model." The EMBM is a simple observational tool that relies on unverified assumptions for inputs as a substitute for real data due to the inadequacy of site characterization. Neither the EMBM methodology generally, nor its application (calibration, verification) in the FFS has undergone external validation or peer review as called for in Section 2.9.4 of the Sediment Guidance.

The NRRB and CSTAG, in their Joint Comments, agree that the modeling methodology utilized by the Region requires peer-review and recommended that the model be subject to peer-review before the Proposed Plan was released, a recommendation that was ignored by the Region: "The Boards recommend that the Region's schedule allow sufficient time to address

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[2] Even if an accelerated approach is viewed as necessary, proceeding with an early action without adequate data also would be inconsistent with the Sediment Guidance. Based on the site description and circumstances as described in the FFS and the Proposed Plan, however, there appears to be no justification to rush to conduct an early action in the absence of source control and adequate data to evaluate the appropriateness of an early action, particularly when the LPRSA RI/FS will be available in the near future.

external peer reviewer's and the CSTAG's comments on the Region's sediment transport, organic carbon, and contaminant transport and fate models before the proposed plan is released." Joint Comments at p. 7.

The failure to provide appropriate, peer-reviewed modeling for the site in the FFS, coupled with the inadequate site characterization, precludes an effective remedial alternatives evaluation process as required by the NCP and the Sediment Guidance. At a highly complex site with alternative remedies ranging from $0.9 - $2.3 billion (U.S. EPA estimates that appear to be substantially low), a comprehensive understanding of contaminant fate and transport under current and proposed post-remedy conditions is a necessity requiring a more sophisticated modeling tool than the EMBM. More discussion of remedial alternative development is included below.

4. Utilization Of A Screening Level Risk Assessment And Failure To Conduct A Site-Specific Baseline Risk Assessment Is Contrary To The NCP And The Superfund Guidance On Risk Assessments.

The Proposed Plan and FFS rely on screening level risk assessment approaches rather than developing a site-specific baseline risk assessment. The use of screening criteria in remedial decision-making (especially on this scale -- $ 0.9 to 2.3 billion) is contrary to sound practice as well as the provisions of the NCP, U.S. EPA's 1997 *Ecological Risk Assessment Guidance For Superfund: Process For Designing And Conducting Ecological Risk Assessment* ("ERAGS"), and the Sediment Guidance (Sections 2.3 and 2.4).

The NRRB and CSTAG Joint Comments noted that the FFS Ecological Risk Assessment "is largely a conservative, literature-based" risk assessment and that such generic risk assumptions were not justified in all cases: "literature-based numerical, chemical-specific ecological preliminary remediation goals (PRGs) do not appear to be necessary for all identified contaminants in this proposed remedial action." Joint Comments at p. 4. Moreover, the NRRB and CSTAG were concerned that the FFS ERA assumptions could be inconsistent with the results of the ongoing Baseline Ecological Risk Assessment undertaken in conjunction with the LPRSA RI/FS.

The Sediment Guidance notes that screening and baseline risk assessments are essential to evaluate the potential threat to human health and the environment and to aid in developing risk-based remediation goals (p. 2-9). Screening risk assessments are used to identify COPCs while baseline risk assessments are a critical part of "the framework for developing risk-based remediation goals." (p. 2-9). Additionally, risk assessments should "provide information to evaluate risks associated with implementing various remedial alternatives that may be considered for the site." (p. 2-9). Although U.S. EPA claims to have "refined" the inadequate baseline risk assessment since the 2007 draft FFS, the Proposed Plan(?) ecological risk assessment continues to rely primarily on generic reference values and not on the available site-specific data, as required by ERAGS. Thus, remedial alternatives should not have been developed until the site had been properly characterized and a proper baseline risk assessment completed.

B. The Proposed Plan Inadequately Develops And Inappropriately Evaluates The Potential Remedial Alternatives In Contravention Of The NCP And The Sediment Guidance.

The Sediment Guidance's requirement of evaluating the remedy's likely ability to reduce risk on a site-specific basis, and to provide realistic cost comparisons also was not followed in developing the FFS and the Proposed Plan (see Sections 2.1, 2.3, 3.1, 3.4, and 3.5 of the Sediment Guidance). The FFS and Proposed Plan fail to develop and provide adequate information and analyses to support the so-called "early action" remedial program that it proposes, which is realistically a 6-10 year, or even longer, project.

Under both the NCP and the Sediment Guidance, the current level of development of the remedial alternatives is wholly inadequate to support the remedial alternative selected in the Proposed Plan, particularly when the projected cost is in the billions of dol1ars.

Examples of the inadequate development and inappropriate remedy evaluation in the FFS and the Proposed Plan follow below:

1. The FFS and Proposed Plan Fail To Appropriately Evaluate The Impact Of Remedy Effectiveness Risks From Resuspension And Releases.

The Sediment Guidance recognizes that "[s]ome contaminant release and transport during dredging is inevitable." (p. 6-22) Therefore, the Sediment Guidance requires resuspension losses and releases to be estimated as part of the remedy evaluation process:

> "To the extent possible, the project manager should estimate total dredging losses on a site-specific basis and consider them in the comparison of alternatives during the feasibility study. " (p. 6-23)

Reasonable estimates of the resuspension and releases that would result from each remedial alternative are necessary to permit reasoned comparisons of the net risk reduction associated with each alternative. The risks associated with resuspension and releases may be substantial because, as the Sediment Guidance notes, sediment resuspension losses "generally range from less than one percent to between 0.5 and 9 percent." (p. 6-23) These estimates and their incorporation into the remedy evaluation process are mandated by the Guidance (Sections 6.2, 6.5.5, 6.5.6, 6.5.7, Highlight 6-11, and Highlight 7-3).

Although the FFS assume that the resuspension rate will be 3 percent of solids removed (FFS p. 5-24), nowhere are the risks and impacts from the differing resuspension rates associated with the different alternatives considered. Considering that the Proposed Plan calls for an estimated 4.3 million cubic yards of material to be removed, the failure to evaluate the potential impact of an estimated 129,000 cubic yards of resuspension loss is a critical oversight. In addition, a number of factors suggest that losses from the Proposed Plan project may be greater than U.S. EPA has assumed for at least the following reasons:

- The large amount of debris and obstructions will increase resuspension losses and releases[3];
- The draft FFS Appendix E concludes that neither sheet pile nor silt curtain containment can be used in this setting; and
- Substantial vertical concentration gradients exist, with the COPCs and COPECs increasing greatly with depth.

Thus, the failure to estimate risks and impacts due to resuspension and releases increases the uncertainty about the expected risk reduction associated with each remedial alternative.

2. Numerous Bridges And Submerged Utilities Will Dramatically Impact Implementability of The Proposed Plan Remedy And The Magnitude Of These Project-Threatening Issues Should Be Re-Evaluated Prior To Selection Of The Remedy.

In addition to failing to adequately take into account the difficulties posed by submerged debris, the Proposed Plan entirely fails to consider issues relating to the more than 30 utility crossings in the lower eight miles. There is no discussion of how to obtain the consent of the utility owners for dredging above or near their utility crossing, if it can even be obtained, nor of the likely additional expense and restrictions on such areas that can be dredged. This was a problem during the River Mile 10.9 dredging project, and is an important implementation issue that should be addressed at the remedy selection phase.

Even more significantly, the Proposed Plan will require bridges over the Lower Passaic River to be opened an estimated 20,000 to 25,000 times during the course of the project. There is no evidence that these bridges are mechanically capable of withstanding such heavy use and the likelihood that one or more of them will malfunction, resulting in obstructions either to navigation or to important surface transportation arteries, has not been considered. The numerous instances of bridge opening and closing failures during the River Mile 10.9 project in 2013-14 clearly underscore the real-world implementability and cost issues that would be magnified a hundred fold with the Proposed Plan's contemplated Passaic River dredging volume.

The numerous bridges and submerged utilities will drastically affect the implementability of the Proposed Plan and will exponentially increase its cost, rending it inconsistent with the NCP's cost effectiveness requirement. Proper characterization of obstructions is an important predicate to remedial evaluations in an urban waterway site like the Passaic River at the remedy selection phase. Unfortunately, the FFS and Proposed Plan fail to adequately evaluate this critical issue.

3. Submerged Debris And Obstructions Were Not Appropriately Evaluated.

The Sediment Guidance directs project managers to evaluate the impact of debris on sediment resuspension and releases during dredging (Sections 6.2, 6.3, and 5.5) as well as on residuals (Sections 6.2, 6.3, and 6.5.7). Understanding debris and its impact is important to

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[3] The Guidance notes that debris conditions often increase resuspension losses and releases during dredging (p. 6-22, 6-26).

evaluating remedial alternatives because, as the Sediment Guidance explains, one condition conducive to effective dredging at a site is one where there is little debris (Highlight 6-2). The Sediment Guidance notes that dredging production rates are likely to be lower and the magnitude of resuspension and releases is likely to be higher at sites containing substantial debris. Moreover, the 2007 NRC report *Sediment Dredging at Superfund Megasites: Addressing the Effectiveness* mentions debris as inhibiting dredging effectiveness more than 60 times. For example:

> "Low sediment bulk density and the presence of debris and hardpan or bedrock all tend to increase resuspension and residuals. " (p. 82)

The FFS describes submerged debris by referencing a 2004 side-scan sonar survey that "identified 47 large objects, 16 of which had the signatures of automobiles" over the entire area. (p. 4-19) A shipwreck has also been identified. Appendix J of the FFS estimates that between 2000 and 8000 tons of debris will be removed during the course of the entire project. However, these quantities are likely to be a significant underestimation because they are inconsistent with observations made elsewhere (see below). The Agency inappropriately suggests deferring a video survey to characterize and locate debris to the pre-design investigation. However, deferring critical site characterization data to the "pre-design" phase is inconsistent with the Guidance (Sections 2.1, 2.3, 3.1, 3.2, 3.4, 7.1, 7.3, and 7.4) and sound practice, because the missing information can often lead to the selection of a different remedy or approach. Furthermore, at a site with such high projected volumes of sediment to be dredged, a significant debris problem could result in increased costs in the hundreds of millions of dollars, which should be considered under the NCP during the remedy selection phase, <u>not</u> the design phase.

The inadequacy of this debris information is illustrated in other documents:

- TAMS (2005) conducted a geophysical debris survey of portions of a 1000 foot long area in the Harrison Reach of the Passaic River. This survey reported that the entire northern shoreline was populated by debris including tires, rocks, poles, and other objects. Within this limited area, this survey identified two other areas with multiple debris targets, plus other discernible targets including a 15' tree, a 26 foot long piling, a 37 foot long piling, several areas of organic debris, and 14 other objects. (p. 16)

- Endesco (2005) recorded that "as-dredged Passaic sediments may contain many different types of debris including wood, tires, telephone poles, fencing materials, white goods, trash, etc." (p. 18)

- In Appendix H of the draft FFS, Biogenesis reported that the Passaic River sediments delivered to their test process contained "an unusually high amount of trash and debris". The trash and debris noted by BioGenesis was smaller in size and was of a nature that would not have been detected by geophysical means such as those employed by TAMS.

Therefore, the SMWG urges that before a remedy is selected for the site, a comprehensive debris survey should be undertaken. The anticipated cost impact of the presence of debris to the project should be estimated, and the implementability and cost implications should be factored into the remedy selection, , consistent with the Sediment Guidance provisions referenced above, rather than being deferred to the remedial design phase.

4. The Proposed Plan's Geotechnical Assessment Of Implementability Issues Relating To Bridge, Bulkhead and Slope Stability, Among Others, Is Incomplete And Unreliable.

Section 5.5 of the Sediment Guidance requires evaluation of geotechnical considerations in the feasibility study, which is key to determining the implementability of different remedial alternatives (p. 5-11, Highlight 7-3). While the FFS makes passing reference to slope stability with respect to a cap scenario, this assessment did not provide assurance that any of the remedial alternatives could be technically implemented or constructed. The SMWG understands that the site poses several issues with the purported slope stability assessment, including: use of textbooks' soil data (based on the USCS soil classification) because no site specific geotechnical data were available; apparent assessment of post-construction conditions only, even though limiting geophysical conditions will almost certainly occur during dredging construction, rather than at its completion; and, analysis which did not extend to informing the project manager about the potential stability of bridge abutments, shoreline buildings and bulkheads, or the safety of underground utilities that pass beneath the areas proposed for dredging, among others.

As noted in the Sediment Guidance, once site-specific geotechnical data are collected to properly characterize a site, a site-specific geotechnical assessment will be necessary to assess the stability and implementability of the various remedial alternatives being considered (Highlight 7-3). This should be a pre-remedy selection study that should be factored into the implementability evaluation of the remedial alternatives.

5. The Proposed Plan Fails To Evaluate Comparative Net Risk Reduction Pursuant To Section 7.4 Of The Sediment Guidance.

U.S. EPA has failed to evaluate the comparative net risk reduction of its preferred alternative compared to the other remedial alternatives. The Sediment Guidance states that "Project managers are encouraged to use the concept of comparing net risk reduction between alternatives as part of their decision-making process for contaminated sites, within the overall framework of the NCP remedy selection criteria" (p. 7-13). To ensure that "all positive and negative aspects of each sediment management approach" are considered, the Sediment Guidance strongly encourages the use of comparative net risk in decision making (p. 7-13). This approach previously had been recommended by the National Academy of Sciences Committee on Remediation of PCB-Contaminated Sediments (NRC 2001).

This should include an evaluation of the risks from remedy implementation:

> "Consideration should be given not only to risk reduction associated with reduced human and ecological exposure to contaminants, but also to risks introduced by implementing the

> alternatives. The magnitude of implementation risks associated with each alternative generally is extremely site-specific, as is the time frame over which these risks may apply to the site. Evaluation of both implementation risk and residual risk are existing important parts of the NCP remedy selection process. By evaluating these two concepts in tandem, additional information may be gained to help in the remedy selection process." (p. 7-13)

As part of the Comparative Net Risk evaluation, the Sediment Guidance notes that "[e]ach approach to managing contaminated sediment has its own uncertainties and potential relative risks." (p.7-13). These risks may include:

- Contaminant releases during sediment removal, transport, or disposal (or capping)
- Continued exposure to contaminants currently in the food chain
- Other community impacts (e.g., accidents, noise, residential or commercial disruption)
- Worker risk during sediment removal and handling (or cap placement)
- Residual contamination following sediment removal
- Releases from contaminants remaining outside dredged/excavated area (movement through the cap)
- Disruption of benthic community

"Sample Elements for Comparative Evaluation of Net Risk Reduction."(p. 7-14)

The Proposed Plan fails to provide sufficient information to determine what, if any, net risk reduction may be associated with any of its alternatives. In light of the NAS Report (2007), the ability of several of the alternatives under consideration to be successful in reducing risk is seriously doubtful. Nor would the NAS Report (2007) support proceeding with such a significant remedial action without a complete understanding of site conditions. Further, the risks that would be introduced by the implementation of each alternative remedy were neither described nor quantified. The failure to perform this analysis is inconsistent with the Guidance.

One of the risks of remedy implementation for dredging projects is the risk of worker injuries and deaths. The risk would be necessarily increased with the increasing size of the extremely large remedial alternatives considered in the Proposed Plan. The NRC (2007) also noted the importance of considering such risks in selecting site remedies:

> "Other 'implementation risks' (risks potentially imposed by the implementation of a remediation strategy) such as worker and community health and safety, equipment failures, and accident rates associated with an active remediation are given little consideration in EPA's feasibility studies at Superfund sites (Wenning et al. 2006). Cura et al. (2004) identify several challenges associated with comparative risk assessment, given data limitations and the unavoidably subjective nature of quantifying

> some risks associated with dredged-material management decisions. However, ignoring those types of risk in comparisons of remedial options is not the solution and may have undesirable consequences, particularly when the cost of being wrong is high (Bridges et al. 2006)." (p. 159)

Leigh and Hoskin (2000) developed and published the methodologies and the five year average worker risk incidence rates for those worker classes that would be involved in a theoretical 427,000 cubic yard dredging project. Leigh and Hoskin's project was defined as using a combination of mechanical and hydraulic removal techniques. Leigh and Hoskin concluded that the probability of at least one fatality occurring in this project was about 1 in 2.4.

The dredging alternatives presented in the FFS are all similar to but comparatively much larger than, Leigh and Hoskin's project. Implementation risks must to be calculated and included in the remedial decision-making process.

Under the Comparative Net Risk concept set forth in Section 7.4 of the Sediment Guidance, the potential effectiveness of a remedy must be considered in the context of the risks associated with that remedy's implementation. With respect to the Proposed Plan, which contains a substantial dredging component, it is likely to increase potential harm to human health and ecological receptors by increasing exposure to contaminants resuspended and/or released in surface water (USEPA 2005; NRC 2007; Bridges et al. 2008). These risks can occur even with the effective use of Best Management Practices ("BMPs"). In recent years, the effectiveness of silt curtains in controlling releases has been questioned (Bridges et al. 2008). For example, approximately 2.2 percent of the mass of contaminants dredged were released downstream at the Fox River Deposit 56/57 dredging project, despite using silt curtains (Steuer 2000).

U.S. EPA's Sediment Guidance provides: "Some contaminant release and transport during dredging is inevitable and should be factored into the alternatives evaluation and planned for in the remedy design." The Guidance goes on to state that "Generally, the project manager should assess all causes of resuspension and realistically predict likely contaminant releases during a dredging operation." (p. 6-22). At this site, the risk of releases during dredging is clearly present despite use of BMPs due to the huge proposed dredged volume, the large number of years to complete it (anticipated to be 6 to 10 years [which seems unrealistically low compared to the other mega site dredging projects]), and the numerous obstructions and debris in the waterway. In other words, this is no "short-term spike" in concentrations of COCs. For example, the dredging in Commencement Bay in Seattle in 2004 caused a spike in fish tissue concentrations that persisted for years (Patmont, et al., Battelle 2013). Simply hoping to "do a better job" dredging than in all past projects is not a realistic expectation and does not constitute sound decision-making.

At this site, U.S. EPA estimates that approximately 3% of the dredged mass of nearly 4.3million cubic yards in the Proposed Plan is likely to be resuspended. Based on the Agency's own estimate that 3% of the COCs contained in the 4.3 million cubic yards of COCs dredged would be released during such dredging, this would be result in significant adverse consequences to the waterbody. It would create both short-term issues and long-term issues as well, as a result of the expected (long) number of years to complete the project, and the spread of COCs

elsewhere in the waterbody as resuspension and releases settle downstream. As noted in the Sediment Guidance and the NRC Dredging Effectiveness Report (2007), resuspension and release is inevitable in any dredging remedy. Here, the Proposed Plan's "bank-to–bank" remedy would subject the waterbody to an unprecedented volume of dredging, which would be far worse than other more targeted removal options, such as the CPG's Sustainable Remedy. Applying the principles of the Comparative Net Risk of Section 7.4 of the Sediment Guidance, the net risk reduction of the Proposed Plan's remedy is far less than the stated effectiveness due to risks introduced by remedy implementation. Therefore, the Proposed Plan should be withdrawn and the array of alternatives in the soon to be released LPSRSA RI/FS, should be carefully evaluated for risk of remedy issues. This comparative net risk reduction analysis should then be incorporated into the evaluation of remedial alternatives under the NCP's Nine Criteria.

6. The Proposed Plan Improperly Excluded Consideration Of The Use Of A Confined Aquatic Disposal Facility

The Region has apparently excluded consideration of the use of a confined aquatic disposal ("CAD") facility even though its own consultant concluded that one was technically feasible based on anticipated opposition. The Region should have included a CAD as part of the remedy, especially considering that the use of a CAD could reduce remedy costs by an estimated $700,000,000.

7. The Proposed Plan Improperly Includes Navigational Dredging As A Component Of The Remedy, Which Is Beyond The Scope Of CERCLA

We understand that, under the Proposed Plan, approximately 48% of the dredging (approximately $850 million) would be undertaken in order to accommodate anticipated commercial and recreational navigation. However, dredging for navigation purposes is beyond the scope of CERCLA, which is concerned with abating risks from the releases of hazardous substances. It is significant to note that the NRRB previously reached the same conclusion at the Waukegan site that it is inappropriate to use CERCLA remediation authority to assist the Army Corps in addressing its navigational obligations (U.S. EPA 2008). Furthermore, it is our understanding that this proposed dredging is not necessary to achieve the cleanup standards. In addition to the issue of the lack of authority, considering the costs associated with the proposed environmental dredging, there is no justification for including navigational dredging of clean sediments as part of the CERCLA remedy.

8. The Proposed Plan's Attempt To Set PRG's Below Anthropogenic Background Is Contrary To U.S. EPA's Long-Established CERCLA Guidance And The Sediment Guidance

U.S. EPA's 2002 policy, *Role of Background in the CERCLA Cleanup Program* (U.S. EPA 2002b) notes that "the CERCLA program, generally, does not clean up to concentrations below natural or anthropogenic background levels." More specifically, this policy states:

> Generally, under CERCLA, cleanup levels are not set at concentrations below natural background levels. Similarly, for anthropogenic contaminant concentrations, the CERCLA program

> normally does not set cleanup levels below anthropogenic background concentrations. The reasons for this approach include cost-effectiveness, technical practicability, and the potential for recontamination of remediated areas by surrounding areas with elevated background concentrations. (Citations omitted.)

The NRRB and CSTAG, in their Joint Comments, noted that the Proposed Plan inappropriately sets cleanup goals below background: "site-specific modeling suggests that the preferred alternative may yield post-remedy concentrations that are below background levels post multi-year remedy implementation. The Boards recommend that the Region clearly explain in its decision documents, how, considering EPA guidance, information regarding background was taken into account when developing RAOs, PRGs and final cleanup levels." Joint Comments at p. 6 (emphasis added). Unfortunately, the Region failed to address the Board's concern.

9. U.S. EPA Failed To Propose A Phased Or Adaptive Management Approach.

Experience at other large sediment sites with high degrees of complexity and uncertainty regarding design and implementation of appropriate remedial action points to the value of using adaptive management strategies, as recommended by the Sediment Guidance, NRC (2007), and other independent, scientific peer reviews of sediment sites throughout the country (U.S. ACE 2008). The Sediment Guidance expounds on the usefulness of a phased or adaptive management approach:

> Phasing in remedy selection and implementation may be especially useful at sites where contaminant fate and transport processes are not well understood or the remedy has significant implementation uncertainties. Phasing may also be useful where the effectiveness of source control is in doubt. By knowing the effectiveness of source control prior to implementing sediment cleanups, the risk of having to revisit recontaminated areas is greatly reduced. High remedy costs, the lack of available services and/or equipment, and uncertainties about the potential effectiveness or the risks of implementing the preferred sediment management approach, can also lead to a decision to phase the cleanup. At some sites, it may be advantageous to pilot less invasive or less costly remedial alternatives early enough in the process that performance could be tracked. If performance does not approach desired levels, then more invasive or more costly approaches could be pursued. (pp. 2-21 to 2-22)

In its recently released Superfund Remedial Program Review (U.S. EPA 2013), U.S. EPA acknowledges that times have changed and that costly Remedial Investigations should no longer be acceptable, particularly in the face of serious limitations in agency personnel and resources. This practical philosophy is further reflected in the remedy implementation phase, with a renewed emphasis on starting remedial actions earlier and encouraging utilization of the concept of "adaptive management." U.S. EPA defines adaptive management at Superfund sites as:

> . . . an iterative approach to site investigation and remedy implementation that provides the opportunity to respond to new information and conditions throughout the lifecycle of a site. Adaptive management assumes there is an explicit intent to respond to new information and conditions, and to the extent it can be done under CERCLA and the NCP site decision making, formal remedial decision documents as well as other project plans and reports incorporate appropriate language that enables efficient planning and execution of adaptive management techniques (USEPA 2013).

Adaptive management requires that "questions critical to the success of a project are identified early and decision points included at key steps in the process allow sampling activities <u>or RA to be terminated or modified</u> based on the results of data analysis." (USEPA 2013 at p. 9, emphasis added.) Moreover, adaptive management allows U.S. EPA to "evaluate remedy effectiveness and track progress toward attainment of remedial action objectives (RAOs) using performance metrics and data derived from site-specific remedy evaluation. The remedy effectiveness information is then used to actively manage site operations and refine remedial strategies" (USEPA 2013 at p. 7)

The benefits of an adaptive management approach include, among other things, an enhanced ability to effectively manage human health and environmental risks:

> Another major concept [of Adaptive Management is] to focus actions on managing project completions to control site risk. Projects would address human and ecological exposures and control migration of contaminated media to stabilize site conditions such that <u>achievable</u> contaminant concentrations are met to provide risk reductions and reach other practicable endpoints in situations where the desired RAOs have not yet been achieved in the near term. (USEPA 2013 at p. 7) (emphasis added)

U.S. EPA's Proposed Plan for the FFS Study Area is the largest proposed remedy for any CERCLA site, <u>ever</u>, and there is significant uncertainty associated with the design, feasibility and implementation of the remedy. Consistent with its own guidance, at a minimum, U.S. EPA should have developed and evaluated an alternative that encompasses a phased remedial approach that can be adapted to ensure acceptable progress towards remedial goals while more effectively managing human health and environmental risks. Of course, that alternative should be consistent with the NCP and the Sediment Guidance, and the Proposed Plan clearly is not, so the Proposed Plan should not be the basis of formulating an Adaptive Management Solution.

VI. A Detailed Review Of The Proposed Plan Against The NCP's Nine Remedy Selection Criteria Demonstrates That The Proposed Plan Is Inconsistent With Those Criteria And Should Be Withdrawn In Order To Appropriately Follow The Traditional CERCLA RI/FS Process, By Utilizing The LPRSA RI/FS As The Basis for Remedy Selection At This Site.

A detailed review of the Proposed Plan in comparison to the NCP's Nine Remedy Selection Criteria demonstrates at least the following deficiencies and inconsistencies:

Criterion #1: Overall Protection of Human Health and the Environment

The Proposed Plan concedes that the PRGs it proposes to utilize (which themselves are inconsistent with CERCLA, the NCP, U.S.EPA's Risk Assessment Guidance and the Sediment Guidance) can never be achieved because the PRGs are below anthropogenic background. In addition to being contrary to U.S. EPA guidance regarding the role of background in CERCLA cleanups (U.S. EPA 2002b), this means that the PRGs are below the concentrations of COCs in sediment in the upper 9 miles of the river and even below the concentrations of COCs found above the Dundee dam. The further unacceptable consequence of implementing the Proposed Plan's remedy is that it is a virtual certainty that the FFS Area will be recontaminated at concentrations well above the proposed PRGs because of significant on-going uncontrolled sources, including CSOs and SSOs in the watershed.

In addition, the huge volume proposed to be dredged in the Proposed Plan of nearly 4.3 million cubic yards, a quantity far exceeding the existing two largest dredging projects in the Hudson and Fox Rivers, will lead to excessive resuspension and releases of COCs compared to more reasonable combination remedial options with a narrower and more focused dredging footprints (such as the CPG's conceptual Sustainable Remedy as one example). The unprecedented volume of the Proposed Plan's dredging will inevitably result in dredging resuspension and release losses, which will render it unprotective, not only on a short-term during the many years of anticipated dredging but also on a long-term basis, both in the context of the number of years during which the dredging occurs, but also on a permanent basis, as those COC releases travel and redeposit or de-solubilize throughout the water body.

Criterion #2: Compliance with ARARs

The Agency concedes in the Proposed Plan that its proposed remedy will not be able to ever achieve the State's surface water quality criteria. Consequently, the Proposed Plan's remedy would need a CERCLA Technical Impracticability waiver for this criteria.

Criterion #3: Long-Term Effectiveness

The Proposed Plan will not achieve long-term effectiveness as noted in the discussion above on the Overall Protectiveness criterion. First, the proposed PRGs simply are not achievable because they fail to follow CERCLA, the NCP, the Sediment Guidance and U.S. EPA policy (U.S. EPA 2002b) requirements to use anthropogenic background when the risk assessment-derived numbers are below background. Second, the Proposed Plan's estimate of releases of 3% of the 4.3 million cubic yards specified in the proposed remedy confirms that the remedy cannot be effective on a long-term (or a short-term) basis. This is a classic case of the

extreme nature of the proposed unprecedented huge "mass removal" causing more harm than good. As noted above, this also fails to comply with the Sediment Guidance's Comparative Net Risk Reduction in Section 7.4 of the Guidance. Finally, with upstream COC concentrations greater than the proposed PRGs, recontamination is inevitable.

Criterion #4: Reduction of Toxicity, Mobility and Volume through Treatment

The Proposed Plan does not distinguish itself in any way with respect to potential reduction of toxicity, mobility and volume through treatment compared to the other remedial options under consideration, and as such, this criterion is not likely to be driving the remedy selection.

Criterion #5: Short-Term Effectiveness

For purposes of short-term effectiveness, due to the inevitable significant risks posed by the resuspension and releases to the environment during the dredging component of the Proposed Plan remedy (see Sections 6.5.5 [Resuspension and Releases] of the Sediment Guidance and Bridges, et al. 2008) the Proposed Plan remedy simply will not be protective from a short-term effectiveness perspective. Worker safety risks, greenhouse gas, particulate matter emissions, and ozone impacts are all likely to far exceed the amount of adverse impact than other alternatives, including the CPG's conceptual Sustainable Remedy.

Criterion #6: Implementability

The list of implementability issues with the Proposed Plan is a long one. Most of the significant, and likely "game-changing" issues are discussed in greater detail above. They include:

1) Non-functioning, old and virtually non-repairable bridges:During the comparatively small River Mile 10.9 2013-4 dredging project, bridge operability issues and breakdowns crippled the project. These lessons learned must be taken into account in evaluating the Proposed Plan and other remedial options. This evaluation is critically important to the remedy selection, and must not be pushed down the road to the remedial design phase, or worse, to the construction phase.

2) Utility crossings: The presence of hundreds of utility crossings means that the dredging must be "offset" (not implemented) for a substantial distance on each side of the utility, typically over 100 yards buffer at all these locations.

3) Infrastructure stability: Geotechnical issues with the stability of the numerous seawalls, docks, piers, etc. have not been appropriately addressed and will pose another whole host of implementation problems.

4) Debris: Significant amounts of debris has been documented and will pose many difficult issues during dredging, which will be greatly magnified compared to other smaller dredging footprint options.

5) Navigation: Navigational constraints will be significant and will invariably lead to significant delays.

6) Numerous other implementability issues are inevitable, especially in the context of an urban river.

Criterion #7: Cost-Effectiveness

The Proposed Plan is not cost-effective as required by CERCLA, the NCP and the Sediment Guidance. CERCLA requires that any remedial action that is selected must be "cost-effective." 40 USC 9621(a). The NCP states, "Each remedial action selected shall be cost-effective, provided that it first satisfies the threshold criteria set forth in § 300.430(f)(1)(ii)(A) and (B). Cost-effectiveness is defined as when "costs are proportional to its [the remedial alternative's] overall effectiveness." (40 CFR §300.430(f)(1)(ii)(D)).

As EPA stated in its Superfund Guidance, "cost-effectiveness is concerned with the reasonableness of the relationship between the effectiveness afforded by each alternative and its costs compared to other available options."(U.S. EPA 1999) Moreover, "if the difference in effectiveness is small but the difference in cost is very large, a proportional relationship between the alternatives does not exist" (U.S. EPA 1990, Preamble to NCP).

These proportionality requirements were reiterated by EPA in the Sediment Guidance. Regions must select remedies that are cost effective (p. 7-17) and should "compare and contrast the cost and benefits of various remedies." (p. 7-1).

In disregard of both the NCP and Section 7.1 of the Sediment Guidance, the Region's remedial alternative evaluation fails to appropriately evaluate and compare the relative benefits and costs for the remedial alternatives. In addition, the Agency concedes that if implemented, the Proposed Plan remedy would not achieve the Plan's PRGs. Despite this serious shortcoming, according to the Proposed Plan, the remedy proposed would cost in the range of billions. Therefore, it would appear on its face to fail to meet the definition of cost-effectiveness in the NCP and the Sediment Guidance.

Criteria 8 and 9: Modifying Criteria

State acceptance and community acceptance have yet to be determined and are not addressed in this analysis.

VII. The CPG's Sustainable Remedy Should Be Further Evaluated Before Any Other Remedy Is Implemented For The FFS Area

We understand the CPG has communicated its "Sustainable Remedy" on a conceptual level to U.S. EPA. We further understand this remedy would focus on dredging areas of bioavailable and bioaccessible impacted sediment, rather than the Proposed Plan's bank to bank approach. Removal of the impacted sediment would result in optimal protectiveness by effectively reducing risk, while the decrease in the volume of dredged sediment would significantly reduce the unintended resuspension and releases which the Sediment Guidance

notes are "inevitable" in any dredging project as part of the LPRSA. This would also reduce both the short-term and the long-term risk posed by the implementation of the remedy itself, satisfying the Sediment Guidance's requirement to evaluate the Comparative Net Risk of the remedial alternatives under consideration (Section 7.4). It would appear that the Sustainable Remedy also would meet the proportionality test for cost-effectiveness under the NCP and the Sediment Guidance. The Sustainable Remedy also appears to be fully consistent with the directives of CERCLA, the NCP's Remedy Selection Nine Criteria and the Sediment Guidance based on the preliminary information we have received. Consequently, it would be appropriate to further evaluate this remedy as part of the LPSRA RI/FS and it would be inappropriate for the Agency to proceed with the Proposed Plan until the full LPSRA RI/FS has been fully reviewed and evaluated.

VIII. Conclusion

Rather than following the CERCLA RI/FS process, despite the scheduled availability of the LPRSA RI/FS in a few months, U.S. EPA in fact proposes to disregard this $100 million effort which it required be undertaken, apparently out of an unfounded need for speed. In the meantime, at least two significant interim actions have already been performed, including both the Tierra Phase I Removal Action at the Lister Avenue site, which removed 40,000 cubic yards of the most contaminated material known to be present in the LPRSA, and the River Mile 10.9 dredge/cap operations that were undertaken in 2013 and 2014, which removed an additional 20,000 cy of contaminated sediments along the Lyndhurst shoreline. Rather than evaluating the effect of these significant interim remedial measures through data collection and analysis before deciding on the next step, as phased or adaptive management would require, the Agency is now proposing to disregard the principles of adaptive management and to prematurely select a record-breaking final dredging remedy for the lower 8 miles of the LPRSA.

U.S. EPA should not implement a decision so clearly contrary to its own policies. Instead of continuing its current course, the Agency should follow the NCP and the Sediment Guidance by selecting a remedy for the FFS Study Area based on the ongoing RI/FS for the full 17 miles. This decision could be supplemented by the additional information and analysis needed to create a technically accurate understanding of current conditions in the LPRSA and the likely effects of various remedial alternatives, and implement the iterative (adaptive management) approach specified in U.S. EPA's guidance.

The Sediment Guidance provides a scientifically sound, risk-based approach to addressing contaminated sediment sites. Sediment sites present challenging problems, but following the policy and procedures in the Sediment Guidance uniformly across the country is necessary to assure that an appropriate remedy is selected which is capable of being successful in reducing risk based on site-specific conditions. In contrast, the draft FFS and Proposed Plan for the Lower Passaic River deviate from CERCLA, the NCP and the Sediment Guidance in several critical ways including proceeding with a lack of source control information which inevitably will result in recontamination, incomplete site characterization, and inadequate and inappropriate remedy evaluation. Accordingly, the Proposed Plan should be withdrawn and the LPRSA RI/FS should be allowed to proceed to completion and to serve as the basis for selection of a remedy for the entire site which is fully consistent with CERCLA, the NCP and the Sediment Guidance.

***

The SMWG would be pleased to answer any questions about its comments on the draft FFS and Proposed Plan for the Lower Passaic River. For further information, please feel free to contact the SMWG's Coordinating Director, Steven C. Nadeau, c/o Honigman Miller Schwartz and Cohn LLP, 2290 First National Building, 660 Woodward Avenue, Detroit, MI 48226, (313) 465-7492, snadeau@honigman.com.

Respectfully submitted,

Steven C. Nadeau

Steven C. Nadeau, Coordinating Director
Sediment Management Work Group

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Exhibit A

Membership in the Sediment Management Work Group

Alcoa, Inc.
Ashland Inc.
AstraZeneca Pharmaceuticals LP
BASF Corporation
Beazer East, Incorporated
BP America, Inc.
CBS Corporation
Chevron Corporation
Covidien
DTE Energy Company
DuPont Co.
E.I. du Pont de Nemours & Co., Inc.
ExxonMobil
Freeport-McMoRan Copper & Gold, Inc.
General Motors LLC
Georgia Pacific, LLC
Glenn Springs Holdings, Inc.
Honeywell International, Inc.
International Paper Company
Kinder Morgan, Inc.
Monsanto Company
National Grid
NW Natural
Port of Portland
Shell
Sherwin-Williams Co.
The Boeing Company
The Dow Chemical Company
The Greenbrier Companies, Inc.
Tierra Solutions, Inc.
U. S. Steel Corporation
We Energies
American Chemistry Council
American Forest and Paper Association
American Gas Association
American Petroleum Institute
Centre for Advanced Analytical Chemistry
CSIRO
Council of Great Lakes Industries
Electric Power Research Institute
International Zinc Association
National Council of Paper Industry for Air & Stream Improvement
Norwegian Institute for Water
Space and Naval Warfare Systems Center
U.S. Army Corps of Engineers
U.S. Army Engineer Research & Development Center
United States Navy
Utility Solid Waste Activities Group

Murdering the Passaic: A Brief History

by

Joseph Nardone, Community Activist

On April 11, 2014, at Riverfront Park on the Passaic River in the Ironbound Section of Newark, the EPA announced that it was going to clean-up the Passaic River by bank-to-bank dredging removing the toxins and making the River once again safe for fishing, swimming and boating. While everyone concerned about the River was excited upon learning that the most polluted river in America was finally being returned to some semblance of habitability, how many people know what happened to turn the Passaic into the largest superfund site in America?

Sitting on an approximately one acre site situated between the Benjamin Moore and Sherwin Williams paint manufacturing plants, all abutting the Passaic River, the Diamond Alkali Co., 80-120 Lister Ave., in Newark's Ironbound Section, manufactured various chemicals from 1943 to 1968. Of the chemicals manufactured, two of the most dangerous were Halogenated Hydrocarbons and 2,4,5-Trichlorophenol (2,4,5-T) which is used in pesticide products and is ranked as more hazardous than most chemicals in 8 out of 9 ranking systems and is in the top 10% as one of the most hazardous compounds to ecosystems. Production of the pesticide was for use in Agent Orange which is a mixture of two pesticides. Of the two pesticides used, the 2,4,5-T is considered the less biodegradable. Dioxin is an impure by-product produced by overheating the pesticide during manufacture and has a half-life of more than ten years in the soil and seven years in human fat tissue. River dumping of the Dioxin was the disposal method. At low tide, workers were dispatched with crow bars, pick-axes and other tools to break-up the exposed coagulated islands of Dioxin.

Agent Orange was a weaponized herbicide which was first use by the British fighting Communist insurgents in Malaysia in the 1950's and then in Vietnam to defoliate the jungle exposing the Viet Cong insurgents and hiding places. It was supposed to be harmless to humans and was indiscriminately sprayed on American troops. The area where it as sprayed became known as "Death Valley" and exposed veterans suffer severe medical problems from the supposedly "harmless herbicide" to this day.

Murdering the Passaic: A Brief History
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After the highest concentration levels of Dioxin in the country were discovered on the Lister Ave. site and surrounding area, which was and still is a densely populated and manufacturing area and had a farmer's market since relocated, the NJDEP and the Company, in March 1984, entered into an Administrative Order of Consent for a remedial investigation-feasibility study and an on-site clean-up. Dioxin, pesticides and Volatile Organic Compounds (VOCs) were discovered in the groundwater which migrates to the Passaic adding to the contamination of the River. Adjacent transportation routes and residential areas were vacuumed and swept by men wearing protective suits, looking like space alien invaders, while vacuuming the sidewalks, the streets, and scraping the dirt from residents' backyards and lawns causing great concern and consternation to the residents to say the least.

After the official clean-up, the contaminated soil, debris, protective suits and equipment were stored in 936 semi-trailers, each 12 feet tall, stacked in a tightly woven column 4 trailers high. For years, the site remained secured but un-remediated while the responsible parties argued in court with the EPA over how to further proceed with the clean-up and, of course, the cost! The local community social organization, the Ironbound Community Corp. (ICC), conducted tours of the site and led the fight for a complete remediation of the Diamond Alkali Site.

When the site was finally remediated, the effort involved encasing the river bank with a steel bulkhead to prevent transfer of polluted groundwater into the River. The 936 semi-trailers and the contents were washed and the water recycled and returned to the River. Trailers and contents were shredded and buried on site. A negative water flow system was devised where any water entering the site is sent to a filtration system before returning to the River. The site was capped and secured with some trees, now dead, in plant holders placed on the site. This grim reminder of environmental abuse will remain in place and visible until a disposal site for the material can be found. On the other side of the River, PATH riders pass in ignorance of what happened there.

Murdering the Passaic: A Brief History
by
Joseph Nardone, Community Activist

Returning to 1984, after the discovery of the contamination, the EPA informed the community that it intended to clean-up the River. Meetings were held with local residents and anyone who wanted to participate in the proceedings. The first ever core borings and samples were taken of the River bottom thirteen feet down to the River's clay bed and analyzed. At the time, it was thought that the River would have to be dredged to its river bed and then where to place the estimated thirteen million cubic yards of material? After years of study and various proposals by the EPA, the Republicans gained control of the Congress and the Presidency and were refusing to fund clean-up of superfund sites. The EPA vanished and the Passaic River remained polluted and abandoned. In July 2009, after 15 years, the EPA returned to the Passaic and established the Citizens Advisory Group (CAG) to renew its efforts to reclaim the Passaic for the cities and towns and citizens who border the River. Five years of very hard work by the EPA and CAG members resulted in the momentous announcement made on April 11, 2014.

Yeh, Alice

From: Joseph Nardone <jsphnardone@yahoo.com>
Sent: Friday, June 13, 2014 2:16 PM
To: Yeh, Alice
Subject: Ray Barron

Contacting you because I do not have Ray's e-mail. Wanted to comment about a statement by Ray which caught my ear last night. If correct, Ray said that as a result of the Tierria clean-up, learned that in the river bed, the material is compacted that only a strong force of water would disrupt it and redistributed it the river again. Ray or some one should issue a report on that statement. To me, at lest, it makes sense about the how the clean-up plans were arrived at. Such info should be common knowledge which I sure would quell controversy about the clean-up & safety of the river. That, at least, is my view.

Yeh, Alice

From: William Neil <w.neil@att.net>
Sent: Wednesday, July 16, 2014 10:19 AM
To: Region2 PassaicLower8MileComments

July 15, 2014

As the former Director of Conservation for the NJ Audubon Society (1989-2001), I know the story of the Passaic River very well, and am proud to have worked to block the tunnel and instead to have begun the flooded property buyout program.

I am in full support of the EPA's preferred river clean up plan, with bank-to-bank dredging and offsite proper disposal of the toxic wastes. It's a human and environmental tragedy to have polluted the River so badly in the first place like Troy Chemicals has done and with a badly underemployed and paid national workforce, we need to put as many of our citizens at work to make sure there is a viable natural world for future generations to live in.

Sincerely,

William R. Neil
2008 Gainsboro Road
Rockville, MD 20851

Yeh, Alice

From: Maria L. Nieves <mnieves@hudsonchamber.org>
Sent: Thursday, August 07, 2014 4:30 PM
To: Region2 PassaicLower8MileComments
Subject: Passaic Lower 8 Mile Comments
Attachments: HCCC_LettertoEPA_2014.pdf

Please see attached letter, which is also being sent via regular mail today.

Thank you,

Maria L. Nieves | President & CEO

Hudson County Chamber of Commerce
857 Bergen Avenue, 3rd Floor
Jersey City, NJ 07306
201-386-0699 ext. 350
201-386-8480 (fax)
201-600-6551 (cell)
mnieves@hudsonchamber.org

Follow us on Facebook
Read our blog on WordPress

August 7, 2014

Ms. Alice Yeh
Remedial Project Manager
United States Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

Dear Ms. Yeh:

The Hudson County Chamber of Commerce, which represents 350 member companies and organizations in Northern New Jersey, is committed to working closely with policy makers at the municipal, state and federal levels to enhance the economic vitality of Hudson County. The Chamber, established in 1888, has throughout its history advocated for initiatives that invest in the region's infrastructure systems and advance the interests of the business community.

I am writing today to express the Chamber's grave concerns about the Environmental Protection Agency's (EPA) proposed plan to dredge 4.3 million cubic yards of sediment from the bottom of the Lower Passaic River from River Mile 0 (near Newark Bay) to River Mile 8.3 (near the Newark/Belleville border). We are concerned that the proposed plan will be highly disruptive to the region's commerce and will not effectively meet the EPA's stated goals.

We are, however, supportive of the Sustainable Remedy Proposal that has been recommended to the EPA by the Lower Passaic River Cooperating Parties Group. We ask that the EPA consider this approach, which will:

- Minimize impacts to the business community and residents.
- Allow for the highest level of surface sediment to be cleaned up and capped in 5 years.
- Bring new green infrastructure projects and employment to individuals in New Jersey.
- Remove the most highly contaminated sediment from the River in a timelier manner.

The Sustainable Remedy Proposal will utilize adaptive management to ensure that the initial goals set by the EPA itself are met, reducing risk to both humans and ecology in the Passaic River.

Hudson County is home to New Jersey's second largest city, and critical sectors of our local, regional and national economy: a robust financial services sector, as well as an industrial base, and manufacturing and distribution centers. It is a vital transportation hub and has been an economic driver for the State over the past decade. That's why the Chamber is asking the EPA to strongly consider the benefits of the Sustainable Remedy Proposal during its comment period on the Proposed Plan for the Lower 8 Miles of the Passaic River.

Thank you for your consideration.

Respectfully,

Maria Nieves

Maria Nieves
President & CEO

857 BERGEN AVENUE, 3RD FLOOR JERSEY CITY, NEW JERSEY 07306
T: 201.386.0699 | F: 201.386.8480 INFO@HUDSONCHAMBER.ORG

Yeh, Alice

From: Rob Buchanan <avironvoile@gmail.com>
Sent: Monday, August 11, 2014 10:54 AM
To: Enck, Judith
Cc: Balla, Richard; rob@harborestuary.org; Adamo, Doug; John.F.Tavolaro@nan02.usace.army.mil; karen.greene@noaa.gov; Jeff Myers; Clay Sherman; Bridget McKenna; PBalci@dep.nyc.gov; brian mitchell; Bernice Malione; meredith; Nellie Tsipoura; rob buchanan; Shino Tanikawa; jweis@andromeda.rutgers.edu; Dennis Suszkowski; Ann Fraioli; Brandt, Peter; Negron, Nesmarie; SKing@neiwpcc.org; Kate Boicourt; gabriela@harborestuary.org; ASlagle@PVSC.COM; plopes@pvsc.nj.gov; rsiegel@panynj.gov; Kerry Kirk-Pflugh (kerry.pflugh@dep.state.nj.us); RFleming@dep.nyc.gov; Yeh, Alice; Paul.Owen@usace.army.mil; Thomas.Creamer@usace.army.mil; jmtierne@gw.dec.state.ny.us; Commissioner@dep.state.nj.us; michele.siekerka@dep.state.nj.us; mayor@elizabethnj.org; alicata@dep.nyc.gov; Warren, Charles S.; Christopher Zeppie; Filippelli, John; Plevin, Lisa; preich@elizabethnj.org; Anne.Tierney@usace.army.mil
Subject: CAC letter re Lower Passaic River Restoration Project
Attachments: PassaicSuperfundComments_CAC_Aug2014_F.pdf

Dear Judith,

Please find attached our letter in support of the comments submitted by the Passaic River Community Advisory Group for the Lower Passaic River Restoration Project.

Sincerely,

Rob Buchanan, NY co-chair, Citizens Advisory Committee, NY-NJ Harbor & Estuary Program
Meredith Comi, NJ co-chair
Shino Tanikawa, alternate NY co-chair
Nellie Tsipoura, alternate NJ co-chair

CITIZENS ADVISORY COMMITTEE

of the New York – New Jersey
Harbor & Estuary Program

To: Judith A. Enck, Regional Administrator, U.S. Environmental Protection Agency Region 2

Cc: Alice Yeh, U.S. Environmental Protection Agency Region 2
Management Committee and Policy Committee of the NY-NJ Harbor & Estuary Program.

From: Co-Chairs of the Citizens Advisory Committee of the New York-New Jersey Harbor & Estuary Program

Re: EPA proposed cleanup for the Passaic River Superfund site

Date: August 11th, 2014

Dear Administrator Enck,

We are writing on behalf of the Citizens Advisory Committee (CAC) of the New York-New Jersey Harbor & Estuary Program (HEP). The HEP CAC is an advisory committee established to support and advocate for the HEP, a national estuary program. The CAC is an official committee of the Management Committee first convened by the U.S. Environmental Protection Agency, Region 2; NY State Department of Environmental Conservation; and NJ Department of Environmental Protection for the HEP and Bight Restoration Programs.

The purpose of the CAC is to: 1) Provide guidance and advice to the Management Committee on Program decision-making on behalf of the diverse stakeholders in the NY-NJ Harbor Estuary and NY Bight; 2) Promote public awareness and understanding of the Program's issues, goals, and recommendations; 3) Assist the Management Committee in developing and implementing the Comprehensive Conservation and Management Plan (CCMP) as required by Section 320 of the Water Quality Act of 1987.

We lend our support to the comments submitted by the Passaic River Community Advisory Group (CAG) for the Lower Passaic River Restoration Project. In particular, we support the values on Environmental Protection and Restoration articulated by the CAG, specifically:

- Make all decisions in light of a long-term goal to eventually return the river to a fishable, swimmable condition
- Restore the Passaic to a living river and a viable natural resource, with coordinated short and long-term efforts to conduct wetlands, habitat, and wildlife restoration
- Place a high priority on locating natural resource restoration activities in the local communities that have been directly affected by the long-term pollution of the river
- Protect against cross contamination to air, groundwater, and other environmental media
- Clean sediments to a level that supports the above conditions and limits the potential for recontamination.

Citizens Advisory Committee Co-Chairs
Meredith Comi, NY/NJ Baykeeper ✧ meredith@nynjbaykeeper.org ✧ 732-888-9870
Rob Buchanan, Village Community Boathouse ✧ avironvoile@gmail.com ✧ 917-656-7285

The HEP CAC agrees with the recommendation that these values be the bases of decision-making for not only the Passaic River but for other waterways around the region, regardless of superfund status.

While in an ideal world we will remove the contaminated sediment from, and restore the shoreline of, the entire stretch of the river, the HEP CAC is keenly aware that such an option is not feasible. Thus the *HEP CAC agrees with the EPA's proposed clean-up plan calling for Alternative #3 which includes dredging bank-to-bank for the lower eight miles with capping and off-site disposal of the dredged materials.* However, we understand that there remain numerous questions and concerns. For this historical clean up to be successful, we believe it is critical that EPA continue to commit to working with all communities along the River and that EPA fully appreciates the notion that a cleaned up river will return the investment in a multitude of ways: social, environmental, and economic.

The HEP CAC further recommends:

- Dredging of the navigational channel to the maximum extent so that future maritime activities are not compromised
- Removing sediments bank-to-bank, rather than hot spots
- Developing a plan for appropriate maintenance dredging, particularly a plan to ensure the cap will not be disturbed
- Considering natural resources restoration and future uses of the river during the design phase of the clean-up, so that future activities are not hindered by the clean-up (e.g., cap design and placement)
- Monitoring and maintaining long term so that we can ensure the clean-up is effective and remains protective
- Turning the clean-up into an economic growth opportunity for local workforce and businesses
- Clarifying how the adaptive management strategies will be implemented and respond to the needs of the communities along the River
- Ensuring continued recreational uses of the River during the construction
- Providing more information on the sediment processing facility and off-site incineration
- Ensuring the clean-up will not create new problems, such as flooding
- Engaging the communities on a regular basis on quality of life impacts during construction to ensure concerns and problems are adequately addressed
- Moving forward on the Phase 2 removal in a timely manner

Many of these points require open and transparent communication with the affected communities. Only through the commitment to collaboration with the affected communities, will we have a successful clean up that best addresses and balances the sometimes conflicting needs. The HEP CAC is hopeful that the EPA and the Passaic River Community Advisory Group will continue to engage in constructive dialog as the clean-up moves forward. We will continue to offer assistance in the area of communication and information dissemination to the wider region beyond the immediate river communities.

Thank you for the opportunity to submit these comments.

The Citizens Advisory Committee, New York-New Jersey Harbor & Estuary Program.

This letter has been adopted by the HEP CAC following procedures established in its bylaws (http://www.harborestuary.org/pdf/CAC%20Bylaws-Revision-Jun-03-11-F.pdf). CAC members who have voted in support of this letter include:

Meredith Comi, NY/NJ Baykeeper, NJ co-chair, Citizens Advisory Committee of the NY-NJ Harbor & Estuary Program
Rob Buchanan, Village Community Boathouse, NY co-chair, Citizens Advisory Committee of the NY-NJ Harbor & Estuary Program
Shino Tanikawa, New York City Soil and Water Conservation District, NY alternate co-chair, Citizens Advisory Committee of the NY-NJ Harbor & Estuary Program
Nellie Tsipoura, New Jersey Audubon, NJ alternate co-chair, Citizens Advisory Committee of the NY-NJ Harbor & Estuary Program
Manuel Russ, Concerned Citizens of Bensonhurst
Michelle Doran-McBean, Elizabeth River / Arthur Kill Watershed Association
Newtown Creek Alliance

In addition, this letter has been endorsed by several non-voting CAC members and non members, including:
Harry J. Bubbins, Friends of Brook Park
Hudson River Boat and Yacht Club Association
Law Office of Tirza S. Wahrman, LLC
Linda Mariano, Friends and Residents Of the Greater Gowanus (FROGG)
Morton Orentlicher
Protectors of Pine Oak Woods

NOTE: The New York-New Jersey Harbor & Estuary Program is a partner program and its members occasionally have conflicting positions on regulatory and management issues. One of the Program's roles is to facilitate the exchange of ideas and to work towards resolution of these issues. The opinions of individual agencies or committees do not necessarily reflect the opinion of the Program as a whole.

The Citizens Advisory Committee provides guidance and advice to the New York-New Jersey Harbor & Estuary Program Management Committee on Program decision making on behalf of the diverse stakeholders in the region. Its membership and meetings are open to all interested parties in the region that use, or have concerns about, the New York-New Jersey Harbor Estuary and New York Bight. The Citizens Advisory Committee is the only body in the New York-New Jersey Harbor & Estuary Program that can adopt official positions on issues and topics. These official Citizens Advisory Committee positions are adopted by a majority vote of Citizens Advisory Committee members. Citizens Advisory Committee positions do not necessarily reflect the opinion of the New York-New Jersey Harbor & Estuary Program or its members and partners.

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

August 25, 2014

District Engineer
New York District, US Army Corps of Engineers

Ms. Judith Enck, Regional Administrator
United States Environmental Protection Agency- Region 2
290 Broadway
New York, NY 10007-1866

Dear Ms. Enck:

The purpose of this letter is to provide US Army Corps of Engineers, New York District comments to EPA's Focused Feasibility Study for the Lower Passaic River.

Our comments remain consistent with the letter I sent to the National Remedy Review Board (NRRB) on 30 November 2012 (enclosed). I request that you accept the NRRB letter as our comments for EPA's Focused Feasibility Study for the Lower Passaic River. This request was communicated to EPA through Mr. Joseph Seebode on 19 August 2014.

New York District looks forward to working closely with EPA Region 2 to find the most comprehensive, expeditious solution for the Lower Passaic River cleanup.

Sincerely,

Paul E. Owen
Colonel, Corps of Engineers
District Commander

Enclosure

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090

REPLY TO
ATTENTION OF

November 30, 2012

Programs and Project Management Division

Ms. Amy Legare
National Remedy Review Board Chair
1200 Pennsylvania Avenue, NW, MC5204P
Washington, DC 20460

Dear Ms. Legare:

The U.S. Army Corps of Engineers, New York District (USACE) welcomes the opportunity to provide comments to the U. S. Environmental Protection Agency (USEPA) National Remedy Review Board on Region 2's Preferred Alternative for the Lower Passaic River Focused Feasibility Study (FFS). The District has been a partner with USEPA and the State of New Jersey (New Jersey Department of Transportation [NJDOT] and New Jersey Department of Environmental Protection [NJDEP]) since 2003 to develop a comprehensive solution for the remediation and restoration of the Lower Passaic River pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Water Resource Development Act (WRDA) authorities.

I want to express my sincere appreciation to the USEPA for this valued partnership; we look forward to continuing to work together to restore the Passaic River and its valuable economic and natural resources. The partners and communities within the region are depending on the advancement and successful implementation of the remediation of the Lower Passaic River. The implementation of a timely, technically sound remedy is critical for the region and its stakeholders to:

- Protect the health of human and ecological communities in the region;
- Stop the migration of contaminants downstream from the Lower Passaic River into the NY/NJ Harbor Estuary that will continue to impact the navigation and restoration programs throughout the Harbor estuary;
- Protect the $1.4 billion taxpayer investment in the 50-ft NY/NJ Harbor Deepening Project that will be completed by 2014. The Port of NY/NJ is a major economic engine in the NY/NJ Metropolitan Region that serves 35% of the US population, provides 280,000 jobs and annually is responsible for approximately $54 billion in personal/business income and local tax revenue;
- Restore the existing federal navigation channel in the Passaic River that will allow local businesses to regain/maintain economic viability;
- Improve water and sediment quality to return the river to a fishable and swimmable condition; and
- Implement ecosystem restoration in the Lower Passaic River and other parts of the estuary as outlined in the draft Hudson Raritan Estuary Comprehensive Restoration Plan

that represents the consensus views of the key stakeholders for restoration within the Hudson Raritan Estuary.

USACE understands that USEPA's Preferred Alternative in the FFS is Alternative 3, Capping with Dredging for Flooding and Navigation, with Dredged Material Management (DMM) Scenario B, Off-Site Disposal. Under this alternative, 4.3 million cubic yards (CY) of contaminated sediments will be dredged from the river and disposed off-site, and 5.3 million CY of contaminated sediments will remain in the riverbed beneath an engineered cap. We have some technical concerns with the long-term efficacy of an engineered cap over seven miles of a dynamic tidal river such as the Lower Passaic. Any capping remedy must be constructed to ensure sequestration of all material from erosion during storm events, river flows, ice flows, propeller wash, wave heights, etc., to ensure no contaminant migration from below the cap. The concerns are highlighted by the impacts from storm surge as were seen recently during Hurricane Sandy. With over 400 acres of river bottom proposed to be capped, it is critical that protocols and strict enforcement measures be implemented to ensure that the cap is frequently monitored and then maintained, as necessary, in perpetuity.

The preferred alternative also provides for the use of the authorized federal navigation channel in the lower 2.2 miles to accommodate current and potential projected future commercial use. The District will continue to assist the USEPA in the process that will be needed prior to any recommendation for modification (between RMs 1.2 and 2.2) and de-authorization (above RM 2.2) of the currently authorized federal navigation channel within the project area.

The USACE recognizes the challenges in selecting an appropriate Dredged Material Management (DMM) option for the large quantities of sediments removed from the river. All DMM options (Contained Aquatic Disposal [CAD] Cells, Decontamination technologies and Off-Site Disposal) have significant challenges for implementation. Ideally, the USACE would prefer an expedited action that removes all 9.6 million CY of contaminated sediments and utilizes decontamination technologies to deliver a product that can be beneficially reused. The District supports USEPA's willingness to modify the Record of Decision (ROD) if decontamination technologies come to fruition. There has been significant investment of more than $40 million over the last twenty years to advance decontamination technologies between USEPA, NJDOT and the USACE, as well as the implementation of decontamination pilots as part of the Lower Passaic River Remedial Investigation/Feasibility Study (RI/FS). The District will continue to support the advancement of decontamination technologies as a solution for managing contaminated sediments throughout the region. We recognize however, given the high cost, extended construction duration, and uncertainties related to treatment and off-site disposal for Alternative 2 (removal of 9.6 million CY of sediment), this alternative could encounter significant challenges that could hamper, delay, or prevent implementation of the critically needed remediation of the Passaic River.

The Passaic River merits and desperately needs a timely and thorough cleanup that will allow the entire NY/NJ Harbor Estuary to improve and function at a higher ecological and economic level. We believe work needs to begin on the eight miles as soon as possible so we can start to see the benefits of a cleaner river and estuary in the near-term. We ask that careful consideration be given to identify a remedial approach that is cost-effective and technically sound and that will be implementable in the near-term.

While the USACE acknowledges the concerns of some partner agencies and non-governmental organizations, we believe that the construction and operation of CAD cells in the vicinity of Newark Bay are a viable and technically proven DMM option that would be capable of achieving the goals stated earlier, if other options do not come to fruition. The USACE understands that EPA did not select a CAD cell alternative since it was considered to be "administratively infeasible" and unsupported by the State of New Jersey and environmental organizations, even when the technology has already been successfully proven in Newark Bay (see enclosure: Castagna, 2012, http://www.asce.org/copri/News/Headlines/2012/Port-s-dredged-materials-management-method-keeps-economy-afloat/) as well as many other areas including Boston Harbor, New Bedford Harbor, Providence River, Puget Sound, St. Louis River, Los Angeles, Netherlands, Hong Kong, Puerto Rico, Brazil and Belgium.

Reasons we believe a CAD option should not be dismissed include:

- CAD cells are proven disposal sites that can be constructed and utilized with only localized short-term impacts;
- CAD cells are a DMM Option with the least impacts to the surrounding communities;
- CAD cells have been implemented successfully all over the country including a local success illustrated by the construction, utilization and recent capping of the Newark Bay Confined Disposal Facility (NBCDF) in Newark Bay (Note: documents including NBCDF Environmental Impact Statement and water quality monitoring reports are available to aid in the evaluation of this DMM Option);
- CAD cells located in Newark Bay present a unique opportunity due to the ideal natural presence of a thick impermeable red-clay shelf over bedrock in a Bay with a well established, already impacted, depositional environment (i.e., very low potential for erosion due to storm events) ensuring the secured and consolidated disposal of contaminated sediment in the long-term;

- CAD cells are cost-effective and only half the price ($916 million) as compared to Off-Site Disposal ($1.716 billion) and Decontamination Technologies ($1.750 billion) for the removal and disposal of 4.3 million CY of sediment;
- CAD cells are easily sized and economical (only $1.4 billion) to accommodate the larger volume of contaminated sediment if decisions were made to dredge the entire 9.6 million CY of existing contaminated sediments in the river; and
- CAD cells can be a source of clean sediment that could be beneficially used to cap the Lower Passaic River, abandoned landfills adjacent Newark Bay, and contaminated mudflats recently identified in Newark Bay, as well as create and restore habitat throughout the region to maximize benefits.

The Corps of Engineers will continue as a project partner and provide technical support to assist the USEPA in planning and implementing a remedial action on the Lower Passaic River. The remediation must be accomplished as soon as possible to not only protect human health and the environment, but to protect the significant financial investments in deepening the navigation channels within the NY/NJ Harbor, as well as ensure that future restoration plans and priorities can be advanced within the Lower Passaic River and the Harbor Estuary. Please feel free to contact our Project Manager, Ms. Lisa Baron at 917-790-8306 if you have any questions.

Sincerely,

Paul E. Owen
Colonel, Corps of Engineers
District Commander

Enclosure

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 19, 2014 4:36 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Ekaterina Pakhomova
Eka0406@yahoo.com
284 American legion dr
Hackensack
Nj
07601

Yeh, Alice

From: Pietrykoski, Thomas <Thomas.Pietrykoski@mail.house.gov>
Sent: Wednesday, August 20, 2014 6:41 PM
To: Region2 PassaicLower8MileComments
Cc: Yeh, Alice
Subject: Rep. Pascrell comments
Attachments: 08.20.14 Pascrell_EPA FFS letter.pdf

Please accept the attached comments on behalf of Congressman Bill Pascrell, Jr. regarding the EPA's proposed cleanup plan of the Passaic River. Thank you.

Tom Pietrykoski
Communications Director
U.S. Rep. Bill Pascrell, Jr.

BILL PASCRELL, JR.
9TH DISTRICT, NEW JERSEY

2370 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225-5751
(202) 225-5782 FAX

ROBERT A. ROE FEDERAL BUILDING
200 FEDERAL PLAZA, SUITE 500
PATERSON, NJ 07505
(973) 523-5152
(973) 523-0637 FAX

http://pascrell.house.gov
bill.pascrell@mail.house.gov

COMMITTEE ON WAYS AND MEANS
SUBCOMMITTEE ON HEALTH

COMMITTEE ON THE BUDGET

Congress of the United States
House of Representatives

August 20, 2014

Alice Yeh
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway
New York, New York 10007-1866

Dear Ms. Yeh:

I write today to offer my comments on the Environmental Protection Agency's Proposed Cleanup Plan for the lower 8 miles of the Passaic River.

First of all, I would like to commend the EPA for its years of hard work on its Focused Feasibility Study (FFS) and its plan to restore the Passaic River. This is an important milestone in moving the cleanup process forward. I also look forward to the completion of the Remedial Investigation/Feasibility Study (RI/FS) of the entire 17 miles of the Lower Passaic, which I hope will result in an achievable plan to restore the entire Lower Passaic. Passaic River communities cannot afford to wait any longer to address these difficult problems. The Passaic should be an asset to the surrounding communities in Northern New Jersey, not a danger or a liability. It is vital that this latest push to address Passaic River contamination result in meaningful action.

As we know, over two centuries of industrialization have contaminated our Passaic River with dangerous substances ranging from dioxins, PCBs and pesticides to mercury and other heavy metals. These toxins are known to cause cancer and other serious risks to human health. Therefore, the river has long been off limits for bathing and seafood consumption, with only limited recreational opportunities. Through no fault of their own, Passaic River communities have been shut out of vital sectors of our State's economy such as fishing and boating.

We have seen time and time again that flooding is a persistent issue throughout the Passaic River basin. When disasters like Hurricane Sandy strike, our residents have enough to worry about without having to fear that flood waters could bring toxic chemicals into their homes. A revitalized Passaic River would increase property values and boost economic activity, resulting in new wealth for residents and new revenue sources for our towns. Clearly, we have no time to lose in finding a solution for the issues with the Passaic River.

EPA's ambitious Proposed Cleanup Plan calls for a bank to bank dredging of the river's lower eight miles, removing about 4.3 million cubic yards of highly contaminated sediment at a cost of roughly $1.7 billion. Under this plan, the material removed from the river would be disposed of

offsite, and the neglected navigational channel for the bottom 2 miles of the river would be restored. This is one of the most extensive and costly dredging projects ever proposed by the EPA, serving to highlight the unprecedented level of contamination present in the Passaic.

The final details of this proposal must be negotiated between the EPA and the responsible parties, who will need to foot the bill. It is my hope that we can work together with the responsible parties to quickly implement a solution that thoroughly protects human health and our environment. We cannot afford to become bogged down in years of expensive litigation, which will only serve to further drag out the process while wasting resources which could be better put towards cleanup efforts.

Although there may be ways to find costs savings to reduce the price tag of the EPA proposal, we must not compromise on the level of protection to be offered to residents. Spot treatment of problem areas will only leave the riverbed vulnerable to recontamination. This partial solution will not suffice.

In closing, I call on the EPA and other federal agencies, state and local government leaders, the responsible parties, and other stakeholders to come together with open minds to agree upon a remedy for the Passaic River once and for all. Please let me know if I can be of assistance in facilitating a solution which continues to move this process forward. It is my sincere hope that the people of Northern New Jersey will soon once again enjoy the scenic, recreational, and economic benefits the Passaic River can provide.

Sincerely,

Bill Pascrell Jr

Bill Pascrell, Jr.
Member of Congress

Yeh, Alice

From: Phil Passantino <spruceweddings@yahoo.com>
Sent: Wednesday, July 23, 2014 2:46 PM
To: Region2 PassaicLower8MileComments
Subject: Comments on Proposed Passaic River Plan

Dear EPA,
Please strongly reconsider your proposed plan for the cleanup of the Passaic River,
and choose Option 1: Remove All Sediment Contamination.
This is the only option that does not require perpetual maintenance of caps,
and ends the whole matter properly so this Superfund site can be done with.
Future generations should not have to struggle with this poison burden!

Thank you for your time :)
Sincerely,
Rev. Phil Passantino

PRESS RELEASE

FOR IMMEDIATE RELEASE
May 7, 2014

Contact: Sandra Meola – Sandra@nynjbaykeeper.org
Office: 732-888-9870 ext 7
Mobile: 201-336-4647

Coalition of Environmental, Labor, Faith and Community Groups Announce Support for EPA's Passaic River Cleanup

NEWARK - A coalition of environmental, labor, faith and community groups will host a press conference announcing their coalition and support of the Environmental Protection Agency's (EPA) Passaic River cleanup plan, Wednesday May 7th at 6:00pm outside the Portuguese Sports Club (55 Prospect St in Newark.) Supporting organizations will include the Ironbound Community Corporation, NY/NJ Baykeeper and more.

In an effort to remediate the used and abused Passaic River, the Environmental Protection Agency proposed a historic cleanup plan on April 11, 2014. The EPA's preferred cleanup method consists of bank to bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two foot cap. An off-site disposal method at a licensed facility, rather than burying the harmful contaminants in Newark Bay, will be the most beneficial in long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health.

"The time has come for everyone involved in this process to finally come together and begin remediation immediately," said Raymond Pocino, Vice President and Eastern Regional Manager of the Laborers' International Union of North America. "The communities surrounding the Passaic River deserve a river that they can enjoy safely without fear of health risks. We believe this bank-to-bank cleanup of the river's lower 8 miles will deliver environmental and economic benefits to the communities that surround the Passaic River for generations to come."

"The EPA's preferred cleanup allows the polluter to pay and not the taxpayers of Newark" said Kim Gaddy, Environmental Justice Organizer for Clean Water Action and Chair of the Newark Environmental Commission. "The cleanup must be done safely and by well trained workers from Newark, who have a vested stake in achieving a thorough clean up of the Passaic River for all residents," Gaddy stated.

Bill Good, Community Organizer for the Greater Newark HUD Tenants Coalition said, "Those who think the people of Newark don't care about the environment. They're wrong. They do care. They want future generations to safely enjoy the river. This community can make a real difference. There is no one I've come across that think the EPA's preferred cleanup is a bad idea. The response for jobs created from this project will be huge."

"It is time to return the Passaic River back to our communities," said Debbie Mans, Baykeeper & Executive Director. "The corporate polluters need to stop paying their lobbyists and their lawyers and start paying for cleaning up the River."

Joe Della Fave, Executive Director of the Ironbound Community Corporation said, "With a new Riverfront Park, Newarkers have greater access to the river than ever before, yet the river remains polluted. The comprehensive clean up of the Passaic must begin immediately and this should be funded by the parties responsible for its demise. We fully support the EPA clean-up plan. For the sake of Newark's revitalization, the environmental justice our community deserves, and for all life along the river, we want a total clean up now!"

Immediately following the press conference, the EPA will hold the first of three public meetings to inform the public of the cleanup plan and to solicit public comments. The meeting starts at 7:00pm inside the Portuguese Sports Club. Public comments should be emailed to PassaicLower8MileComments.Region2@epa.gov by July 21, 2014 in support of the EPA's preferred cleanup plan with off-site disposal at a licensed facility.

American Friends Service Committee • American Littoral Society • Clean Ocean Action • Clean Water Action • Coalition for Healthy Ports • Environment New Jersey • Food and Water Watch • Greater Newark Conservancy • Greenfaith • Housing and Community Development Network of NJ • Hudson Riverkeeper • Ironbound Community Corporation • Ironbound Super Neighborhood Council • La Casa de Don Pedro • Metropolitan Waterfront Alliance • National Lawyers Guild of Rutgers School of Law Newark • National Resources Defense Council •Newark HUD Tenants Coalition • New Community Corporation • New Jersey Communities United • New Jersey Community Capital • New Jersey Highlands Coalition • New Labor • NJ Environmental Justice Alliance • New York City Environmental Justice Alliance • NY/NJ Baykeeper • SEIU 32BJ • Sierra Club NJ Chapter • Sisters of Charity • SPARK Friends of Riverbank Park • Teamsters Local 469 • The Trust for Public Land • New Jersey Work Environmental Council

May 7, 2014

Dear EPA Administrator McCarthy:

Please accept this letter from the over 30 signed organizations supporting the Environmental Protection Agency's proposed cleanup plan for the lower Passaic River.

In an effort to remediate the highly toxic Passaic River, on April 11th, the EPA released its Focused Feasibility Study and proposed cleanup plan for the lower eight miles of the River.

The EPA's preferred cleanup method consists of bank-to-bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two-foot cap and off-site disposal of contaminated sediment. This cleanup and disposal method will be beneficial with respect to long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health. We believe this plan will result in a clean and healthy river.

This bank-to-bank cleanup will deliver environmental and economic benefits to the communities surrounding the River for generations to come.

We are eager to be a part of the solution that reclaims the Passaic River for our region. Together, we support EPA's proposed cleanup plan and call on the polluters to pay for a full clean up that OUR communities deserve and demand!

Thank you,.

Sincerely,

American Friends Service Committee, Amy Gottlieb
American Littoral Society, Tim Dillingham
Clean Ocean Action, Cindy Zipf, Executive Director
Clean Water Action NJ, David Pringle, Campaign Director
Coalition for Healthy Ports, Amy Goldsmith
Environment New Jersey, Doug O'Malley
Food and Water Watch, Jim Walsh
Friends of Riverfront Park, Nancy Zak
Greater Newark Conservatory, Robin Dougherty
Greenfaith, Rev. Fletcher Harper
Housing and Community Development Network of NJ, Staci Berger, President
Hudson Riverkeeper Paul Gallay, President
Ironbound Community Corporation, Joseph Della Fave
Ironbound Super Neighborhood Council, Lenny Thomas
La Casa de Don Pedro, Ray Ocasio
Metropolitan Waterfront Alliance, Roland Lewis, President and CEO
National Lawyers Guild of Rutgers School of Law Newark, Victor Monterrosa
National Resources Defense Council, Lawrence Levine, Senior Attorney
Newark HUD Tenants Coalition, Bill Good
New Community Corporation, Richard Rohrman
New Jersey Communities United, Trina Scordo
New Jersey Community Capital, Wayne Meyer
New Jersey Highlands Coalition, Julia Somers
New Labor, Marien Casillas Pabellion
New Jersey Environmental Justice Alliance, Dr. Nicky Sheats
New York City Environmental Justice Alliance, Eddie Bautista
NY/NJ Baykeeper, Debbie Mans, Executive Director
SEIU 32BJ
Sierra Club NJ Chapter, Jeff Tittel, Chapter Director, Dave Yennior, Barbara Conovor
The Sisters of Charity
SPARK, Nancy Zak
Teamsters Local 469, Christina Montorio
The Trust for Public Land, Marc Matsil, New York State Director and Anthony Cucchi, State Director NJ and PA
New Jersey Work Environmental Council, Rick Engler

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 12:24 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

carmela pellito
rpellito@hotmail.com
4 Lincoln Dr.
Flanders
New Jersey
07836

9735849298

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 12:25 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

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Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

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Thank you.

richard pellito
rpellito@hotmail.com
4 Lincoln Dr.
Flanders
New Jersey
07836

9735849298

May 7, 2014

Please accept this letter from the signed organizations and residents supporting the Environmental Protection Agency's proposed cleanup plan for the lower Passaic River. In an effort to remediate the highly toxic Passaic River, on April 11th, the EPA released its Focused Feasibility Study and proposed cleanup plan for the lower eight miles of the River.

The EPA's preferred cleanup method consists of bank-to-bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two-foot cap and off-site disposal of contaminated sediment. This cleanup and disposal method will be beneficial with respect to long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health. We believe this plan will result in a clean and healthy river.

This bank-to-bank cleanup will deliver environmental and economic benefits to the communities surrounding the River for generations to come.

We are eager to be a part of the solution that reclaims the Passaic River for our region. Together, we support EPA's proposed cleanup plan and call on the polluters to pay for a full clean up that OUR communities deserve and demand!

Thank you.

Sincerely,

Peggy Nulty

Sherrula Carr

Dorothy Respin

Anita Cruetaro

Cathy Vincent

Virginia Thomas

Elizabeth Acheils

Marie Gilligan

May 7, 2014

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Thank you.

Sincerely,

Sister Jean Ruppel
Sr Audrey Moloughney
Sister Maria Cordis
Bernadette A. Crowley, SC
Eleanor Zampese
Marianne Tracy SC

May 7, 2014

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Thank you.

Sincerely,

Sister Maria Brigita

Sister Mary Agnes

Sr. Noreen Kelly

Sr. Dory Dillon

Sr. Joseph Marion

Sr. Peter Thabet

May 7, 2014

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Thank you.

Sincerely,

Joan Walsh Schildwächter

Vicki Breakey Pratt

Anne Marie Civinskas

Rosemary Carroll

Patricia Fyfe

Mary-Ellen Siersere

Catherine Walsh Hardle

May 7, 2014

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Thank you.

Sincerely,

Rosemary Rognikar, OC
Anne Haarer
Edna Francis Hayes
Margaret Conlon
Dorothy M Morgan
Mary Canavan
Marcella Nolan
Fran Salerni

May 7, 2014

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Thank you.

Sincerely,

Mary Morley, SC

Mary Ellen Gleason SC

Carol Flanagan

Mary Anne Katerach, SC

Sr Barbara Jenkins

Sr Rosemaria Di Censo

Sister Robert Clare Swartz

Mary Anne Rattigan SC

May 7, 2014

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Thank you.

Sincerely,

Dr. Jacqueline Bolivia

Dr. Bruce Rappe

Mary Elizabeth Hayes

S. Delores Humphrey SC

Dr. Mary Clendorf

Sister Clare Maureen Tracy

Sister Marian T. Budreau

Dr. Beverly Policastro

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Thank you.

Sincerely,

Kathryn Clement SC	Convent Station, NJ 07961
Dolores Walsh, SC	
Sr Patricia Meidhof	
Sister Anne Claytor	
S. Teresa G. Bruno	
Marianne Campeotto	Clifton, NJ
Patricia Butler, SC	Red Bank, NJ
Ellen Farrell SC	Convent Station, NJ
Mary Jane Stapleton	Convent Station, N.J.

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Thank you.

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Margaret E. Tierney
Elena Colicelli
Rita O'Farrell S.C.
John Margaret S.C.
Eileen Shaw, S.C.
Kathy Dunglay, SC
Peggy Welch, S.C.
Ellen Dauner, SC

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Sincerely,

Sister Monica Vargas
Sister Regina McCartney
Sister Joan Repka
Sister Angela M Colanuri
Sr Mary Pauline Hogan
Sister Constance V. Tarnoski
Sister Jean Lafferty

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Sincerely,

Pat Reynolds, SC
Evelyn Gebhardt
Maureen Sullivan
Rose Marie Patovano
Sr. Agnes Lucy Robinson
Sr Kathy Flanagan
Peggy Zagiblow, S.C.

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Thank you.

Sincerely,

Sister Francis Cordis Barnardo

Sr Prudentia Rizzi

Sr Mary Pierre

Sr Catherine Mousel

Sr Mary Cuckone

Sr Mary George Sendzak

Sr Madeline Sahy

Sr Maryanne Van Riet

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Sincerely,

Diane Callesano

Judy Mertz

Patricia Mazzy

Thomas Mary Talucci

Mary Elizabeth Davis

Paula Blue

Elizabeth Hoppson

Barbara Ariis

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Sincerely,

Patricia Conroy Reinhardt	228 West Market St Newark, NJ
Mary Ann Bergiso Motuk	Meadow Lane, New Vernon NJ.
Judith L. Rosenberg	1453 Madison Pl. Pompton Lakes, NJ
Evelynn Gazzabeh	797 11TH Ave-7A, Paterson, N.J.
Anne Marie Gardner	206 Frankfort Ave, Rockaway, NJ
Bonnie Lynch	Selm Associate, Convent Station, NJ

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Mary Jane O'Hare S.C.
Sr. Anita Thompson
Mary Elizabeth Tracey SC
Sister Lillian Silkowski
Sister Helen Moore
Sister Patricia Metzger
Barbara Ferland, SC
Sr. Rose Mahoney

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Sincerely,

Sr. Elizabeth Brennan

Sr. Alice T. Neff

S Ethel Beyerle

Sister Maureen Dwyer

Sister Jacqueline Burns

Sister Flora O'Brien

Sister Mary Corrigan

Sister Emily Walsh

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Sincerely,

Sister Regina Gregory Gray
Sister Joyce O'Shea
Sister Mary Jane Zimmermann
Sister Ann Doherty
Sister Elizabeth Cahill
Sr. Marian Scanlon
Sr. Peggy Fitzgibbon
Sister Mary Dwyer

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Sister Pat Flynn

Sister Bea Guider

Sister Patricia Lemon

Sister Teresa Conferg

Sister Maeve McDermott

Sister Mary D Spano

Sister Agatha Mathangani

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Mary L. Moran S.C.
Barbara Greco, SC
Maria M. Studer
Catherine Drury
Sister Gabriel Mary Donahue
Sister John Mary Feeney
Maureen Crowley SC
Sister Ann Foy
Sister Cecilia McManus

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Sr. Roberta Fiel

Lorraine Reilly

S. Dolores Lew

Celine SCNJ

Sr. Theo Francis

Sister Julia Scusla

Sister Margaret Hevolt

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Sister Mary Fallon
Sister Mary Cullen S.C.
Sr. Geneviève Nwaizu
Rosemary Smith
Carol Williams
Dorothy Strachan
Sister Ann C. Olive
Ellen Offgang

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Marilyn Ribis, SC
Claire Donnelly
Joan Lowden
Mary Bernadette S.C.
Pat Bray S.C.
Sister Jan Walters
Sister Roberta Rooney
Carol Ann Lockwood, SC

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Sr. Patricia Beaumont
Sr. Lorraine Hudson
Leadership Team
Sisters of Charity of St Elizabeth

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Sincerely,

Sr. Barbara A. Connell
Sr. Anita Hillian O'Neill
Lillian Starrock SC.
Winnifred A. Kelly SC
Beverly Bligh S.C.
Sister Lawrence Mahon SC
[illegible]
Marie Russo, SC

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Sincerely,

(Print)	(Sign)
2204 Signatures from Ironbound Community and community partners	

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Sincerely,

(Print)	(Sign)
Fernando Vázquez	
Gabriela Neto	Gabriela Neto
Meire da Paixão	Meire da Paixão
Celsto Franco	
Vanessa Enrique	
Kenneth Bueso	
Yenmily Ulloa	
Dayanara Moine	Don Juan el viejo abuelito
Diego Romero	Diego Romero
	Edgar Ferreira
Ruddy Diaz	
Jose Medrano	
Yasmin Hernandez	
Beatriz Figueroa	Beatriz Figueroa

Kevin Aguirre	
Eliana Ayala	
Sandra Gomez	Sandra Gomez
Luis Ramos	
Kevin Alves	Kevin Alves
Barbra Barbosa	Barbara Barbosa
Stephanie Nerio	Stephanie Nerio
Greysha Rios	Greysha Rios
Michelle Galvez	Michelle Galvez
Ana Vilaverde	Ana Vilaverde
Victor Luque	Victor L.
Asya Smith	Asya
Jefferson Rincon	Jefferson Rincon
Lamiyah Rivera	Lamiyah Rivera
Jaikram Lee	Claudio Reyes
Jenniter Morquecho	Natalie Benavente
Steven Perez	Reina Rodriguez
Amanda Martinez	
Daniel Adamoyo	

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Sincerely,

(Print)	(Sign)
Olga Figol	O. Figol
Andres Murillo	Andres Murillo
Edgar Segredo	
Nathally Vasquez	Nathally V.
Marlon Olivera	Marlon Olivera
Jose Miguel	
Eladis Tejada	E A
Breno Caetano	
Dayanara Torres	
Mirella Henriquez	
Karen Sosa	
	Selena Rosario.
	Faibel Martinez

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Sincerely,

(Print)	(Sign)
Alwaaja Holmes	Alwaaja Holmes
Luis Angamarca	Luis Angamarca
Andre Dos Santos	Andre Dos Santos
Yankhari Velecela	Yankhari Velecela
Catarina Vieira	Catarina Vieira
Ana Nascimento	Ana Nascimento
Jessenia Lojan	Jessenia Lojan
Erika Macarcela	Erika Macarcela
Tania Oliver	Tania Olivos
Odalys Vazquez	Odalys Vazquez
Angela Vasquez	Angela Vasquez
Isaac Rodriguez	

Joshua Hernandez	[illegible]
Sara Enparracion	Glenda Gonzalez
Kassandra Sarnoza	Kassandra Sarnoza
Nyes Williams	[illegible]

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(Print)	(Sign)
Jonathan Davila	Jonathan Davila
Angel Ramirez	Angel Ramirez
Vanessa Maia	Vanessa Maia
David Rosario	David Rosario
~~Alisha~~ Alisha Aponte	Alisha Aponte
Travis Wasklewicz	
Marel Murillo	Marel Murillo
Giselle Cruz	Giselle Cruz
Tatiana Gomez	Tatiana Gomez
Invod Reyrosa	
DAVIEL Rodriguez	

Bryan Rodriguez	Bryan Ro
Kevin Castillo	Kevin Castillo
Mario Lebron	Marina Lebron
Diana Sanz	Diana Sanz
Nicole Lopes	Nicole Lopes
Joao Dunhaes	
Carina Silva	Carina Silva
Rita Perez	
Iramis Ochoa	
Samuel Pereira	Samuel Pereira
Sandro Brandi	
Heven Hernandez	Heven Hernandez
Andre Marques	Andre Marques
Jason Pereira	Jason Pereira

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Thank you.

Sincerely,

(Print)	(Sign)
Samantha Oliveira	Samantha Oliveira
Chabelly Pinzon	Chabelly Pinzon
Rosa Lasso	Rosa Lasso
Stephanie Hernandez	Stephanie Hernandez
Indira Marte	Indira Marte
Samuel Pereira	Samuel Pereira
Rita Perez	
Raquel Vitorino	Raquel Vitorino
Rana Ibrahim	Rana Ibrahim
Daniel Tymochko	Daniel Tymochko

10

Serina Fisher	Serina Fisher
Marta Esteves	Marta Esteves
Stephanie Oliveira	Stephanie Oliveira
Eric Lopes	Eric Lopes
Steven Cortesão	Steven Cortesão
João Sousa	João Sousa
Elias De Jesus	Elias de Jesus
Luis Ferreira	Luis Ferreira
Kimberly Crespo	Kimberly Crespo
Karina Ferreira	Karina Ferreira
Brenda Silva	Brenda Silva
Yarvic Gonzalez	Yarvic Gonzalez
Michelle De La Torre	Michelle De La Torre
Adrian Gonzalez	Adrian Gonzalez
Ismael Basilio	Ismael Basilio
Michael Rivera	Michael Rivera
Rene Arqueta	Rene Arqueta
Demya	Demya St. Louis
Jahnir Bowman	Jahnir Bowman
Sada Bramwell	Sada Bramwell

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Thank you.

Sincerely,

(Print)	(Sign)
Michael Ferreira	Michael Ferreira
Alberto Jimenez	Alberto Jimenez
Emily Vega	Emily Vega
John Jumbo	John Jumbo
Giovani Rengel	Giovani Rengel
Jason Martinez	Jason Martinez
Jennifer Romero	Jennifer Romero
Steven Luzio	Steven Luzio
[redacted]	[redacted]
Lucas Moraes	Lucas Moraes
Jonathan Cueva	Jonathan Cueva
Ines Ferreira	Ines Ferreira
[redacted]	[redacted]

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Thank you.

Sincerely,

(Print)	**(Sign)**
Thayna Guimaraes	Thayna Guimarães
Jennifer Andrade	Jennifer Andrade
Graziele Pandini	Graziele Pandini
Wylene Gonzalez	Wylleme Gonçalves
Gwendolyn Rodriguez	Gwendolyn Rodriguez
Elizabeth Rodriguez	Elizabetto Rodriguez
Adaluz Baez Paulino	Adaluz Baez Paulino
Carolina Martins	Carolina Martins
Sarah De Matos	Sarah De Matos

Abigail Quesada	[illegible]
Lilibeth Miranda	Lilibeth Miranda
Markita Bullock	Markita Bullock
Vitoria Silva	Vitoria Silva
Kayla Lopes	Kayla Lopes
Alexandra De Aguiar	Alexandra De Aguiar

Hugo Santos	Hugo Santos
Luis Rodriguez	Luis Rodriguez
Ana Da Silva	Silva
Kathia Alfaro	Kathia Alfaro

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Thank you.

Sincerely,

(Print)	(Sign)
Rafael Martins	Rafael Martins
Kelly Swartz	Kelly Swartz
Flávia Teixeira	Flávia Teixeira
João de Almeida	João de Almeida
James Schwartz	James Schwartz
Vitoria de Oliveira Varela	Vitória de Oliveira Varela
Doris de los Santos	Doris de los Santos
José Pacheco	José Pacheco
Joselin Ojeda	Joselin Ojeda
Luis Guamán	Luis Guamán
Selena Caguana	~~Selena Caguana~~
Victor Rezende	Victor Hugo P Rezende
Jaqueline De Lima B.	

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Thank you.

Sincerely,

(Print)	**(Sign)**
Janet Kaback	
Yeneida Colon	
Wlenderson Da Silva	
Gabriel Santos	
Andy Fernandez	
Jeanita Ugwumadi	
Bianca Damas	
Reynor Cavalcante	
Carlos Lizenzo	
Christopher De Sousa	
Leonardo Malagi	
Kaio Mikoleit	
Roberto Vasquez	

Luiz Pineda	Luiz Pineda
Amisaday Rodriguez Santos	
Kimberly Samaniego	Kimberly Samaniego
Camila Montero	Camila Montero
Calin Fisher	Calin Fisher
Consuelo Paz	Consuelo Paz
Maria G. Rosson	
Manuel C. Queiruga	Manuel Queiruga
Esther Paz	
Maria Queiruga	Maria Queiruga
Maria Muñiz	Maria Muñiz

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Sincerely,

(Print)	(Sign)
Nyasia Cooper	Nyasia Cooper
Yamerei Teseda	
YANIQUE TUCKER	Yanique Tucker
Nichole Moran	Nichole Moran
Sarah Teixeira	Sarah Teixeira
Luis Da Fonseca	Luis Da Fonseca
Salaam Scott	Salaam Scott
Lizandra Fuster	
Jane Soares	Jane
David Coelho	David Coelho
Kimberly Cuadrado	Kimberly Cuadrado
Jessica Alves	Jessica Alves

Jessica Goncalves
Brianna Pereira
Austin Verissimo
Adelmar Diaz
Jessica Burestan

Jessica Goncalves
Brianna Pereira
~~Austin Verissimo~~
Adelmar Diaz

Alexander J. Diaz

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Sincerely,

(Print)	(Sign)
Audry, Kamal, Alexander	
Eduardo santana	
Paulo Fontes	
Eric Rodriguez	Eric Rodriguez
Eliana Antunes	Eliana Antunes
Ana Sofia Facanha	Ana Sofia Facanha
Aaliyah Halvey	Aaliyah Halvey
Nashley Rodriguez	Nashley Rodriguez
Pierette Gonzalez	
Conceicao Ferrari	

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Sincerely,

(Print)	(Sign)
WILLIAM ARNDT	William Arndt
Cristian Valle	
Billy Sanjinez	Billy Sanjinez
Cristofer Orellana	
Sharon Velastegui	Sharon Velastegui
Marcello Silva	Marcello Silva
Arthur Carvalho	
Marcel Lopes	Marcel Lopes
Ismael Sanogo	Ismael Sanogo
Joseph Lazzaro	
Muhitul Islam	Muhitul Islam

MA

Bhagyesh Patel	BP
Marlene Cerqueira	Marlene Cerqueira
Lucy Ruiz	Lucy Ruiz
Milagro Blanco	Milagro Blanco
Annabelle Mazagua	Annabelle

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Thank you.

Sincerely,

(Print)	(Sign)
Bernardo Santos	
Lucy Sanchez.	
Elga Dominguez	Elga Dominguez
Angeles Jimenez	
Manny Pudilla	

Mr. A. DIAZ

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Sincerely,

(Print)	(Sign)
Julia Fajardo	Julia Fajardo
Lana Vercellino	Lana
Kasey Navarrete	Kasey A.
Nathaniel Jackson	Nathaniel Jackson
Jordan Silva	[illegible]
Julian Montes	Julian Montes
Joshua Torres	Joshua Torres
Bryan Aguilar	Bryan Aguilar
Ashley Amorim	Ashley Amorim

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Thank you.

Sincerely,

(Print)	(Sign)
Margarita Chaparro	Margarita Chaparro
Evalina Garcia	Evalina Garcia
Carlos A. Chaparro	Carlos A. Chaparro
Rosa Morales	Rosa Morales
Destini S. Santiago	Destini S. Santiago
Yajaira Marte	Yajaira Marte
Glenda Caquas	Glenda Caquas
Luis Diaz	Luis Diaz
Zoila Diaz	Zoila Diaz
Edison Mesia	Edison Mesia
Hilda Mesia	Hilda Mesia
Juan Choy Ramos	[illegible]

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Sincerely,

(Print)	(Sign)
MARIA L TEIXEIRA	
Doissy Cordeiro	
ANGELA PICARDA	

Lívia Vergara	Lívia Vergara
Robert Santos	Robert Santos
Filipe Vergara	Filipe Vergara
Manny Silva	Manny Silva
Fabio Mendes	Fabio Mendes
Daniel Santos	Daniel Santos
Debbie Marinho	Debbie Marinho
Vicky Mosinho	Vicky Mosinho
Paulo Mosinho	Paulo Mosinho
Marilene Mosinho	Marilene Mosinho

Page 2

Ricardo Vegas	Ricardo Vegas
MARIA SILVA	Maria Silva
SAUL SANTOS	SAUL SANTOS
Isabel Pascual	Isabel Pascual
JUAN F. PASCUAL	Juan F. Pascual
Angela Novo	Angela Novo
Fernando Novo	Fernando Novo

[illegible]	[illegible]
LUZ BERNARD	Luz Bernard
Aurora Vallejo	Aurora Vallejo
Eduardo Flores	
María Azuara	María Azuara
[illegible]	M. COTE
Carol L. Marciano	Carol L. marciano
	Patty Alvarez
Sandra Gamaiel	Sandra Gamaiel
Kenneth Williams	[illegible]

Page 2

GIL GRIJO	Gil Grijo
ADOZINDA SILVA	Adozinda Silva
ILZA Teixeira	Ilza F. Teixeira
Julio NACIPUCHA	[illegible]
JOHAN CASTILLO	[illegible]
María Franco	MARIA FRANCO
Kelri M. Nedd	KELRI M. NEdd

Florbela R	FLORBELA ALMEIDA
Eulaine P. Lurski	Eulaine P. Lurski
Sandra Ferreira	Sandra Ferreira
[illegible]	[illegible]
Ana Paula Lopes	Ana Paula Lopes
Aline P. Vitova	Aline P. Vitova
Patrick Franciello	Patrick Franciello
Sandra Celia Lopes	[illegible]
DAVID meneses	[illegible]
AMAL BOUTARP	Amal

Page 2

Santos [illegible]	Jonathan Crespo
Mariana Valenzuela	Mariana Valenzuela
Mercedes Medina	Mercedes Medina
Justo Castillo	JUSTO CASTILLO
Patricio Mendoza	PATRICIO MENDOZA
Marcia Villa	[illegible]
Victor Castillo	[illegible]

Patricia Oliveira	(201) 877 2910
Mayra Jimenez	(973) 350-4062
Narcisa Lara	(973) 392-0378
Jenny A. Montoya	862 - 7726025
MAGDA VELASQUEZ	201 -3540833
CESAR Fernando Rueda	201 471 1154
Milsa Cerpa	Milsa Cerpa
Renzo Cerpa	Renzo Cerpa
Maribel Cerpa	Maribel Cerpa
Yoselin castro	
Luisa Licona	
Ana Maria E.	A. M. E.
Karla Licona	

Frank Ocalla	
Marcia Ferreira	
ALCIDES HARRIGUES	
Marinor Beiner	
José Ramos	
Maria Escobar	Maria Escobar
Piedad Soto	
Luis Diaz	Luis Diaz
Glenda Caguas	Glenda Caguas
Jose Rodriguez	
Stephanie Rodriguez	Stephanie Rodriguez
Juan de Jesus	

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Thank you.

Sincerely,

(Print)	(Sign)
Sonia Fredrique	Sonia Fredrique
TREJEN STRICKLAND	
Hattie Thomas	Hattie Thomas
Jason McCleod	J McC
NAYDESA Y. DE GRACIA	Nydegracia
LEONARD MADUDAKOLAM	
Tatinah Demane	Tatinah Demane
Darnell Thomas	
Tameshu Brown	
RABAKI ADEWUNMI	
EBENEZER GBAROYA	
Teasha Glover	

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Victoria Egbuchman	Victoria Egbu
INEBANEKA, DANIEL	
Frank K Sanpowly	
Elizabeth Sokan	
Savanna Demarde	Savanna Demarde
TRACE WILLIAMS	
DIVAY Abrol	
DAVENDRA Abrol	
Phyllis Whitaker	Phyllis Whitaker
Paul	
Theresa Coleman	Theresa Coleman
Eleanor Osborne	Eleanor Osborne
Theresa Bethea	
GAIL VENSON	Gail Venson
Roslyn Gillard	Roslyn Gillard
Tyrone Sweeney	Tyrone Sweeney
EDWARD Dobson	Edward Dobson
Imani Coleman	Imani Coleman
Adara Coleman	adara Coleman
TERESA MOORE	Teresa Moore
Providencia Melgar	
SELINA MORRIS	Selina Morris
Alison Kabazzi	

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Sincerely,

(Print)	(Sign)
Donna Marie Tannia	Donna Marie Tannia
Diana Bynum	Diana Bynum
Lisa Kabazzi	[illegible]
Robin Demanda	Robin Demanda
Lydia Mota	[illegible]
Vanessa Mota	Vanessa Mota
Scott Mota	[illegible]
Erwin Lawson	E. Lawson
Rocio Jácome	[illegible]
Roy Jácome	Roy Jácome
Anabel Jácome	Anabel Jácome

Niema Jones	Niema Jones
Lateefah Reddick	Lateefah Reddick
Yesenia Fuentes	
Gloria Villanueva	
Luis E. Fuentes	
Evelyn Salvo	
Denise Abreu	Denise Abreu
Ernesto Abreu	
Mariana Gilles	
Michael Walker	Michael Walker
Carol Malcolm Lynsung	
Miguel Sarrongo	Miguel Sarrongo
Olga Cortez	
Esteban Alvarez	
Adrian Yllapa	
Marilyn Maizonet	Marilyn Maizonet
Felix Rodriguez	Felix Rodriguez
Yolanda Vega	Yolanda Vega
Elva Rodriguez	Elva Rodriguez
Ximena Paredes	
Ramiro Paredes	
Zoila Moreira	Zoila Moreira
David Castro	David Castro

Soli

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Sincerely,

(Print)	(Sign)
Solimar Chavana	Solimar Chavana
Lorraine Ferreira	Lorraine Ferreira
Melissa Urzua	Melissa Urzua
Joseph Gotto	Joseph Gotto
Saeri Higa	Saeri Higa
Sam Baer	Sam Baer
Kevin Blanchard	[illegible]
Kevin Lanza	Kevin Lanza

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Sincerely,

(Print)	(Sign)
Alexandra Gonzales	Alexandra M Gonzales
Angela Gonzales	Angela Gonzales
Penny Reynaga.	Penny Reynaga

el 7 mayo de 2014

Favor de recibir esta carta, firmada por las organizaciones y residentes que apoyan el plan presentada por la Agencia de Protección Ambiental (EPA) para la limpieza del segmento más bajo del Río Passiac. El 11 de abril, como parte de sus esfuerzos para remediar el tóxico Río Passaic, la EPA lanzó su Estudio Enfocado sobre la Viabilidad, así como su propuesta para la limpieza de los 13 kilómetros más bajos del río.

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Gracias.

Atentamente,

(Letra de Molde)	**(Firma)**
Wesley Alexandre Valentim	
LAUREN ABRANTES	
Juana Agaro	
Sandra Ruela	Sandra Ruela
Esmeralda Da Costa	ESMERALDA DA COSTA
	Manny Ramos Jr.
DINA Santos	Dina Santos
Lucy Sanches	
Dénia Alves	Dénia Alves
Isabel Araujo	
Graciele Monteiro	

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Thank you.

Sincerely,

Helia Milliouli	Helia Milliouli
Flávio Chaves	Flávio Chaves
GRAYC Chaves	Grayc Chaves
Sirlei Moto	Sirlei Moto
Juliana Nazareth	Juliana Nazareth
Maria F. Alarcon	
João F. Alarcon	
Barbara Carvalho	B. Carvalho

Sergio Abad	
Claudia Dias	
Angel Fernandez	Angel Fernandez
Leo Lomay	Leo Lomay
Valeria Pérez	
Kleve2 Pezéz	
Poncio Desvio	
Silvia Lena	
Vilma Mendez	vilma Mendez
Angel Abad	Angel Abad
Reyna Lopez	Reyna Lopez
Amabilia Solum	Amabilia Solum
~~Ana Silva~~ Ana Silva	
Elsa Matias	Elsa Matias
Silvam Mauro	
GILVETO Souza	
Velosca Teixeira	
Rosa De Matos	
MARISE FERREIRA	Marise Ferreira
Nancy M. Cunha	
Digna Fernandez	Digna Fernandez
Liliana Velasquez	Liliana Velasquez
Liliana Marques	Liliana Marques

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(Letra de Molde)	**(Firma)**
FABIANO ASIS	
Jessica Veloz	
Paul Costa	
Hanna Pereira	
Sony Mello	Kimberly Barrento
Graciosa Oliveira	
Maria Montesdeoca	
Daria Guamán	Emilia Oliveira
Jannett Sanchez	

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Atentamente,

(Letra de Molde)	(Firma)
Natan Oliveira	Natan Oliveira
Maria [illegible]	[illegible]
Maria Evia	Maria Evia
Rosa Perez	Rosa Perez
Blanca Lopez	Blanca Lopez
Jennifer Garzo	Jennifer Garzo
Johana Jimenez	Johana Jimenez
CARMEN D. ALVES	Carmen D. Alves
Olinda D. Amaral	Olinda D. Amaral
CHARLES DINIZ	[illegible]
Lidia Arias	Lidia Arias

Maria Horza	
Juan Nieves	
Danielle Silveira	
ELIANA CUNHA	Eliana Cunha
NORMA ORE-	Norma Ore
Alexandra Pinto	Rossalpinto
Mayra Moreni	
Flor Chagllo	Flor Chagllo
	Jose M. Moledo
ELIZANDRA PAITCH	Elizandra Paitch
Matilde Guaman	
LUCE MARY PALHANO	
Renata Moreira	Renata Moreira
Johana Espinoza	
Maria R Jesus	
Lilibetty Tacuto	Lilibetty Tacuto
Mara Andrade	
Alliny Gonçalo	
NATHALIA ANDRADE	nathalia andrade
Janet Gonzáles	Janet González
Jose Calycicuta	
Silvia Amorim	
Kelly Braga	

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Sincerely,

(Print)	(Sign)
Marlene Raimundo	Marlene
MARIA F. CUNHA	Maria F. Cunha
SANDRA ROCHA	Sandra Rocha
Maria Ramos	Maria Ramos
MARIA N. MARTINS	Maria N. Martins
Isabel de Lima	Isabel de Lima
Nidia Gouna	Nidia Gouna
Linda Soa	Linda Soa
Yesenia Rivera	Yesenia Rivera
Micaela Santos	Micaela Santos
Sofia Tavares	Sofia Tavares
Claudia Rodrigues	Claudia Rodrigues
Silvia Montez	Silvia Montez

Maria Lucia	Maria Lucia
Jessica Lopes	Jessica Lopes
MARIA VILLEGAS	Maria Villegas
Maria Cagarita	Maria Cagarita
Emilia Correia	EMILIA CORREIA
LILIANA MARQUES	Liliana Marques
Daniel Sandia	Daniel Sandia
Gizelly Souza	Gizelly
Vania Milliorelli	Vania Milliorelli
VANILDA MILLIORELLI	Vanilda Milliorelli
VILMA MATTOS	Vilma Mattos
GISLON MILLIORELLI	Gislon Milliorelli
Junior Nazareth	Junior Nazareth
JUINA de ANGOS	Juina de angos
Nancy Abad	Nancy Abad
Giuliana Gomes	Giuliana Gomes
Daniel Costa	Daniel Costa
Kimberly Chaves	Kimberly Chaves
Kathlyn Mattos	Kathlyn Mattos
Jonathan Mattos	Jonathan Mattos
Kellnett Feliciano	Kellnett Feliciano
Angel Lalvay	Angel Lalvay
Sara Baptista	Sara Baptista

Josefita De Rosa	SOSEFITA DE ROSA
Elisa Vieira	
Gloria Coelho	
Gisela Andrade	
Kiana Reed	
Marcia Henriques	
Carlos Ramos	
Nicole Mateus	
Celia Mateus	
Elias de Lima	
Arthur de Lima	
Rosangela Souza	Paula Bartolomeu
Jessica Veloso	
Olga Vara	
Kimberly Parayi	
Paula Ferreira	
Antonio Martins	
Patricio Sanchez	
Bruna Nogueira	
Gabriela Alonso	
Ana Ferreira	
Elizabeth Ch.	
Maria Rangel	Maria Rangel

Andre Vianna	
Helena Ramos	
Rosa Garcia Lup.	
Andrea Simones	Andrea Simonez
Sonia Ferreira	Sonia Ferreira
Emerita santos	Emerita santos
Maura Monteiroza	Maura Monteiroza
Marcia Rabelo	
Silmara Martins	Silmara Martins
Fomilda Souza	
Claudia Santos	Claudia Santos
gracinda santos	gracinda santos
sonia santos	sonia santos
Margarida Pereira	
Debora Oliveira	
Ricardo Neto	R. Neto
Luzia Caetano	Luzia Caetano
Ricardina Oliveira	
Liliana Sarango	Liliana Sarango
Ofelia Cameira	Ofelia Cameira
JONHE MARQUES	
JOAQUIM VACENTE	
Juliano Carvalho	L. C.

Elizabeth Abreu
Suzi Pereira
Maria Bartolomeu
Melissa Neto
Karina Veliz

Davi Loaõ
Sergio Bartolomeu
Bryan Neto

Karina Veliz

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(Print)	(Sign)
Diogo Marques	Diogo Marques
Manuel Correia	Manuel Correia
Andreia Simões	Andreia Simões
Bruno Simões	Bruno Simões
Carminda Rafael	Carminda Rafael
Antonio Maia	Antonio Maia
Graciete Ribeiro	Graciete Ribeiro
Narcisa Deleg	Narcisa Deleg
Wilson Marquez	[illegible]
Angela Ramos	Angela Ramos
Lilian Llamatumbi	[illegible]
Maria Silva	[illegible]
[illegible]	

Rui M Neto	
Hendra Neto	Hendra Neto
Christianna Neto	Christiannaffieto
Suzete Ferreira	
Maribel Hernandez	Maribel Hadoz
Luisa Daran	
Noemi Matos	
Ana Zavala	
Mourina Garcia	
Paulo Correia	
Adelana dos Santos	Santos
Rosely dos Santos	
Claudia Sousa	SOUSA
Liana M. Almeida	L A
Sandra Branco	S.B
Clezisse Miglietta	
Deolinda Martinho	Linda
Michele Marques	Marques
Lourdes Ortiz	
SANDRA RIBEIRO	
Ruth Goncalves	Ruth Goncalves
Bolivar Gonzalez	Bolivar Gonzalez
Zelia Chocai	Zchocai

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(Print)	(Sign)
ATALIBA Gomes Jr.	
MANUEL TEIXEIRA	Manuel Teixeira
DOROTHY RUTLEDGE	Dorothy Rutledge
MARIE COLUCCI	Marie Colucci
MARY CATERA	Mary Catera
JANET MARINO	Janet Marino
TERRY COLUCCI	Terry Colucci
Fernanda Farelo	Fernanda Farelo
GERALDINE BROWN	Geraldine Brown
ELSIE E. JACKSON	Elsie E. Jackson
Loretta Roberson	Loretta Roberson
ALICE SCHREINER	Alice Schreiner

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Sincerely,

(Print)	(Sign)
Martha V. Valdaeva	Martha Val
Joyce Teixeira	Joyce Teixeira
FERNANDA MENDES	Fernanda Mendes
Joselia Simao	Joselia Simão

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(Letra de Molde)	**(Firma)**
FONSECA ETELVINO	Etelvino Fonseca
FONSECA MARIA	Maria Fonseca
MARIA JIMENEZ	Maria Jimenez
JACINTO MONTALVO	Jacinto Montalvo
CANDIDA MONTALVO	Candida Montalvo
GLORIA Silva	Gloria Silva
THERESA FIORE	Theresa Fiore
Elizabeth BAY	Elizabeth Bay

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(Letra de Molde)	**(Firma)**
ROSA VALENTE	Rosa Valente
HAYDEE SOARES	Haydee Soares
Gloria Alulema	Gloria Alulema
Benilde Rodriguez	Benilde Rodriguez
Rosa Gomez	Rosa Gomez
FERNANDA ESPADA	Fernanda Espada
Cidalia Marques	Cidalia Marques
Cristina Couto	Cristina Couto
Manuel Couto	Manuel Couto

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(Print)	(Sign)
Isabel Couto	Isabel Couto
Antonio Ferreira	Antonio Ferreira

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(Print)	(Sign)
ELAINE RIZZO	Elaine Rizzo
ARTURO CAMPOS	Arturo Ricardo Campos
~~HELEN~~ HELEN SCHAEFER	Helen Schaefer
LUCY M SCHERZO	Lucy M Scherzo

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Para la EPA, el método preferido para la limpieza consiste en dragar de una orilla a la otra, una distancia de 3.9 millones de metros cúbicos en los 13.4 kilómetros más bajos del río, y tapar el fondo con una capa de 0.61 metros de profundidad. Los sedimentos contaminados serán transportados a un sitio lejos de la comunidad. La limpieza y el método de desechar de los sedimentos tóxicos serán benéficos con respecto a la eficaz de largo plazo. Reducirán el nivel de toxicidad y los impactos ecológicos y el riesgo a la salud humana. Creemos que este plan resultará en un río sano.

Una limpieza de orilla a orilla traerá beneficios ambientales y económicos a las comunidades ubicadas cerca al río para las generaciones venideras.

Estamos anciosos por ser parte de la solución para recuperar el Río Passaic para nuestra región. Juntos, apoyamos la propuesta de la EPA para la limpieza y hacemos un llamamiento para que los que contaminaron el río paguen para una limpieza completa, consecuente con lo que NUESTRAS comunidades merecen y exigen!

Gracias.

Atentamente,

(Letra de Molde)	**(Firma)**
MARIA FREIRE	Maria Freire
Licinia Raimundo	Licinia Raimundo
AURORA RIVERA	Aurora Rivera
JOSE FERNANDES	Jose Fernandes

May 7, 2014

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This bank-to-bank cleanup will deliver environmental and economic benefits to the communities surrounding the River for generations to come.

We are eager to be a part of the solution that reclaims the Passaic River for our region. Together, we support EPA's proposed cleanup plan and call on the polluters to pay for a full clean up that OUR communities deserve and demand!

Thank you.

Sincerely,

(Print)	(Sign)
ALFREDO DE MATOS	Alfredo de Matos
MARIA FERNANDEZ	Maria Gloria Fernandez
ANA DE MATO	Ana de Matos

May 7, 2014

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Thank you.

Sincerely,

Shirley Lewis
Juana Valente
Johann Fernandez
Maria Fernandez
Gladys Cagano
Nancy Rodriguez
[illegible]
N. Greene
Cecilia Lewis
[illegible]
Virginia DeSouza
[illegible]
Raul Molestina
[illegible]
[illegible]
[illegible]
[illegible]
Maria Rosa

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Sincerely,

Ana Baptista	Ana Baptista
Albina Fernandes	Albina Fernandes
MARIA MAURICIO	Maria Mauricio
Silvia Pedroso	Silvia Pedroso
Isabel Raiz	
António Vieira	
Nicoy	Nicoy
Daniela Pizani	
	Luis Correia
Jose Silva	Jose Silva

MARIA ABRAGAO	Maria Abragao
JOAQUIM ABRAGÃO	
Elsa Braga	
Mikaela Caetano	Mikaela Caetano
Steve Duarte	
RICARDO MONTEIRO	
ARMINDO GONÇALVES	
maria Jurado	Maria Jurado
Mario Araujo	
Maria Pires	Maria PIRES
Jason Couto	Jason Couto
JASON L. Guerra	JASON L. GUERRA
Aloizio Pascoal	ALOIZIO PASCOAL
Fatima Antunes	FATIMA ANTUNES
Margarita Hernandez	Margarita Hernandez
Rosemarie Ferreira	
Marlene Da Cunha	Marlene Da Cunha
Jason Da Cunha	Jason da Cunha
Ines Da Cunha	Ines Da Cunha
Jaime Da Cunha	
Rogelme Chaves	Chaves
Vivianne Antunes	Vivianne ANTUNES

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Sincerely,

(Print)	(Sign)
Kay Coll, SSJ	Kay Coll, SSJ
Georgette Gavioli	Georgette Gavioli
Diana Mejia	[illegible]
Paul Schumann	Paul Schumann
Vera Parra	[illegible]
Fr. Jack Martin	
Rev Eugene J Squeo	[illegible]
Chin-Chin Wang	[illegible]
Carolina Adorno	[illegible]
Kimberly Krone	[illegible]
Kathy Lopez	[illegible]
Catherine M. Stanford	Catherine M. Stanford

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Sincerely,

(Print)	(Sign)
Melissa Miles	
Ethan Feldman	Ethan Feldman
Meagan Rieger	Meagan Rieger
Kevin Blanchard	
Sarah Cruz	
Stephanie Lee Garcia	Stephanie Garcia
Michelle Azevedo	Michelle Azevedo
Jessica Duran	
Luciene Leal Godoy	
Irone Marques	
Francisco Barbosa	Francisco Barbosa
Juana Alberto	Juana Alberto

Jaime Alberto	Jaime Alberto
Juana Alberto	Juana Alberto
Marlene Báez	Marlene Báez
Polivio	Polivio Quiroz
H. de Matos	H. Justiniano de Matos
Margarita Moreira	Margarita M.
Manuel Padilla	
Lorenzo Rios	
Juan Rios	Juan Ríos
Angel Báez	Angel Báez
Joseph Peña	Joseph Peña
Junior Miranda	Junior Miranda
Raúl Rangel	Raúl Rangel
Diego Ceron	
Mirian Pazuiño	Mirian Pazmiño.
Kersin Alonso	
Ximena Villa.	Ximena Villa.
Wilmer Alberto	
Gladys Pillajo	
Juan Manuel	
Diana Zeas.	
Veronica Guerrero	Veronica Guerrero.
Elvia Rivera	

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Sincerely,

(Print)	(Sign)
NATASHA DWYER	
Michael Molina	Molina
Emily Perez	
Chris Kok	
Cynthia Mellon	
[illegible]	Dennis Ceron
MARIA CORREIA	
Jennifer Stradiotti	Jennifer Stradiotti
Andrea Ribeiro	Andrea Ribeiro
Irenes Arce	Irenes Arce
Gladis Sandoval	
Teresa Medina	Teresa Medina

Marly Mattos	Marly Mattos
Ana Abecasis	Ana Abecasis
Christian Saguay	Christian Saguay
Whitney Jenkins	
Bobbie JAMES	Bobbie James
Julissa Herrera	
Amy Goldsmith	
Kim Gaddy	Kim Gaddy
Laureen Boles	
Cynthia Mellon	
Eileen Fleig	
Robert Lauenbach	
Jordan Fry	
Dorothy Bragell	Dorothy Bragell

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Glevis Acosta
Ron Esteves
Elba Mattos
Carlos Gonzalez
Shanda Mitt
Arthur J. Rogers Jr.
Chasity
Omayra Molina
Darlene Hall
Alkurick Kenney
Lyndon Brown
Brenda Y. Brown
Victoria Scott
Vernon Scott
Catherine Jackson
Frederick Chestnut
Kimberly R. Santos
Laquan Thomas
Kim Griffin

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Thank you.

Sincerely,

Alle Rie

Diane Stoina

Vivien Fraser

Patricia Anthony

Raymond Ocasio

Richard Cammarata

Judith Morris

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Bob Brown

Katilia Velez

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Edward Roan

Marlene Quiroz Hurtado

Felisa Caminos

Judith Vega

EMILY MALDONADO

Diana Gonzalez

Enrique

Cristina Zamora

Judith Villegas

Luis Del Valle

Rosemary Collier

Rose Lamm

Martha Fajardo

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Sincerely,

MARIA Z. OLIVEIRA
N. Cortez
BETTY ABRAHANTES
Maria Ramos
Susan Hudson
Filal Bauman
Dominque Velez
Manuel Pereira
CARLOS ALCOCER
MARGARITA HUAZHCO
Margaret O. Cortez
Emily Perez

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Sincerely,

(Print)	(Sign)
Naralie Ramirez	Naralie Ramirez
Jordan Castillo	Jordan Castillo
Diana Canepa	Diana Canepa
Brenda DeCastro	Brenda DeCastro
Barbra Barbosa	Barbra Barbosa
Sayaya Ramirez	[illegible]
	Yennifer Jardino
Ade Mohammed	[illegible]
Tenzin Choden	Choden
João Da Silva	João Da Silva
Roberth Jaramillo	[illegible]
Jessica Urquilla	Jessica Urquilla

Alondra Aquino

Alondra Aquino

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(Print)	(Sign)
Galo Padilla	Galo Padilla
Davon Hines	Davon Hines
Erlin Monge	
Marianne Torres	
Alejandro Pacon	
Juan Peravanda	Juan Peravanda
Zoeina Valentin	Zoeina Valentin
Jordy Salas	Jordy Salas
Sandra Reyes	
Shiana Pina	Shiana Pina
Jasmin Garcia	Jasmin Garcia

Olivia Soares

João Dunhem

João Pedro Almeida

Sonia Robles	Sonia Robles
Ana Perez	
Fabian Jenkins	
Jessica Botta	
Andria Amider	Andria A.
Keith Thornton	Keith Thornton
Rene Cruz	Rene Cruz
[illegible]	[illegible]
Maureen Gonzalez	Maureen Gonzalez
[illegible]	[illegible]
Armando Santos	Armando Santos
Tony Sanchez	
John F Dugan	
ERIC PEEVE	
Rita Machado	Ana Rita Machado
Danny Yoder	
Gloria Aguirre	Gloria Aguirre
Leidy Ordoñez	
[illegible]	
Claudio Landes	Claudio Landes
Susana Orellano	
CARLOS DAMELE	
Elba Roman	Elba Roman

el 7 mayo de 2014

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(Letra de Molde)	**(Firma)**
MARIA ORTEGA	MARIA ORTEGA
KARINA CAMPOS	Karina Campos
Valentina Nascimento	Valentina
Yoel DA Silva	
JORJE BRICEÑO	
MARITZA CASTILLO	M C.
Loretta Fallone	Loretta Fallone
Susan Correira	
Carmen Ordoñez	
Diana P. Vargas	

Guidel Hidalgo

Duarte Carmeiro

Ana Maria Perez

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(Print)	(Sign)
Elsa Vivanco	Elsa Vivanco
Gladys Pinzon	Gladys Pinzon
Tasha Lawson	
Katty Orozco	Katty Orozco
James McIntosh	Jim McIntosh
Wendy Saguay	Wendy Saguay
Michael Rodriguez	

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(Print)	(Sign)
Silvana Castillo	Silvana Castillo
Yolanda Villalba	Yolanda Villalba
Maria Vallalares	Maria Vallalares
Leon Romero	
Dina Santos	Dina Santos
Maria Todaggo	Maria Todaggo
GLADYS PINZON	
Nancy Ruiz	
Janeth Alvarez	Janeth Alvarez
Angelita Costales	
Erika Carchipulla	Erika Carchipulla

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(Print)	(Sign)
Primerde Cadete	Primerde Cadete
Brymsha Petty	
Jessa Lopes	
Patricia Torres	
SOLANGE EVARISTO	
Nubia Duarte	Nubia Duarte
Jertrudis vidal	J. v. 2
KATTY MARCILLO	Katty Marcillo
Angelica Cardilla	

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(Print)	**(Sign)**
Andrea Jara	[illegible]
Yinett Rodriguez	Yinett Rodriguez
Ines Solano	Ines

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Thank you.

Sincerely,

(Print)	(Sign)
Marilyn Ruiz	Marilyn Ruiz
Andrea Da Silva	Andrea Da Silva
ERIKA ZUÑIGA	ERIKA ZUÑIGA
Johana Narvaez	[illegible]
Gladys Uinansaca	Gladys Uinansaca
Daiane Silva	Daiane Silva
Monica Benedic	[illegible]
FLOR Silva	[illegible]
Livia Araujo	[illegible]
Thessia Pedrosa	Thessia Pedrosa

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Sincerely,

(Print)	(Sign)
Bertha Pérez	
Dina Santos	Dina Santos
Gladis Sandoval	
Jertrudis Vidal	J. V.

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Sincerely,

(Print)	(Sign)
Daria Rodrigues	Daria Rodrigues
ANITA L VILLACIS	
WILSON BUSTAMANTE	
Xaira Serrano	Xaira Serrano
Juan Carlos	Juan Serrano
Maria Gabez	
Chausin G.	
Sue Terre	
Jeaneth Rosales	Jeaneth R.
Christopher Vargas	

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Thank you.

Sincerely,

(Print)	**(Sign)**
Angela Gonzales	Angela Gonzales
Monserrat Macarena	Monserrat Macarena
Cindy Perez	Cindy Perez
Tom Wolverton	Tom Wolverton
Marta Baptista	Marta Baptista
Edoardo Mungiello	Edoardo Mungiello
Lawrence Jay	Lawrence Jay
VICTOR FERNANDES	[illegible]
Maria Spirito	[illegible]
Matthew Ramsay	[illegible]
Anthony DosSantos	Anthony DosSantos
Marcel Arno	[illegible]
Joana Botelho	Joana
Betty Spinoprio	Betty

PRINT	SIGN
Veneida Colon	Veneida Colon
Apolyanne Carvalho	Apolyanne L. Carvalho
Diana Canepa	Diana Canepa
Brenda De Castro	Brenda De Castro
Yasmin Proescholdt	[illegible]
Jesica Rodriguez	Jesica Rodriguez
Jessica Miranda	Jessica Miranda
Jennifer Santos	Jennifer Santos
Khareem Mercer	[illegible]
Diana Carvalho	Diana Carvalho
Camilyan Francis	Camilyan Francis
N. Posolasco	[illegible]
BRYAN BARZAGA	[illegible]
Robert Cuellar	R Cuellar
Dan Barahona	Dan B[illegible]
Steven Dias	[illegible]

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Sincerely,

(Print)	(Sign)
Kelly Csaszar	
Luiz Lacerda	Luiz Lacerda
Cathy Velez	Cathy Velez
Matthew Cortes	Matthew Cortes
Vito Cui	Vito Cui
Scheherazade Paul	Scheherazade Paul
Mariela Polanco	Mariela Polanco
Suma Islam	Suma Islam
Mike Lin	
Steven Hesseldenz	Patrick Lopez
Gessselle Castillo	
Kenya Palacios	Kenya Palacios

Gabriely Gonzalez	[illegible]
Freiddy Herrera	Freddy Herrera
Yamantha Cuzco	Yamantha Cuzco
Cristian Godinez	Cristian Godinez
Aniyah Parker	Aniyah Parker
Pablo Ruiz	Pablo Ruiz
Shelly Aquilar	Shelly Aquilar
Muzamil Ali	[illegible]
John Brown	[illegible]
Mirwais Rahimi	[illegible]
Alpha Bamba	Alpha Bamba
Tiago Afonso	Tiago [illegible]
Christalie Gonzalez	Christalie Gonzalez
Ashley Charles	Ashley Charles
Andrea Whitney	Andrea Whitney
Ignacio Pantaleon	Ignacio Pantaleon
Sabrina Costa	[illegible]

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Sincerely,

(Print)	**(Sign)**
Mumin Carter	MAM
Kevin Rivera	KR
Sharif Valentine	SV
Laurie Molloy	Laurie Molloy
Niurka Polanco	Niurka Polanco
Aiven Rosario	[illegible]
Hector Ramirez	Hector Ramirez
Danny Rogue	Danny Rogue
Natalie De Rosa	Natalie De Rosa
~~Alex Ciola~~ Alex Ciola	Alex Ciola
Tamia Oliver	Tamia Oliver
Rose Cumba	Rose Cumba
C Sangale Orage	C Sangale Orage

Isabel Duarte	Isabel Duarte
Dennis Paz	Dpaz13
Joao Dunhao	
Tracey Tucker	
Alani Shockness	Alani Shockness
Faisal EKLU	faisal EKLU
Jose Galaor	Jose Galaor
Isaac Hill	Isaac Hill.
Nate Toney	
Karmin Burgos	Karmin Burgos
Roberto Marfil	
Sarina Vall	Sarina Vall
Joania Palacio	Joania Palacio
Frandy Castellanos	
William Rodriguez.	
Melanie Muñoz	Melanie Muñoz
Frany Mercedes	
Jorge Acosta	
Waylin Rojas	
Nelly Estevez	
Yascarlin Gonzalez	
Christian Estela	Christian Estela

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Thank you.

Sincerely,

(Print)	**(Sign)**
Soraya Ramirez	Soraya Ramirez
Kenia Duran	Kenia Duran
Luis Chimborazo	Luis Chimborazo
Katherine Arizaga	Katherine Arizaga
Wanda Cerda	
Melissa Rodriguez	
Oscar Grullón	
Julennie Fernández	
Bryam Bustamante	Bryam Bustamante
Yuly Freire	Yuly Freire
Nelly Estevez	Nelly Estevez
Vicky Avelino	Vicky Avelino
Danniela Luna	Danniela Luna
Pedro Marques	

Bruna da Silva	Bruna da Silva
Romario Correa	Romario Correa
Ketlyn Santana	Santana
Bruna Oliveira	Bruna
Bianca Soares	Bianca
Jose Pereira	Jose Pereira
Marcos Vinicius Almeida	Marcos Vinicius Almeida
Gabriel Souza	Gabriel Almeida Souza
Valter Martins	Valter Martins
Victoria Yoramine	Victoria Yoramine
Isadora Verwork	Isadora Verwork nascimento
Alexandra Teodoro	Alexandra Reis Teodoro
Xavier, Sue E.	Sue Ellen Xavier
Victor Oliveira	Oliveira Victor
Luan de Souza	de Souza
João Victor Almeida	João Victor Almeida
John Thomason	John C. Thomason
Jennifer Santos	Jennifer Santos
Kevin Leon	Kevin Leon
Mirl M Deumingolf	[illegible]
Joop Angamaron	[illegible]
[redacted]	
Kevin Cenac	Kevin

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Sincerely,

(Print)	**(Sign)**
Nusrat Hossain	Nusrat
Kaomi Burgos	Kaomi Burgos
Jareck Pardo	Jareck Pardo
Juan carlos ortega	juan carlos ortega
Mercedes Galarza	Mercedes Galarza
IQRA ALI	Iqra Ali
SMITA SARASWAT	Smita Saraswat
MARGARET LYONS	Margaret Lyons
Dayane Pimenta	Dayane Pimenta
victoria coelho	Victoria Coelho
Mazeda Khandakar	MK
Bajib Douglas	Bajib Douglas
Jorge Quinteros	Jorge Quinteros
Jennifer Moreira	Jennifer Moreira

Jaleel Thomas	Jaleel Thomas
Isaiah Bullock	Isaiah Bullock
Anthony Carey	Anthony Carey
David coelho	David coelho
Phil Ingles	Phil Ingles
Jasmin Proescholdt	[illegible]
Lorena Moreira	[illegible]
Bethin Erazo Lorera	Bethin Erazo-Lorera
Samara Martins	Samara Martins
Makeda Frazer	Makeda Frazer
Kiara López	Kiara López
Angelo Gatto	Angelo Gatto
Hilta Bagana	[illegible]
Tania Torres	[illegible]
Rosemary Jimenez	Rosemary Jim
Jhany Morocho	Jhany Morocho
Katherin Cortacon	[illegible]
Moises Brito	Moises Brito
Edisson Mendoza	[illegible]
Aldreris Melo	Aldreris Melo
Sheilin Jerez	Sheilin Jerez
Indira Bonilla	[illegible]

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Sincerely,

(Print)	(Sign)
Ms. E. Carletta	E. Carletta
Hector Hernandez	Hector Hernandez
Jorge Quinteros	Jorge Quinteros
Kiara López	Kiara López
Kellynett Feliciano	Kellynett Feliciano
Jacqueline Yari	Jacqueline Yari
Jennifer Moreira	Jennifer Moreira
Jalisa Ochoa	Jalisa Ochoa
Vitor Ciola	Vitor Ciola
Sebastian Garcia	Sebastian Garcia
Osmayra Pichardo	Osmayra Pichardo
~~Deija Higgins~~	~~Carlos Ramirez~~
~~Moira Chabla~~	~~Hassanah Coleman~~

~~Israel Martinez~~

~~Sada Bramnell~~	~~Sada Bramnell~~
Tahjmaya crockson	Tahjmaya goodson

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Thank you.

Sincerely,

(Print)	(Sign)
Jhovanny Diaz Pacheco	Jhovanny Diaz Pacheco
Joshua Geyer	Joshua Geyer
Ashley Rivers	Ashley Rivera
Kaylee Castillo	Kaylee Castillo
Yasmeen Lino O.	[illegible]
Kevin Avila	[illegible]
DEBORA RODRIGUEZ	[illegible]
Jennifer Leon	Jennifer Leon
Elizabeth Castillo	Elizabeth Castillo
Emelly Lopez	Emelly Lopez
Monica Arevalo	Monica Arevalo
Isaiah Quimbaya	Isaiah Quimbaya
John Tamayo	John Tamayo

Brian Infante	Brian Infante
Jessenia Novaes	Jessenia Novaes
Tariq Ayers	
Jessica Virgen	Jessica Virgen
Sherly Ocana	Sherly Ocana
Gabriel Almeida	Gabriel Almeida
Daniella Demoaes	
Christian San M	

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Sincerely,

(Print)	(Sign)
Armando E. Amay	
Jertrudis vidal	J. V.
Dina E Zavala	
ERICA PRIETO	Erica Prieto.
Lucia Brito.	Lucia Brito
Maria Solano	M. T. S.
Maria Saranga	
MARY VILLEGAS	
Melissa	Melissa Jimenez
Floridalia Feliciano	Floridalia Feliciano
Nelson Torres	Nelson Torres
Nelida Rivera	Nelida Rivera

el 7 mayo de 2014

Favor de recibir esta carta, firmada por las organizaciones y residentes que apoyan el plan presentada por la Agencia de Protección Ambiental (EPA) para la limpieza del segmento más bajo del Río Passiac. El 11 de abril, como parte de sus esfuerzos para remediar el tóxico Río Passaic, la EPA lanzó su Estudio Enfocado sobre la Viabilidad, así como su propuesta para la limpieza de los 13 kilómetros más bajos del río.

Para la EPA, el método preferido para la limpieza consiste en dragar de una orilla a la otra, una distancia de 3.9 millones de metros cúbicos en los 13.4 kilómetros más bajos del río, y tapar el fondo con una capa de 0.61 metros de profundidad. Los sedimentos contaminados serán transportados a un sitio lejos de la comunidad. La limpieza y el método de desechar de los sedimentos tóxicos serán benéficos con respecto a la eficaz de largo plazo. Reducirán el nivel de toxicidad y los impactos ecológicos y el riesgo a la salud humana. Creemos que este plan resultará en un río sano.

Una limpieza de orilla a orilla traerá beneficios ambientales y económicos a las comunidades ubicadas cerca al río para las generaciones venideras.

Estamos anciosos por ser parte de la solución para recuperar el Río Passaic para nuestra región. Juntos, apoyamos la propuesta de la EPA para la limpieza y hacemos un llamamiento para que los que contaminaron el río paguen para una limpieza completa, consecuente con lo que NUESTRAS comunidades merecen y exigen!

Gracias.

Atentamente,

(Letra de Molde)	**(Firma)**

Page

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Thank you.

Sincerely,

(Print)	(Sign)
LUIS	Luis Castillo
ANA PAULA SZEREMETA	
ANGEL	Angel Castillo

FRANKLIN TORRE	FRANKLIN TORRE
Carlos Eduardo	
Julio Morales	
Patricia Castillo	
MONICA BALLESTOS	
MARIO THOMAS	Mario Thomas
MEREGILDO IMAICEDA	Meregildo Imaiceda
Bill x McKOY	Bill x McKoy
JUAN NUNEZ	Juan Nunez
JOSE RAMOS	José Ramos
BENITO Guafugo	Benito Guafugo
Jerome Hargrove	Jerome Hargrove
JON VINAN.	Jon Vinan
Joseph Hernandez	Joseph Hernandez
JOSÉ SANCHEZ	José Sanchez
Edwin Meléndez	Edwin Meléndez
Felipe Rosales	Felipe Rosales
J.C Burns	Jerry Burns
Hector Vazquez	Hector Vazquez
LUCILMA P ALBANES	
Jorge Sanchez	
Liz Narvaez	Liz Narvaez
RAPHAEL IENCZMIONKA.	Raphael Ienczmionka

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Sincerely,

(Print)	(Sign)
Emanuel Braga	
ANGELA BRAGA	
Mark Martins	

	M Bugg
ANTONIO ZSVOLETA	ANTONIO ZSVOLETO
ROSA TORRES	
AIDA PAEZ	Aida Paez
MARCO P	Marco Paez
MARCO Rodriguez	
Lydia GRILLO	Lydia Grillo
MANUEL BRAGA	
MARIA BANOS	
Christina Figueiredo	Christina Figueiredo

Page 2

JOAO Figueiredo	
Suzett Marques	
CRUZ LAURA	
Angelo DICIANI	Angelo
MARCOS	
EVELYN LASALLE	
CRISTAL LASALLE	

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Sincerely,

(Print)	(Sign)

DIANA BRAGA	
Olinda MARTINEZ	
MANUEL martins	
TUFN RODRIGUE	
ANA ADRIANO	
DOUGLAS DIAS	

Page 2

Page

Santos

4

20

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Thank you.

Sincerely,

(Print)	(Sign)
Freddy Molina	
MARIA VILLESCAS	
Jose E. Vasquez	Jose E. Vasquez

Arturo Barrios lopez

Carlos Castañeda

Lorena Banda

Arturo Sanchez

Jose Sanchez

Lizbeth Sanchez

Jennifer Sanchez

Edison Sandoval

Luis Padilla

João M. Garcia

Josh Jungeman

CRISTIAN SARAIVA

Page 2

SEGUNDO GONZALEZ
136 FERRY

SANTIAGO LOPEZ
136 FERRY ST.

Maria Cabrera.

LUIS CASTILLO

Carlos Castillo

Patricia Carrera

JOE CASTILLO

Carlos Castillo

Patricia Carrera

JOE CASTILLO

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Thank you.

Sincerely,

(Print)	(Sign)
Marita I. Cruz	
Angelina Pollard	Angelina Pollard
Crystal Rodriguez	
Jessenia Rodriguez	Jessenia Rodriguez
Glenda Caguas	
Luis Diaz	Luis Diaz
Zoila Diaz	Zoila Diaz
Christian Crespo	Christian Crespo V.
Rach Perez	
Luis Felipe	
MARCELO Moda	Marcelo Moda

John Jumbo
Anais Lema
Wilson Martinez
Isabel Montesdeoca
Fernando Paz
Karla Chamba
Lydin Vega
Sirbande Philippe
Ronnie Gonzalez
Karen Averos

Page 2

FROILA HERNANDEZ
Hugo Cardenas
DANIEL SAMBILAY
Ed Buitrago
William Martinez
Jorge NIETO
Walter Carpio

Laura Mercado	
Jenna Jorge	
Tania M. Guaman	Tania Guaman
Carla Delgado	Carla Delgado
Jose thomas	
Maria Torres	
CHEM	
HERNAN LEIVA	
JOE ZIMON	
TYRONE BROWN	
JORGE RODRIGUES	
DARIN GRAVES	Darin Graves
RAY ALTAMO	
RAFAEL RAMOS	
Connie German	Connie German.
[illegible]	[illegible]

	Juan Rosa.
	Angel Vizcaino
	Alfonso Corral
	Christopher A Stevens
Carlos Vizcaino	
Marcos Llanes	Marcos Llanes
Carlos Metz	Carlos F Metz
Cirio Arlitto Bustamante	Cirio A. Bustamante
Hubert Segarra	Hubert Segarra
Eumeles de Lora	Eumeles D Lora

Page 2

	CARLOS A. LOPEZ
	Fernando Rivera
	JOSEPH OLMEDO
Joaquin A Marino	Joaquin A Marino
Manuel Arbelaez	Manuel Arbelaez
Lisseth Morales	Lisseth Morales
	Gina Naranjo

Maria G. Pepore
Yaghaira Santos
Shirdeya Sizemore
Victor Cibas
Julio Cumba
Jose Linares
J. Colon
E Woodruff
Jose Ortiz

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(Print)	(Sign)
Olga Morales G.	
MARCIA LUCAS	Marcia Lucas
Annie Olivenia	

Jacobo Ortiz Pérez	
Margarito Sánchez	
JOSE GERALDO ~~FEIXEIRA~~	
Sebastião Lopes Oliveira	Sebastião Lopes Oliveira
Andreia Bertasio	
Bilde Dant	Bilde Dant
MAURO CERQUEIRA	
Nancy Souza	Nancy Souza
Lorena Arruda	
	Leonilda Barquinha
Erika Hartell	
Yasmin Calixto	Yasmin Calixto
Mariedalo Favarato	Favarato
RAUL JOÃO PAULO	
Sildiney M. Briere	
DANCI ANDRADA	

Lurdes Neves	Lurdes Neves
Rosa Maria Stank	Rosa Maria Stank
Nereisa Rodriguez	Nereisa Rodriguez

22

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Sincerely,

(Print)	(Sign)
Ollyn J. Lettman	Ollyn J. Lettman
Jane Kruszewski	Jane Kruszewski
Veronica Faulkner	Veronica Faulkner
Duwon C. Robertson	Duwon C. Robertson
DAVID ROBINSON	
Rosa Tomas	Rosa Tomas
Andrea Jara	
Joseph Della Fave	Joseph Della Fave
Molly Greenberg	

el 7 mayo de 2014

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Gracias.

Atentamente,

(Letra de Molde)	**(Firma)**

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Sincerely,

(Print)	(Sign)
Alba de Feijo	Alba de Feijo
ITALA RIVERA	Itala Rivera
VALKIRIA KNOTTS	[illegible]
Rosamelia Rodriguez	[illegible]
JOSE LOPES	[illegible]
Marli Maria Vincenzi Lopes	M M Lopes
ARLETE ALMEIDA	Arlete Almeida
VALDA DE AGUIAR	Valda de Aguiar
SANDRA G. DE SOUZA	Sandra G. de Souza

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Atentamente,

(Letra de Molde)	(Firma)
ELISA MARIA GONZALEZ	Elisa Mª González
Victor PERES	
Washington Torres.	
Cristhoper Enrolado	
HOLGER HERNAN	
MARCO JUNGA	

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(Print)	**(Sign)**

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Sincerely,

(Print)	(Sign)
Dina Castro	
MARIA E MERINO	
MARIA DEL CARMEN FERNANDEZ	
ANDREA BRAZ	
OSCAR BENAVIDES	
Gilda Mora	
EDNALDO GOMES	
LUIZ CARLOS NOGUEIRA	

FSC elm

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Atentamente,

(Letra de Molde)	(Firma)
Maria Avila	
Pablo Garcia	
GARY S. OLORTEGUI	
OSCAR OLORTEGUI	
Noemi Cabrera	
Maria Dahud	
Karen Ludeña	
Ana Cedillo	
Juan Sacta	
María Guamán	

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VICTORIA LOPEZ	Victoria López.
Jose A. CORREIA	
Reina ESTERAS	
Sylvana Linetti	
Hazel Applewhite	
Irene Torres	Irene Torres
Rosa Lliguicota	Rosa Lliguicota
Maria Padilla	Maria Padilla
Joann ADAMS	Joann Adams
Rosa Yugui	Rosa Yugui
Loly Ordoñez	
Veronica Coronel	Veronica Coronel
Elvana Lemache	
Stephany Sanchez	
Zoila Morocho	
Emilia Nata.	Pls Help us!
Bolivar Bayas	Bolivar Bayas
carmen Lazarx6	
Elimanuel Jimenez	Elimanuel Jimenez
Veronica NAVA	
Edilia Espinoza	Edilia Espinoza F.
Fabiana Guimarães	
Angeles Jardon.	

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Zaila Pereira	Zaila Pereira
Tania martin	Tania Martin
Jennifer Medeiros	
Diane Flippen	Diane Rodrigues
LUCIO NONTOL	
ANTONIO R. OLIVEIRA	
MANUEL C. OLIVEIRA	
AMERICO FERNANDES	
Teresa Rodrigues	
Antonio GOUVEIA	
Danielle Moser	
ALDINCIA P. DASILVA	
ANABEL ARENAS	
Janette Calle	Janette Calle
DAVID FEIJOO	
José Colón Vázquez	
Claudia NEV	
Marcia Lemos	Marcia Lemos
João	João
Denis Manoko	

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José pardo villarreal	
Pablo Guzman	
MANUEL SOTO	
* Icela Bernal	
Flario De Patillas	X
Juan Jimenez	Juan Jimenez
DOLORES LARA.	DOLORES LARA

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Ninfa Mayaguari	Ninfa Mayaguari
Adriana Lisboa	
Carla Lopes	Carla Lopes
Maria Lopez	Maria Lopez
Bouchra Assila	B. Assila
Janaina Almeida	
Ana Trelles	
Mónica López	Mónica López
Michael Mercado	Michael Mercado
Gladys Contreras	Gladys Contreras
Cecilia Chamla	
Maria Sequeira	
Mayra Marin	
Kattia Cada.	Kattia Cada.
Rosa Potino	Rosa Potino

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Sincerely,

(Print)	(Sign)
Ana Saguay	A Saguay
ANGEL SAGUAY	A Saguay
Bouchra Assibd	
Elizabeth Castillo (Yaya)	
Gabriel Castillo	Gabriel Castillo
Mikael Castillo	Mikael Castillo
Vicente LOSANA	Vicente Losana
MARIA LOSANA	Maria R Losana
Jertrudis vidal	J. V.L
Enedina Leal	
Rosmery Sayuez	
Lebra Sánchez	

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Carlos J. Calón	Carlos J. Calón
Julia Cabrera	Julia Cabrera
Nancy Rodriguez	Nancy Rodriguez
Maria Calle	Nube Posada
Nube Posada	Alex Bermejo
Alex Bermejo	ALCIDES A BARRAGAN
Alcides A Barragan	M
Maria Almeida	Maria Almeida
Maria Dolores Matos	Maria Dolores Matos
Iris Alvarez	Iris Alvarez
Ana Abecasis	Ana Abecasis.
Angel Filian	Angel Filian
Ana Filian	
Maira Mercha	
Marcelo Conin	
Manuel Merchan	
Antonio Sanchez	
Luane Teixeira	

FSC Elm

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Atentamente,

(Letra de Molde)	(Firma)
Maria Aguilar	Maria Aguilar
JORGE CABRERA	[illegible]
EDITH CABRERA	[illegible]
Maria Feliciano	Maria Feliciano
Tonya Outing	[illegible]
Gisella Colchado	Gisella Colchado
Teresa Tora	Teresa Tora
MANUEL SILVA	
Rosmary Sanjinez	[illegible]
Jenny Bulwin	Jenny Bulwin
Norma Torres	Norma Torres

Maria Luis	Sport Club Port
Angela C Santos	Sport Club Port
Nelida Torres	Nelida Torres
Carlos Anjos	Sport Club Port
Paula Oliveira	PAULA OLIVEIRA
Antonio Sampedro	Antonio SAMPEDRO
Maggie Cardona	Maggie Cardona
MARIA PEREIRA	Maria Pereira
EDSON Silva	Edson Filho
RODRIGO CRUZ	Rodrigo Cruz
Maximiliano Avila	[illegible]
LIDIA SILVA	Lidia da Silva
HORIPINA Doughety	Hepipina Doughety
George Stewart	George Stewart
Mario Camas	Mario Gomes
JOAQUIM GOMES	[illegible]
Gloria Vera	Gloria Vera
Tracy Smyth	Tracy Smyth
Luis Arce	Luis Arce
Lizaire Arce	Lizaire Arce
Nelson Torres	Nelson Torres
Herminio Lopez	Herminio Lopez
Leonidya Rivera	Leonidya Rivera

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Thank you.

Sincerely,

Sariyyah Jackson
Emonie Williams
Jahzeer
Aniayah Jalil
Michael Bones
Katherine Pavcar
Jacqueline J.
Jakob Wallace
Veronica Soleda
Miriam Telto
Jesenia Perez
Lucille Annunziata

Veronica Soleda
Miriam Telto
Jesenia Perez
LUCILLE ANNUNZIATA

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(Print)	(Sign)
Grace Blanco	
NAIR OLIVEIRAS	
Luciano Olmos	Luciano Olmos
Fabiana Silva	Fabiana Silva
Rosa M Teixeira	
Michelle Lopes	Michelle Lopes
ANNE RUIVO	Anne Ruivo
Lucia Pinzon	Lucia Pinzon
MATILDE	Matilde L. Almeida
Ana M. Valenzuela	Ana M. Valenzuela
Rafaela Remelgado	
Barbara Auriemmer	Barbara Auriemmer

Juana Alvino
Andrea Henriques
Barbara Azevedo
Corina Apaza
Jennifer De Almeida
Rosa Sanchez
Jennifer Louvado
Rosalie Barbosa
Lucy Jasmin Monterrosa
Vanessa Soares
Sonia Pessoa-Henriques
Margaret Magro
Nicole Ramos
Fernanda Gomes
Beatriz Flores
Denise Figueroa
Alda Oliveira
Sharon Pravetz
Kat. Flamingo
Patricia silva
Valdineia da Costa
Ingrid Sandia
Juliano de Souza

Print	Sign
Magdalia Roman	Magdalia Ro
Norma Becerra	Norma Becerra
Lisa Grant	[illegible]
[illegible]	
Patricia Moreira	Patricia Moreira
Manuel Guapo	Mario Guapo
Nuria Bera	Bera
Alberto Bialoglowko	Alberto
Jose Pinto	Jose Pinto
Carolina Flores	[illegible]
Jaime Noguera	J. Noguera.
Victor Solano	
Priscila Lima.	Priscila Lima.
Paca Torres	PACA TORRES
Carmita Sinaiqo	
Irma Peñaloza	Irma Peñaloza
Tamara Marais	Tamara Marais
Aparecida Helena Pires Marais	Aparecida Marais
Vanesa Cabrera	[illegible]
Luis Jimenez	[illegible]
Angelia Bobadilla	Angelia Bobadilla
Rosa Payuay	Rosa Payuay
Jennifer McGrath	J. McGrath

Print	Signt
Norma Guadalupe	Norma Guadalupe
MARÍA BORGES	MBorges
CLAUDIA LACERDA.	Claudia Lacerda.
Graciela LUZARDO	
NORMA FERRARI	
Washington Luzardo	
Alex Luzardo	
Jorge C Hdz	
Silvana L	
Olga Acosta	
Marlene Torres	
Nilsa Herrera	
Nilsa Ruballos	
Fábio Costa Sousa	
FABIANA ISAÍA	
MONICA DIAS	
Angela dos Santos	Angela dos Santos
Danny M. Espinal	
Adriana Orellana	Adriana Orellana.
Jurneide Cadete	Jurneide Cadete.
DINA SANTOS	Dina Santos
Franklin Teixeira	
Veruschka Salerno	

Print	Sign
Natasha Rosado	
Andrew Teixeira	
Gaby Teixeira	
MARIA G DURICAN	
Graciela Souza	
DALIA CORTES	
Isabel Matos	
Rosa Cedeño	
Idania Murrato	
Cleyber Murrato	
Marieta Cabrera	
Angelito Paramillo	
Andreea Mayo	
FELIPE CARDOSO	

May 7, 2014

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Thank you.

Sincerely,

(Print)	(Sign)
Walter Enrique Xicay chay	
Jaime Perez	
Marilyn Imonan	
Zoila Lema	
Liseany Hernández	
Francheska Polanco	
Frany Mercedes	
Anshy Reza	
Alex Zarama	
Maria franco	
Herson O. Diaz	
Juan Carlos Reyes	

Nombre (Name)	Firma (Signature)
Rosa Guaman	Rosa Guaman
Marisol Textle	Marisol Textle
Delvis Bernard	Delvis Bernard
[illegible]	[illegible]
Carlos Tirado	Carlos Tirado
Bruno Conrad	Bruno Conrad
Katerine Salazar	[illegible]
Carlos Tomás Rojas A.	[illegible]
Juan Delgado	[illegible]
Christian Estela	Christian Estela
Darling Delgado	[illegible]
Alexa Martinez	Alexa [illegible]
Sachalia Rundy	Sachalia Rundy
Tachina Mugga	Tachina [illegible]
Andres Alarcón M.	[illegible]
Israel martinez	Israel martinez
Cristopher Heru	Cristopher Heru
Ana Muñoz	Ana Muñoz
Marcos Sarita	Marcos
Carlos Pacheco	carlos pacheco
Erik Jaramillo	Erik Jaramillo
Tianna Montanez	Tianna Montanez
Ma.rocha	Ma.rocha

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Thank you.

Sincerely,

(Print)	**(Sign)**
Francisco Vicente	
Kathrin Barre	Kathrin Barre
Dalvin Grullon	Dalvin Grullon
Joshua Pacheco	Joshua Pacheco
Angel Soler	Angel Soler
Anthony Valdivieso	
Kevin Marquez	Kevin Marquez
Ever Sosa	
Jose Martinez	
Edwin Regalado	Edwin Regalado
Vicente Melgar	Vicent Melgar
Tatianah Figueroa	Tatianah Figueroa
Marco Bueras	
Ma	

Geovanny Ruiz	Geovanny Ruiz
Michael Villalva	Michael Villalva Jr
Sergio Ortega	Sergio Ortega
Frany Mercedes	
Ana morera	
Hugo Torres	Hugo Torres
Laly Vicuna	
Daniel Rodriguez	
Trays Ushida	Trays Ushida
Leonard Ikejiofo	Leonard Ikejiofor
M. Nesheiwat	
Travis weskiewicz	
Marlon Dossantos	
Bryan Baculima	
Anthony E Sandoval	
Andrew Martinez	Andrew Martinez
Ms Gonzmaica	
Hilda Ruiz	
Zulkun Lanne	
Heidy Lopez	Heidy Lopez
Darrigan Smith	Darrigan Smith
Bianca Pareto	Bianca Pareto

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Sincerely,

(Print)	**(Sign)**
William Freire	
Charlie Lema	
Nancy Zuniga	
Manuel Pz Zuniga	
Maricela Lema	Maricela Lema
Suzanne Poole	
Miguel Ferreira	Miguel Ferreira
Thaddeus Diggs	
Nathaly Vera	Nathaly Vera
Martha Fernandez	Martha Fernandez
VICTORIA CORCHO	
Laurie Molloy	Laurie Molloy
Mark Dem	

Ana Silva	Ana Silva
Jared Johnson	Jared Johnson
Tiago Afonso	Tiago Afonso
Ignacio Pantaleon	Ignacio Pantaleon
Mery Cevallos	Mery Cevallos
J.R. Dudley	J.R. Dudley
BARRETT SWANITZ	[illegible]
Julia Pereira.	Julia Pereira
Emiliz Martinez	Emilia
Nelly Pullutasig	Jimena Pullutasig
Juan Cocadillo	Juan Cocadillo
Hugo Santos	Hugo Santos
Jose Vasquez	Jose Vasquez
Cristian Rodriguez	Cristian R.
Joana Botelho	Joana B
Dolores Cruz	Dolores Cruz
Tom Lovelock	Tom Lovelock
Malik Toney	Malik Toney
Gabriel Pulla	[illegible]
Samuel Moneto	Samuel Moneto
Yanelis Esteves	Yanelis Esteves
Nelina Chacu	Nelina Chacu

Jesly Cabrera	Jesly Cabrera
Alexis Ware	Alexis Ware
Iheven Hernandez	Iheven Hernandez
Markita Bullock	Markita Bullock
Rebeca Vasquez	
Daylin Reynoso	Daylin Reynoso
Shuaib Ismail	Shuaib Ismail
Vanessa Lourenço	
Ignacio Scacco	
Michael Da Rocha	
Dy'shaun Hall	Dy'shaun Hall
Yean Williams	
Roberta DaSilva	Roberta DaSilva
kevin Silva	
Jacqueline Paz	
Ana morera	
Laly Vieira	
Jose Cazares	Jose Cazares
yago Fernandez	
Luis Acosta	Luis acosta
Yamirex Velasco	
Brittany Timpone	B. Timpone
ms. melissa mott	

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Sincerely,

(Print)	(Sign)
Cruz Caldera	Cruz Caldera
John M. Perez	J. Perez
Ximena Morales	Ximena Morales
Charlie Huacon	Charlie Huacon
Sterling Ortiz	Sterling Ortiz
Stephanie Merlo	Stephanie Merlo
Anthony Pallitto	[illegible]
Alexa Valentin	Alexa Valentin
Darwyn Rodriguez	Darwyn Rodriguez
Luis Chamborazo	[illegible]
Henry Soto	Henry Soto
Carmen Melendez	Carmen Melendez

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Sincerely,

(Print)	**(Sign)**
Brayan Guaman	Brayan Guaman
Bruno Teixeira	Bruno Teixeira
Denise Figueroa	Denise Figueroa
Maria Camara	
Jairy Melendez	Jairy Melendez
Katherine Bonilla P	Katherine Bonilla P
Sterlin Hernandez	Sterlin Hernandez
Alexander Vintimilla	Alexander Vintimilla
Daylin J. Banegas	Daylin J. Banegas
Raul Melgar	Raul Melgar
Evelin Calle	
Maria Tapia	
Wendy Castillo	Wendy Castillo

Javier Morales	Javier Morales
Gianni Diferico	Gianni Diferico
Felix Pardo Rodriguez	Felix Pardo Rodriguez

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Thank you.

Sincerely,

(Print)	(Sign)
Sebastian Lopez	
Indira Bonilla	Indira Bonilla
Jennifer Ruballos	
Jennifer Maradiaga	
Erlinda Santos	

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Sincerely,

(Print)	(Sign)
Frank Moreno	
Edisson Mendoza	
Kevin Feliciano	Kevin F.
Jose Miguel	

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Thank you.

Sincerely,

(Print)	(Sign)
Jaul guller	
Maria A. Crucey	
Andrea Rosado	
Jonathan Fernandez	
Brian Alexander	
Cesar Macario	

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Sincerely,

(Print)	(Sign)
TAWANYA Richardson	Tawanya Richardson
Jovan Reid	Jovan Reid
Madeline Sito	M. Sito
Felix Perez	Felix Perez
Ebony Malone	Ebony Malone
Latoya Howard	Latoya Howard
Jade White	Jade White
Audrey Johnson	Audrey Johnson
Tanya Rawls	Tanya Rawls
Sakinah Woods	Sakinah Woods

Print	Sign
Nilsa Caldera	Nilsa Caldera
Rosa Ocasio	Rosa Ocasio
Carmen Nazario	Carmen Nazario
Musiel Agee	Musiel Agee
Cecilia Polanco	Hallfax C+P2C
Andrea Strawder	A. Strawder
Malcolm Scavi	[illegible]
Rita Gurai	561 HAWKINS ST
Curtis Jones	Curtis Jones
Patricia Beard	Patricia Beard
Theresa Boyce	Theresa Boyce
WINIFRED L. MILTON	Winifred L Milton
Dwayne Wilks	[illegible]
Cleka Candy	Cleka Candy
Robert M. Ricks	Robert M. Ricks
IAKeema Banks	Iakeema Banks
Leeanne Howard	Leeanne Howard
Faith Edmonds	Faith Edmonds
Renee Tynes	Renee Tynes
Francine Richardson	Francine Richardson
Betty Ellis	Betty Ellis
Sonja Ellis	Sonya Ellis
Sonji Ellis	Sonya Ellis

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Sincerely,

(Print)	(Sign)
Adri	
Maria Mendez	Maria Mendez
BLADIMIR RAMOS-QUENDO	BLADIMIR QUENDO RAMOS
Aesha Sulla	
SARA PEREZ	
Rosmari muñoz	Rosmari muñoz
Denise Ford	Denise Ford
Marisol McKenzie	Marisol McKenzie
Rodney Collins	
Patricia Moreira	Patricia Moreira
Luis felipe Costa silva	
ANDERSON POWELL	Cristina Bitegranto
Shimse Allen	

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Sincerely,

(Print)	(Sign)
Janetta Rowley	J. Rowley
Laura Rowley	L. Rowley
Carmelot Dorcelus	
Madalena Mazzelli	Madalena Mazzelli
Erica Benjamin	Erica Benjamin
Nancy L. Mincey	Nancy L. Mincey

EAST FERRY *BUSINESS*

May 7, 2014

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Thank you.

Sincerely,

(Print)	(Sign)
*OTRA CASITA Nelson Solano	
*J.H. Fischer) Orlando Kam	Orlando Kam
*Jade Garden) CHI FAI ZHI	
*Angelo's) Jesus Suarez RPK	
*Vic's CAFE) Fábio S Santos	
*MA's Munchies) Mac Munchies	
*Morgan's Bakery Tania Marques	Marques
Andres Hernandez	
Diego Bravo	Diego Bravo
*Seidler Chemical Corp Barnowen	*Adam George Xtreme Graphics*
L&B *) Louis Lio STORS	
Hakeem Osman	

(NHA) Hy ATT Court Tenant Association

Ruby Mayor	Ruby Mayor
Flouette Mayor	Flouette Mayor
Esther Moreno	Esther Moreno
VERA Rodriguez	Vera Rodriguez
Ann Marie Velasco	314 - Ferry ST
Luis DeSalle	30 Vincent ST
Blanca Yanez	30 Vincent ST
Xtreme Graphics CESAR Pineda	
Veronica Golden	Veronica Golden 123 Polk St.
Miriam Tello	110½ Summer Ave.
Dolores McBride	Dolores McBride
Michelle Hall	Michelle Hall
JULIO OLIVO	V.P. HAWKINS
VINCENT SANTORELLA	
~~MARIA~~ CANVETTA	
Lindsay Griesbach	Lindsay Griesbach
Carlos Gonzalez	
Monique Brown	Monique Brown

Petra Lebrón - Rising Tide Class Capital

el 7 mayo de 2014

Favor de recibir esta carta, firmada por las organizaciones y residentes que apoyan el plan presentada por la Agencia de Protección Ambiental (EPA) para la limpieza del segmento más bajo del Río Passiac. El 11 de abril, como parte de sus esfuerzos para remediar el tóxico Río Passaic, la EPA lanzó su Estudio Enfocado sobre la Viabilidad, así como su propuesta para la limpieza de los 13 kilómetros más bajos del río.

Para la EPA, el método preferido para la limpieza consiste en dragar de una orilla a la otra, una distancia de 3.9 millones de metros cúbicos en los 13.4 kilómetros más bajos del río, y tapar el fondo con una capa de 0.61 metros de profundidad. Los sedimentos contaminados serán transportados a un sitio lejos de la comunidad. La limpieza y el método de desechar de los sedimentos tóxicos serán benéficos con respecto a la eficaz de largo plazo. Reducirán el nivel de toxicidad y los impactos ecológicos y el riesgo a la salud humana. Creemos que este plan resultará en un río sano.

Una limpieza de orilla a orilla traerá beneficios ambientales y económicos a las comunidades ubicadas cerca al río para las generaciones venideras.

Estamos anciosos por ser parte de la solución para recuperar el Río Passaic para nuestra región. Juntos, apoyamos la propuesta de la EPA para la limpieza y hacemos un llamamiento para que los que contaminaron el río paguen para una limpieza completa, consecuente con lo que NUESTRAS comunidades merecen y exigen!

Gracias.

Atentamente,

(Letra de Molde)	(Firma)
Victor Montemosa, Jr.	
Miles Roman	
Lydia H. García	Lydia H. García
Consuelo Vera Acebo	
Roberto C. Ortega	
Fred Domínguez	
Manuel Santos	
Raul Mercado	
Rosmery Garcia	
Martha Granda	

Ramona Henna	[illegible]
Reina Maradiaga	[illegible]
Rosanna Abreu	[illegible]
Narciso Ortiz	[illegible]
Manuel H. Quezada	
Angel Ayala	[illegible]

Print	Signature
Janneth Triana	
Susan Dos Santos	
Rosa Garcia	
Sandra Paz	
Maria Pivetta	
Amabela Marques	
Ly Luyn	
Evelyn Torres	
Madelyne Dos Santos	
Shakira Henderson	
Maria Rebitolas	
Carlos Santos	
José B. Lamas	JOSE B. LAMAS
Alicia Veliz	
Augusto Cornejo	
Lorena	Lorena Izquierdo
Angie Paltu	
Melissa Carrion	
Filipa Magesty	
Yakdine Pinedo	
Holmes Izquierdo	
Carlos Andrade	

Print	Signature
Altagracia	Rosario
Rita	Rita Velez
Edith Rivera	Edith Rivera
GLADYS CASTRO	Gladys Castro
TABBASUM JAFRI	Tabbasum Jafri
Rene Granados	
Paula DaSilva	Paula DaSilva
Ana Carolina Viana	
ELMER MUÑOZ	Elmer Muñoz
Alyssa Ruivo	Alyssa Ruivo
Alex Jaramillo	
LUCIANA MARTINS	
Analia Ferreira	
Blanca Velecela	Blanca Velecela
Giselle Cruz	
Elia Rivera	Elia Rivera
Paola C. Palermo	Paola Palermo
Keyla Oliveira	
Suhaib Mohammad	
Kathleen Kuziel	Kathleen Kuziel
Amy DeMarco	Amy DeMarco

Print	Signature
Elias S.	
Lilian C.	
Lizoth Domingues	
Claudia Galvez	
BEATRIZ MONZON	
CLEOPATRA CARDENAS	
Isabelle Dominguez	
Shanian Rivera	
Maria Llanes	
Sabrina	
ROSARIO ESPINOZA	
Milagros Garcia	
LUCIA DIAZ	
ADRIANA URBINA	
Diana Canizales	
Ben HUTHIKUI	
Alicia Hernandez	
Lourdes Pintado	
RAUL A. VELIZ	
Joseph DeRisi	
CAROL SOLINSKI	
Mayei Ramos	
Andreia Paz	

Print	Signature
Dawn Lau	
Marina Kaminski	
Lauren Venner	Lauren Venner
David Murphy	David Murphy
Markella Potamousis	Markella Potamousis
Paul de Castro	
Subasini Pasupuri	
Betty Nystrom	Betty Nystrom
Wanda Reyes	Wanda Reyes
Blanca Huerta	Blanca Huerta
Tanya Arias	Tanya Arias
Maria Almazan	
Carlos Figueiredo	
Peter Grob	

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Sincerely,

(Print)	(Sign)
Elaine Elliott	
Diana Abad	
Addaite Neto	
Celia C. Mateus	
Ana De Oliveira	
Pamela Vargas-Uriol	
MADALENA ROSETE	
Maria Engra	
Cristine Peri	
Sigara Lemus	Graciela Garcia
Maria Gomes	
Ana Bellini	
Melissa Lameira	

Lucia Brito	Lucia Brito
Amparo Pardo	Amparo Pardo
CARLA NARANJO	CARLA NARANJO
Jorge Tafurth	
Maria da Cruz	Maria da Cruz
Camila Grata	Camila Grata
Priscila Reyes	
Eulalia C. Oliveira	
Antonia Mota	
Carmen Miguens	M. M.
Mariane Costa	
Erika Hastel	
Graciela Perez	Graciela Perez
Edina Flor	
Abilina Silva	Abilina Silva
Regina Zatti	Regina Zatti
Elizandra Santos	Elizandra Santos
Valquiria dos	Valquiria dos
Julieth Barbosa	Julia M Barbosa
Julia Oliveira	Olivia Oliveira
	Emerson Ferreira
PATRICK OLIVEIRA	
Camila P.R Reis	Camila P.R Reis

May 7, 2014

Please accept this letter from the signed organizations and residents supporting the Environmental Protection Agency's proposed cleanup plan for the lower Passaic River. In an effort to remediate the highly toxic Passaic River, on April 11th, the EPA released its Focused Feasibility Study and proposed cleanup plan for the lower eight miles of the River.

The EPA's preferred cleanup method consists of bank-to-bank dredging of 4.3 million cubic yards of the lower 8.3 miles of the River, with a two-foot cap and off-site disposal of contaminated sediment. This cleanup and disposal method will be beneficial with respect to long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health. We believe this plan will result in a clean and healthy river.

This bank-to-bank cleanup will deliver environmental and economic benefits to the communities surrounding the River for generations to come. We are eager to be a part of the solution that reclaims the Passaic River for our region. Together, we support EPA's proposed cleanup plan and call on the polluters to pay for a full clean up that OUR communities deserve and demand!

Thank you.

Sincerely,

(Print)	**(Sign)**
Darcoyn Rodriguez	Darcoyn Rodriguez
Hernan Jumbo	Hernan Jumbo
José Gonzalez	José Gonzalez
Nilurka Polanco	Nilurka Polanco
Edgar Chavez	Edgar Chavez
Rodrigo Rivas	Rodrigo Rivas
Jordan Laguerre	Jordan Laguerre
Melissa Quinis	Melissa Quinis
Lozada Cristian	[illegible]
Jacqueline Paz	Jacqueline Paz
Candy Torres	Candy Torres
Hilda Caguana	[illegible]
Michelle Galvez	Michelle Galvez
Lessly Vega	Lessly Vega

7

Michelle Ojeda	Michelle Ojeda
Randy Ross	Randy Ross

Alan Perez

Rutgers
New Brunswick

May 7, 2014

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Thank you.

Sincerely,

(Print)	(Sign)
Yujie Zhang	
Jun Rao Liu	
Nowair Hussain	Nowair Hussain
Jewen DANCY	
Holton Ilemny	
Jasanna Sevier	
Fawzan Lari	
Nicolette	
Mia	
Breno Paiva	
Paulo Kravchuk	
Tiffany Rose Villa	

Wilson Young	
Vivian Chiu	
Diana Diaz	Diana Diaz
Luisa Diaz	Luisa Diaz
Samantha Lopez	
Raymond Phan	Raymond Phan
Nithya Gnanasegaran	Nithya
Atanya McKnight	Atanya McKnight
Maithreyi Thukaram	
Prekshya Singh	Prekshya Singh
Gabriella Russo	Gabriella Russ
Amy Mueller	Amy Mueller
Erica Salmirs	Erica Salmirs
Connie Villanueva	
Jaline Morillo	Jaline Morillo
Stephanie Acevedo	Stephanie Acevedo
Stephanie Acevedo	Stephanie A
Chanade Akporotu	
ATOLABI SANUSI	
Matthew Hernandez	
Khalil Batie	Khalil Batie
Katie Dempsey	
Tasnia Ahamed	

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Thank you.

Sincerely,

(Print)	(Sign)
Irene Eze	
Tyron Bethea	
Eileen Young	Eileen Young
Doug Park	
Kamil Patel	Kamil Patel
Jizhu Ji	
Nico Djulianto	
Vishesh Bilakhia	
Dolly Petal	
Yanni Antonatos	
Ndeye Gueye	Ndeye Gueye
Sabina Iqbal	

Jasmine Ahmed	
Joseph Nicoletti	
Anna Alberti	
Dabin Lim	
Gisu Lee	
Dabin Kim	
Jenette McCant	
Samantha Anderson-Blair	
Andrea Velarde	
Zach Torres	
Marissa Trinidad	
Aquira Thomas	
Jade Gilliard-Boyle	
GLORIA BLAISE	
Daniel Kwarteng	
Justin Adams	
Brandon C. Frisier	
Arlim Guerrero	
Delmul Pelez	
Jenny Jenny Ca	
Daya Baptist	
Koti Osei	
Anika Soleyn	

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Thank you.

Sincerely,

(Print)	(Sign)
Kimberly Balao	KBalao
Alaisha Verdefior	
Camila Polad	C. Palad
JOANNE MODESTO	
Elaina Yu	
Derek Kim	
Iqra Ali	
Karin Arias	
Cynthia Liu	
Crystal Cheung	
Joy Kim	
Albert Kim	

Janice Kim	
Brittany Winkler	
Rachel Hess	
Pushkar Chavan	
Jaikanth	
Javahn Walker	
Kerstin Ring	
Mary Gettings	
Hai Ann Nguyen	
Sarah Navrani	
Robert Rosch	
Amanda Allen	
Daniel Park	
Christina Cho	
Briyanna Zamora	
Mohamed Zayat	
Khalid Samarrai	
Ryan Elmachtoub	
Shruti Patel	
Eunice Jang	
Hanna Yoo	
Wonyang Cho	
Kieu-Nhi Le	

Sikanda Raja	
[illegible]	
[illegible]	
Doug Powell	
Norman [illegible]	
[illegible] Middleton	
[illegible]	
Travis Henry	
Nora Mancera	
Chris Terlingo	
Ashley Boge	
Jorge Flores	
Amit Ismail	

May 7, 2014

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Thank you.

Sincerely,

(Print)	**(Sign)**

TOWNSHIP OF NUTLEY
OFFICE OF THE MAYOR
228 CHESTNUT STREET
NUTLEY, NEW JERSEY 07110

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US POSTAGE

Ms. Alice Yeh
Remedial Project Manager, EPA
290 Broadway, 19th Floor
New York, NY 10007-1866

U.S. EP
RD-DIREC
AUG 26

10007186699

TOWNSHIP OF NUTLEY

DEPARTMENT OF PUBLIC SAFETY
228 CHESTNUT STREET
NUTLEY, NEW JERSEY 07110
PHONE: (973) 284-4935
FAX: (973) 284-4920

ALPHONSE PETRACCO
Mayor

August 20, 2014

Ms. Alice Yeh
Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Email: PassaicLower8MileComments.Region2@epa.gov

Dear Ms. Yeh:

This is to provide you with the Township of Nutley's comments and concerns about the EPA's proposed plan for the lower 8 miles of the Passaic River.

Since the EPA's proposed plan addresses only the lower 8 miles of the Passaic River and provides no benefits to the residents of Nutley, the Township of Nutley does not support the EPA's propose plan. I urge the EPA to look towards a more comprehensive remedial solution that addresses the full 17 miles of the Lower Passaic River Study Area (LPRSA) in a quicker and less disruptive manner.

Residents of the Township of Nutley have waited far too long for action in the Passaic River. To be asked to sit back and wait longer, as we watch work commence in the lower 8 miles of the Passaic is insulting to our residents and illogical.

Attached for your reference is an August 11, 2014 letter from Senator Ronald Rice to the EPA with his formal comments and questions about the EPA's proposed plan. Senator Rice represents the Township of Nutley in the New Jersey State Senate. Rather than restate the comprehensive comments and questions submitted by Senator Rice, for the record the Township of Nutley supports Senator Rice's formal submission to the EPA and looks forward to your reply.

Thank you for the opportunity to provide our comments and concerns. Unfortunately, the Township of Nutley does not support the EPA's plan as proposed. We look forward to your reply.

Sincerely,

Alphonse Petracco
Mayor
Township of Nutley

cc: Township of Nutley Commissioners
Congressman Rodney Frelinghuysen
Senator Ronald Rice
Assemblywoman Cleopatra Tucker
Assemblyman Ralph Caputo
Governor Chris Christie
Commissioner Bob Martin, NJDEP
US Senator Robert Menendez
US Senator Cory Booker
Congressman Albio Sires
Congressman Donald Payne
Congressman Bill Pascrell
Essex County Executive Joseph DiVincenzo
Gina McCarthy, EPA Administrator
Judith Enck, EPA, Region 2

Yeh, Alice

From: Linda Phillips <lph.shore@gmail.com>
Sent: Monday, August 11, 2014 11:53 AM
To: Region2 PassaicLower8MileComments
Subject: Please support the total clean up of the Passaic River

Clean up of the Passaic River is crucial to getting rid of the contaminants that have built up over the years. Alternative 2 would completely dredge the river, removing contaminants and putting the depth of the river back to old levels. Capping as proposed in alternative 3 would not get rid of the majority of the pollutants and will be costly over time because of maintenance requirements. The capping will not last forever, only total removal of the many years of silt full of dangerous pollutants would complete the task required.

I urge your support of Alternative 2 in the clean up efforts on the Passaic River.

Thank you for considering this issue,
Linda Phillips
Asbury Park, NJ

Yeh, Alice

From: David Pringle <dpringle@cleanwater.org>
Sent: Thursday, August 21, 2014 12:55 AM
To: Region2 PassaicLower8MileComments
Subject: RE: Comments on Passaic River Lower 8 mile clean up
Attachments: Comments on USEPA Passaic River Cleanup.docx

Attached this time!

-----Original Message-----
From: "David Pringle" <dpringle@cleanwater.org>
Sent: Thursday, August 21, 2014 12:53am
To: PassaicLower8MileComments.Region2@epa.gov
Subject: Comments on Passaic River Lower 8 mile clean up

Attached please find comments in support of EPA proposed bank to bank remedy, Alternative 3, with conditions (that it be in implemented quickly and strongly), opposition to doing nothing or just removing hot spots, and vigilance so that if alternative 3 fails, alternative 2 is pursued. Thank you for the opportunity to comment.

Sincerely,
David Pringle
NJ Campaign Director
Clean Water Action*
Cell: 732-996-4288
Email: dpringle@cleanwater.org

Web: www.cleanwateraction.org/nj
Donate | Volunteer | Twitter | Facebook | Youtube | Blog

**** Formally also known as the NJ Environmental Federation, State Chapter of Clean Water Action***
Please consider the environment before printing this e-mail.
****
This message (including any attachments) is intended only for the use of the person(s) to whom it is addressed, and may contain information that is privileged, confidential, and exempt from disclosure under applicable law. If you receive this message in error, please notify me immediately by email, telephone, or fax, and delete the original message from your records. Thank you.

By Tirza Wahrman and David Pringle, for Clean Water Action (New Jersey)

August 20, 2014

COMMENTS ON BEHALF OF CLEAN WATER ACTION, NEW JERSEY, ON U.S. EPA'S RECOMMENDATION OF A REMEDIAL ACTION PLAN FOR THE LOWER EIGHT MILES OF THE PASSAIC RIVER

Summary

On behalf of Clean Water Action, we submit the following comments in strong support (with conditions) of U.S. EPA's proposed alternative 3 remedy of bank-to-bank dredging of approximately 4.3 million cubic yards of the lower 8.3 miles of the Lower Passaic River which runs through Newark Bay and the City of Newark.

Clean Water Action is a one million member organization of diverse people and groups from across the US joined together to protect our environment, health, economic well-being and community quality of life. Our goals include clean, safe and affordable water; prevention of health threatening pollution; creation of environmentally safe jobs and businesses; and empowerment of people to make democracy work. Clean Water Action (in NJ formerly aka/dba NJ Environmental Federation, the state chapter of Clean Water Action) has over 100.000 members in New Jersey and is also dedicated to promoting environmental justice.

Newark is a majority minority city, one of New Jersey's poorest, and it's largest. Its per capita income is approximately $17,367; 53% less than the New Jersey average, and 32.7% less than the national average.

The Lower Passaic River runs through downtown Newark; along side it is one of the first designated Superfund sites in the country, the Diamond Alkali site. Newark residents also face assaults of living along side the Essex County garbage incinerator, Passaic Valley sewage treatment plant, Newark Airport, and Newark-Elizabeth container sea port (and the ensuing heavy truck traffic), all of which are among the nation's largest.

No other community would have to wait the years and years it has taken for the government to propose a final remedy for this contaminated stretch of river especially when the responsible parties are well known and extant. Studies of the sediment date back some twenty years now. The time for action is long past.

The proposed alternative 3 remedy is the product of many years of high-caliber, peer-reviewed and intensive study dating back to the mid 1990's, which include data from a series of studies of the lower 17 miles of the river. The proposed alternative 3 remedy of the bank-to-bank dredging and off-site disposal of 4.3 million cubic yards of the lower 8 miles, based on data finding it to be the most contaminated stretch of the river, should be adopted and implemented without delay in the strongest fashion. This would be consistent with the agency's stated goal of treating all people fairly, and reducing the disproportionate burden of environmental harm long endured by Newark residents.

Background

The City of Newark has a long industrial past, dating back to the 1800's. As the EPA proposed plan points out, by the end of the 19th century, many industrial operations, from manufactured gas plants, paper manufacturing and recycling facilities, petroleum refineries, chemical manufacturers and others were located along the river's banks. Industries and municipalities often discharged wastewater directly into the river.

More recently, between 1948 and 1969, Diamond Alkali, also known as Diamond Shamrock Corp, and its successor corporations, Maxus, Inc. and Occidental Chemical, produced approximately 800 tons of 2,4,5-T, a major component of Agent Orange, at the 80 Lister Avenue facility. This production comprised roughly fifteen percent of the total output of 2,4,5-T in the United States. Diamond Alkali's policies were noteworthy for their disregard of workers' health at the time, even by the standards of the 1950's and 60's. With apparent full knowledge of the negative health effects of Agent Orange on their workers, Diamond nonetheless directed them to dump tons of Agent Orange waste material, the 2,4,5-T, into the Passaic River. The dumping was so prolonged that "(e)mployees were directed to surreptitiously wade into the river at low tide and 'chop up' the deposits so that they would not be seen by passing boats." Diamond Shamrock Chemical Co. v. Aetna, 258 N.J. Super. 167, 183-184 (App. Div. 1992).

The Lower Passaic River is part of the Diamond Alkali Superfund Site, which was placed on the National Priorities List in 1984; Occidental Chemical (a successor corporation which had purchased Diamond Alkali) at EPA's request undertook an

early investigation of the river in 1994. In the years that followed, EPA also identified approximately seventy companies that also contributed to the contamination issues on the river. The leading hazardous substances found in the Study Area sediments, which pose the greatest potential risks to human health and the environment include 1. Dioxins and furans; 2. PCB's; 3. Mercury; 4. DDT; 5. Copper; 6. Dieldrin; 7. PAH'S and 8. Lead.

EPA's Proposed Remedy Is the Most Cost-Effective Remedy Designed to Insure Long-Term Restoration of the River and Protection of Human and Ecological Health

The Focused Feasibility Study Area is the lower eight miles of the Lower Passaic River in northeastern New Jersey, from the river's confluence with Newark Bay at River Mile (RM) 0 to RM 8.3 near the border between the City of Newark and Belleville Township. A primary requirement of CERCLA, the Superfund statute, is that the selected remedial action be protective of human health and the environment. The study shows convincingly that the concentrations of contaminants of concern (COC's), like dioxins and furans, PCB's and mercury, have not declined over the past fifteen years. The proposed bank-to-bank dredging is required to address the ongoing and persistent contamination in the sediment by removing it from the lower eight miles of the river.

The goals of the remedial action objectives set forth in the study document are: 1. To reduce cancer risks and non-cancer health hazards for people eating fish and shellfish by reducing the concentration of COCs in the sediments of the FFS

study area; 2. To reduce the risks to ecological receptors by reducing the concentrations of COC's in the sediments of the FFS Study Area; and 3. To reduce the migration of COC-contaminated sediments from FFS Study Area to upstream portions of the Lower Passaic River and to Newark Bay and the New York-New Jersey Harbor Estuary. Each of these goals can only be attained by the proactive remedy of extensive dredging of the highly contaminated site. Removing these sediments will reduce COC concentrations in biota including fish and crab tissue, thereby significantly reducing potential human health and ecological risks. The remedy includes the placing of an engineered cap to sequester the extensive inventory of contaminants that would remain after the dredging is completed.

Two other alternatives studied by EPA—a no-action alternative or "hot spot" dredging of some of the most contaminated spots—will not address the persistent contamination which characterizes the river. Clean Water Action opposes these alternatives in the strongest of terms.

A fourth alternative, a more extensive dredging program -- the 9.7 million cubic yard proposal contained in alternative 2 --- has merit and is supported by the Sierra Club, et al. Clean Water Action generally supports and in this case would like to support more permanent cleanups like alternative 2. However, Clean Water Action is supporting alternative 3 over 2 given unfortunate realities -- alternative 2 would be of unprecedented scope due to the negligence and continued recalcitrance of the extant responsible parties, the clean-ups already been delayed too long, and federal officials in all 3 branches of government lack the political will to do more.

Accordingly, it is imperative that implementation of alternative 3, which calls for the removal of 4.3 million cubic yards, be expedited rigorously. Clean Water Action strongly supports the comments of the Passaic River Community Advisory Group (CAG) and Ironbound Community Corp. (ICC) including (most importantly) but not limited to 1) offsite disposal with no CAD in Newark Bay as well as no onsite or near sight thermal treatment facilities or CDF's, 2) including future use and natural resource restoration in remedial design and implementation,
3) expanding the monitoring and maintenance plan beyond 30 years, 4) being incredibly vigilant in monitoring and maintaining the cap, and 5) revisiting the record of decision including but not limited to the final remedy and the RP's financial contributions if/when the cap fails and/or more the resources are needed.

****

Yeh, Alice

From: Donald Harris <dlh1226519@gmail.com>
Sent: Sunday, August 17, 2014 9:28 PM
To: Yeh, Alice
Cc: Tom Puryear
Subject: NAACP'S letter of support.
Attachments: download-1408325114386.docx

Yeh, Alice

From: Tom Puryear <puryeartl@gmail.com>
Sent: Monday, August 18, 2014 3:29 PM
To: Region2 PassaicLower8MileComments
Cc: Donald Harris; Yeh, Alice; Harriet Reaves; EDDIE YOUNG; Kelly Henry
Subject: re: A letter of support for "Sustainable Remedy".
Attachments: Address Passaic River Concerns.docx

Hi,

Please acknowledge receipt of this communication.

Thanks much.

Tom Puryear, President
Oranges and Maplewood: NAACP

ORANGES & MAPLEWOOD UNIT

P.O. Box 1127, East Orange, NJ 07019 (973) 675-5325

orangesmaplewoodnaacp@yahoo.com

August 17, 2014

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh:

As Unit President of the National Association for the Advancement of Colored People (NAACP) Oranges and Maplewood Unit, I write to request that your office select a remedy for the Lower Passaic River that considers the socio-economic impact that a multi-decade dredging project would have on the urban areas in Essex, Hudson, Passaic and Bergen counties. We are very concerned about the possible impact on the Belleville and Newark communities.

Our Unit supports the cleanup of the Passaic River, but would like it done in a way that closely weighs the impacts vs. benefits to the local communities. We support a remedy that would involve projects outside of the River that will inspire community modifications and promote employment in the area.

While our organization is not in the position to comment on the technical aspects of the Environmental Protection Agency's (EPA) proposed plan to dredge and cap the lower 8 miles of the Passaic River, we learned recently about another remedy that we believe will improve Passaic River communities and the watershed. This remedy is known as the "Sustainable Remedy". It is our Unit's beliefs that this proposed remedy will achieve nearly the same results as other alternatives being considered but in a way that will be less intrusive, have fewer impacts to citizens for a shorter period of time and will include projects outside of the River that benefit everyone in River communities.

We urge you to consider the full impact of your plans on the communities along the Passaic. Environmental contamination must be addressed, but in a way that considers the quality of life for all those living and working near the River. The scale and duration of the bank to bank dredge would negatively impact the quality of life for too many of our residents for nearly a generation.

Sincerely,

Thomas L. Puryear, President
Oranges and Maplewood: NAACP

Yeh, Alice

From: RAMOS, JOANN S <JOANN.S.RAMOS@CBP.DHS.GOV>
Sent: Thursday, May 22, 2014 1:02 PM
To: Region2 PassaicLower8MileComments
Subject: Passsaic River CleanUp

For decades, polluters dumped dioxin and other harmful, cancer-causing contaminants into the Passaic River in Newark, NJ. In an effort to remediate the abused River, the US Environmental Protection Agency proposed a historic cleanup plan on April 11, 2014. The EPA's preferred cleanup method consists of bank to bank dredging of 4.3 million cubic yards of contaminated sediment from the lower 8.3 miles of the River, with a two foot cap.

As far as disposal is concerned, we believe that off-site disposal of contaminated sediment at a licensed facility is the best method. Burying and capping the contaminants in Newark Bay is NOT a viable, clean option. The plan will be beneficial in long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health and improve the environment and economy.

I am in favor of EPA's cleanup plan with off-site disposal. It is time for the polluters to take responsibility and accountability for the murder of our River!

Sincerely

Joann Ramos
Iselin, NJ 08830

Yeh, Alice

From: RAMOS, JOANN S <JOANN.S.RAMOS@CBP.DHS.GOV>
Sent: Wednesday, August 13, 2014 1:40 PM
To: Region2 PassaicLower8MileComments
Subject: Lower Passaic River Restoration

I am writing regarding the Lower Passaic River Restoration**.** This proposal is to clean the lower eight miles of the Passaic River, which contains the most contamination. The proposed plan included dredging and capping the contamination. This sediment contains dioxins, PCBs, mercury and other toxins, which has been impacting the local community for far too long. Dioxin, a bi-product of Agent Orange, is an extremely harmful chemical and has been dumped into the Passaic River. The Agent Orange from this plant not only hurt people and destroyed the environment in Vietnam, but people in Newark. This contamination has been posing risks to both human health, marine ecosystem, and the community for far too long.
The EPA needs to fully clean up the Passaic River so the people of Newark and beyond can enjoy the natural resource that belongs to all of us.
This is the first real step forward for cleaning up the Passaic River however there has to be a complete clean up not just removing hot spots and capping. I fully support Alternative 2, which will completely clean up the River while the other Alternatives will not.
Rivers should not be Superfund sites they should be places where people can walk along the river bank or kayak.

Sincerely,

Joann Ramos
Iselin, NJ

Yeh, Alice

From: ravit@envsci.rutgers.edu
Sent: Tuesday, August 19, 2014 3:22 PM
To: Region2 PassaicLower8MileComments
Cc: debbie@nynjbaykeeper.org; captain@hackensackriverkeeper.org
Subject: Passaic Remedy Comments Attached
Attachments: Passaic Cleanup Comments_August 19.2014.docx

Beth Ravit, PhD
Co-Director, Center for Urban Environmental Sustainability (CUES) Department of Environmental Sciences
School of Environmental & Biological Sciences Rutgers University
14 College Farm Road
New Brunswick, NJ 08901
P: 848-932-5752
C: 201-774-1614

August 19, 2014

Via Email

Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

Dear Dr. Yeh,

Thank you for the opportunity to comment on the USEPA proposed cleanup plan for the lower Passaic River. I was able to attend two USEPA public presentations and would like to share my thoughts about the proposed recommended remedy that would leave some of the contamination in place, covered by an engineered cap:

1. The State of New Jersey has more designated Superfund sites than any other state in the country, even though NJ is the fourth smallest state in land mass. The state has also suffered instances of cleanups that were not effective or complete (the Ford sludge contamination is an obvious example). Given New Jersey's contamination history, the ongoing presence of historic contamination, particularly in the Hudson-Raritan Estuary, and the state's number of remaining un-remediated Superfund sites, I would argue that the preferred remedy to clean up the largest Superfund site in the country should be total contaminant removal.

2. Timeframe – it seems a bit disingenuous to suggest that the proposed remedy is better because it can be completed in half the time, given the three decades plus that the contamination has remained unaddressed. Isn't it better to invest a few more years in removing the contamination and at the end of the process know this site will not become a future problem?

3. Capping of contaminated sediments – as stated during the Kearny public meeting, the capping technology has not been in place for a very long timeframe (approximately the last ten years), and so the long term effectiveness and

maintenance required for the proposed underwater cap is not yet known. To suggest that there will be responsible parties and regulators who will monitor and maintain the proposed cap ***in perpetuity*** strains credulity. ***In fact, maintenance of a cap in perpetuity was given by USEPA as an argument against burying the contaminated material in Newark Bay.*** This argument is equally valid when applied to leaving the contaminated sediments in place and capping the Passaic River.

For the above reasons, I would ask you to reconsider the proposed remedy and fight for removal of all the contaminated sediments – in the interest of both human and environmental long-term health.

Sincerely,

Beth Ravit

Beth Ravit, PhD
Co-Director, Rutgers Center for Urban Environmental Sustainability (CUES)
Department of Environmental Sciences
School of Environmental & Biological Sciences
Rutgers University
New Brunswick, NJ 08901

cc: Debbie Mans, NY/NJ Baykeeper
Captain Bill Sheehan, Hackensack Riverkeeper

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Monday, August 11, 2014 9:38 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Patrick Reilly
preilly@reillysweeping.com
748-B Lincoln Blvd
Middlesex
New Jersey
08846

732-356-2440

NEW JERSEY SENATE

RONALD L. RICE
SENATOR, 28TH DISTRICT
1044 SOUTH ORANGE AVENUE
NEWARK, NEW JERSEY 07106
(973) 371-5665
FAX: (973) 371-6738

COMMITTEES
VICE-CHAIRMAN
COMMMUNITY AND URBAN AFFAIRS
CO-CHAIRMAN
JOINT COMMITTEE ON
THE PUBLIC SCHOOLS
MEMBER
HEALTH, HUMAN SERVICES AND
SENIOR CITIZENS

August 11, 2014

Ms. Alice Yeh, Remedial Project Manager
EPA
290 Broadway, 19th floor
New York, NY 10007-1866

EPA PUBLIC COMMENT EMAIL
PassaicLower8MileComments.Region2@epa.gov

Dear Ms. Yeh:

This is to provide you with my formal concerns and comments concerning the EPA's Focused Feasibility Study (FFS) which has proposed a 4.3 million cubic yard bank to bank removal of contaminated sediment for the lower 8 miles of the Passaic River.

My entire career has been dedicated to the people of the City of Newark and the State of New Jersey. From 1982 – 1996 I served as a member of the Newark City Council. From 2002 through 2006 I served as Deputy Mayor of the City of Newark. In 1986 I was honored to be elected as the NJ State Senator to represent the 18th Legislative District, a position I continue to serve in today. Since 2009 I have served as the Chairman of the New Jersey Legislative Black Caucus and I currently serve as Vice Chairman of the Committee on Community & Urban Affairs.

My entire career has been dedicated to advancing the interests of the residents of the City of Newark and supporting projects that will improve the quality of life, provide employment and encourage economic development in the City of Newark. Unfortunately, I do not see the EPA's proposed plan for the lower Passaic River achieving any of these objectives. Therefore, I cannot support the EPA's proposed plan. Below you will find my specific concerns and comments for your review and consideration.

PROJECT STAGING

Since 2004 I have followed the Lower Passaic River Study Area (LPSRA) project closely and I continue to do so. In 2007 I was both concerned and confused by the EPA's decision to advance a second overlapping study on the Passaic River. The full 17 mile study (RI/FS) was moving along, consistent with the usual EPA process, and then EPA Region 2 Administrator Alan Steinberg suddenly announced the so called "early action" study for the lower 8 miles of the Passaic River.

Today, seven (7) years later, I remain both concerned and confused about the EPA's approach to the Passaic River. There was nothing "early" about the FFS and it remains unclear why the EPA would release the FFS when the RI/FS (full 17 miles study) is scheduled to be complete by the end of 2014. I have followed the EPA's most recent public meeting process closely and understand that the EPA has indicated that the reason for advancing the FFS is because "90% of the most contaminated sediment exists in the lower 8 miles of the river."

If the EPA is correct in its assumption, why would the EPA wait to address the remaining 10% of contaminated sediment in the upper 9 miles of the river? Why did the EPA release the FFS a few months in advance of the completion of the RI/FS? Are there any other Superfund sites in the nation that is being addressed in a similar manner? While the EPA has indicated that the FFS is an "early action" or interim step in the project, isn't the FFS in fact a final remedy for the lower 8 miles of the Passaic River? Is the EPA approach to the Passaic River consistent with the National Contingent Plan (NCP)?

SCHEDULE

A review of the propose plan indicates that the EPA believes it can complete the FFS in five (5) years -- dredge 4.3 million cubic yards of sediment, bank to bank, out of the Passaic River and install an engineered cap from the border of Belleville and the City of Newark south to Newark Bay. My understanding is that the EPA assumes work will take place 24 hours a day, six (6) days a week, for 40 weeks a year.

During the public meeting process sponsored by the EPA, I heard a number of public officials question the EPA's project schedule. After hearing the EPA's response, I have a number of concerns about the EPA's estimated project schedule, as well as the EPA's representation of the project schedule in general.

Having lived in the City of Newark my entire life and having served the residents of the City of Newark my entire career, I highly doubt that a 4.3 million cubic yard removal and capping can be completed in five (5) short years. In fact, I believe a more realistic and achievable project schedule would be more like 15-20 years.

How did the EPA arrive at the five (5) project schedule estimate? Has the EPA ever managed a dredging project of this size in a highly urbanized waterway chock full of moveable bridges and achieved a dredging rate of one (1) million cubic yards a year? Has the EPA retained a third party engineering firm/consultant to affirm its five (5) project schedule? Has the EPA met with the various stakeholders, specifically owners and operators of the infrastructure (NJDOT, NJ TRANSIT, City of Newark, Amtrak, local Police Departments, Essex County, Hudson County) spanning the Passaic River and next to the Passaic River to assess what impact this project will have?

COMMUNITY DISRUPTION

As you are well aware, the Passaic River is a narrow and shallow waterway. I am concerned that a 4.3 million cubic removal will require the placement of hundreds of barges and dredging derricks in the Passaic River for the duration of the project. A project of this scale will require that placement of a number of pieces of large equipment

in the Passaic River for a very long time, whether the five (5) year estimate is correct or it is not.

I am concerned that during the execution of the project, residents of the City of Newark, Harrison, East Newark and Kearny will be staring at a very large and complex industrial operation in the Passaic River and subject to the noise and odors associated with a dredging operation that will continue 24 hours a day/6 days a week.

As a former law enforcement officer I am very concerned about what impact the bridge openings will have on traffic congestion, and more importantly, response times for emergency services agencies. As I understand the proposed plan, in excess of 10,000 bridge openings will be required, which could translate into 8-12 bridge openings for each bridge each day. Traffic along the Passaic River and over the Passaic River bridges is already very congested during peak travel times.

How will the EPA deal with minimizing the adverse impacts of the required bridge openings? Has the EPA meet with local law enforcement personnel, emergency responders and Offices of Emergency Management to seek their input and suggestions?

JOB CREATION – LOCAL EMPLOYMENT

Proponents of the EPA's proposed plan consistently raise the issue of job creation and local employment opportunities as one of the reasons to support the EPA's proposed plan. As I indicated earlier, I have a long history of supporting projects that provide employment opportunities to my constituents.

Unfortunately, as proposed, I do not see any reliable data that the EPA's proposed plan will result in any meaningful gains in local employment opportunities. I do see companies active in the fields of dredging, sediment treatment and transportation as the entities that will benefit from a project like the EPA is proposing. Due to the scale of the project, I suspect the vast majority of the employment opportunities will be imported into the State of New Jersey from other states as project positions and not result in a net gain of long term employment for residents of the City of Newark.

Stated simply, I do not see the EPA's proposed plan as a job creator. In fact, given the amount of community disruption and the "occupation" of the Passaic River by dredging contractors, a very strong argument could be made that the EPA's proposed plan will be a job killer. I am very interested in hearing the EPA's views on job creation and local employment as it relates to the proposed plan.

ECONOMIC DEVELOPMENT

Similar to the concerns articulated above, I am especially concerned about what impact the EPA's proposed plan will have on economic development and attracting businesses to the banks of the Passaic River. During the implementation of the project itself, I see little or no economic development taking place on the banks of the Passaic River. Once complete, I do have a number of specific concerns that relate to future development and encouraging businesses to locate on the banks of the Passaic.

As I understand the EPA's proposed plan, once the 4.3 million cubic yard removal is complete, the river itself will look no different and there is nothing in the proposed plan that calls for improvements to be made on the banks of the Passaic River. If I do not fully understand the EPA's proposed plan, please correct me. If my understanding is correct, why is the EPA not advocating for or advancing river bank improvements that would encourage economic development along the Passaic River?

I also have a concern about the proposed engineered cap, specifically the ability of future economic development projects to penetrate that engineered cap. Will future projects along the Passaic River be allowed to install piles for a dock or a foundation? Will there be required setbacks or no build zones? Will the new engineered cap encourage or discourage economic development along the banks of the Passaic River?

USE OF RIVER

Under the EPA's proposed plan, my understanding is that the Passaic River will not be usable for commerce or recreation for the duration of the project. Is this in fact true? If so what is the EPA's plan to mitigate this community disruption?

I thank you and the EPA for the opportunity to provide my input and look forward to your reply.

Sincerely,

Senator Ronald Rice
28th Legislative District

cc: Mayor Ras Baraka, City of Newark
Assemblyman Ralph Caputo
Assemblywoman Cleopatra Tucker
Senator Teresa Ruiz
Assemblywoman Pintor-Marin
Assemblywoman Grace Spencer
Congressman Donald Payne
Congressman Bill Pascrell
Congressman Albio Sires
US Senator Robert Menendez
US Senator Cory Booker
Essex County Executive Joe DiVincenzo
Essex County Freeholders
Governor Chris Christie
Commissioner Bob Martin, NJDEP
Gina McCarthy, EPA Administrator
Judith Enck, EPA, Region 2

COMMENT CARD

PASSAIC RIVER PROPOSED PLAN

MAY 7, 2014

NEWARK, NEW JERSEY

Commenter Name Robert M. Rocks **Contact Information (Optional)**

8623689068

I SUPPORT the EPA'S PLAN FOR A PASSIC RIVER A FULL CLEAN UP WILL BRING A JOB WHICH I would LIKE to SEE GO to NEWARK RESIDENTS NO MATTER THIER BACK GROUND

Note: If this is a request for information, please give us a way to get in touch with you. Thank you.

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 14, 2014 12:57 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Bruce Rimmer
brucerimmer@gmail.com
606 Parker Ave.
Brick
NJ
08724

7327011222

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 14, 2014 12:58 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Rhonda Rimmer
bruce-rhonda@verizon.net
606 Parker Ave
Brick
NJ
08724

7327011222

Commerce and Industry Association of New Jersey
61 South Paramus Road • Mack-Cali Centre IV • Paramus, New Jersey 07652
Tel: 201-368-2100 • Fax: 201-368-3438 • www.cianj.org

June 23, 2014

Ms. Alice Yeh
Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Re: United States Environmental Protection Agency (USEPA)'s Proposed Plan Dredging of the Passaic River, New Jersey

Dear Ms. Yeh:

On behalf of the Commerce and Industry Association of New Jersey (CIANJ), we respectfully submit the following comments on the referenced subject. The CIANJ has been advocating for New Jersey's businesses for more than 85 years and is regarded as the premier business association in New Jersey representing the interests of more than 900 entities from virtually every business sector. Our mission and vision is the promotion and enhancement of a free market economy and the creation of private sector jobs in New Jersey.

The CIANJ is very concerned with the USEPA's proposed plan to dredge the lower Passaic River (River) from Newark Bay to River Mile (RM) 8. We believe this approach to remediating the River will takes years, and possibly decades, to complete at historic costs. Additionally, we believe this action will adversely affect commerce and industry along the River.

There are a number of reasons why CIANJ is concerned with the USEPA's proposed plan:

- The USEPA's proposed plan estimates that it will take 5 years to complete the dredging of 4.3 million cubic yards from the River. If the project in Lyndhurst at RM 10.9 is any indication, it will likely take decades to dredge this amount of material from the River. A multi-decade dredging project would hinder new development in North Jersey and discourage our existing businesses from further investing in the area.

- As shown by the work at RM 10.9 and the recent replacement work on the Pulaski Skyway, New Jersey's transportation infrastructure is aging and in need of repair. During the RM 10.9 project, multiple bridges broke causing project delays that doubled the length of time for this project. A 4.3 million cubic yard dredge would require thousands of openings of the 15 bridges that cross the River between Newark Bay and RM 8.3. Has the USEPA considered what the impact of this project will be to the business community if one or more of these bridges break

- The USEPA's proposed plan only addresses the lower 8 miles of the River and due to the high volume of material that will be dredged, there is the likelihood that recontamination will occur throughout the River. A solution that addresses the full 17 miles and minimizes recontamination should be considered.

- While a bank-to-bank dredge of the lower 8 miles will address sediment contamination, the plan does nothing to address stormwater runoff and discharges from combined sewer outflows which contribute to the pollution to the River. Until these sources are addressed, the River will never be truly clean.

The CIANJ believes there is a more effective way to address risk to human health and the ecology and minimize disturbance to North Jersey's economy. We understand that the Lower Passaic River Study Area Cooperating Parties Group (CPG) proposed a Sustainable Remedy that could be implemented more quickly and follows USEPA's own guidance for remediation in complex river systems. In addition, the shorter implementation schedule of the Sustainable Remedy, when compared to a bank to bank dredge, could encourage new businesses to invest in and develop new projects in the Passaic River region.

The CIANJ hopes that the USEPA will consider the impact that a bank-to-bank dredge of the lower 8 miles will have on the business community. We believe that the Sustainable Remedy would be just as effective as a bank-to-bank dredge, while being less intrusive to the business community.

We hope that the USEPA will seriously consider this alternative remedy. Thank you.

Sincerely,

Anthony Russo
Executive Vice President
Government Affairs and Communications

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 20, 2014 9:35 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Anthony Russo
arusso@cianj.org
61 south paramus road
paramus
nj
07762

908-415-4597

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 3:27 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

James Salierno
salierno@fdu.edu
285 Madison Ave
Madison
New Jersey
07940

9734438776

Yeh, Alice

From: Mike & Jean <chuser@comcast.net>
Sent: Tuesday, August 05, 2014 1:55 PM
To: Region2 PassaicLower8MileComments
Subject: vote for alternative 2

I urge the EPA to accept the alternative 2 proposal for the Passaic River. While Alternative 2 initially costs more it is a permanent restoration of the river. Alternative 3 is not permanent; it would require constant monitoring of the river for years and follow up remediation which may or may not get implemented depending on the political winds of the future. Alternative 2 will also pay for itself as it will make the Passaic a living river again with all the follow up economic benefits that will encourage recreational development. Alternative 2 keeps the Passaic in a mostly unusable state. It just covers up the existing toxins with no guarantees they will remain buried nor allowing the river to be used fully again for the public good. Please accept alternative 2 as your decision.

Sincerely,

Michael Ser
Bloomfield, NJ

Yeh, Alice

From: Christopher Len <chris@hackensackriverkeeper.org>
Sent: Friday, August 15, 2014 4:10 PM
To: Region2 PassaicLower8MileComments
Cc: Bill Sheehan; debbie@nynjbaykeeper.org
Subject: Comments on the proposed Diamond Alkali Lower 8-Mile Plan
Attachments: Hackensack Riverkeeper Comments on Diamond Alkali.pdf

Dear Ms. Yeh,

attached, please find Hackensack Riverkeeper's comments on EPA's proposed remedy for the lower eight miles of the Passaic River. If you have any questions, please contact me or Captain Bill.

Sincerely,

Chris Len

Christopher Len
Staff Attorney
Hackensack Riverkeeper
201-968-0808
chris@hackensackriverkeeper.org
http://www.hackensackriverkeeper.org

Hackensack Riverkeeper
231 Main Street
Hackensack, NJ 07601
201-968-0808
www.hackensackriverkeeper.org

August 15, 2014

Alice Yeh
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway
New York, New York 10007-1866

RE: EPA Proposed Remedy For The Lower Eight Miles Of The Passaic River

Dear Ms. Yeh,

Thank you for taking comments on EPA's proposed remedy for the lower eight miles of the Passaic River affected by the Diamond Alkali Superfund Site in Newark New Jersey. Hackensack Riverkeeper supports the immediate, thorough and complete removal of contaminated sediments from the Passaic, and their safe disposal in a federally licensed hazardous waste facility. New Jerseyans have been deprived of their river for generations and they should have it returned to them in a fishable and swimmable state as soon as is technically possible.

EPA should not permit, and Hackensack Riverkeeper would not accept, any remedy that would fail to meet the remediation standards required by the Comprehensive Environmental Response, Compensation and Liability Act in section 121. The remedy must permanently and significantly reduce the volume, toxicity and mobility of the hazardous substances, 42 USC § 9621(b)(1), sufficient to assure protection of human health and the environment, 42 USC § 9621(d)(1). We are confident that EPA's proposal accomplishes this standard for the lower eight miles of the river; we have not seen any other proposal that we feel approaches this standard.

We know that in many cases, Superfund responsible parties press for a less expensive remedy. There may be cases where such complaints carry a certain moral – if not legal – weight. In some cases, a

responsible party may have had no knowledge of the hazardous release; or, in some cases, the release may have resulted from an act of God, the bad actions of a third party or as an unforeseeable outcome of an innocent activity. This is not the case at the Diamond Alkali Superfund Site.

We write to remind the agency, and to place firmly in the record, that Diamond Shamrock poisoned the river systematically, knowingly, and for the purpose of maximizing their profits at the expense of the river, their workers, their neighbors, our servicemen and women, and the people of Vietnam.

This is the only conclusion available after reading the findings of the New Jersey Appellate Division when they considered the factual record in Diamond Shamrock Chemicals Company v. Aetna Casualty and Surety Company in 1992. Below, we thoroughly site the conclusions of that court so that the Agency may know how the Passaic River came to be destroyed, and at what cost. The quotes are exact, but all emphasis is ours.

- Diamond knowingly and routinely discharged contaminants over a period of 18 years. The judge determined that Diamond knew "the nature of the chemicals it was handling," knew that "they were being continuously discharged into the environment," and knew that "they were doing at least some harm." Diamond Shamrock Chemicals Co. v. Aetna Cas. & Sur. Co., 258 N.J. Super. 167, 211, 609 A.2d 440, 461 (App. Div. 1992)
- The critical fact remains, however, that Diamond knew it was dealing with a toxic substance. Perhaps it was not aware of the exact extent of the dangerous consequences emanating from its polluting activity. However, we cannot ignore reality by accepting the blithe assurance of Diamond that it did not intend to injure others. The evidence abounds the other way. Id., at 215, 463
- In the Autumn of 1959, Diamond's representative, Thorton Holder, offered a two-step process by which dioxins could be eliminated, or at least reduced, in the manufacturing process. Despite specific preventive recommendations, Diamond made a conscious decision to run the autoclave, in which chemicals were processed into TCP, at a higher temperature than suggested by Holder. The reason for its decision is obvious. When the temperature in the autoclave was reduced, the reaction time was prolonged, resulting in a decrease in the volume of production. The general rule was that a reduction in temperature of ten degrees reduced the reaction time by 50%. The only conclusion to be drawn is that Diamond's management was wholly indifferent to the consequences flowing from its decision. Profits came first. Id., at 212-13, 462
- Almost from the day production of the phenoxy herbicides commenced, Diamond's workers experienced a skin disease called chloracne. Chloracne was characterized by Diamond's corporate medical official, Dr. William York, as a "serious ... very disfiguring social disability." It was clear that by June 1955, Diamond, though not certain of the specific cause of the chloracne, was aware that something in its chemical processing to which its workers were exposed resulted in this inflammation. Id., at 182, 447
- Diamond was advised to reduce air contamination, and to insist on both personal and plant cleanliness. Specific recommendations for reducing the level of worker exposure

to the toxic substance included the covering of conveyor belts, installing spouts through which liquid or powder went into cans or bags with suction around them to prevent spillage, channeling the chemical liquid overflow to pipes, not open gutters, and using the least toxic solvents for cleaning. As testimony from plant employees at trial graphically demonstrated, however, these suggestions were either ignored or poorly implemented. Id., at 182, 447

- Contaminants, including dioxin from the TCP process, were regularly vented directly into the atmosphere ... a grayish cloud of smoke would come out of the scrubber, which was attached to the TCP process building. The cloud of smoke would flow into the atmosphere but residue from the smoke would settle on employee cars in the parking lot causing the paint "to pit"-to look as if acid had been thrown on the cars. Id., at 214, 463
- Former Diamond employees provided graphic descriptions of the company's heedless indifference to the environmental damage which resulted from its manufacturing operations. Id., at 184, 448
- The Agent Orange was always on the floor; it solidified into a slippery oil film that made normal walking impossible. To move one had to "sort of slide along" instead of taking steps. The floor was not cleaned daily. Rather, every other week or so it was washed down with sulfuric acid. As we mentioned previously, the sulfuric acid wash damaged the concrete floor, turning it to dust. Therefore, every few years the company installed a new concrete floor. The floor was then hosed down and the water directed into trenches which ran directly into the river or into an industrial sewer. However, many times the trenches would block up, sometimes by trash, but generally by the chemical material which would solidify. The liquid would back up onto the building floor or spill out of the trenches and onto the surrounding ground. Id., at 214-15, 463
- Pipes with caustic material also ran between the two buildings. Often the material would freeze. In order to free the substances, employees would break and then steam clean the pipes. The material steamed from the pipes would either be released onto the ground or discharged into the river. Pipelines along the 2,4,5-T unit constantly became clogged with phenol which would seep into the ground because the trenches designed to carry the substance away from the building had been destroyed by acid. Id., at 185, 448
- As we mentioned in our recital of the facts, a carbon absorption system was devised and installed in September 1967. The carbon tower was able to remove dioxin at or below one part per million. Nevertheless, Diamond employees acknowledged that monthly readouts starkly revealed the inadequacy of this approach. Indeed, in October 1968 the level was 8.4 parts per million; November 1968 was 9.3 parts per million, and December 1968 was 9.6 parts per million. Diamond's employees admitted that "cooking" the TCP in the autoclave at 170 degrees centigrade occasionally produced TCP with 80 parts per million dioxin contamination. Additionally, a government document entitled "Herbicide Stock at Gulfport, Mississippi" indicates that, of the government's stockpile of Agent Orange, the average dioxin content of the product manufactured by Diamond was greater than that of the product manufactured by the four other companies whose products were stored at that location. Id., at 213, 462-63

- Despite the certain and documented dangers of the dioxin produced in the TCP process, Diamond treated this substance no differently than it treated any of the nonchloracnegen-containing products. Both the air and the ground, inside and outside of the Lister Avenue plant, were regularly subjected to dioxin emissions through venting, and contamination from spills, leaks and "sloppy practices" in and around the plant. Id., at 213, 463
- Overwhelming evidence was presented that Diamond knew about the release of dioxins from its plant and the migration of these substances to surrounding areas Id., at 213, 463

From the record on appeal, it is clear that Diamond Shamrock knew that its activities were subjecting its workers, the environment, the neighborhood and people exposed to its Agent Orange to extreme hazards. Further, it is clear that Diamond Shamrock knew that it could –at the very least- reduce those hazards and chose not to. Diamond made this choice to maximize its profits.

The corporate successors to this behavior should not now claim that ANY remedy it is ordered to undertake now is too costly. The EPA should not entertain any such claims. The Agency cannot restore health to any of the people made ill by Diamond's shameful behavior, but it can restore this river.

Hackensack Riverkeeper endorses the EPA's proposed remedy as the only remedy likely to quickly and thoroughly restore the lower eight miles of the Passaic River. We ask that the agency brook no delay in approving its proposed remedy and beginning work.

Sincerely,

Capt Bill Sheehan

Captain Bill Sheehan
Riverkeeper and Executive Director
Hackensack Riverkeeper

Yeh, Alice

From: Yeh, Alice
Sent: Friday, July 11, 2014 9:06 AM
To: Region2 PassaicLower8MileComments
Subject: FW: Cleanup of Passaic River

From: Louis Shenman [mailto:lshenman@aol.com]
Sent: Thursday, July 03, 2014 3:25 PM
To: Kluesner, Dave
Subject: Cleanup of Passaic River

Mr. Kluesner

I have **OVER 30 YEARS** experience in dealing w/ **REMOVAL OF FLOATING DEBRIS...TRASH & AQUATIC VEGETATION** from waterways **throughout the U.S. and WORLDWIDE**.

I also have **OVER 15 YEARS** experience in **DREDGING SILTS & SEDIMENTS** from **RIVERS, INDUSTRIAL LAGOONS, LAKES & RESERVOIRS, etc.**

I have personally SOLD OVER 250 PIECES OF EQUIPMENT (throughout the U.S. & worldwide) w/ VALUES RANGING FROM $100K TO OVER $600K

Having been the Vice President of my firms, my experience has always been at the operational (field), financial & bureaucratic levels....thus providing me with a well rounded understanding of how to approach & deal w/ such potentially sensitive problems.

I realize that this may yet be in the early stage of deciding which course of action to take, including possible selection of contractors with the capability to deal w/ these problems in the Passaic River, but I want you to know that I am available to you & your staff should you want to "tap" me for advice & ideas.

I live in Bergen County (and my wife grew up in Clifton & Passaic), so I am familiar w/ the area. Also, I am an independent consultant and available on relatively short advance notice.

I look forward to hearing from you.

Louis E. Shenman
304 Ridgewood Blvd. N.
Washington Twp., NJ 07676
Home Ph: (201)666-4939
Office Ph: (201664-7500
Cell Ph: (201)218-6842
E-mail: lshenman@aol.com

Yeh, Alice

From: Grace Sinden <glsinden@comcast.net>
Sent: Monday, August 11, 2014 11:09 AM
To: Region2 PassaicLower8MileComments
Subject: COMPLETELY CLEANED UP PASSAIC RIVER REQUIRED

ATT: ALICE YEH, REMEDIAL PROJECT MANAGER U.S. ENVIRONMENTAL PROTECTION AGENCY

WE NEED TO HAVE THE PASSAIC RIVER COMPLETELY CLEANED UP, NOT JUST IN SPOTS WITH CAPPING AND OTHER SUCH TECHNIQUES. THE RIVER CONTAINS DEADLY DIOXIN, PCB'S AND OTHER TOXINS WHICH MUST BE REMOVED TO THE GREATEST EXTENT POSSIBLE.

WE URGE THAT THIS ACTION BE THE OPTION SELECTED FOR THIS IMPORTANT PROJECT FOR PROTECTION OF THE ENVIRONMENT AND PUBLIC HEALTH.

SINCERELY,
GRACE & FRANK SINDEN
120 RIDGEVIEW CIRCLE
PRINCETON, NJ 08540

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 10:11 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jessica Skowyra
marviemarv78@yahoo.com

Yeh, Alice

From: Lis Smith <lsmith@dewindonepass.com>
Sent: Tuesday, May 20, 2014 11:58 AM
To: Region2 PassaicLower8MileComments
Subject: Deep Trenching - No Open Excavation: DeWind One-Pass Trenching
Attachments: Trencher Pic Blue Sky.tiff; ATT00001.htm; DeWind One-Pass Trenching- Slurry Walls copy.pdf; ATT00002.htm; DeWind One-Pass Trenching; Collection Trenches copy 2.pdf; ATT00003.htm; DeWind One-Pass Trenching PRB Walls copy 2.pdf; ATT00004.htm; 131302b.jpg; ATT00005.htm

Good Afternoon ~

I just thought you might want be aware of DeWind. We specialize in the installation of groundwater control, collection, and containment systems using our custom built Deep One-Pass Trenchers (slurry walls, prb walls, groundwater/product recovery trenches...) all installations are completed in a single pass, no open excavation. We are based in West Michigan but work all over North America.

Thank you for your time!

(Info. attached below my signature)

Lis Smith
DeWind One-Pass Trenching
9150 - 96th Ave.
Zeeland, MI 49464
P: (616) 875-7580
F: (616) 875-7334
www.dewindonepasstrenching.com
Skype: lis.smith1521
www.linkedin.com/pub/lis-smith/1a/577/955

DeWind One-Pass Trenching is the Leader in Deep Trenching Technology:

Our technology allows us to install groundwater control/remedial systems underground, under the water table and IN A SINGLE PASS without the need to pump, treat, shore, or dig mass excavations.

You will not find these one-of-a-kind machines anywhere else. DeWind designs, builds, and operates these Deep One-Pass Trenchers. We have been in business 25+ years and work all over North America.

* With our trenching process, multi-step installations are condensed into a single-pass operation *

**Examples:*

- In-situ mixed slurry walls up to **75/80** feet deep

- Groundwater/product recovery trenches up to **40/45** feet deep

- PRB walls up to **40/45** feet deep

*** Installation Rates: Hundreds of Feet Per Day ***

www.dewindonepasstrenching.com

Additional Installation Options:

* Soil-Bentonite / Soil-Cement-Bentonite Walls
* Groundwater & Product Recovery Trenches
* Permeable Reactive Barriers / ZVI Walls
* Vapor Extraction & Injection Trenches
* Funnel & Gate Systems
* Leachate Collection Systems
* Erosion Control Systems for Slope and Tailings Stability
* Relief Trenches
* HDPE Barrier Walls

...and more

Animated Videos:

Slurry Wall:
www.koibeach.com/Dewind_slurry

Groundwater Collection/Product Recovery Trench:
www.koibeach.com/Dewind

Lis Smith
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www.dewindonepasstrenching.com
Skype: lis.smith1521
www.linkedin.com/pub/lis-smith/1a/577/955

DeWind One-Pass Trenching:

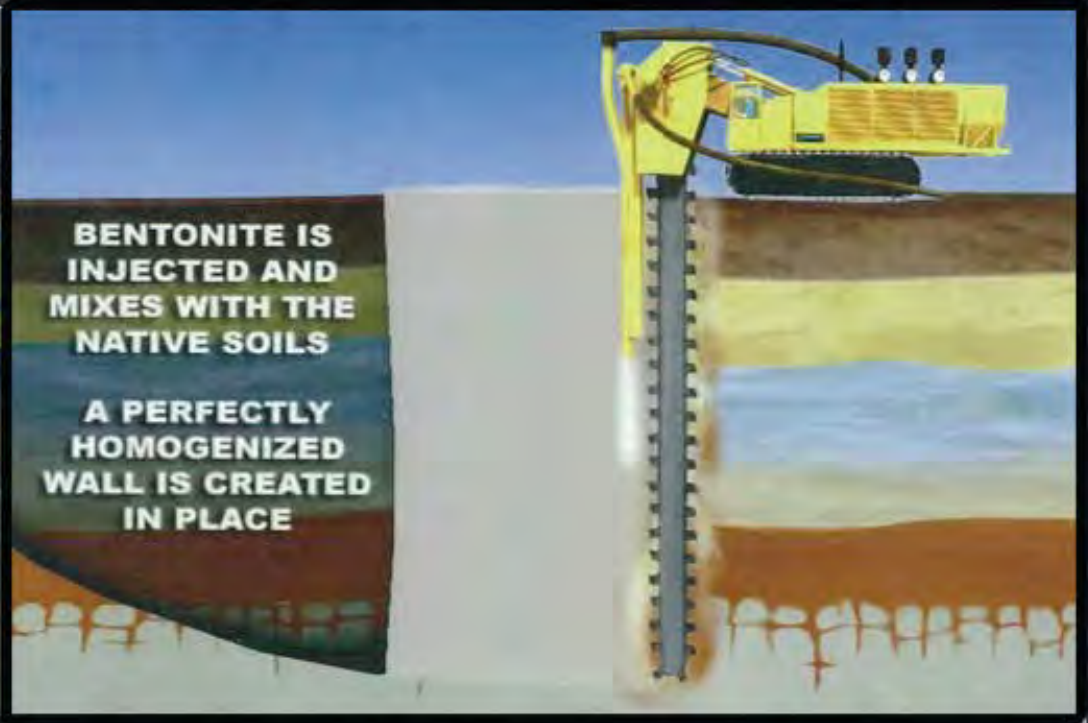
Permeable Reactive and Non-Reactive Barrier Walls

- ZERO VALENT IRON
- ZEOLITE
- MULCH
- GRAVEL
- SAND

- ACTIVATED CARBON
- WALNUT SHELL
- MUSHROOM
- BIO-WALL
- LIMESTONE

PERMEABLE REACTIVE BARRIERS

INSTALLATION RATE OF: 200 - 400 LINEAR FEET PER DAY!



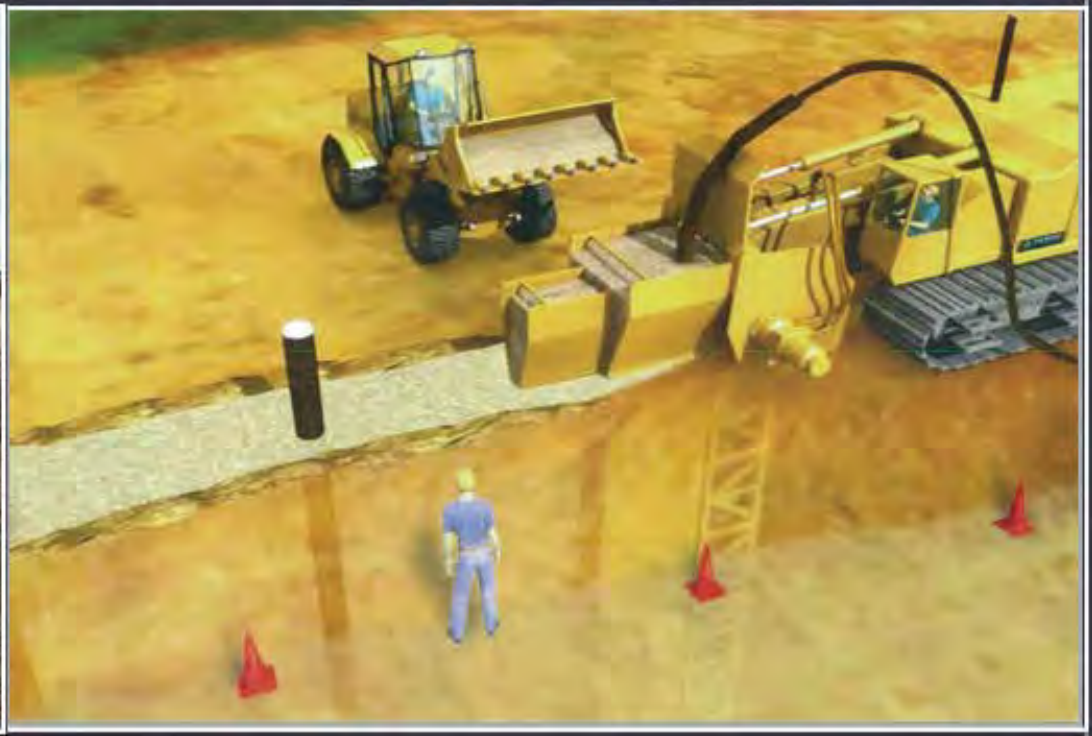
* SUPER FAST WALL INSTALLATIONS --- 5X CONVENTIONAL PRODUCTION RATE
* TRENCHER CAN FIT IN NARROW PLATFORMS AND IN TIGHT SITES
* NO OPEN EXCAVATION
* NO MESSY MIXING PONDS
* NO HANDLING OF CONTAMINATED SPOILS
* COMPLETE HOMOGENIZED WALL FROM TOP TO BOTTOM
* NO POSSIBILITY OF VOIDS IN THE WALL
* CARBIDE TEETH CUT INTO BOTTOM CONFINING LAYER MAKING A SECURE SEAL
* LOWER OVERALL COST

DeWind Slurry Walls are in-situ mixed:

Homogenized top to bottom

Up to 80 feet deep

INSTALLATION RATE OF: **300 - 500** Linear feet per day!



- LNAPL
- DNAPL
- GROUNDWATER COLLECTION
- LEACHATE COLLECTION

Up to 45 feet deep

One-Pass Collection Systems

INSTALLATION RATE OF: 200 - 300 linear feet per day!

Yeh, Alice

From: marekosmith@outlook.com on behalf of Mark Smith <marekosmith@verizon.net>
Sent: Saturday, August 09, 2014 7:22 AM
To: Region2 PassaicLower8MileComments
Subject: Passaic Lower Mile 8

As a parent of a son who has rowed on the Passaic for 4 years through High School with the Montclair Rowing Team, based out of Nereid boat club, I want to voice my very strong support for Alternative 2. The river is disgusting and polluted, and it is a tribute to the Crew teams that row on the Passaic that they stick it out. When we visit other rivers or schools for regattas, we are always saddened by the rivers they have to row on, and really want to see the Passaic restored to the point where it can once again be viewed as a community resource rather than a floating river of garbage with polluted banks. Please do the right thing while you have a chance. We need bank to bank dredging.

Mark Smith
176 Bellevue Ave, Apt #1
Montclair

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 7:32 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Walt Sodie
wsodie@aol.com
123 Riverwalk Blvd.
Burlington
NJ
08016

171 LARCH AVENUE, TEANECK NEW JERSEY 07666
JULY 18, 2014

PASSAIC LOWER 8 MILE COMMENTS
REGION 2 USEPA

RE: DIAMOND'S RESPONSIBLE PARTIES & EPA PROPOSALS
YES TO REMEDIATION OPTION 1

AFTER DECADES OF POISONING OUR CITIZENS AND IMMEDIATE WORLD THE ONLY ACCEPTABLE PASSAIC RIVER REMEDIATION OPTION IS :

A) REMOVE ***ALL*** SEDIMENTATION CONTAMINATION
AND
B) DISPOSE OF THE CONTAMINATED SEDIMENTS OFFSITE (*NO CAPPING)*

THE 73 OR SO COMPANIES THAT WERE/ARE ENGAGED IN INDUSTRIAL ACTIVITIES ALONG THE PASSAIC (THE RESPONSIBLE PARTIES) ARE ARGUING FOR THE CHEAP ALTERNATIVE OF LEAVING THE POISONING CONTAMINANTS IN PLACE WITH CAPPING AND ANNUAL CONTINUED MAINTENANCE REQUIRED IN PERPETUITY. THEY ARE LOOKING FOR A BARGAIN. THEY WISH TO PAY (BELATEDLY) ½$ BILLION RATHER THAN THE $3+ BILLION OPTION 1 ABOVE WILL COST.

IT HAS COST US, THE VICTIMS OF THE PASSAIC RIVER'S WORST SUPERFUND SITE IN THE NATION, MILLIONS OF $ OF LITIGATION, AND THE HIGHEST LEVELS OF CANCER AND AUTISM IN THE COUNTRY.

SINCERELY,

Théo Solman

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 20, 2014 2:45 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Southern NJ Development Council
snjdc@snjdc.org
900 Route 168
Turnersville
NJ
08012

8562287500

NEW JERSEY GENERAL ASSEMBLY

L. GRACE SPENCER
DEPUTY SPEAKER
ASSEMBLYWOMAN, 29TH DISTRICT
223 HAWTHORNE AVENUE, 1ST FLOOR
NEWARK, NJ 07112
(973) 624-1730
FAX (973) 624-5045
EMAIL: AswSpencer@njleg.org

ENVIRONMENT AND SOLID WASTE, CHAIRWOMAN
APPROPRIATION COMMITTEE, VICE CHAIR
WOMEN AND CHILDREN

July 29, 2014

Via email: PassaicLower8MileComments.Region2@epa.gov
Ms. Alice Yeh
Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

RE: EPA's Proposed Plan for the Lower 8 miles of the Passaic River

Dear Ms. Yeh:

Thank you for the opportunity to provide input on and ask questions about the United States Environmental Protection Agency Region 2's (EPA) Proposed Plan or the lower 8 miles of the Passaic River, which is part of the Diamond Alkali Superfund site. As you may know, I currently serve as an Assemblywoman in the 29th Legislative District representing the Cities of Newark and Belleville. My entire legislative district touches the shores of the Passaic River. I also have the honor and privilege of serving as the Chair of the Assembly Committee on Environment & Solid Waste.

I recognize that the New Jersey Department of Environmental Protection has worked diligently to ensure that the environment and the natural resources in New Jersey are protected for the public's benefit. The level of contamination in sediments in the Lower Passaic River hinders environmental and business development. By addressing the contamination, it may potentially spur economic growth and the revitalization along the Passaic River and throughout Northern New Jersey.

I would also like to thank EPA Region 2 for its work on the Diamond Alkali Superfund site, seeking public comment/input and taking action towards restoration of the Passaic River. I have been following the study process and have recently monitored the EPA public outreach/involvement process to determine the level of public acceptance of the Proposed Plan. While there are many opinions about how best to remediate the Passaic River, there appears to be a great deal of consensus that action is required and it is time to act.

As I understand the Proposed Plan, the EPA has proposed a 4.3 million cubic yard, bank to bank removal of sediment in the lower eight miles of the Passaic River. The EPA estimates that the entire project can be completed in five (5) years, including four (4) years of dredging followed by one (1) year of capping. The work would continue 24 hours a day, 6 days a week for 40 weeks a year while I don't not object to consideration being given to this plan I do have issues and questions which should be considered. Below you will find my comments/questions for your review and consideration:

Project Approach: As I understand the EPA's approach to the Passaic River, there are two overlapping studies, the remediation investigation/feasibility study (RI/FS), which is focused on the entire 17.4 mile Lower Passaic River Study Area (LPRSA) and the Focused Feasibility Study (FFS), which is focused on the lower 8 miles of the Passaic River. It is my understanding that the RI/FS study is scheduled to be completed in late-2014. Is there any other Superfund site in the United States that involves a final remedy for half of the area being studied? Is this approach consistent with the National Contingency Plan (NCP)?

Project Scale: The bank to bank remedy calls for the dredging of 4.3 million cubic yards of sediment, enough to fill MetLife Stadium twice over. The scale of the project is unprecedented the EPA has indicated that this project is the largest cleanup in the history of the Superfund program. Scale is important because most of the adverse consequences of the Proposed Plan remedy are directly related to the scale of the project (e.g., truck/railcar loads, resuspension of contaminants, thousands of bridge openings). I understand that EPA has evaluated a targeted dredging alternative but determined that it was not protective. In its evaluation, did the EPA consider whether EPA's policy on adaptive management would provide an avenue for additional work, as needed, to achieve EPA's goals of protectiveness?

Project Schedule: Throughout the FFS public outreach/involvement process to determine public acceptance, and in the Proposed Plan itself, the EPA has indicated that following a +/- 3 year design process and negotiation period with the PRPs, the bank to bank remedy will take five (5) years to implement the remedy. Is a dredging rate of one million cubic yards a year in the Passaic River, in the heart of a very heavily urbanized environment, realistic or achievable?

Furthermore, has the EPA ever managed a Superfund removal that achieved a dredging rate of 1 million cubic yards per year? Is this an accurate representation or does it overlook the practical challenges presented by a highly urbanized tidal river like the Passaic River?

Job Creation: During the April 2014 public release of the FFS and in the resulting media coverage, there was a great deal of attention paid to job creation and local jobs going to residents within the LPRSA. The EPA styled the FFS as a significant job creator. My understanding is that the vast majority of the jobs created for this kind of dredging project will be imported from existing contractors active in the field of dredging and sediment treatment, not New Jersey residents or residents of the City of Newark. Could the bank to bank dredge turn out to be a net job reducer because of negative

impacts on local communities and stunted economic development due to uncertainties inherent in the project? Has the EPA estimated how many jobs a project of this size would create or what the effects on future development would be? What assurance has or can the EPA provide to ensure local job creation?

Bridge Openings: As a long-time resident of the City of Newark and as an Assemblywoman representing the shores of the Passaic River, I am very familiar with the bridges that span the River and connect Essex to Hudson County. As you are well aware, there are a number of movable bridges within the FFS study area. Three of the bridges that connect Newark to Hudson County communities are over 100 years old, have not been properly maintained, and failed on multiple occasions during a removal action in the upper River last year. Others are well maintained but serve some of the busiest rail lines in the United States, like Amtrak's Northeast Corridor service, carrying over a half a million people over these bridges each day.

As I understand the bank to bank remedy, these bridges will have to be opened multiple times a day to accommodate the sediment removal, capping material, and the movement of equipment up and down the Passaic River. Some of these bridges are now opened only a few times a year. Those bridge openings will adversely impact local traffic patterns, PATH riders, Amtrak riders, NJ TRANSIT commuters, and freight railroads such as Conrail. Has the EPA evaluated the impact of no-opening periods. Has the EPA discussed bridge openings with municipal officials and local law enforcement personnel to determine what impact multiple bridge openings a day will have on their communities? Has the Proposed Plan and FFS adequately determined the required bridge openings to implement the bank to bank remedy and their impact on the project schedule?

Access to In-River & Out-of-River Recreation: As currently proposed, the Passaic River will not be usable for commerce or recreation for the duration of the project. Significant adverse impacts will be felt in the surrounding communities throughout. . How do you address my concern that the scale of the bank to bank dredge will, in essence, create an industrial operation in the Passaic River that will inflict noise, odors, air pollution and traffic on the surrounding towns, 24 hours a day, 6 days a week for 40 weeks every year for at least 5 years and, much more likely, decades? Have these issues been adequately evaluated in the FFS?

I do not to see anything in the Proposed Plan that recommends any out-of-river improvements or upgrades geared toward attracting residents back to the Passaic River and encouraging more recreational opportunities, in river and out. More importantly, at the conclusion of project will the public and community at large have anymore use of the river that it does now?

Does EPA's bank to bank plan contemplate advancing any out-of-river improvement projects intended to improve the riverfront, encourage economic development and/or enhance recreational opportunities?

Protectiveness and Recontamination: As I understand the Proposed Plan, its implementation may not achieve the protectiveness goals set by the NCP. To achieve this risk reduction, EPA claims that the concentrations of the key contaminants will have to be reduced to levels far below existing levels upstream and downstream of the 8-mile project area.

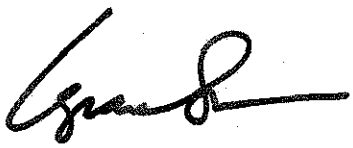
Please also note that I am concerned that the engineered cap installed after the dredging in that area will be immediately recontaminated by the tidal action of the River, causing contaminated water and sediment from Newark Bay and the upper Passaic River to repeatedly wash over the newly capped sediment. It seems like a forgone conclusion that the partially capped area is likely to be recontaminated even before the project is finished. What controls is the EPA considering to limit/minimize recontamination of contaminants for a project this large in a tidal river like the Passaic?

Dioxin: While I understand there are a number of contaminants of concern listed in the Proposed Plan, the primary reason the Passaic River was designated as part of the Diamond Alkali Superfund site in the first place is dioxin contamination emanating from the Lister Avenue plant. How much of the Proposed Plan is directly attributable to the removal of dioxin from the Passaic River?

In summary how many key considerations such as production rates and bridge openings present challenges to the predictability of completion and disruption to my community. My constituents and the public at large have a right to fully understand the true implications of the proposed project.

Again, I thank EPA Region 2 for its work on the Diamond Alkali Superfund Site, seeking public comment/input and taking action towards restoration of the Passaic River. I look forward to your prompt reply and to one day enjoying a "staycation" on the Passic

Sincerely,



Assemblywoman L. Grace Spencer
29th Legislative District

cc: US Senator Robert Menendez
US Senator Cory Booker
Congressman Bill Pascrell
Congressman Albio Sires
Congressman Donald Payne
Mayor Ras Baraka, City of Newark
Senator Teresa Ruiz
Assemblywoman Pintor-Marin
Senator Ronald Rice
Assemblywoman Cleopatra Tucker
Assemblyman Ralph Caputo
Essex County Executive Joe DiVencenzo
Governor Chris Christie
Commissioner Bob Martin, NJDEP
Gina McCarthy, EPA Administrator
Judith Enk, EPA, Region 2

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Sunday, August 10, 2014 5:48 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Brian Sprinitis
brian.s@twinlogixx.com

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Sunday, August 10, 2014 5:48 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

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Thank you.

Brian Sprinitis
lexsprint@comcast.net
11 Londonderry Drive
Flemington
NJ
08822

Yeh, Alice

From: Elizabeth Stagg <stagg@bcoem.org>
Sent: Tuesday, June 24, 2014 10:08 AM
To: Region2 PassaicLower8MileComments
Subject: FW: Bacteria for river cleanup
Attachments: wang et al., 2013.pdf; Tas et al., 2011.pdf; Bunge et al 2003.pdf; Kao et al.pdf

FYI, Betsy Stagg

From: John H Pardue [mailto:jpardue@lsu.edu]
Sent: Thursday, June 19, 2014 8:02 PM
To: Elizabeth Stagg
Subject: Re: Bacteria for river cleanup

Betsy,

Thanks for your note. Look over these 4 papers as examples of studies informing what we want to try in the river sediments. Lets stay in touch and as soon as our work plan is completed in a week or so—lets talk more and see what you think. I need local supporters for this study to have impact and I would appreciate the opportunity to get your feedback. Thanks again, John

John H. Pardue, Ph.D., P.E.
Elizabeth Howell Stewart Professor
Civil & Environmental Engineering
Director, Louisiana Water Resources Research Institute
Co-Dir., Hazardous Substance Research Center, S&SW
Louisiana State University
Baton Rouge, LA 70803-7511
Phone: 225-578-8661
FAX 225-578-5043
http://www.lwrri.lsu.edu <http://www.lwrri.lsu.edu/>
http://www.hsrc-ssw.org/ <http://www.hsrc-ssw.org/>

From: Elizabeth Stagg <stagg@bcoem.org>
Date: Thursday, June 19, 2014 at 8:23 AM
To: John Pardue <jpardue@lsu.edu>
Subject: Bacteria for river cleanup

Dr. Pardue,
Would it be possible to get copies of some of your research papers on this topic? My PhD thesis work is on flood issues in the Passaic River, but the topic of using bacteria for cleanup has been a topic I have brought up numerous times in meetings on the river cleanup. I would love to support this , if you can share some more info with me.
Thank you,
Betsy Stagg

Elizabeth (Betsy) Stagg PE, PP, CFM
Bergen County Flood Management Coordinator
Bergen County Office of Emergency Management
285 Campgaw Road
Mahwah, NJ 07430
201-785-5748

stagg@bcoem.org

Copyrighted Material Submitted as Attachment to Elizabeth Stagg E-Mail to Region2_PassaicLower8MileComments dated June 24, 2014 at 10:08 AM

Bunge, M., L. Adrian, A. Kraus, M. Opel, W. G. Lorenz, J.R. Andreesen, H. Gorisch and U. Lechner, 2003. Reductive dehalogenation of chlorinated dioxins by an anaerobic bacterium. Nature 421:357-360.

PERGAMON

Chemosphere 44 (2001) 1447–1454

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Evaluation of TCDD biodegradability under different redox conditions

C.M. Kao [a,*], S.C. Chen [b], J.K. Liu [c], M.J. Wu [d]

[a] *Institute of Environmental Engineering, National Sun Yat-Sen University, Kaohsiung 804, Taiwan, ROC*
[b] *Department of Medical Technology, Fooyin Institute of Technology, Kaohsiung Hsing, Taiwan, ROC*
[c] *Department of Biology Science, National Sun Yat-Sen University, Kaohsiung 804, Taiwan, ROC*
[d] *Institute of Marine and Agricultural Research Inc., Raleigh, NC, USA*

Received 14 April 2000; received in revised form 1 August 2000; accepted 27 August 2000

Abstract

Polychlorinated dibenzo-*p*-dioxins have been generated as unwanted by-products in many industrial processes. Although their widespread distribution in different environmental compartments has been recognized, little is known about their fate in the ultimate environment sinks. The highly stable dioxin isomer 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) has been called the most toxic compound known to man. In this laboratory microcosm study, TCDD bioavailability was evaluated under five reduction/oxidation (redox) conditions including aerobic biodegradation, aerobic cometabolism, methanogenesis, iron reduction, and reductive dechlorination. Activated sludge and aquifer sediments from a TCDD and a pentachlorophenol (PCP) contaminated site were used as the inocula. Acetate, sludge cake, and cane molasses were used as the primary substrates (carbon sources) in cometabolism and reductive dechlorination microcosms. After a 90-day incubation period, microcosms constructed under reductive dechlorination conditions were the only treatment showing promising remediation results. The highest TCDD degradation rate [up to 86% of TCDD removal (with an initial concentration of 96 μg/kg of soil)] was observed in the microcosms with anaerobic activated sludge as the microbial inocula and sludge cakes as the primary substrates. Except for reductive dechlorination microcosms, no significant TCDD removal was observed in the microcosms prepared under other conditions. Thus, application of an effective primary substrate to enhance the reductive dechlorination process is a feasible method for TCDD bioremediation. Bioremediation expense can be significantly reduced by the supplement of some less expensive alternative substrates (e.g., sludge cakes, cane molasses). Results would be useful in designing a scale-up in situ or on-site bioremediation system such as bioslurry reactor for field application. © 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Dioxin; TCDD; Microcosm; Reductive dechlorination; Biodegradation

1. Introduction

Polychlorinated dibenzo-*p*-dioxins, also called dioxins, comprise a group of compounds that consists of 75 individual isomers. Dioxins can enter the environment from numerous sources including municipal solid waste incinerator emissions, pulp, and paper mill waste discharges, and through the manufacture and use of organochlorine pesticides (McAdams and Aquino, 1994; Kao et al., 1996). Dioxins have also been identified at many hazardous waste sites. The most toxic dioxin isomer, 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD), and many of the other isomers have been detected in sediments, soils, and in the adipose tissue of livestock and

* Corresponding author. Tel.: +886-7-525-2000 ext 4413; fax: +886-7-525-4449.
E-mail address: jkao@mail.nsysu.edu.tw (C.M. Kao).

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PII: S 0 0 4 5 - 6 5 3 5 (0 0) 0 0 4 6 4 - 1

fish in both rural and industrialized areas (Gallo et al., 1991; McAdams and Aquino, 1994).

The isomer TCDD has been called the most toxic compound known to man (Gallo et al., 1991; McAdams and Aquino, 1994). Many adverse health effects have been associated with dioxins, including skin lesions (chloracne), stomach cancer, soft tissue sarcomas, lymphomas, immune system effects, and neurological effects (Esposito et al., 1980; Chastain and Pazdernik, 1985; Manahan, 1990; Gallo et al., 1991; Gasiewicz et al., 1991; McAdams and Aquino, 1994). TCDD has the LD_{50} (dose at which 50% of a population dies) of 0.04 mg/kg for rats. However, other dioxin isomers have LD_{50} values up to 100 mg/kg for rats (Esposito et al., 1980; Manahan, 1990; Gallo et al., 1991). Thus, the public health risk from environmental exposure to dioxins from contaminated sites can be significant. As a result, the clean up of environmental dioxin contamination is an area requiring more attention.

Beyond the toxicity of TCDD and its presence in the environment, many researchers have shown the compound to be highly resistant to biodegradation (Gallo et al., 1991; Orazio et al., 1992; Kao and Wu, 2000). Part of this resistance may be due to its poor bioavailability (Gallo et al., 1991; Orazio et al., 1992; Kao and Wu, 2000). The physical properties controlling environmental transport of TCDD are water solubility (19.3 ng/l), octanol–water partition coefficient (1.4×10^6), vapor pressure (7.4×10^{-10} Torr at 25°C), and molecular weight (321.974). With its low vapor pressure and aqueous solubility, strong sorption to soils, and hydrophobicity, the mobility of TCDD in a soil environment is low (Orazio et al., 1992; Rogers and Abramowicz, 1993). TCDD in sediment and soil will tend to biologically, and chemically degrade slowly. It also has a strong potential to bioaccumulate within ecosystems.

Oxidation converts hazardous contaminants to nonhazardous or less toxic compounds. The oxidizing agents most commonly used for the treatment of hazardous contaminants are ultraviolet radiation, ozone, chlorine dioxide, hydrogen peroxide (H_2O_2), and Fenton's reagent [(H_2O_2) oxidation in the presence of ferrous iron (Fe^{2+})] (EPA, 1989; Watts et al., 1991; Joseph and Mirat, 1994; Boulding, 1996; Kao and Wu, 2000). Chemical oxidation has been used to treat liquids, slurry soils, and sludges that contain oxidizable contaminants (EPA, 1989; Boulding, 1996). However, oxidation processes have been demonstrated to be only partially effective for some highly toxic and stable compounds including pesticides, organic cyanides, polychlorinated biphenyls (PCBs), and dioxins/furans (EPA, 1989; Boulding, 1996; Kao and Wu, 2000). Therefore, using chemical oxidation alone may not be an effective and appropriate method for the remediation of TCDD-contaminated soils.

One potential method for managing hazardous waste contaminated sites is the intrinsic bioremediation or natural bioremediation. Recent regulations adopted by US Environmental Protection Agency (EPA) allow intrinsic bioremediation to be considered as an alternative during development of corrective action plans. Compared to other available physical/chemical technologies, the use of intrinsic bioremediation could be very cost-effective (Mohn and Tiedje, 1992; Newell et al., 1995; Rifai et al., 1995; Brady et al., 1998).

Depending on the site situations, enhanced in situ or on-site bioremediation can be applied to accelerate the contaminant biodegradation rates. Therefore, biological systems, including intrinsic and enhanced approaches, offer the possibility of a cost-effective destruction technology for many classes of contaminants, including chlorinated and nonchlorinated organic chemicals. However, some highly chlorinated compounds (such as TCDD) are usually recalcitrant to biodegradation. Despite this difficulty, chlorinated organic molecules still can be biologically dechlorinated through reductive metabolic pathways. In fact, attempts to develop biotreatment schemes using cometabolism or reductive dechlorination have been moderately successful (Mohn and Tiedje, 1992; Newell et al., 1995). A number of organic compounds, including acetate, methanol, glucose, benzoate, phenol, methylamines, and alkylbenzenes, have been used as primary carbon sources to enhance cometabolism or reductive dechlorination processes. Therefore, in situ or on-site bioremediation is a feasible technology to clean up highly chlorinated hydrocarbon contaminated sites if the biodegradation rate can be effectively accelerated by some primary organic substrates, which can be supplied economically.

The first objective of this study was to evaluate the effectiveness of using bioremediation as a remedial option to clean up TCDD contaminated soils under different reduction/oxidation (redox) conditions including aerobic conditions, aerobic cometabolism, methanogenesis, reductive dechlorination, and iron reduction. The second objective was to evaluate the feasibility of using activated sludge cakes and cane molasses as the primary substrates to enhance the reductive dechlorination of TCDD. Based on the experimental results, the favorable bioremediation conditions can be determined and bioremediation system such as on-site bioslurry reactor can be designed to bioremediate TCDD contaminated soils efficiently and cost-effectively.

2. Materials and methods

2.1. Soil spiking procedures

To produce the dioxin-contaminated soils used in this study, uncontaminated soils from the backyard of

an abandoned petrochemical factory (collected from the unsaturated zone) were spiked with TCDD. Soil samples were kept refrigerated at 4°C until analyzed (within 2 months). Based on the results from the grain-size distribution analysis, the collected soils consisted of mainly silty sands. Ten kg of soil was mechanically homogenized in a stainless steel container. The soil was spiked with 1250 μg of TCDD dispersed in 1.5 l of a 45/55 % (v/v) acetone/hexane solution. The soil was then further homogenized. The solvents were allowed to evaporate from the soil by placing the container of spiked soil in a fume hood, thus leaving behind the TCDD in the soil at a theoretical concentration of 125 ng/g or 125 μg/kg of soil. The effectiveness of the spiking procedure was verified through extraction and analysis of 10 g subsamples immediately after preparation of the spiked soil (Kao et al., 1996; Kao and Wu, 2000). Five subsamples were analyzed and the average concentration was 96.25 μg/kg. The average recovery was 77% with a coefficient of variation of 4.8.

2.2. Soil extraction procedures

Soil extraction procedures were applied to extract TCDD in the spiked soils and soils after biodegradation processes. The extraction procedures included internal standardization, overnight soxhlet extraction with toluene (16–24 h), snyder column concentration, and nitrogen gas vaporization to a final volume of 50 μl for analysis. The isotopically labeled internal standards (^{13}C-1,2,3,4-TCDD and ^{13}C-1,2,3,7,8,9-hexaCDD) were added before the extraction to measure the recovery efficiency. After the extraction, collected toluene was passed through a sodium sulfate column to remove any water from the toluene solution, then concentrated down to 50 μl using snyder column concentration and nitrogen gas evaporation for gas chromatography (GC) analysis.

2.3. Analytical methodology

Analysis of TCDD was performed using a Hewlett-Packard 5890A GC equipped with an electron capture detector. A 20 m × 0.25 mm DB-5 capillary column with a 0.25 μm film was used to separate compounds. The injector temperature was 290°C and the detector temperature was 300°C. The oven temperature was programmed to increase from 150°C (5 min) to 290°C (35 min) at 3°C/min. He gas was used as the carried gas and N_2 was used as the make-up gas. The detection limit for TCDD was 0.5 ppb.

2.4. Microcosm study

Microcosms were constructed to evaluate the degradability of TCDD under different biodegradation conditions. The five redox conditions applied in this study included aerobic biodegradation (group A), aerobic cometabolism (group B), methanogenesis (group C), reductive dechlorination (group D), and iron reduction (group E). Table 1 lists the designed conditions and site background for each group of microcosms. Under aerobic cometabolism and reductive dechlorination, sodium acetate, cane molasses from a sugar cane factory, or activated sludge cake from a domestic wastewater treatment plant were used as the primary substrates (or primary carbon sources).

Under iron reduction,amorphous Fe(III) oxide was used as the source of ferric iron (or electron acceptor). Downgradient aquifer sediments from a TCDD con-

Table 1
Characteristics of microcosms

Microcosm and control	Treatment	Inocula	Primary substrate	Site DO (mg/l)
A1 & A1–C[a]	Aerobic biodegradation	Sediments from TCDD contaminated site	TCDD	1.4
A2 & A2–C	Aerobic biodegradation	Activated sludge	TCDD	3
B1 & B1–C	Aerobic cometabolism	Sediments from TCDD contaminated site	Acetate	1.4
B2 & B2–C	Aerobic cometabolism	Activated sludge	Acetate	3
C1 & C1–C	Methanogenesis	Sediments from TCDD contaminated site	TCDD	<0.5
C2 & C2–C	Methanogenesis	Anaerobic activated sludge	TCDD	0
D1 & D1–C	Reductive dechlorination	Sediments from TCDD contaminated site	Acetate	<0.5
D2 & D2–C	Reductive dechlorination	Sediments from TCDD contaminated site	Sludge cake	<0.5
D3 & D3–C	Reductive dechlorination	Anaerobic activated sludge	Acetate	0
D4 & D4–C	Reductive dechlorination	Anaerobic activated sludge	Sludge cake	0
D5 & D5–C	Reductive dechlorination	Anaerobic activated sludge	Cane molasses	0
E1 & E1–C	Iron reduction	Sediments from TCDD contaminated site	TCDD	<0.5
E2 & E2–C	Iron reduction	Sediments from PCP contaminated site	TCDD	<0

[a] $HgCl_2 + NaN_3$ were added into each control microcosm.

taminated site and aerobic activated sludge from an industrial wastewater (pulp and paper industry) treatment plant were used as inocula for aerobic and cometabolic microcosms. Aquifer sediments near a mid-plume area of the TCDD site and anaerobic sludge from an anaerobic sludge basin of the pulp and paper wastewater treatment plant were used as inocula for methanogenic and reductive dechlorination microcosms. Aquifer sediments from mid-plume areas of TCDD site and aquifer sediments from mid-plume areas of a pentachlorophenol (PCP) contaminated site were used as inocula for iron reduction microcosms. Results from the preliminary studies indicate that iron reducers (varied from 10^3 to 10^4 cells/g of sediments) were present at both sites (TCDD site and PCP site) (data not shown).

More than 10^8 cells of total heterotrophic bacteria per ml of sludge were detected in both aerobic and anaerobic sludges collected from the pulp and paper wastewater treatment plant using plate count technique (APHA, 1995). Aerobic and anaerobic sludges were purged with air and nitrogen to remove any residual volatile and semi-volatile organics.

Each microcosm was constructed with 25 ml nutrient medium, 15 g (or 15 ml) of inocula, and 20 g of spiked soil in a 70 ml bottle sealed with Teflon-lined rubber septa. The headspace in each microcosm was approximately 17 ml. The final mineral medium in each microcosm consisted of (milligram per liter of H_2O) $(NH_4)_2SO_4$, 100; K_2HPO_4, 174; KH_2PO_4, 136; $CaCl_2$, 0.4; $FeCl_3.6H_2O$, 0.3; H_3BO_4, 0.03; concentrated HCl, 0.25, $MgSO_4.7H_2O$, 3; $MnSO_4.H_2O$, 0.09; and $NaMoO_4.2H_2O$, 0.01. Two milliliter of acetate solution (100 mg/l) was provided to supply the primary carbon source in cometabolic and reductive dechlorination microcosms. The pH of each microcosm solution was approximately 7.5, and was relatively stable throughout the experiment (varied from 7 to 7.5) (data not shown). Control bottles contained 250 mg/l $HgCl_2$ and 500 mg/l NaN_3, and inocula used for the control groups were autoclaved before use. Microcosms were incubated in the dark at 16°C. Triplicate microcosms were scarified and analyzed for TCDD at each time point during the analysis.

2.5. Aerobic and cometabolic microcosms

Aerobic microcosm experiments were conducted to examine the feasibility of TCDD biodegradation under aerobic (microcosm A) and cometabolic (microcosm B) conditions using acetate as the primary substrate. The inocula used in this group of microcosms included aquifer sediments from a TCDD spill site and aerobic activated sludge. The primary substrate used in the cometabolic microcosm was sodium acetate (Table 1).

2.6. Methanogenic and reductive dechlorination microcosms

Anaerobic microcosms [including methanogenesis (microcosm C) and reductive dechlorination (microcosm D)] were prepared in an anaerobic glovebox to preclude intrusion of oxygen. Hungate techniques were used to prepare anaerobic solutions (Kota, 1998). A redox indicator (0.0002% resazurin) and reducing agent (1 mM sodium sulfide) were added to each bottle. Sodium sulfide was chosen because it would not serve as a carbon source and it has a redox potential (−571 mV) low enough to completely reduce resazurin. The inocula used in the methanogenesis and reductive dechlorination microcosms were aquifer sediments from the TCDD spill site and anaerobic activated sludge. The primary substrates used in the reductive dechlorination microcosms were sodium acetate, sludge cakes, and cane molasses (Table 1).

2.7. Iron reduction microcosm

Large amounts of ferric iron are present in the sediments of most subsurface environments and could potentially provide a large reservoir of electron acceptor for contaminant biodegradation (Hunt et al., 1997; Kota, 1998; Kao and Wang, 2000). Available evidence suggests that the iron-reducing process can significantly influence the fate and transport of hydrocarbons in the subsurface (Hunt et al., 1997; Kota, 1998; Kao and Wang, 2000). Thus, this set of microcosm was prepared to simulate TCDD biodegradation under iron reducing conditions (microcosm E) (Table 1). Anaerobic glovebox, redox indicator, and Hungate techniques were also applied to preclude intrusion of oxygen and to prepare anaerobic solutions. The experimental methods were similar to the anaerobic procedures described above. Amorphous Fe(III) oxide was used as the source of ferric iron (electron acceptor). It was prepared by neutralizing a 0.4 M $FeCl_3$ solution with 1 M NaOH and washing the suspension with deionized water to remove NaCl (Kota, 1998). One potential hypothesis was that Fe(III) availability was not limiting Fe(III) reduction for TCDD removal. Therefore, Fe(III) concentration of 2 mM in each microcosm was prepared. This was to provide sufficient Fe(III) for each microcosm.

3. Results and discussion

Aerobic microcosms [aerobic biodegradation (microcosm A) and aerobic cometabolism (microcosm B)] using sediments inocula from a TCDD contaminated site (microcosms A1 and B1) and activated sludge (microcosms A2 and B2) from a pulp and paper wastewater treatment plant were incubated for 90 days. The average

concentrations of the triplicate analyses of TCDD before and after 90-day incubation were presented in Table 2. Results show that no significant TCDD degradation was observed in any A and B microcosms after incubation. This suggests that TCDD cannot be biodegraded under aerobic or aerobic cometabolic (using acetate as the primary substrate) conditions using the sediments and activated sludge as the inocula.

Microcosms constructed under iron reducing conditions using sediment inocula from TCDD (microcosm E1) and PCP contaminated sites (microcosm E2) were incubated for 90 days. Table 2 presents the concentrations of TCDD before and after a 90-day incubation period. Compared to the control microcosms (E1-C and E2-C), no significant TCDD removal was detected after incubation in any E1 and E2 microcosms.

Fig. 1 presents the variations in TCDD concentrations versus time in microcosms C1 and C2. No TCDD biodegradation was observed in the methanogenic microcosm C1 with aquifer sediments as the inocula after a 90-day incubation period. However, 28% of TCDD removal was detected in the methanogenic microcosm C2 with anaerobic activated sludge as the inocula. TCDD decrease was observed after 23 days. However, no further TCDD decrease was achieved during the remaining operating period from 35 to 90 days. This suggests that the TCDD decrease in C2 might be due to the occurrence of reductive dechlorination process. Existing organic materials in the activated sludge may serve as the primary carbon sources and cause the degradation of TCDD. After the complete removal of bioavailable organic materials in the sludge, degradation of TCDD ceased. Other possibilities, which caused the cease of TCDD degradation, include the buildup of toxic by-products or changes in environmental factors during incubation.

Reductive dechlorination microcosms (D1 to D5) were the only treatment conditions showing very positive TCDD biodegradation results in this study. Fig. 2 presents the variations in TCDD concentrations versus time in microcosms D1 and D2 using aquifer sediments as the inocula. Fig. 3 shows TCDD concentrations versus time in microcosms D3 to D5 using anaerobic sludge as the inocula. Acetate, sludge cake, and cane molasses were used as the primary substrates in D3 to D5, respectively. Significant TCDD removal (varied

Table 2
Averaged biodegradation results of each microcosm after a 90-day incubation period

Microcosm	Treatment	Initial TCDD concentration (μg/kg)	Final TCDD concentration (μg/kg)	TCDD removal (%)
A1	Aerobic biodegradation	94 ± 12[a]	90 ± 8	4
A2	Aerobic biodegradation	87 ± 7	79 ± 9	9
B1	Aerobic cometabolism	93 ± 15	80 ± 5	14
B2	Aerobic cometabolism	95 ± 12	93 ± 11	2
C1	Methanogenesis	96 ± 9	86 ± 7	10
C2	Methanogenesis	94 ± 5	68 ± 8	28
D1	Reductive dechlorination	98 ± 10	46 ± 7	53
D2	Reductive dechlorination	91 ± 9	37 ± 9	59
D3	Reductive dechlorination	91 ± 8	19 ± 9	79
D4	Reductive dechlorination	91 ± 10	13 ± 6	86
D5	Reductive dechlorination	90 ± 12	27 ± 11	70
E1	Iron reduction	92 ± 9	95 ± 7	–[b]
E2	Iron reduction	96 ± 9	84 ± 8	13
A1–C[c]	Control	91 ± 9	81 ± 7	11
A2–C	Control	88 ± 8	96 ± 6	–
B1–C	Control	92 ± 6	84 ± 9	9
B2–C	Control	88 ± 8	91 ± 4	–
C1–C	Control	98 ± 10	90 ± 5	8
C2–C	Control	93 ± 6	94 ± 12	–
D1–C	Control	90 ± 5	94 ± 8	4
D2–C	Control	94 ± 8	85 ± 7	10
D3–C	Control	90 ± 11	88 ± 10	2
D4–C	Control	91 ± 9	89 ± 8	2
D5–C	Control	95 ± 7	90 ± 7	5
E1–C	Control	97 ± 8	84 ± 12	13
E2–C	Control	94 ± 9	89 ± 7	9

[a] Mean ± standard error of the mean.
[b] Not available.
[c] Control group.

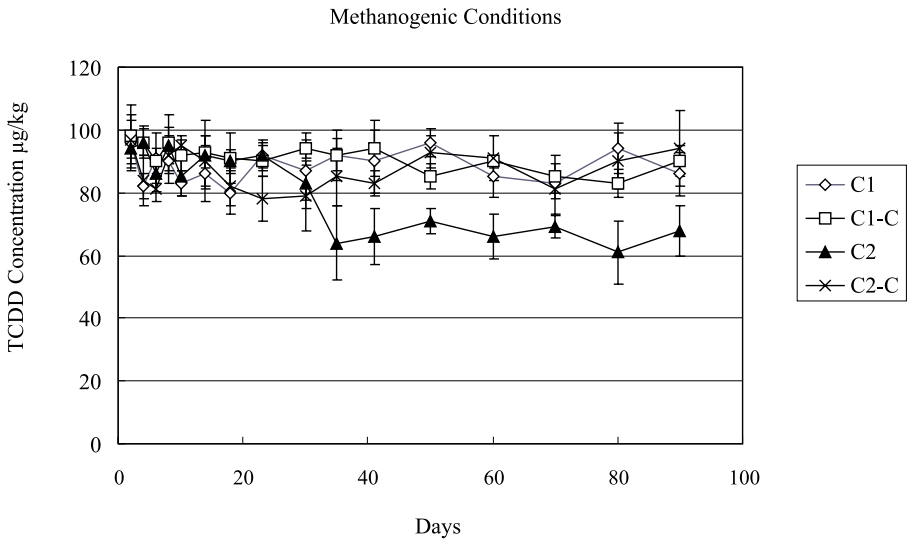

Fig. 1. Variation in TCDD concentrations versus time in methanogenic microcosms (C1 and C2).

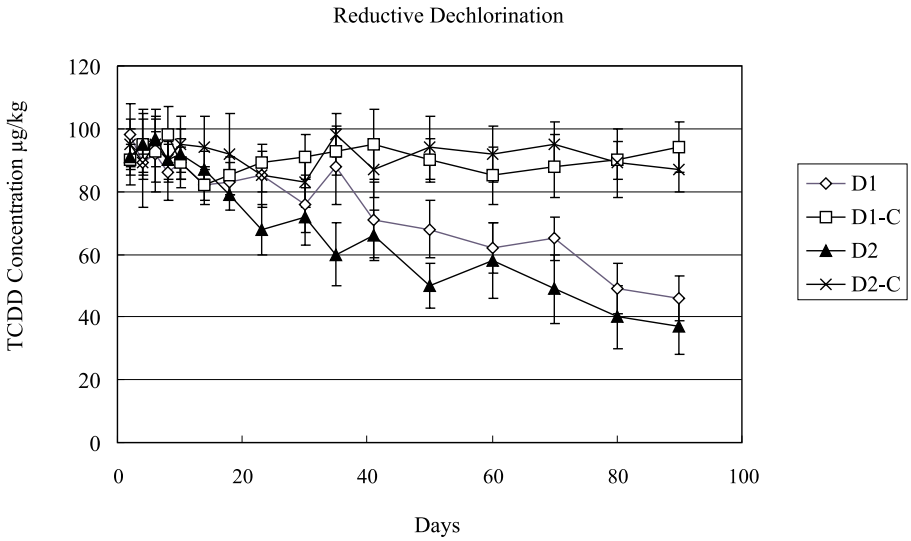

Fig. 2. Variation in TCDD concentrations versus time in reductive dechlorination microcosms (D1 and D2).

from 53% to 86% removal efficiencies) was observed in these microcosms after the 90-day incubation period (Table 2).

The highest TCDD biodegradation efficiency (86% removal) was observed in the microcosms (D4) containing activated sludge and sludge cake. The higher TCDD removal efficiency might be due to the high and versatile microbial populations and active microbial consortia in the activated sludge. Results also show that 8- to 30-day lag periods were observed in these microcosms. This suggests that culture enrichment may be required to accelerate the TCDD biodegradation rate. Only 53% TCDD removal was observed in the D1 microcosms (with a 8-day lag) containing aquifer sediments and acetate. These findings indicate that the aquifer sediments collected from the TCDD contaminated site had some beneficial effects on lag period reduction. However, TCDD removal efficiency was not significantly enhanced possibly due to the lower microbial population in the sediments compared to the numerous population in the activated sludges.

A zero-order decay model was fit to the TCDD degradation data from the reductive dechlorination microcosms (D1 to D5) to allow comparison of TCDD

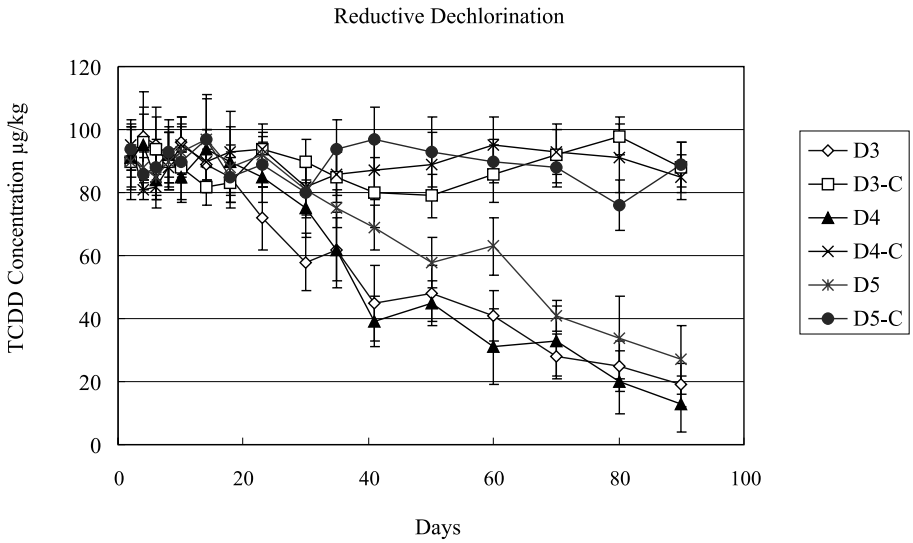

Fig. 3. Variation in TCDD concentrations versus time in reductive dechlorination microcosms (D3 to D5).

biodegradation rates. During the period of active biodegradation (after the lag period), the zero-order loss rates for D1 to D5 were 0.5, 0.6, 0.88, 1.05, and 0.93 µg/kg/day, respectively. The zero-order regression equations for D1 to D5 microcosms are:

D1	$Y = -0.5\ (\mu g/kg/day)X + 94$	$R^2 = 0.91$
D2	$Y = -0.6\ (\mu g/kg/day)X + 90$	$R^2 = 0.89$
D3	$Y = -0.88\ (\mu g/kg/day)X + 93$	$R^2 = 0.93$
D4	$Y = -1.05\ (\mu g/kg/day)X + 101$	$R^2 = 0.9$
D5	$Y = -0.93\ (\mu g/kg/day)X + 110$	$R^2 = 0.96$,

where Y = TCDD concentration in soil phase (µg/kg) and X = incubation time (day).

Higher degradation rates were observed in D3 to D5 microcosms containing activated sludges. However, lower rates were observed in D1 and D2 microcosms with aquifer sediments as the inocula. The less indigenous microbial population in the sediments might cause the lower degradation rates observed in D1 and D2 microcosms. Thus, microbial acclimation and enrichment plays an important role on biodegradation rates. Results show that using sludge cake and cane molasses as the primary substrates can also significantly enhance the reductive dechlorination compared to the commonly used simple compound, acetate.

4. Conclusions

The highly stable compound TCDD is considered to be one of the most toxic substances known to man. Beyond the toxicity of TCDD and its presence in the environment, many researches have shown the compound to be highly resistant to biodegradation in the natural ecosystem (Gallo et al., 1991; Orazio et al., 1992; Kao and Wu, 2000). In this study, TCDD biodegradation was evaluated in microcosms under different redox conditions including cometabolism and reductive dechlorination. Acetate, sludge cakes, and cane molasses were used as the primary substrates during the cometabolism and reductive dechlorination processes. Activated sludges and aquifer sediments were used as the inocula. Conclusions from this laboratory microcosm study include the following:

1. Results of this study show that TCDD degradation was only effective in microcosms representing reductive dechlorination processes. No significant TCDD removal was observed in the microcosms prepared under the other redox conditions (e.g., aerobic biodegradation, iron reduction).
2. Reductive dechlorination of TCDD was supported by simple as well as complex organic matter such as acetate, sludge cakes, and cane molasses as the substrates and electron donors under the experimental conditions provided. This finding suggests that bioremediation cost can be further reduced by the application of some less expensive and bioavailable carbon sources.
3. Significant lag periods were observed in reductive dechlorination microcosms. To increase the biodegradation efficiency and reduce the lag period, the microbial consortia can be further acclimated before application. Sediments collected from TCDD contaminated sites contain acclimated microbial consortia, however, enrichment step is still necessary to accelerate the biodegradation rate.
4. In situ or on-site bioremediation using TCDD as the sole carbon source is not a feasible technology to

clean up TCDD-contaminated site. Application of an appropriate second carbon source (e.g., acetate, sludge cakes, cane molasses) to enact the reductive dechlorination process is a necessity to enhance TCDD biodegradation.

5. Results show that natural bioremediation of TCDD is feasible with the presence of appropriate redox conditions and primary substrates to enhance the reductive dechlorination. The microcosm results will be useful in designing a scale-up in situ or on-site TCDD bioremediation system (e.g., on-site bioslurry reactor) for field application. Results also indicate that for the higher level TCDD contaminated sites, using bioremediation alone might not be suitable because of its longer biodegradation time. A two-stage treatment system for the higher level TCDD removal may be more appropriate. For example, chemical oxidation can be used to transform the major portion of TCDD to compounds more amenable to biodegradation, then biodegradation technique can be employed to destroy the residual TCDD and by-products from the chemical pretreatment step.

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Role of "*Dehalococcoides*" spp. in the Anaerobic Transformation of Hexachlorobenzene in European Rivers▽†

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The diffuse pollution by chlorinated organic compounds in river basins is a concern, due to their potential adverse effects on human health and the environment. Organohalides, like hexachlorobenzene (HCB), are recalcitrant to aerobic microbial degradation, and "*Dehalococcoides*" spp. are the only known microorganisms capable of anaerobic transformation of these compounds coupled to their growth. In this study, sediments from four European rivers were studied in order to determine their HCB dechlorination capacities and the role of *Dehalococcoides* spp. in this process. Only a weak correlation was observed between *Dehalococcoides* species abundance and HCB transformation rates from different locations. In one of these locations, in the Ebro River sediment, HCB dechlorination could be linked to *Dehalococcoides* species growth and activity by 16S rRNA-based molecular methods. Furthermore, HCB dechlorination activity in this sediment was found over the full range of ambient temperatures that this sediment can be exposed to during different seasons throughout the year. The sediment contained several reductive dehalogenase (*rdh*) genes, and analysis of their transcription revealed the dominance of *cbrA*, previously shown to encode a trichlorobenzene reductive dehalogenase. This study investigated the role of *Dehalococcoides* spp. in HCB dechlorination in river sediments and evaluated if the current knowledge of *rdh* genes could be used to assess HCB bioremediation potential.

Production of hexachlorobenzene (HCB)-containing pesticides is banned in most of the world due to HCB's toxic and carcinogenic nature. However, production and emission of the compound still occurs as an intermediate in chemical processes and from natural sources, such as volcanoes (5, 17). In aquatic environments, HCB is mainly deposited in the sediment due to its hydrophobicity. Bacterial reductive dechlorination plays an important role in the degradation of chlorinated aromatic contaminants like HCB in these anaerobic environments (15, 19). Under anaerobic conditions, HCB is used by some bacteria in their energy metabolism by coupling reductive dehalogenation to electron transport phosphorylation (36). This is the only known pathway, so far, for the microbial transformation of HCB that is linked to microbial growth. Reductive dechlorination of HCB and its lesser chlorinated derivatives was previously reported in several river sediments (8, 11, 18, 19). Nevertheless, in none of these studies were the microorganisms responsible for the process characterized.

Three strains of bacteria capable of degrading HCB via reductive dechlorination have been isolated so far. "*Dehalococcoides*" sp. strain CBDB1 and "*Dehalococcoides ethenogenes*" strain 195 dechlorinate HCB to 1,3-dichlorobenzene (DCB), 1,4-DCB, and 1,3,5-trichlorobenzene (TCB) (3, 14). Additionally, production of 1,2-DCB was also observed with strain 195. A distant relative of *Dehalococcoides* spp., "*Dehalobium chlorocoercia*" DF-1, dechlorinates HCB only to 1,3,5-TCB (48). Besides HCB, strain CBDB1 can also degrade polychlorinated dibenzodioxins, ethenes, phenols, and benzenes (1, 3, 10), whereas strain 195 can also use chlorinated ethenes and ethanes as electron acceptors (14, 31). Enzymes catalyzing the reductive dechlorination of HCB have not yet been identified. However, genomes of strains CBDB1 and 195 were shown to have multiple copies of putative reductive dehalogenase (*rdh*) genes that were predicted to code for enzymes mediating reductive dechlorination (29, 35). An *rdh* gene from strain CBDB1, *cbrA*, was recently characterized as a 1,2,3,4-tetrachlorobenzene (TeCB) and 1,2,3-TCB reductive dehalogenase gene (2).

The goal of the current study was to assess the HCB dechlorination potential of *Dehalococcoides* spp. in contaminated river sediments from different locations on the European continent and to evaluate if the current knowledge of *rdh* genes could be used to assess HCB bioremediation potential. Previous field surveys in several locations in two HCB-contaminated European rivers indicated that *Dehalococcoides* species activity and *rdh* gene content are variable between different geographical locations (42). Moreover, river water temperature was identified as one of the environmental parameters significantly affecting *Dehalococcoides* species composition in the river sediments. To this end, we used batch microcosm incubations to detect HCB dechlorination potentials in sediment samples from four different rivers. Moreover, the sediment from one location was exposed to the range of different temperatures to study the effect of this parameter on

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HCB dechlorination by *Dehalococcoides* spp. Changes in the *Dehalococcoides* species activity and diversity were detected via 16S rRNA-based approaches. Gene-specific PCR assays and sequencing were used to detect *rdh* gene diversity and expression.

MATERIALS AND METHODS

Origin of the river sediments. Samples were collected from four European rivers within the framework of the EU project Aquaterra (7). This project aimed to provide a foundation for a better understanding of the fate of pollutants in these river basins (for more information, see http://www.eu-aquaterra.de). The list of sampling locations is provided in Table S1 in the supplemental material. Some of the locations in these river systems have a known history of HCB contamination (e.g., Flix in the Ebro River basin), but almost all of them have been additionally contaminated with other chlorinated compounds, e.g., pesticides and/or chlorinated aliphatic compounds (7). River sediment and water samples were taken approximately 1.5 m away from the river shore. A closed 0.5- to 1-liter sterilized air-tight jar was submerged and opened just above the water-sediment interface. The jar was completely filled with top-layer sediment. The top 5 cm of the jar was filled with the river water, and the jar was closed before it was brought to the surface and transported to the laboratory in a cooler. Besides river sediment, samples from floodplain soil were also taken at the Elbe River. The sediments and water were stored at 4°C until further use. Sediment and soil characteristics have been reported elsewhere (42).

Chemicals. All chemicals were at least of analytical grade. HCB, 1,2,4,5-TeCB, 1,2,3,5-TeCB, 1,3,5-TCB, and 1,2-DCB were obtained from Aldrich Chemicals Co., Ltd. (Dorset, England). Pentachlorobenzene (QCB), 1,2,3,4-TeCB, 1,2,4-TCB, 1,3-DCB, and 1,4-DCB were purchased from Merck (Darmstadt, Germany). 1,2,3-TCB was from Janssen Chimica (Beerse, Belgium). All chemicals (purity, >99%) were used as received without further purification.

Batch experiments. The transformation of chlorinated benzenes was tested with 5 g (wet weight) of sediment in 120-ml glass bottles containing 50 ml basal medium specifically designed for the cultivation of reductively dechlorinating bacteria (0.1 g sediment/ml basal medium) as described previously, but without the addition of fermented yeast extract (20).The pH of the batches was 7.0 to 7.3. The gas phase consisted of N_2 (80%) and CO_2 (20%). The bottles were sealed with Viton stoppers (Maag Technic AG, Dubendorf, Switzerland). Lactate was added as an electron donor (final concentration, 50 mM), and 30 or 50 μM HCB was added from a stock solution prepared in acetone. The resulting acetone concentration in the bottles was below 1 mM. Experiments were set up in an anaerobic glove box. The oxygen concentration in the glove box was kept low with a palladium catalyst and 3% H_2 in the gas phase, which otherwise consisted of N_2. The bottles were incubated statically at 30°C in the dark unless otherwise indicated. All experiments were carried out in triplicate. Sterile controls did not contain any sediment. Abiotic sediment controls were prepared by autoclaving the sediments twice for 20 min at 120°C at the start of the experiment. HCB dechlorination was not observed in the abiotic controls of the study (data not shown). Microcosms were sampled in intervals of 7 to 10 days to monitor dechlorination. Liquid phase extractions for chlorinated benzene measurements were performed on the sampling day.

Three different sets of batch scale experiments were conducted. (i) To test transformation of HCB in the sediments of four European rivers, samples taken from 2003 to 2006 were used. Within 2 to 4 weeks of sampling, batch experiments were established, except for sediments collected from the Rhine River. (ii) To assess the effect of laboratory medium compared to river water, samples that were collected in February 2006 from Flix in the Ebro River basin were used. The batch experiments were started within 2 weeks of sampling. In this experiment, two sets of bottles with river water as a growth medium were prepared with and without the addition of lactate as an external electron donor. River water controls without sediment addition were prepared to check if dechlorination occurs in the river water. (iii) Experiments that addressed the effect of temperature on HCB transformation were started in October 2006 with sediments collected in February 2006 from the Ebro River. The river sediments were subjected to temperatures in the range of 4 to 37°C.

Analytical methods. Total masses of chlorinated benzenes were determined by gas chromatography (GC)-mass spectrometry analysis of liquid phase samples. One microliter sediment culture slurry was extracted to 1 ml hexane-acetone (4:1 [vol/vol]) solution via sonication for 20 min, followed by overnight end-over-end shaking at room temperature. At least 95% of the added HCB could be recovered with this procedure. One microliter of the hexane-acetone solution was injected into a Trace DSQ System (Trace [Milan, Italy] DSQ MS Detector and Trace GC Ultra) equipped with an injection splitter (split ratio, 20:1) and an flame ionization detector (FID) connected to a capillary column (30 m by 0.25 μm [inner diameter]; Rtx 5MS [0.25 mm thick]; Restek, PA). The carrier gas was helium, and the inlet pressure was 3 kPa. The operating temperatures of the injector and detector were 220 and 250°C, respectively. The column was operated with the following temperature program: initial column temperature, 60°C (1 min); increase of 5°C/min to a final temperature of 180°C (3 min). Output data were analyzed with the Trace (Milan, Italy) Xcalibur Data System 1.3. The chlorobenzenes (CBs) were quantified using 1,2-DCB and HCB as internal standards. For each bottle, duplicate measurements were done. As little as 2 μM CB could be measured with this detection system. Graphs were drawn from averages of values measured in triplicate microcosms with corresponding standard deviations.

Sampling and nucleic acid extraction. DNA was isolated directly from sediment microcosms using the Fast DNASpinKit for Soil (Qbiogene, Carlsbad, CA) according to the manufacturer's instructions. During the experiments, 1.5 ml sediment-liquid mixture per sampling point from Flix (Ebro River basin) sediment microcosms was stored at −80°C for nucleic acid extraction. RNA was extracted using the FastRNA Pro Soil-Direct Kit (Qbiogene, Carlsbad, CA) according to the manufacturer's instructions with minor modifications (42).

16S rRNA-targeted DGGE, cloning, and sequencing and quantitative PCR. cDNA synthesis, PCR, denaturing gradient gel electrophoresis (DGGE), cloning, and sequence analysis were performed as described previously (41, 42). A complete list of primers used in this study is given in Table S2 in the supplemental material. Real-time quantitative PCR (RT-qPCR) was performed using an iQ5 iCycler (Bio-Rad, Veenendaal, The Netherlands) with the primers and thermocycling program as previously described (37) for 16S rRNA genes of *Dehalococcoides* and total *Bacteria* using SYBR green dye. For comparison, the 16S rRNA copy abundance of two other dechlorinating genera, namely, *Desulfitobacterium* and *Dehalobacter*, was also followed. Members of neither *Desulfitobacterium* nor *Dehalobacter* are currently known to be able to degrade HCB or its transformation products. All of the sampling points were analyzed in triplicate, and no-template controls were included. Regressions with r^2 values of at least 0.994 were fitted to the data. The amplification efficiency was 99 to 103% for 16S rRNA- and 16S rRNA gene-targeted assays and 103 to 108% for reductive dehalogenase-encoding gene-targeted assays. As a measure of the relative abundance of active dechlorinating bacteria, the percentage of 16S rRNA copies of dechlorinating bacteria compared to the number of total bacterial 16S rRNA copies (e.g., [*Dehalococcoides* species 16S rRNA copies/total *Bacteria* 16S rRNA copies] × 100) was calculated. The growth yield of *Dehalococcoides* spp. was calculated as the ratio of 16S rRNA gene copies/ml to the amount of Cl^- per ml released during HCB transformation at the point of HCB depletion by assuming (i) *Dehalococcoides* spp. are the only microorganisms responsible for HCB transformation and (ii) *Dehalococcoides* spp. carry only one copy of the 16S rRNA gene in their genomes.

Detection of reductive dehalogenase genes. Terminal restriction fragment length polymorphism (T-RFLP), sequencing, and qPCR were used to detect *rdh* genes in the genome of strain CBDB1 in sediment microcosms. As described previously by Wagner and coworkers, 13 degenerate primer pairs were used to amplify specific fragments of catalytic-subunit-encoding *rdh* genes (*rdhA*) from strain CBDB1 (44). T-RFLP analysis of 6-carboxyfluorescein (FAM)-labeled fragments amplified from the sample taken in the third week of HCB dechlorination in Flix sediment microcosms was performed by Dr. Van Haeringen Laboratorium b.v. (Wageningen, The Netherlands). Additionally, degenerate primers (forward primer, fdehal, and reverse primer, rdehal [see Table S2 in the supplemental material]) were used to amplify 550- to 660-bp fragments. These primers target conserved motifs in the upstream region of the iron-sulfur cluster binding motif of *rdhA* genes in strain CBDB1 (21). After cloning and sequencing of these PCR fragments, the sequences obtained were compared to those deposited in the National Center for Biotechnology Information (NCBI) database using the BLASTX tool (4). Deduced amino acid sequences were obtained with the TRANSLATE program (http://us.expasy.org/tools/dna.html). Amino acid sequences were aligned using the MUSCLE program (http://www.ebi.ac.uk/Tools/muscle/), and phylogenetic trees (neighbor joining; default settings) were generated by using MEGA version 4.0 (40). cDNA for the detection of *rdh* gene expression was synthesized with random hexamers from 0.1 μg of total RNA using the SuperScript III First-Strand Synthesis System (Invitrogen, Carlsbad, CA) according to the manufacturer's instructions. The expression of two reductive dehalogenase-encoding genes of strain CBDB1, namely, *cbrA* (CAI82345.1) and cbdbA1624 (CAI83644.1), was followed in experiments addressing the effect of temperature on HCB transformation via RT-qPCR using an iQ5 iCycler (Bio-Rad, Veenendaal, The Netherlands) with the primers and thermocycling program as previously described (44). *cbrA* is a 1,2,3,4-tetrachlorobenzene and 1,2,3-trichlorobenzene dehalogenase gene. Furthermore, Wagner and coworkers

TABLE 1. Summary of results from batch biotransformation experiments and quantitative PCR analysis

Location	Nature[a]	Biotransformation expt, HCB			Quantitative PCR analysis[e]	
		$t_{1/2}$ (days) (n^b)	Lag phase[c] (days)	Product[d]	*Dehalococcoides* spp. (10^2 16S rRNA gene copies/ml)	*Bacteria* (10^6 16S rRNA gene copies/ml)
Ebro River						
Reinosa	RS	∞ (3)	ND[1/2]	ND	BDL	0.04 ± 0.01
Conchas de Haro	RS	7–30 (3)	5–48	1,3,5-TCB, 1,3/1,4-DCB	BDL	4.58 ± 1.81
Zaragoza	RS	3–27 (3)	5–19	1,3,5-TCB, 1,3/1,4-DCB	1.46 ± 0.5	1.41 ± 0.03
Monzon	RS	5–6 (2)	<28	1,3,5-TCB, 1,3/1,4-DCB	2.00 ± 0.1	0.63 ± 0.05
Lerida	RS	14–30 (2)	<28	1,3,5-TCB, 1,3/1,4-DCB	6.23 ± 0.3	3.85 ± 0.67
Flix	RS	2–47 (4)	<28	1,3,5-TCB, 1,3/1,4-DCB	3.15 ± 0.16	0.42 ± 0.05
Tortosa	RS	6–12 (2)	<28	1,3,5-TCB, 1,3/1,4-DCB	5.38 ± 0.21	1.68 ± 0.51
Delta rice field	RS	5–62 (4)	<36	1,3,5-TCB, 1,3/1,4-DCB	2.30–4.61 ± 0.1–0.2	2.27 ± 0.28
Delta-estuary	RS	8–11 (2)	<28	1,3/1,4-DCB	0.86 ± 0.14	1.87 ± 0.86
Elbe River						
Schönberg	RS	6–17 (3)	<62	1,3,5-TCB, 1,3/1,4-DCB	BDL–2.15 ± 0.1	1.96 ± 0.12
Schönberg-42	FPS	∞ (2)	ND	ND	BDL	5.33 ± 0.37
Schönberg-45	FPS	6–140 (3)	28–62	1,2,4/1,3,5-TCB, 1,2-DCB	BDL	5.45 ± 0.88
Roßlau	RS	∞ (4)	ND	ND	1.23 ± 0.1	0.35 ± 0.15
Other sampling locations						
Danube River, Budapest	RS	4–64 (3)	5–19	1,3,5-TCB, 1,3/1,4-DCB	1.92 ± 0.11	1.35 ± 0.15
Rhine River, Wageningen	RS	6–14 (2)	<28	1,3,5-TCB, 1,2/1,4-DCB	2.07 ± 0.1	1.01 ± 0.06

[a] RS, river sediment; FPS, flood plain soil.
[b] Calculated half-life (via first-order rate constants) n, number of bottles used for the calculation.
[c] Observed lag phase before dechlorination occurred.
[d] Major chlorinated benzene products after 5 months.
[e] Mean value and standard deviation of (at least) triplicate analysis. BDL, below detection limit.
[f] ND, no transformation could be detected in the experimental period of 153 days.

(44) showed that cbdbA1624 is expressed at levels similar to those of *cbrA* by strain CBDB1 in the presence of 1,2,4-TCB. Expression of both *cbrA* and cbdbA1624 was found to be induced—compared to the other *rdh* genes of strain CBDB1—during 1,2,3-TCB and/or 1,2,4-TCB dechlorination.

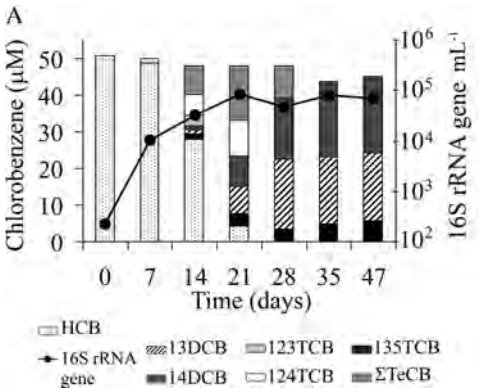
Nucleotide sequence accession numbers. The sequences obtained were deposited in the NCBI database under accession numbers HQ008326 to HQ008336.

RESULTS

Dechlorination of HCB in river sediments from different geographical locations. The primary objective of this survey was to test the anaerobic transformation potential of HCB in sediments of different rivers across Europe. Twelve out of 15 sediments were able to transform HCB to lower chlorinated benzenes (Table 1). HCB was not degraded in abiotic or autoclaved controls, indicating that microbial transformation was responsible for the removal of chlorinated benzenes. Penta- or tetrachlorobenzenes were always below the detection limit, suggesting that these intermediates were dechlorinated rapidly. Monochlorobenzene (MCB) formation was not observed during the 150 days of incubation. The electron donor was completely consumed, and methane accumulation was observed (data not shown). In most cases 1,3,5-TCB and 1,3- and 1,4-DCB were the end products observed after (up to 5 months) incubation. In Schönberg-45 soil and river sediment from Wageningen, 1,2-DCB was also an end product of the transformation (Table 1). Samples from Reinosa, Schönberg-42 soil, and Roßlau were inactive toward HCB, but methanogenic activity was detected in these samples. Lack of dechlorination activity in the Roßlau samples could be due to the large amount of heavy metal deposition in this river (28).

Dehalococcoides was detected in most, but not all, of the samples studied here (Table 1). In most of the samples exhibiting HCB-dechlorinating activity in microcosms, *Dehalococcoides* was present, but in some cases, i.e., Conchas de Haro and the Schönberg flood plain soils, *Dehalococcoides* could not be detected in the sediment or soil prior to the experiments, although HCB dechlorination was observed. The *Dehalococcoides* species 16S rRNA gene copy number per gram of Reinosa, Roßlau, and Schönberg-42 material was below the detection limit, which may explain the lack of transformation by these particular samples. The relative abundance of *Dehalococcoides* species 16S rRNA gene copies was mostly below 0.1% compared to the total *Bacteria* 16S rRNA gene copies. The data from the HCB transformation experiments was used to determine HCB dechlorination rates, where first-order rate constants were calculated from the HCB transformation curves (Table 1). A large variation was observed in degradation rates among the samples from each basin (see Fig. S1 in the supplemental material). These transformation rates had a weak negative correlation (Spearman's rho = -0.33; $P < 0.1$) with the number of *Dehalococcoides* organisms in the samples, suggesting that the initial *Dehalococcoides* species content of the samples is not necessarily indicative of HCB transformation rates. Short half-lives of only a few days were observed for sediments at some locations. One of these, Flix in the River Ebro basin, Spain, was selected for follow-up experiments.

Dechlorination of HCB in river sediment from Flix in the Ebro River basin. Flix sediments were amended with 50 μM HCB to gain additional insight into HCB transformation and the role of *Dehalococcoides* spp. in the process. HCB was completely transformed in all microcosms to 1,3,5-TCB, 1,4-



B

Gene Clusters	Number of genes in each cluster	Detected	Not Detected
cluster 1a	5	cbdbA1453, 1550, 1570, 1595, 1624	
cluster 1b	2	cbdbA1495, 1508	
cluster 1c	4	cbdbA1588, 96, 1582, 1535	
cluster 1d	3	cbdbA1546, 1575	cbdbA1578
cluster 2a_1	2	*cbrA* (cbdbA84), 1563	
cluster 2a_2	1	cbdbA1638	
cluster 2a_3	2	cbdbA1560	cbdbA1627
cluster 2b_1	2		cbdbA1542, 1491
cluster 2b_2	2		cbdbA238, 1455
cluster 2b_3	2		cbdbA1598, 1618
cluster 3	3		cbdbA80, 88, 243
cluster 4a	2	cbdbA1503, 1092	
cluster 4b	2		cbdbA187, 1539

FIG. 1. (A) Transformation of 50 μM HCB in river sediment microcosms from Flix (Ebro River basin, Spain). The bars represent the concentrations of HCB and transformation products. The line represents *Dehalococcoides* species 16S rRNA gene copies/ml (standard deviations are not displayed if they are smaller than the symbol). (B) T-RFLP fingerprinting of *Dehalococcoides* sp. strain CBDB1 reductive dehalogenase (*rdh*) genes in sediment microcosms. The gene clusters are as previously defined in Table 1 of reference 44 and represent the degenerate primer pairs used to amplify specific fragments of all 32 *rdhA* genes of strain CBDB1.

DCB, and 1,3-DCB (Fig. 1A). Throughout the experiment (91 days), MCB production was not detected. Additionally, no changes could be detected in tri- or dichlorobenzene concentrations after the 28th day of the experiment (data not shown). Interestingly, 16S rRNA gene copy numbers of *Dehalococcoides* spp. increased rapidly to 10^4 copies/ml in the first week of the experiment where no HCB dechlorination was observed. Dechlorination proceeded with an additional further increase in 16S rRNA gene copy numbers to 10^5 copies/ml, which was reached after 3 weeks (Fig. 1). Similar population densities were also observed in *Dehalococcoides*-containing enrichment cultures and isolated strains (13, 22, 23, 31). Besides absolute 16S rRNA gene copy numbers, rRNA relative abundance (*Dehalococcoides* species 16S rRNA copies/total *Bacteria* 16S rRNA copies) was used to relate the growth of the species to the transformation of HCB. Even though the rRNA content of metabolically active or inactive *Dehalococcoides* spp. is not known, a strong positive correlation between activity and high rRNA content has been shown for some other microorganisms (24, 25). Over the duration of HCB transformation, the relative abundance of *Dehalococcoides* species rRNA compared to total bacterial rRNA levels increased from 0.7 to 5.7%. This value rapidly decreased again after HCB transformation was complete (see Fig. S2 in the supplemental material). There was no substantial change in the relative abundance of *Desulfitobacterium* species rRNA (less than 0.1% during the experimental period [data not shown]), and *Dehalobacter* species rRNA was not detected at any time (data not shown). The measured *Dehalococcoides* species growth yield was $3.61 \times 10^6 \pm 0.5 \times 10^6$ 16S rRNA gene copies/μmol Cl^- released. *Dehalococcoides* sp. strain CBDB1 and strain 195 were reported to have growth yields 17 and 23 times higher, respectively, than this value during dechlorination of dichlorophenol to monochlorophenol (1).

Dehalococcoides species 16S rRNA-targeted DGGE analysis showed no changes in the composition of the *Dehalococcoides* species population during dechlorination (see Fig. S3A in the supplemental material). The dominant DGGE band corresponded to a single *Dehalococcoides* strain (EU700498), the 16S rRNA sequence of which had 98.1% (~1,200 bp) similarity to that of *Dehalococcoides* sp. strain CBDB1. In addition, during the dechlorination of HCB and its intermediate products, no significant changes were detected in the total bacterial DGGE fingerprints targeting the 16S rRNA gene (see Fig. S3B in the supplemental material).

We used T-RFLP to assess whether the *Dehalococcoides* spp. in Flix river sediment possessed *rdhA* genes corresponding to those previously identified in the genome of strain CBDB1 (44). Analysis of 57 T-RFs in the sample taken in the third week of the experiment showed that the Flix sediment batches contained 19 of the 32 *rdh* genes from strain CBDB1 (Fig. 1B). Almost all of the *rdh* gene sequences belonging to clusters 1a to d, 2a, and 4a were detected. Sequencing of gene fragments (550 to 660 bp) amplified with the fdehal-rdehal primer pair resulted in 11 unique sequences. Deduced amino acid sequences of partial *rdhA* gene sequences from Flix microcosms (184 to 221 residues) were used to generate a tree in which *rdhA* genes from *Dehalococcoides* species isolates with at least 70% similarity to Flix microcosm sequences were also included (Fig. 2). The recently characterized trichlorobenzene reductase-encoding gene, *cbrA*, could be detected with T-RFLP analysis but could not be found in the clone library. In contrast, two genes that could not be detected by T-RFLP analysis (cbdbA1455 and cbdbA1618 of cluster 2b) were found in the clone library. Sequences clustered in several groups. Cluster 1 contained four sequences similar to cbdbA1624 alongside several uncharacterized *rdhA* genes from *Dehalococcoides* species strains KB1, GT, and VS and putative *trans*-dichloroethene-producing reductive dehalogenase from *Dehalococcoides* sp. strain MB (12). Cluster 2 comprised *rdhA5* from *Dehalococcoides* sp. strain FL2 and an uncharacterized *rdhA* gene from strain GT, besides four sequences from Flix microcosms with highest similarity to cbdb1560. The deduced amino acid sequences of RdhA01, RdhA04, and RdhA09 contained at least one stop codon, suggesting that these genes are likely to be nonfunctional.

Dechlorination of HCB in Flix sediment with river water as a growth medium. The Flix sediment was subjected to river water instead of the defined laboratory medium to test whether HCB transformation could be achieved. In all of the river sediment batches, methane production could be observed 20

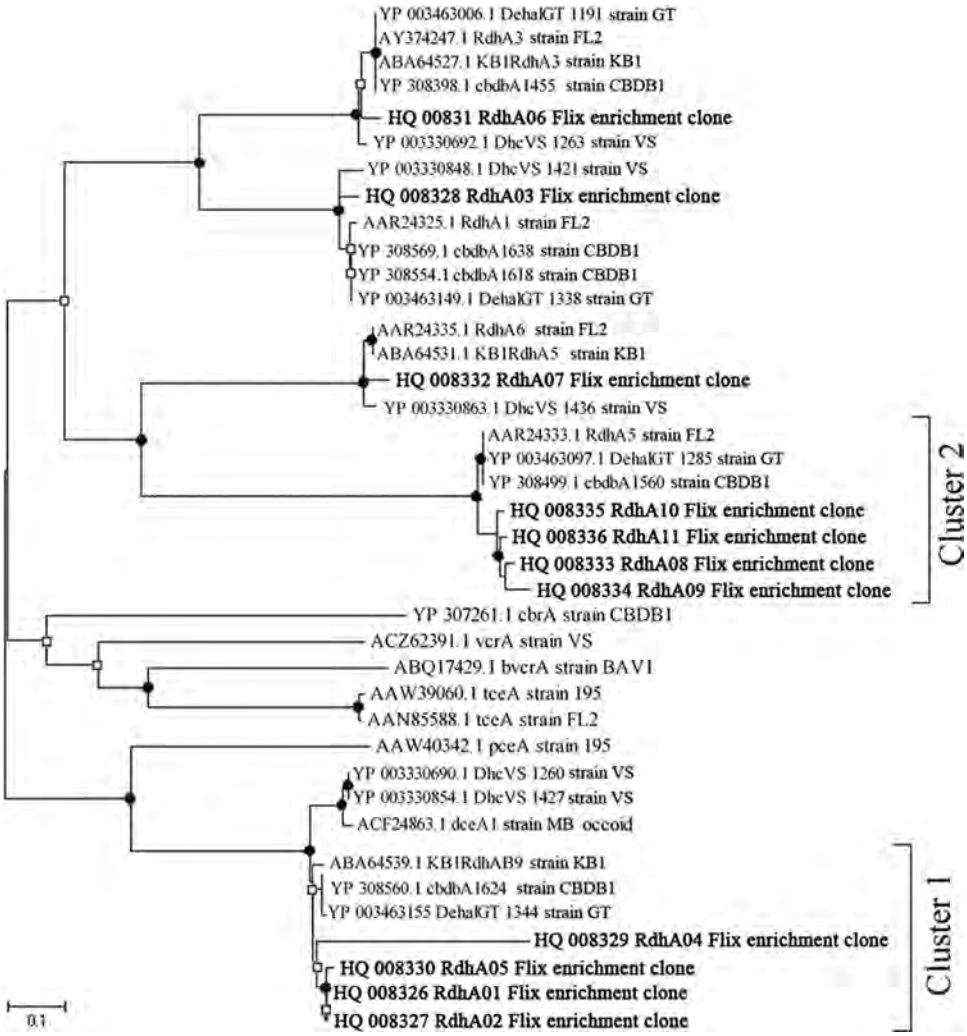


FIG. 2. Phylogenetic analysis of *rdhA* genes amplified from HCB-dechlorinating sediment microcosms from Flix in the Ebro River basin. The unrooted neighbor-joining tree was generated from deduced amino acid sequences of partial *rdhA* gene fragments. Branching points supported by 85 to 100% of 1,000 bootstrap sampling events are indicated by solid circles, and those with 50 to 84% support are indicated by open squares. The scale bar represents 10% sequence divergence. Distances were computed using the Poisson correction method. All positions containing gaps and missing data were eliminated from the data set. The labels show the GI number of the gene, the locus tag of the coding sequence, and the taxonomic name of the *Dehalococcoides* strain. Genes sequenced in this study are presented in boldface.

days after the start of the experiment (data not shown), indicating the development of methanogenic conditions. HCB dechlorination in bottles with lactate started after 10 days, whereas bottles without an external electron donor had a lag phase of 30 days before dechlorination could be observed (see Fig. S4A and B in the supplemental material). Full dechlorination of HCB was achieved in both cases. The end products were similar to those observed in the previous experiment with defined medium, namely, 1,3,5-TCB, 1,3-DCB, and 1,4-DCB. However, more 1,3,5-TCB was produced (compare Fig. 1A with Fig. S4A and B in the supplemental material). No dechlorination was observed in river water controls without sediment. Comparison of DGGE fingerprints showed that active species in the sediment batches had the same fingerprint as *Dehalococcoides* sp. CBDB1 (see Fig. S4C in the supplemental material). On the other hand, these fingerprints were different than those from the predominant endogenous populations observed in the original sediment samples from the sampling location. Molecular screening showed that the activity of *Dehalococcoides* spp. (based on 16S rRNA) increased during dechlorination, covering 0.5 to 0.9% of the bacterial 16S rRNA pool, in the absence and presence, respectively, of the external electron donor (see Fig. S4D in the supplemental material). Bottles with the external electron donor showed a pattern of activity similar to that observed in the bottles with a defined medium. On the other hand, incubations without an external electron donor showed a more gradual increase and decrease in the 16S rRNA copy numbers, as well as a 2-fold-lower maximal relative abundance.

Dechlorination of HCB at different temperatures. In order to assess whether seasonal differences in ambient temperature have an effect on HCB transformation, the Flix river sediment was subjected to temperatures between 4 and 37°C. Transformation of 30 μM HCB was observed at all tested temperatures,

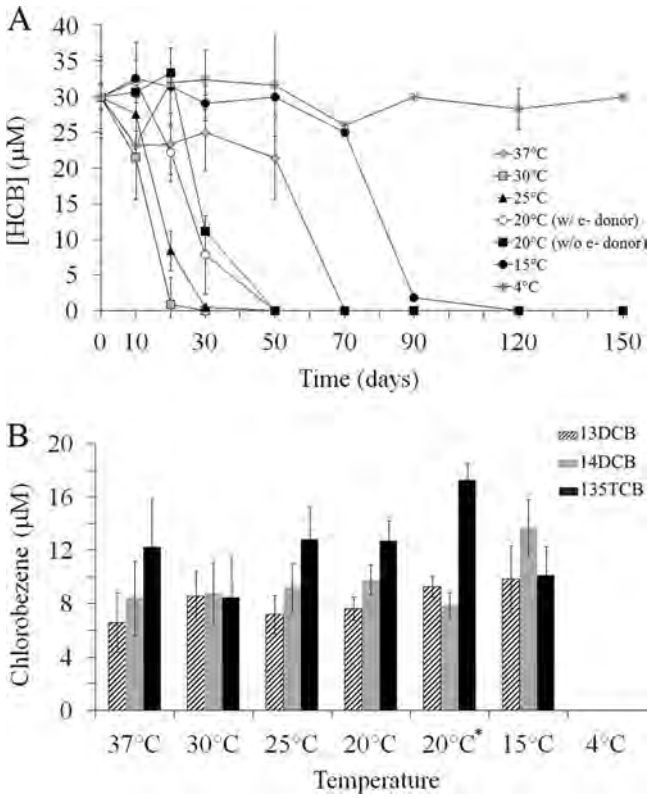


FIG. 3. (A) Transformation of HCB at various temperatures (4 to 37°C) in Flix river sediment. "20°C w/e- donor" represents the batch microcosm at 20°C with lactate as an electron (e^-) donor. "20°C w/o e- donor" represents the batch microcosm at 20°C without any additional e^- donor. (B) HCB transformation products at the end of the experiment (150 days). The asterisk represents the batch microcosm at 20°C without any additional e^- donor. The data points are averages of duplicate measurements of triplicate bottles. The error bars represent the standard deviations between the triplicate microcosms.

except for 4°C (Fig. 3A). The highest HCB transformation rates were observed at 25°C and 30°C, whereas at temperatures below 20°C or above 30°C, the dechlorination rate dropped considerably (Fig. 3A). The results indicated that it was still possible to have reductive dechlorination at low temperatures, yet the time needed for complete degradation almost doubled (from 50 days at 20°C to more than 100 days at 15°C). Similar to the results obtained in the river water microcosms, at 20°C, the lack of an added external electron donor slightly delayed the start of HCB dechlorination. Interestingly, more 1,3,5-TCB was produced in microcosms without an added electron donor (Fig. 3B). There were no prominent differences between the end products of the transformation process at 30°C and 15°C (Fig. 4). 16S rRNA gene copies of *Dehalococcoides* spp. increased with HCB depletion at 30°C. On the other hand, at 15°C *Dehalococcoides* species copy numbers increased gradually without a significant change in HCB concentrations. Additionally, the relative abundance of *Dehalococcoides* species 16S rRNA increased to its highest level (5.2% ± 1.0% at 30°C and 5.5% ± 1.2% at 15°C) (see Fig. S5 in the supplemental material) during HCB dechlorination. DGGE fingerprinting showed that at both temperatures the *Dehalococcoides* species 16S rRNA composition was the same in the batches, dominated by a single band (data not shown).

To further investigate the involvement of specific reductive dehalogenases in the transformation of HCB, we also measured transcript levels of 1,2,3,4-TeCB and 1,2,3-TCB reductase-encoding *cbrA* and cbdbA1624, the latter of which is potentially involved in 1,2,4-TCB degradation (44). Transcript copy numbers were normalized to 16S rRNA and examined during the transformation of HCB at the two different temperatures (Fig. 5). At both temperatures, transcription of *cbrA* could be detected from the early weeks of the experiment, whereas transcription of cbdbA1624 could be observed only during the later phases of dechlorination. At 30°C, the relative transcript levels of *cbrA* increased by an order of magnitude compared to the beginning of the experiment (Fig. 5A). A similar response was observed during 1,2,3-TCB and 1,2,4-TCB dechlorination by strain CBDB1 (44). Throughout the experiment, *cbrA* transcript levels were found to be 3- to 50-fold higher than those at the start of the incubation. When transcribed, the expression of cbdbA1624 was lower than that of *cbrA*. At 15°C, transcription of the two genes was not detected at the beginning of the experiment. Later, *cbrA* was transcribed at a constant level until the transformation of HCB was set off. The *cbrA* transcription increased by only 1 order of magnitude once HCB transformation and accumulation of intermediates could be observed (Fig. 5B). On the other hand, cbdbA1624 did not follow a particular pattern, and its transcription level remained lower than that of *cbrA* (except for the sample taken at day 20 of incubation). Interestingly the

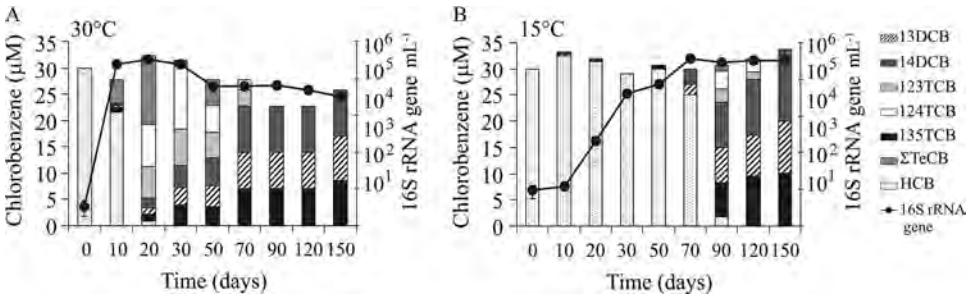


FIG. 4. Transformation of 30 μM HCB in microcosms incubated at 30°C (A) and 15°C (B). The bars represent changes in the concentrations of HCB and the end products of transformation (with an average standard deviation of 5 μM). The lines represent *Dehalococcoides* species 16S rRNA gene copies/ml. The error bars represent the standard deviations of duplicate measurements (standard deviations are not displayed if they are smaller than the symbol). A lack of data points indicates that concentrations were below the detection limit.

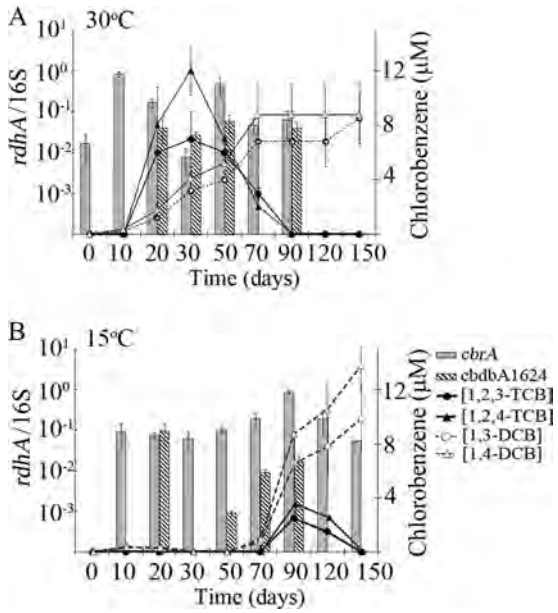


FIG. 5. Expression of *cbrA* and cbdbA1624 genes at 30°C (A) and 15°C (B) in sediment microcosms. Normalization was based on 16S rRNA copies. The bars represent the ratio of each *rdh* transcript to 16S rRNA. The error bars represent the standard deviations of duplicate measurements. When not detected, the gene expression in the samples is not displayed. The lines represent changes in HCB concentrations; The error bars represent average measurements of triplicates.

cbdbA1624 transcription level increased in the later stages of the experiment where 1,2,4-TCB dechlorination was observed. Subsequently, the number of *Dehalococcoides* 16S rRNA copies present in batch cultures was compared to the sum of *cbrA* and cbdbA1624 transcript copies. This comparison was made to determine whether a positive linear correlation existed between 16S rRNA and *rdh* gene transcription, as an indication of overall metabolic activity in relation to *rdh* transcription (see Fig. S6 in the supplemental material). A strong positive linear correlation (r^2 = 0.969) was found in the microcosms at 15°C, whereas a weaker correlation (r^2 = 0.636) was observed at 30°C.

DISCUSSION

In this study, we used a combination of molecular tools with chemical analysis to determine the role of *Dehalococcoides* spp. in the transformation process of HCB in river sediment microcosms. The majority of samples tested exhibited the capacity to dechlorinate HCB irrespective of the amount of HCB or *Dehalococcoides* spp. present *in situ*. The relatively widespread capability of sediments and soils to transform HCB is remarkable but not entirely unexpected. Although the amount of HCB in the environment has been decreasing over the past 3 to 4 decades, there still remains a substantial amount (between 10,000 and 26,000 tons worldwide) due to the global turnover of HCB (6). Our previous studies on these sediments indicated that the *in situ Dehalococcoides* composition is highly heterogeneous and cannot always be significantly correlated with HCB contamination (42). A similar conclusion could be drawn from the present study, as we observed only a weak correlation between *Dehalococcoides* species abundance in sediments and the rate at which the transformation of HCB took place in microcosms. Therefore, it could be postulated that not all of the *Dehalococcoides* spp. detected in sediments were capable of transforming HCB and/or that other populations not detected by the assays used in this study are at least partially responsible for HCB dechlorination. The 16S rRNA gene-based detection of *Dehalococcoides* used here overlooks the involvement of populations like strain DF-1, Lahn, and Tidal Flat clusters (26, 27), which are closely related to but not within the genus *Dehalococcoides*. It should be noted, however, that the current data set is small from a statistical viewpoint and may be too small to observe significant and/or strong correlations.

Even though dechlorination capacity and *Dehalococcoides* spp. were present in the samples, HCB contamination is still prevalent in the environment. This is not entirely unexpected, since the transformation experiments described here were carried out under optimized conditions for the dechlorinating bacteria, e.g., the medium contained, to the best of our knowledge, every nutrient the microorganisms might require. For example, as nonfermentative bacteria, *Dehalococcoides* spp. depend in the environment on the H_2 supplied by other microorganisms (38). Conversely, our results also showed that river water and sediment microorganisms could support the growth and dechlorination activity of *Dehalococcoides* spp. This discrepancy with the real-life situation of HCB still being present in the sediment indicates that prevailing environmental conditions often do not allow complete natural attenuation of HCB by *Dehalococcoides* spp. in contaminated sediments. However, compared to chemical (e.g., chemical reaction with hydroxyl [OH] radicals, with a half-life of 156 days to 4.2 years) or physical (e.g., atmospheric photolysis, with a suggested half-life of about 80 days) processes, biological reductive dechlorination of HCB with the half-lives observed in this study, ranging from 2 to 62 days, is a relatively fast process, provided that the conditions are suitable for dechlorination. Moreover, the results presented in this study support the findings of recent multimedia fate models, which predict that, on a global scale, the greatest losses of HCB in the environment may occur from sediment and soils (6).

Significant changes in the 16S rRNA relative abundance and 16S rRNA gene copy numbers of *Dehalococcoides* spp. were observed in all microcosms during HCB dechlorination. The results suggested the involvement of *Dehalococcoides* spp. in reductive dechlorination of HCB, while 16S rRNA sequence analysis confirmed the high sequence identity of *Dehalococcoides* spp. from the microcosm to strain CBDB1. We observed an increase in *Dehalococcoides* 16S rRNA gene copies before HCB transformation, which contradicts the recent knowledge that *Dehalococcoides* spp. can only use chlorinated compounds as their electron acceptor. Sequenced *Dehalococcoides* genomes have shown no strong indication of the presence of genes encoding enzymes involved in the use of any other electron acceptors (29, 32, 35). However, the sequenced species were enriched and maintained in the laboratory for a long time solely on chlorinated compounds and might have lost their ability to use other compounds. Even though we lack sound experimental proof, it is tempting to speculate, based on this observation, that *Dehalococcoides* might be able to use other

naturally produced (chloro)organic compounds, such as humic acids, as the electron acceptor in these river sediments. This should be addressed in future studies, aiming at a more profound understanding of the *in situ* ecophysiology of *Dehalococcoides* spp.

Experiments showed that, like the laboratory isolates, naturally occurring *Dehalococcoides* spp. are mesophilic and can tolerate 15 to 20°C environments, as well. Decreasing temperature caused a significant delay in the dechlorination of HCB and growth of *Dehalococcoides* spp. Our results also showed that *Dehalococcoides* spp. in the Flix sediment are not adapted to temperatures as low as 4°C. Tetrachloroethene (PCE) and polychlorinated biphenyls (PCBs) can be transformed at low temperatures (4 to 12°C) (9, 33); however, the involvement of *Dehalococcoides* spp. in these transformations is not known. There was no notable difference in the composition and relative abundance of the genus between 30°C and 15°C. It can therefore be assumed that below the optimum growth temperature of *Dehalococcoides* spp., HCB dechlorination is possible, with longer lag phases. Moreover, this experiment could not confirm our prediction from *in situ* surveys that temperature has a significant effect on *Dehalococcoides* species composition. The *Dehalococcoides* species population involved in HCB dechlorination in the microcosm showed 95.5 to 98.2% 16S rRNA sequence similarity to *Dehalococcoides* spp. detected in the sampling location (42) and 98.1% similarity to strain CBDB1. However, it should be kept in mind that the conditions used for *in vitro* microcosm experiments are selective and might not be ideal to support the growth of all endogenous *Dehalococcoides* species populations, which are involved in HCB transformation in these sediments at different seasons throughout the year.

The *Dehalococcoides* species 16S rRNA gene is highly conserved among currently known species. However, there are considerable differences in *rdh* gene contents (30). HCB transformation end products in microcosms were most similar to those reported for strain CBDB1. For this reason, we have focused on *rdh* genes from this strain. PCR assays targeting all *rdh* genes predicted from the genome sequence of strain CBDB1 showed the presence of 19 *rdh* genes in the microcosm. However, efforts to confirm this finding with sequencing were not successful. Our repeated attempts to amplify full-length fragments of *rdhA* genes (~1.7 kb) with the primer pair RRF2-B1R (21) did not result in any PCR product. Even though the majority of known *rdh* genes from *Dehalococcoides* spp. were amplified using this primer set (21, 39), it also failed to amplify some *rdh* genes (21, 45). Additionally, in the full genome sequence of strain CBDB1, there are only four *rdhA* genes that have a perfect binding site to these primers. Sequencing of partial *rdhA* genes with the fdehal-rdehal primer pair showed conflicting results by amplifying two genes that could not be detected with T-RFLP analysis and showing low *rdh* gene diversity. The fdehal-rdehal primer pair has binding sites in two *rdhA* genes of strain CBDB1, cbdbA1495 and cbdbA1550; however, sequences obtained from the Flix microcosms showed only moderate similarity to these genes. The high overall sequence variability of *rdhA* genes required the use of degenerate primer pairs, but primer degeneracy introduces difficulties in detecting highly variable or low-abundance sequences (44). Nevertheless, we were able to gain a significant amount of information about *rdh* gene content and transcription in the microcosms. Flix sediment microcosms contained multiple copies of *rdh* genes, as previously shown for *Dehalococcoides* isolates and enrichments. Moreover, most of the genes detected via T-RFLP and sequencing analysis in the microcosms were also found *in situ* with functional gene microarrays (42). The 16S rRNA concentrations and *cbrA* transcription increased concurrently during dechlorination, supporting previous reports on the metabolic involvement of this gene in one of the HCB degradation pathways (44). The transcription of *cbrA* in the early phases of the degradation could also be an indication of the involvement of the gene in dechlorination of highly chlorinated benzenes. However, *cbrA* was consistently transcribed in most of the microcosms even after dechlorination was complete. As a result, substrate specificity and/or tight transcriptional regulation of the gene in our case is uncertain. Transcription of cbdbA1624 could not be correlated with *Dehalococcoides* growth and was observed only when HCB dechlorination had already started. Lack of expression during early HCB dechlorination supports the idea that the corresponding gene product is involved in dechlorination of lower chlorinated benzenes. Interestingly, at 15°C, *rdh* gene transcripts showed a stronger correlation with 16S rRNA copy numbers than at 30°C. Therefore, it can be speculated that at mesophilic temperatures, besides *cbrA* and cbdbA1624, some other *rdh* genes contribute significantly to the metabolic activity. Complex transcriptional responses to various chlorinated compounds were previously reported for *Dehalococcoides* isolates and cocultures (16, 44, 45) and were predicted to be tightly regulated by two-component and/or MarR-type regulators (29, 35). The majority of *rdh* genes detected with T-RFLP and sequencing analysis were similar to those of strain CBDB1, which are located close to MarR-type regulators. These regulators were shown to have "phenolic-sensing capabilities" (47) and to activate or repress gene expression during aromatic-compound degradation (43) in several other bacteria. It has been suggested that the possibly MarR-regulated *rdhA* genes might play an important role in haloaromatic compound degradation pathways (29). Since these genes could be detected both *in situ* and in sediment microcosms, it is tempting to speculate that they carry a great potential to be used as biomarkers of anaerobic haloaromatic-compound degradation capacity.

Conclusions. The HCB transformation capability of the river systems studied here is a promising indicator of their *in situ* capability for pollutant biodegradation. More environmental surveys are still needed to fully understand the degradation of halogenated aromatic pollutants, like HCB, in river basins. As strictly anaerobic and mesophilic bacteria, *Dehalococcoides* spp. were shown to take part in HCB transformation and to be resistant and adaptable to different temperatures. Our results suggest that similarities in *rdh* gene content and 16S rRNA-based identity can be used to assess HCB dechlorination capability and as possible indicators of degradation pathways. However, it is also evident that with biomolecular assays targeting ribosomal and process-specific functional genes, such as those encoding reductive dehalogenases, it will remain difficult to understand the full extent of the process, since the dechlorination process is part of a complex web of metabolic and regulatory interactions (34, 46). Future efforts focusing on

gene trait matching and elucidation of structure-function relationships for possibly MarR-regulated *rdhA* genes of *Dehalococcoides* spp. will further improve the predictive power of these molecular analyses.

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Dechlorination of Commercial PCBs and Other Multiple Halogenated Compounds by a Sediment-Free Culture Containing *Dehalococcoides* and *Dehalobacter*

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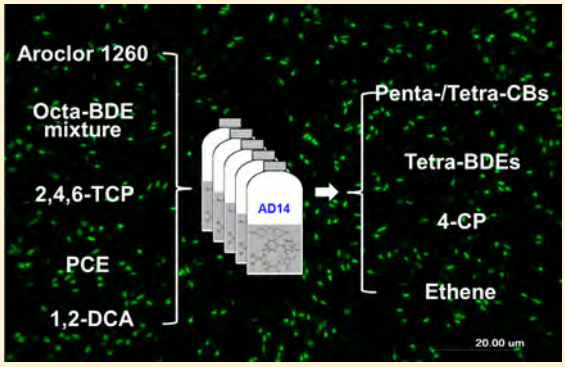
Supporting Information

ABSTRACT: At the contaminated sites, polychlorinated biphenyls (PCBs) frequently coexist with other halogenated compounds, such as polybrominated diphenyl ethers (PBDEs), chloroethanes, and chloroethenes. The presence of multiple halogenated compounds usually poses toxicity to dehalogenating microbes, because few cultures are capable of detoxifying a broad spectrum of halogenated compounds. In this study, a sediment-free culture, designed as AD14, is able to sequentially remove halogens from PCBs and other cocontaminants. Culture AD14 dechlorinated the commercial PCB mixture—Aroclor 1260—mainly by removing flanked *para*- and doubly flanked *meta*-chlorines. It also dehalogenated octa-brominated diphenyl ether mixture predominantly to tetra-BDEs, 2,4,6-trichlorophenol (2,4,6-TCP) to 4-CP, and tetrachloroethene (PCE)/1,2-dichloroethane (1,2-DCA) completely to ethene. When applied to a mixture of the above-mentioned compounds, culture AD14 stepwise removed halogens from 2,4,6-TCP, 1,2-DCA, PCE, PBDEs, and PCBs. Illumina sequencing analysis of 16S rRNA genes showed that only two known dechlorinating genera, *Dehalococcoides* and *Dehalobacter*, were present in culture AD14. Quantitative real-time PCR analysis showed that the 16S rRNA gene copies of *Dehalococcoides* and *Dehalobacter* increased from 1.14×10^5 to 7.04×10^6 copies mL^{-1} and from 1.15×10^5 to 8.20×10^6 copies mL^{-1} after removing 41.13 μM of total chlorine from PCBs. The above results suggest that both *Dehalobacter* and *Dehalococcoides* could be responsible for PCB dechlorination. Although two *Dehalococoides mccartyi* strains with identical 16S rRNA genes were isolated from the PCBs-dechlorinating mixed culture using trichloroethene (TCE) and vinyl chloride (VC) as alternatives to PCBs, the two isolates are incapable of dechlorinating PCBs. In all, culture AD14 is promising for bioremediation applications at sites cocontaminated with PCBs and other halogenated compounds.



INTRODUCTION

Polychlorinated biphenyls (PCBs) are a family of 209 congeners that were produced and sold as complex mixtures, e.g., Aroclor 1260. Although the production of PCBs has been banned in most countries since the late 1970s, their massive industrial usage has resulted in their widespread distribution in sediments of many lakes, rivers, and harbors.[1] Thus, PCBs still remain a major concern to the health of human beings and ecosystems.[2] For example, an exponential increase in the concentrations of PCBs and polybrominated diphenyl ethers (PBDEs) was found in dolphins and sharks from Florida coastal waters based on a 10-year period study.[3] A more troublesome problem is that many PCB-contaminated sites are cocontaminated by other various halogenated compounds such as PBDEs[4,5] and chloroethenes,[6] posing challenges to the bioremediation strategies.

Thus far, chlorine removal from highly chlorinated PCB congeners has been observed in anaerobic environments via a microbial reductive dechlorination process.[7] Many PCB-dechlorinating cultures have been established with sediments from different geographic sites, in which the PCB dechlorinators were identified to be either *Dehalococcoides*[7−11] or *o*-17/DF-1-like *Chloroflexi* bacteria.[7,10,12] Among them, only three cultures showed the capabilities to dehalogenate both PCBs and other halogenated compounds, i.e., *Dehalococcoides mccartyi* strain 195, *Dehalococcoides mccartyi* strain CBDB1 and *Dehalobium chlorocoercia* DF-1.[8,11,13,14] Strain 195, best known for perchloroethene (PCE) and trichloroethene (TCE) dechlorination, has been reported to dehalogenate three PCB congeners[11] and PBDEs.[13] Strain CBDB1 has broad dechlorination activity on chlorinated aromatic compounds, e.g., chlorobenzenes,[15] chlorinated dioxins,[16] and Aroclor 1260.[8] Bacterium DF-1 can dechlorinate weathered Aroclor 1260 through attacking double-flanked chlorines,[14] and hexachlorobenzene to 1,3,5-trichlorobenzene.[17] However,

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strain 195 is known only to dechlorinate PCB congeners chlorinated on a single ring (i.e., 23456-CB, 2346-CB, and 2356-CB), which are usually not the PCBs present at contaminated sites. Information on PDBE debromination by both strains CBDB1 and DF-1 is not available, and their PCE/TCE dechlorination can only extend to *trans*- and *cis*-dichloroethenes (DCEs).[18,19] Therefore, information remains limited on cultures capable of dehalogenating mixtures of PCBs and their frequently coexisting halogenated compounds (e.g., PBDEs and chloroethenes). Furthermore, the effect of the coexistence of other halogenated compounds on PCBs dechlorination is still unknown.

The aim of this work was to cultivate and characterize an enrichment culture AD14 that could extensively dechlorinate Aroclor 1260 and other multiple halogenated compounds; to identify the dechlorinating bacteria by using 16S rRNA gene based Illumina sequencing approach; to further enrich and isolate the dechlorinators by using alternative chlorinated compounds (e.g., chloroethenes).

■ MATERIALS AND METHODS

Chemicals. Unless otherwise stated, chemicals were purchased from Sigma-Aldrich at the highest purity available. All PCBs were purchased from AccuStandard (New Haven, CT, U.S.). H_2 was obtained from a hydrogen generator (NM-H250, Schmidlin-DBS AG, Neuheim, Switzerland).

Microcosm Preparation, Culture Transferring and Growth Conditions. The slurry used for preparing PCB dechlorinating microcosms was sampled from an anaerobic digester in a wastewater treatment plant in Gehua (Hubei Province, P.R. China), in which concentrations of PCBs, PBDEs, chlorophenols, chloroethenes, and chloroethanes were under detection limit (<0.1 μM). The sample was acquired by filling sterile 50-mL plastic Falcon tubes that were capped and transported to the laboratory at an ambient temperature. Microcosm setup was conducted in anaerobic chamber as previously described.[13,20] Briefly, 90 mL of bicarbonate-buffered mineral salt medium amended with 10 mM of lactate was dispensed into 160 mL serum bottles containing 10 mL of the slurry. The bottles were sealed with black butyl rubber septa (Geo-Microbial Technologies, Ochelata, OK, U.S.) and secured with aluminum crimp caps. Then, a 60 μL of Aroclor 1260 (AccuStandard, New Haven, CT, U.S.) stock solution (50 mg of total PCBs per mL) in GC grade isooctane was spiked into the medium to a final concentration of 30 ppm (or 80.65 μM). The microcosms were incubated stationary in the dark at 30 °C. PCB dechlorination activities were measured frequently with a gas chromatograph equipped with an electron capture detector (GC-ECD), as described in the following section. Sediment-free cultures were obtained by six consecutive supernatant transfers of the active microcosm to the same fresh medium (5%, v/v) as described.[20] Cultures amended with two individual PCB congeners (i.e., 2345-245-CB and 234-245-CB) were also prepared to determine their dechlorination pathways in the sediment-free cultures. The sediment-free PCB dechlorinating culture was used to inoculate (2%, v/v) four subcultures amended with PCE (~0.7 mM), 1,2-DCA (~0.6 mM), 2,4,6-TCP (~50 μM), and octa-BDE mixture (0.4 ppm, dissolved in TCE), respectively. Cultures amended with all these halogenated compounds (~ 15 ppm or 40.32 μM Aroclor 1260, ~0.1 mM PCE, ~0.6 mM 1,2-DCA, ~10 μM 2,4,6-TCP and 0.1 ppm octa-BDE mixture) together were also prepared to study their inhibition effects to PCB dechlorination and their dechlorination priorities. After observing dehalogenation activities in the four subcultures, enrichments through serial transfers were conducted using the same halogenated compound in the media amended with acetate (10 mM)/hydrogen (5×10^4 Pa or 0.40 mM), a vitamin solution consisting of 0.05 mg l^{-1} of vitamin B_{12}, and 2% inocula of respective subcultures to prevent the growth of fermentative bacteria.[13] Since *Dehalococcoides* resist the antibiotic ampicillin, further enrichment was conducted by serial dilutions in 20 mL vials filled with 10 mL of mineral salts medium spiked with TCE (0.8 mM) or VC (0.4 mM), acetate (10 mM), hydrogen (5×10^4 Pa or 0.40 mM), and ampicillin (50 ppm). Culture purity was confirmed via DGGE, clone library and qPCR analysis. After obtaining pure cultures, dechlorination time-course studies were conducted in triplicate 160-mL serum bottles containing 100 mL of mineral salts medium amended with TCE (~0.8 mM) or VC (~0.4 mM), acetate (10 mM)/hydrogen (5×10^4 Pa or 0.40 mM), a vitamin solution consisting of 0.05 mg L^{-1} of vitamin B_{12}, and 5% inocula. The following compounds were tested on the new isolates as a sole electron acceptor: chlorinated ethenes (DCE isomers and VC) (0.2 mM); 1,2-DCA (0.2 mM), Aroclor1260 (30 ppm), octa-BDE mixture (0.5 μM), or 2,4,6-TCP (50 μM). In addition, the isolates were also tested for their ability to use the following compounds (10 mM each): fumarate, malate, lactate, pyruvate, glucose, glumate, sulfate, sulfite, nitrate, or nitrite. All experiments were set up in triplicate. Duplicate abiotic controls (without bacterial inocula) and non-PCB controls (without PCBs injection) were also set up for each experiment.

Analytical Methods. Headspace samples of chloroethanes, chloroethenes, and ethene were injected manually with a glass, gastight, luer lock syringe (Hamilton, Reno, NV, U.S.) into a gas chromatograph (GC) 6890N equipped with a flame ionization detector (Agilent, Wilmington, DE, U.S.) and a GS-GasPro column (30 m × 0.32 mm × 0.25 μm film thickness; J&W Scientific, Folsom, CA, U.S.). PCBs, PBDEs, and chlorophenols were extracted as described.[21] Before chlorophenols' extraction, derivatization was conducted by taking 1 mL of liquid sample and mixing with 5 mL of potassium carbonate solution (5% w/v), acetylated with 200 uL acetic anhydride. PCBs were measured with the same GC but equipped with an electron capture detector (GC-ECD) and a DB-5 capillary column (30 m × 0.32 mm × 0.25 μm film thickness; J&W Scientific, Folsom, CA, U.S.) as described.[22] The temperature program was initially held at 170 °C for 5 min, increased at 2.5 °C min^{-1} to 260 °C, and held for 10 min. Injector and detector temperature were 250 and 300 °C, respectively. Nitrogen was used as the carrier gas at a flow rate of 1.2 mL min^{-1}. Sample of one μL was injected into the GC inlet in a splitless mode. The elution time of all 209 PCB congeners was determined with PCB congener mixtures 1 through 9 from AccuStandard. The relative elution time of the PCBs in these mixtures were published for the DB-5 column.[23] PCBs were quantified by using a customized calibration standard prepared from Aroclor 1260 plus 33 congeners that are possible dechlorination products and intermediates.[24] Additional congeners were quantified from standards prepared from the AccuStandard PCB congener mixtures. Mole percent value for each congener, total number of chlorines per biphenyl and the PCB homologue distribution were calculated as described.[25] PBDEs were tested and quantified by gas chromatograph/mass spectrometer (GC-MS) with a model of GC 6890/MSD 5975 apparatus (Agilent, Wilmington, DE,

U.S.) equipped with a Restek Rxi-5 ms column (15 m × 0.25 mm × 0.25 μm film thickness; Restek Corporation, Bellefonte, PA, U.S.) as described.[21] Chlorophenols (2,4,6-TCP, 2,4-DCP and 4-CP) were analyzed on a GC-MS set in a selected ion monitoring mode (QP 2010, Shimadzu Corporation, Japan) and equipped with an HP-5 capillary column (30 m × 0.32 mm × 0.25 μm film thickness; J&W Scientific, Folsom, CA, U.S.). The oven temperature of the GC-MS was initially set at 40 °C, increased at 15 °C min^{-1} to 200 °C, and held for 3 min. Helium was used as the carrier gas, with a column flow of 1.92 mL min^{-1}. Derivatized sample of 1 μL was injected into the GC inlet in a splitless mode with 250 °C injector temperature. Chlorophenols were quantified by using customized calibration standards at gradient concentrations from 5, 10, 20, 30, 40, 50, to 60 μM.

DNA Extraction, PCR, Clone Library, And Sequencing. Total genomic DNA was extracted from 1 mL of dehalogenating culture and the control according to the manufacturer's instructions (DNA extraction kits, QIAGEN, Hilden, Germany) but with minor modifications.[26] The concentration of the nucleic acid was determined by a Nanodrop-1000 instrument (NanoDrop Technologies, Wilmington, DE, U.S.). Amplifications of 16S rRNA gene and other gene sequences were conducted with GoldTaq DNA polymerase (Applied Biosystems, Foster City, CA, U.S.) by using a Mastercycler (Eppendorf, Hamburg, Germany) under conditions previously described.[20] The primer sequences used in this study are shown in Table S1 of the Supporting Information, SI. Clone libraries were established by using TOPO-TA cloning kit (Invitrogen, Carlsbad, CA, U.S.), and all further clone-based experiments were carried out as previously described.[26] Purified plasmids or PCR products were sequenced and aligned by using MEGA4.[27]

Illumina High Throughput Sequencing Analysis of 16S rRNA Genes. To analyze the taxonomic composition of the sediment-free PCB dechlorinating culture, the V9 region of the 16S rRNA gene (from base 1392-1509, *E.coli* numbering) was chosen for PCR amplification with the universal primer set (targeting most of the archaeal 16S rRNA genes) containing a barcode sequence (underlined) - 1392F (5′-ACAGCTCAG-YACACACCGCCCGTC-3′) and 1492R (5′-GGYTACCTT-GTTACGACTT-3′). Amplified PCR products were purified by using QIAquick PCR purification kit (QIAGEN, GmbH, Germany) according to the manufacturer's instructions. Then the PCR sample was mixed with other samples for subsequent Illumina high throughput sequencing, of which sequences will be differentiated based on barcode sequences of the forward primers. Illumina (Highseq2000, Illumina, San Diego, CA, U.S.) sequencing services were provided by BGI (Hongkong, P.R. China). Raw sequencing reads were checked for their quality through elimination of sequences that did not perfectly match the proximal PCR primer and that with short sequencing length (<70 nt). A total of 34 724 pair-end reads were obtained for the PCB dechlorinating culture with an average read length of 120 bp. Pair-end reads were joined to form longer composite reads by using the SHERA software package.[28] Sequence alignments were conducted with each subset reads based on NAST,[29] and with other settings kept at their default values as described.[30] After NAST alignment, aligned subsets were merged into one Microsoft Excel file, in which sequences were clustered (based on 97% of sequence similarity) according to template ID. Manual adjustments were performed to improve the alignment and clustering whenever necessary. Representative sequences for each cluster were identified through RDP Classifier with 100% coverage and 95% confidence threshold[31] and BLAST analysis,[32] which were further utilized to construct phylogenetic tree by using MEGA 4.[27]

DGGE. PCR products amplified with the GC-clamped primer sets were separated on an 8% polyacrylamide gel with a gradient range of 30−60% (100% denaturant consisting of 7 M urea and 40% deionized formamide) in 0.5 × TAE buffer. Gradient gels were cast with Bio-Rad's Model 475 gradient delivery system (Bio-Rad, Hercules, CA, U.S.) as described.[33] The electrophoresis was performed for 15 h at a constant electric current of 30 mA and a temperature of 60 °C with the D-Code Mutation Detection System (Bio-Rad, Hercules, CA, U.S.). Gel images of SYBR Gold (Invitrogen, Carlsbad, CA, U.S.) staining DNA were taken by using a Molecular Imager Gel Doc XR System (Bio-Rad, Hercules, CA, U.S.). Bands of interest were excised and DNA fragments were extracted by using the QIAEX II Gel Extraction Kit (QIAGEN, GmbH, Germany). The captured DNAs were then PCR reamplified and reanalyzed by DGGE to confirm that single bands were obtained before sending the PCR reamplified products for sequencing. Two step DGGE (2S-DGGE) was performed as previously described,[33] which was developed to obtain full-length 16S rRNA gene sequences simultaneously from multiple samples.[33]

qPCR. A TaqMan quantitative real-time PCR (qPCR) (ABI 7500 Fast real-time PCR system; ABI, Foster City, CA, U.S.) assay was performed in triplicate for PCB dechlorinating cultures by using *Bacteria* and *Dehalococcoides* 16S rRNA gene-targeted and *tce*A/*vcr*A gene-targeted primers/probes, respectively, as described previously.[26] *Dehalobacter* species in these cultures was quantified by targeting 16S rRNA genes using SYBR green assays. The primer and probe sequences used in this study were shown in Table S1 of the SI. A calibration curve was obtained by using 10-fold serial dilutions of known plasmid DNA concentrations. The standard curves spanned a range of 10^2 to 10^8 gene copies per μL of template DNA. Nuclease-free water or plasmid without an insert was used as the negative control.

Nucleotide Sequence Accession Numbers. The nucleotide sequence data obtained in this study were submitted to the Genbank with the following accession numbers: KC342960-KC342971.

RESULTS

Reductive Dechlorination of Aroclor 1260. A sediment-free culture, designed as culture AD14, was obtained after six serial transfers (5% inocula, v/v) in the defined medium amended with Aroclor 1260 (30 ppm or 80.65 μM) and lactate (10 mM). Figure 1 showed the PCB congener distribution in abiotic controls (without inocula) and in cultures AD14 after 120 days of incubation. The abiotic controls showed no obvious difference from original Aroclor 1260. In culture AD14, major hexa- through octa-CB congeners of Aroclor 1260 were substantially dechlorinated to lower halogenated PCB congeners, of which the prominent dechlorination products were penta- (i.e., 245-25-CB, 245-24-CB, 235-25-CB, and 236-24-CB) and tetra-CB congeners (i.e., 25-25-CB, 24-25-CB, and 24-24-CB). Four major hepta-CB congeners, accounting for 59.61 mol % of total hepta-CB congeners, experienced more than 50% decreases, i.e., 2345-245-CB (a 65.61% decrease), 2345-236-CB (55.66%), 2345-234-CB (66.06%), and 2346-245-CB (66.55%). Two most abundant hexa-CB congeners in Aroclor

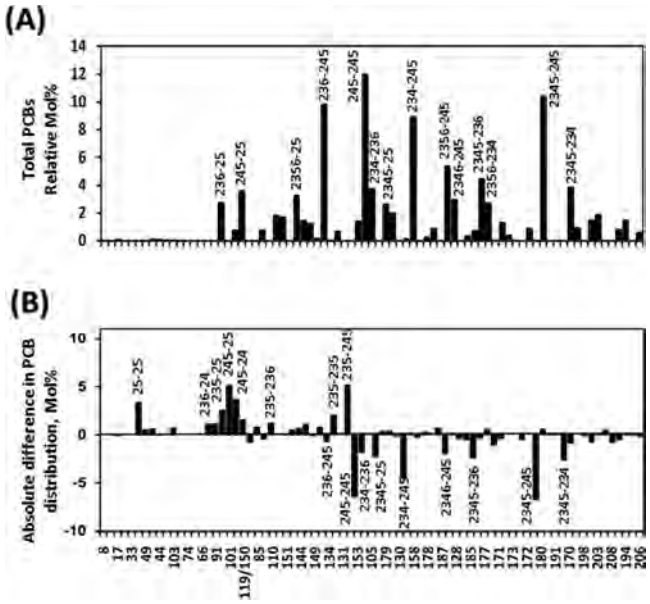

Figure 1. (A) Congener distribution in the abiotic control and (B) differences in congener distribution of Aroclor 1260 residues between the control bottles and culture AD14 after 120 days of incubation. Abiotic controls showed no changes from original Aroclor 1260. The congeners with obvious changes in relative abundance were indicated.

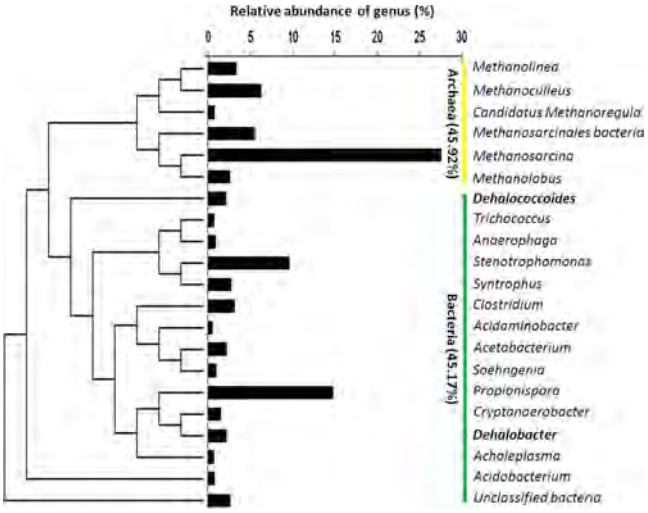

Figure 2. Phylogenetic compositions of culture AD14 (after 120 days of incubation with Aroclor 1260) obtained via Illumina high throughput sequencing of 16S rRNA genes. The percentage of bacteria/archaea from each genus was calculated, and only the genera with ≥0.5% in relative abundance were shown. Known dechlorinators presented in this enrichment culture were highlighted with bold font. Phylogenetic analyses was conducted via neighbor-joining with MEGA4.[27].

1260, 245-245-CB, and 234-245-CB, were significantly reduced from 11.94 mol % to 5.10 mol % (a 57.29% decrease), and from 8.90 mol % to 4.24 mol % (a 52.36% decrease), respectively. However, several other hexa-CB congeners (e.g., 235-245-CB and 235-236-CB) were produced from reductive dechlorination of higher chlorinated hepta-CB congeners (Figure S1 of the SI). Thus, the overall hexa-CB congeners, accounting for half of total PCBs in Aroclor 1260, were slightly decreased by 19.94% (Table S2 of the SI).

On the basis of appearance/disappearance of PCB congeners and their mass balance together with dechlorination of two PCB congeners (i.e., 2345-245-CB and 234-245-CB), dechlorination pathways were inferred for the dominant reductive dechlorination in culture AD14 (Figure S1 of the SI). Dechlorinators in culture AD14 primarily attacked flanked *para*-chlorines from 23<u>4</u>5- and 2<u>4</u>5-chlorophenyl rings, and doubly flanked *meta*-chlorines from 2<u>3</u>45- and 2<u>3</u>4-chlorophenyl rings. The dechlorination pattern mainly matches PCB dechlorination process H, which was first observed in situ both in the Acushnet Estuary (New Bedford, MA) and in parts of the Hudson River (New York).[34,35]

Microbial Community Structure in Culture AD14. To obtain a clear insight into microorganisms involved in reductive dechlorination of Aroclor 1260 in culture AD14, the whole microbial community structure was deciphered based on captured 34 724 pair-end Illumina sequences of the 16S rRNA genes (Figure 2). After 120 days of incubation, 6 genera of archaea and 15 genera of bacteria became dominant in the enrichment culture (≥0.5% in relative abundance for each genus). Among them, the high ratio of 16S rRNA gene sequences (45.92% of total sequences) of methanogens (e.g., *Methanosarcina*, *Methanoculleus*, and *Methanosaeta*) explained the abundant methane production (data not shown) in culture AD14. Two known dechlorinators were identified to be present in the sediment-free PCB dechlorinating culture, i.e., *Dehalococcoides* (2.12% of total sequences) and *Dehalobacter* (2.16% of total sequences). Illumina high throughput sequencing data ruled out the possibility that other known reductively dechlorinating bacteria (e.g., *o*-17/DF-1-type *Chloroflexi*, *Desulfitobacterium*, *Geobacter*, *Sulfurospirillum*, and *Anaeromyxobacter*) may be involved in dechlorination of Aroclor 1260 in culture AD14. Members of a new bacterial division, *Acidobacterium* (0.74% of total sequences), was also present in culture AD14 as shown in Figure 2. The rest mainly belonged to phyla of *Firmicutes* and *Proteobacteria*.

Reductive Dehalogenation of Other Halogenated Organic Compounds. To determine whether other common halogenated contaminants can be dehalogenated by culture AD14, four subcultures were set up with culture AD14 as inocula and with octa-BDE mixture (subculture AD14-PBDE), PCE (subculture AD14-PCE), 1,2-DCA (subculture AD14-DCA), and 2,4,6-TCP (subculture AD14-TCP), respectively, as an electron acceptor. After incubating for 75 days, subculture AD14-PBDE dechlorinated 24 and 173 nM of octa- and hepta-BDEs in the octa-BDE mixture (with an initial concentration of 27.12 nM nona-BDE, 124.01 nM octa-BDEs, 490.07 nM hepta-BDE, and 27.81 nM hexa-BDE) to the prominent tetra-BDEs (167.74 nM) (Figure 3A), and it dechlorinated TCE (~300 μM)—used for dissolving octa-BDE mixture powder—completely to ethene (data not shown). In both subcultures AD14-PCE and AD14-DCA, 675.4 μM PCE (Figure 3B) and 655.4 μM 1,2-DCA (Figure 3C) were completely dechlorinated to nontoxic ethene after 50 days and 35 days of incubation, respectively. Vinyl chloride (VC), the most toxic one among all chloroethenes, was not accumulated in subculture AD14-PCE, i.e., PCE was prominently dechlorinated to *cis*-DCE within the first 30 days, and further dechlorinated to ethene following another 20 days of incubation (Figure 3B). Subculture AD14-TCP can completely dechlorinate 2,4,6-TCP to 4-CP via 2,4-DCP within 10 days through removing *ortho*-chlorines (Figure 3D), and no further dechlorination to phenyl even after three extended months of incubation.

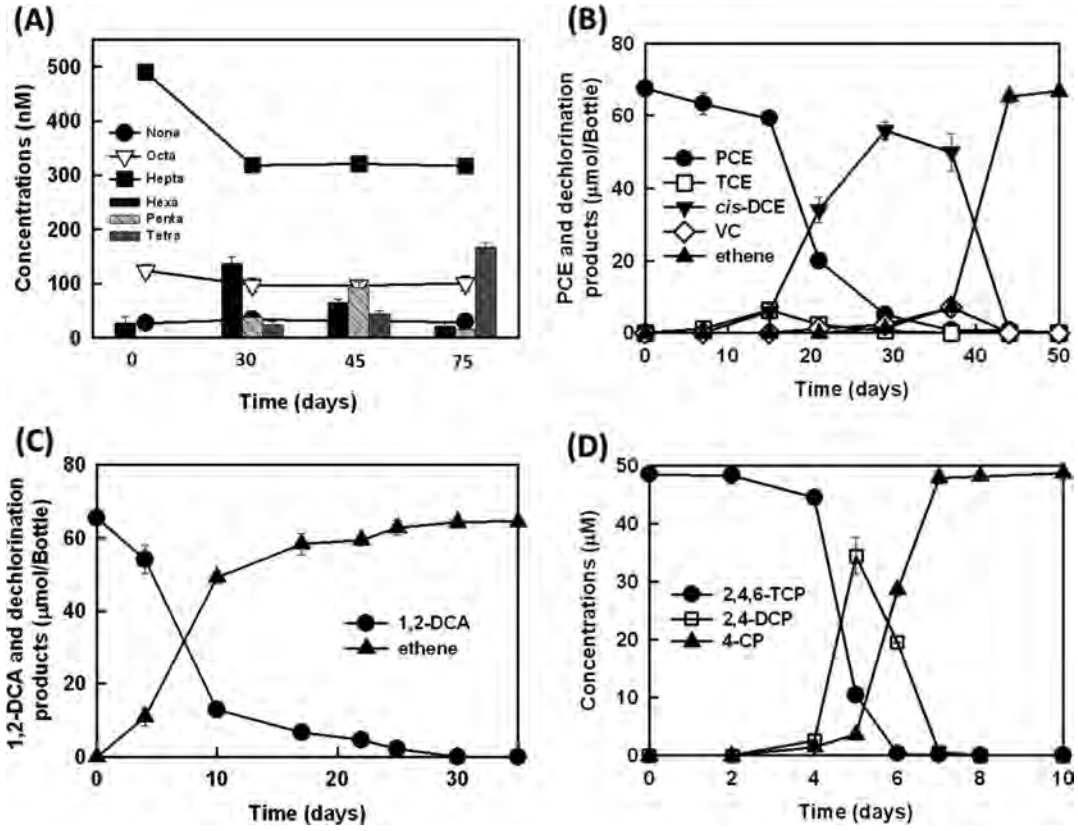

Figure 3. Dehalogenation of (A) octa-BDE mixture, (B) PCE, (C) 1,2-DCA, and (D) 2,4,6-TCP in AD14 subcultures.

In cultures amended with mixtures of the five halogenated compounds (i.e., 40.32 μM Aroclor 1260, 0.1 mM PCE, 0.6 mM 1,2-DCA, 10 μM 2,4,6-TCP, and 0.1 ppm *octa*-BDE mixture), complete dechlorination of 2,4,6-TCP (to 4-CP), 1,2-DCA (to ethene), and PCE (to ethene) were observed after incubating 14, 35, and 56 days, respectively. Tetra-BDEs as debromination products of octa-BDE mixture were detected on day 35, and the concentration further increased to 57.24 nM on day 56. For Aroclor 1260 dechlorination, similar PCB dechlorination products were observed after 4 months of incubation, which suggests no inhibition on PCB dechlorination even in the existence of other halogenated compounds (e.g., PBDEs, PCE, 1,2-DCA, and 2,4,6-TCP) in culture AD14.

Enrichment and Characterization of Dechlorinators. To enrich PCB dechlorinators present in culture AD14, alternative electron acceptors (i.e., octa-BDE mixture, PCE, 1,2-DCA, and 2,4,6-TCP) were used in order to speed up the process. After several serial transfers (11 times for subcultures AD14-PBDE, AD14-PCE, and AD14-DCA, and 25 times for subculture AD14-TCP), highly enriched subcultures were obtained and their community DNAs were extracted for subsequent DGGE analysis (Figure 4). Known dechlorinators enriched from these four subcultures were *Dehalococcoides* (present in subcultures AD14-PBDE, AD14-DCA, and AD14-PCE) and *Dehalobacter* (bacterium Deb-AD14-TCP from subculture AD14-TCP, and Deb-AD14-PCE from subculture AD14-PCE), which was consistent with the Illumina sequencing result of parent culture AD14.

Surprisingly, all *Dehalococcoides mccartyi* strains present in subcultures AD14-PBDE, AD14-DCA, and AD14-PCE shared identical 16S rRNA gene sequence over 520 bp (base 8-529, *E. coli* numbering), which was further confirmed by DGGE analysis with *Dehalococcoides* genus-specific primers 1FGC/259R (Figure S2 of the SI). The nearly full-length 16S rRNA gene sequences of these dechlorinators were obtained by using 2S-DGGE method.[33]

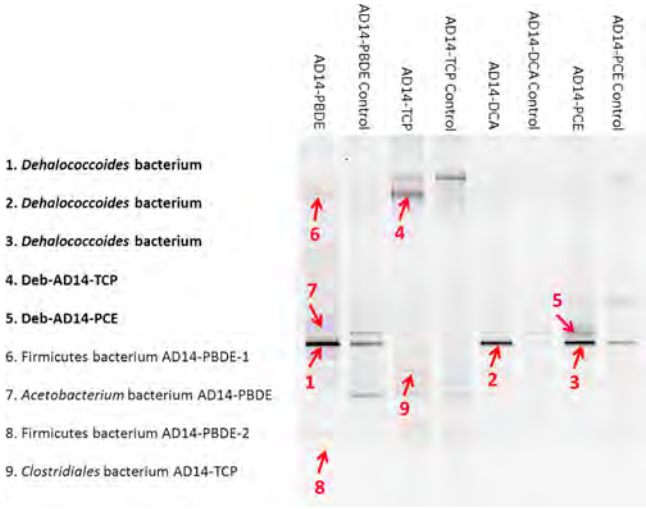

Figure 4. DGGE analysis of amplified 16S rRNA gene sequences from highly enriched subcultures and their controls (without halogenated compound amendment). Bands possibly correlated with dehalogenation activities were excised out for DNA extraction and subsequent sequencing. Obtained sequences were blasted and are shown on the left (known dechlorinators were highlighted with bold font).

Bacterium Deb-AD14-TCP identified in subculture AD14-TCP shared the highest 16S rRNA gene sequence identity (99% over 1421 bp) with *Dehalobacter* clone FTH2 (AB294743) from a 4,5,6,7-tetrachlorophthalide dechlorinating

culture (Figure S3 of the SI).[36] The closest relative of bacterium Deb-AD14-PCE enriched from subculture AD14-PCE was *Dehalobacter sp.* WL (DQ250129) by sharing 99% sequence identity over 1423 bp.

Dehalococcoides enriched in subcultures AD14-PBDE, AD14-PCE, and AD14-DCA share identical 16S rRNA gene sequences over 1353 bp, which have only 1 bp difference with that of their closest relative, *Dehalococcoides mccartyi* vs (CP001827) (Figure S3 of the SI). To further characterize the *Dehalococcoides* bacteria, PCR amplification with primers specifically targeting known functional genes (i.e., *pce*A, *tce*A, *cbr*A, *vcr*A, *bvc*A, and *mbr*A) was conducted, showing that only *tce*A (bacterium AD14-1) and *vcr*A (bacterium AD14-2) genes were present in these *Dehalococcoides*-containing subcultures (data not shown).

Quantification of PCB Dechlorinators. To determine whether dechlorinators enriched in these four subcultures still maintained PCB-dechlorination capabilities, Aroclor 1260 was amended to medium inoculated with subcultures pregrown on octa-BDE mixture, PCE, 1,2-DCA, or 2,4,6-TCP. After 90 days of incubation, only subculture AD14-PCE showed extensive dechlorination activity on Aroclor 1260, in which dechlorination products were the same with those formed in its parent culture AD14. Therefore, subculture AD14-PCE was reinoculated to Aroclor1260-spiked medium with acetate as a carbon source and H_2 as an electron donor, together with control bottles without Aroclor 1260 amendment, to quantify the growth of dechlorinators coupled with PCB dechlorination. As shown in Figure 5, both *Dehalococcoides* and *Dehalobacter* may grow in PCBs-dechlorinating cultures. Compared with its parent culture AD14 amended with lactate or subculture AD14-PCE pregrown with PCE, the PCB dechlorination here had longer lag phase (i.e., ~90 days). Upon a decrease of average chlorine number per biphenyl from 6.38 to 5.87 (or 41.13 μM of total chlorine decrease, Figure S4 of the SI) after 210 days of incubation, 16S rRNA gene copy numbers of *Dehalococcoides* and *Dehalobacter* increased from 1.14×10^5 to 7.04×10^6 copies mL^{-1}, and from 1.15×10^5 to 8.20×10^6 copies ml^{-1}, respectively (Figure 5). *Dehalobacter* have a longer lag phase in growth, which might be due to lower bacterial activity or the requirement of intermediate PCBs generated by *Dehalococcoides*. Correspondingly, *tce*A and *vcr*A gene copy numbers increased from 5.40×10^4 to 2.73×10^6 copies mL^{-1}, and from 5.82×10^4 to 3.23×10^6 copies mL^{-1}, respectively, of which total gene copies were roughly equal to 16S rRNA gene copy numbers of *Dehalococcoides*. No growth of dechlorinators was observed in control bottles without Aroclor 1260 amendment.

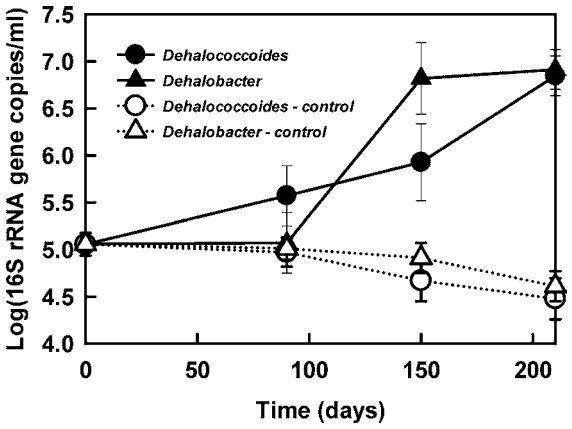

Figure 5. Growth of *Dehalococcoides* and *Dehalobacter* in culture AD14 and in its control bottles without PCBs amendment.

Isolation of Two *Dehalococcoides mccartyi* Strains. To isolate *tce*A and *vcr*A gene-containing *Dehalococcoides* from subculture AD14-PCE, TCE, and VC were amended to their respective serial dilution bottles as sole electron acceptors. Since both strains can dechlorinate *cis*-DCE to VC, the culture of *tce*A gene-containing *Dehalococcoides mccartyi* strain AD14-1 was transferred to the next serial dilution bottles once observing 25−50% TCE being dechlorinated to *cis*-DCE. In following dilution series, TCE and VC dechlorination activities can be repeatedly observed in 10^{-7} TCE- and 10^{-6} VC-fed dilution vials, respectively. After 8 serial dilutions, uniform morphology of coccoid-shape bacteria through microscopy observation suggested that only *Dehalococcoides mccartyi* strains existed in these two dilution series (data not shown), which was verified by DGGE analysis (Figure S5A of the SI). Although similar to strain AD14-1 and strain AD14-2 sharing identical 16S rRNA gene sequences, *Dehalococcoides mccartyi* strain GT and strain CBDB1 can be differentiated by their *adk* and *atp*D genes (Figure S6 of the SI). Therefore, strain AD14-1 and strain AD14-2 were further distinguished by multilocus sequence typing (MLST) approach targeting these two housekeeping genes, which was developed specifically for unambiguous characterization of bacterial isolates.[37] Interestingly, the sequences of *adk* and *atp*D genes in strains AD14-1 and AD14-2 shared 100% sequence identities (over 464 bp for *adk* and 1201 bp for *atp*D). In addition, specific gene-targeted PCR showed culture AD14-1 (fed with TCE) and culture AD14-2 (fed with VC) possessing *tce*A and *vcr*A gene, respectively (Figure S5B of the SI). On the basis of the fact that common reductive dehalogenase (RDase) genes (e.g., *tce*A, *vcr*A, and *bvc*A) are single copy genes in the *Dehalococcoides* genomes,[38−41] RDase genes together with 16S rRNA genes can be monitored by qPCR to confirm the culture purity. This has been perfectly demonstrated in isolation of *Dehalococcoides mccartyi* strain GT.[41] To further corroborate the culture purity, qPCR analysis using *universal* and *Dehalococcoides* 16S rRNA gene- and RDase (i.e., *tce*A and *vcr*A) gene-targeted primers was performed in this study (Figure S7 of the SI). The total bacterial cell numbers in TCE- or VC-fed cultures almost equaled to the total *Dehalococcoides* cell numbers and *tce*A/*vcr*A gene copies, suggesting the purity of the cultures. The microscope observation, DGGE analysis, MLST result, and both the qualitative and quantitative PCR data all together verified the culture purity of strain AD14-1 and strain AD14-2.

Kinetic studies showed that strain AD14-1 can dechlorinate TCE (80.30 ± 3.28 umol/bottle) to VC (46.36 ± 1.33 umol/bottle) and ethene (32.83 ± 0.73 umol/bottle) within 30 days (Figure S8A of the SI), and strain AD14−2 dechlorinate VC completely to ethene after 20 day's incubation (Figure S8B of the SI). Strain AD14-1 and strain AD14-2 have distinct substrate range, as summarized in Table S3 of the SI. Among the potential electron acceptors tested, TCE, 1,2-DCA and octa-BDE mixture can be extensively dehalogenated by strain AD14-1, and DCEs, 1,2-DCA and 2,4,6-TCP can be dechlorinated by strain AD14−2. No Aroclor 1260 dechlorination activity was observed in either pure culture after 12 months of incubation, suggesting that these two isolates either incapable of dechlorinating PCBs or capable of dechlorinating PCBs but depending upon the presence of other beneficial bacteria. Neither of the two isolates showed fermentation

capability on fumarate, malate, lactate, pyruvate, glucose, glumate, or used sulfate, sulfite, nitrate, or nitrite as an electron acceptor. Therefore, similar with other *Dehalococcoides mccartyi* strains, strain AD14-1 and AD14-2 requires hydrogen as an electron donor and acetate as a carbon source.

DISCUSSION

In this study, an enrichment culture AD14 was successfully established for extensive dehalogenation of Aroclor 1260 and the common coexisting halogenated compounds, e.g., PBDEs, PCE, 1,2-DCA, and 2,4,6-TCP. Although PBDEs were widely detected as cocontaminants at PCB contaminated sites,[4−6] no culture has been reported to dehalogenate both PCB and PBDE mixtures. PCB dechlorinators in culture AD14 are capable of extensively dehalogenating multiple compounds that are common contaminants in groundwater and sediments, e.g., PBDEs, 2,4,6-TCP, PCE, and 1,2-DCA. PCB dechlorination was not inhibited by the existence of above cocontaminated halogenated compounds because dechlorinators in culture AD14 could detoxify them more rapidly than could PCBs. Therefore, culture AD14 can be a special culture for cleaning up sites cocontaminated by PCB mixtures and other halogenated compounds (e.g., PBDEs and chloroethenes).

Both *Dehalococcoides* and *Dehalobacter* were identified in culture AD14 to be responsible for PCB dechlorination with evidence provided by both Illumina high-throughput sequencing and qPCR. The PCB dechlorinators identified in early studies were all placed within *Chloroflexi* phylum, i.e., *Dehalococcoides*[10,42] and *o*-17/DF-1 like bacteria.[10,12,43] The taxonomic identification of these PCB dechlorinators were usually conducted by DGGE[10,12,43] or PCR amplification with genus-specific primers.[42] Both methods have their own limitations in charactering PCB dechlorinating bacteria which are normally present as minor populations, e.g., DGGE can hardly discriminate bacteria with relative abundance less than 1% of total microbial community.[44] Compared with DGGE analysis, genus-specific PCR amplification is a faster and more sensitive way to identify PCB dechlorinators, especially when those bacteria exist as minor populations. However, this method may cause false negative results due to primer mismatch or limited primer coverage. Previous studies have shown that short reads from Illumina sequencing suffice for accurate microbial community analysis.[45] In this study, combination of Illumina high throughput sequencing, 2S-DGGE and qPCR analysis has been employed to pinpoint the PCB dechlorinating bacteria, an effective and comprehensive way to study microbial community structures.

Thus far, only two pure cultures (i.e., *Dehalobium sp.* DF-1 and *Dehalococcoides mccartyi* strain CBDB1) showed dechlorination activities on PCB mixtures, which were isolated on 2345-CB[14] and trichlorobenezes,[8] respectively. Isolation of PCB dechlorinators directly from Aroclor 1260-dechlorinating cultures is challenging due to their long lag phase and low growth rates on PCB mixtures.[46] Previous studies have shown that single dechlorinating bacteria can possess multiple RDase genes in single genomes,[38,40] and thus the same isolate may grow on various substrates.[11,18,40] Therefore, all of those observations suggest that PCB dechlorinators may be isolated by using alternative halogenated compounds. In this study, *Dehalococcoides mccartyi* strain AD14-1 and strain AD14-2 were isolated by using TCE or VC as an alternative electron acceptor rather than using PCBs. The two strains share identical 16S rRNA, *adk*, and *atp*D genes. However, both strains could not dechlorinate congeners in Aroclor1260 in defined medium amended with acetate and H_2 after 12 months of incubation. This might be attributed to the loss of the PCB dechlorinators or the functional reductive dehalogenase genes for PCB dechlorination during the isolation process, or PCB dechlorination requiring the cooperation of both *Dehalobacter* and *Dehalococcoides*. Another reason might be because the isolates require the existence of other beneficial bacteria to supply nutrients and cofactors. A similar phenomenon was observed in DF-1 pure culture, of which PCB dechlorination depended on the presence of cocultured *Desulfovibrio* species or its cell extract.[14] Whether strain AD14-1 or AD14-2 is able to dechlorinate PCBs still warrants future studies. However, isolation of both strains in this study may shed light on future cultivation of other PCB dechlorinators.

In conclusion, an enrichment culture AD14 was developed to dehalogenate PCBs and other halogenated compounds (i.e., PBDEs, PCE, 1,2-DCA, and 2,4,6-TCP). The *Dehalobacter* species was confirmed to grow in a PCBs-dechlorinating culture. In addition, two *Dehalococcoides mccartyi* strains with identical 16S rRNA gene sequences were isolated to be able to dechlorinate TCE and VC.

ASSOCIATED CONTENT

Supporting Information

The primer sequences used in this study (Table S1); inferred PCB dechlorination pathways and PCB homolog distribution in AD14 culture (Figure S1 and Table S2); various incubation and dechlorination paradigms (Figures S2−S8); and strain AD14-1 and strain AD14-2 distinct substrate ranges (Table S3). This material is available free of charge via the Internet at http://pubs.acs.org.

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Notes

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Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 01, 2014 5:17 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

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Thank you.

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Thank you.

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Yeh, Alice

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Subject: Passaic BFM
Attachments: Technical-Brochure-BallastedFilterMattressCPSenglish.pdf; BFMProductInstallationGuide_draft_2.pdf; BFMTechincalDatasheet_062411.pdf; eabedstabilisationandothercoastalengineeringapplications.pdf; VeneziaMoseeng.pdf

Hi Alice -

In keeping with the spirit that I have embodied over my career in innovation related to sediments/technology I'd like to bring to your attention and interest a possible enhancement approach to the challenge of capping sediments in the Passaic in high transport regimes as well as coupling it with navigational dredging and side slope stability. Besides the Passaic, the application here could be of value to the Gowanus where you have ebullition exchange and really need a good stable demarcation between the DNAPL layer of soft sediment and what you are trying to protect.....

Reactive Core Mats, geotextiles, armoring with sand and rocks as you know need to be "babysitted" for perpetuity. I've said this to ERRD for most of my career.... I have seen RCMs over time get frayed (recently in Bergen Harbor, Norway) and certainly in other places have worked well like in Duluth. High energy environments are tough and keeping armoring in place is equally tough unless you start putting out boulders and then raising the height of the sedbed and flooding and you know the rest... Also you need to get a sense that the PAC, amendments that you have put in place are really doing what it's supposed to be doing - hard to monitor and core what's going on below unless you do have a fix for that - and maybe LB does?

From my sediment Italy days at USEPA (Port of Venice) I was intrigued by the Ballasted Filtering Mattress that were developed by Maccaferri. Maccaferri is based in Bologna, Italy but has several offices in the US (US HQ in MD). They develop and engineer coastal protection solutions/products – i.e. geotubes (breakwaters, reefs, groins), protection and anchorage for offshore pipelines and cables and **ballasted filtering mattresses.** As mentioned Maccaferri was involved in the Venice MOSE flood protection mobile gates and implemented the “ballasted mattress” both in the sea and back barrier lagoon for anti-scouring protection of the mobile gates. The mattress has a non-woven geotextile bottom – central body consisting of a polypropylene geomat strengthened w/ 2x twist wire mesh and a ballasting central body with crushed stone. Non-woven geotextile is the upper layer. These mats are rolled out on the ocean floor and heavy boulders are placed on top of these mats to ensure sediment bedform stability and to minimize erosion (Venice MOSE). It keeps the overlying weight of engineered structures from sinking into the sedbed.

The concept here is to utilize a BFM with an amendment that is incorporated into the BFM structure for capping adsorption and sedbed stability (stays in place). It would also be beneficial in anchoring the side slopes of the "navigation channel" to minimize contaminant "sloughing" into the channel. Also it would help in shoreline stability since the FFS is proposing "bank to bank" dredging. I've thought of adding "portals" into the BFM that allows for sediment coring through the BFM to see if there is activity occurring depending on what amendment you would be using (i.e. AquaBlok etc..). Below are links to Maccaferri. Maccaferri works closely with Alpine Ocean in Norwood, NJ

who performs coastal work for the USACE and knows the installation process - of course it's not that complicated in the sense that you will see from the video/technical info. that it's "rolled out".

http://www.maccaferri-usa.com/products/15054-1.html

http://www.youtube.com/watch?v=LnbRF4S0jdI

Again Alice, the interest in the BFM could be for a high energy environment such as the Passaic, shallow capping and side slope stability such as for Pompton Lake, NJ and certainly for the Gowanus Canal where you really need some ballasted conditions because of the DNAPL where contamination is found to nearly 10m. A ballasted mat could be placed at the dredging cut interface.

From the business side I do have a working/agreement relationship with Maccaferri in assisting them in developing this application for sediments. When you have a moment (sure right?) that you can take a look at the information perhaps we can chat about it or Maccaferri and I can come in to 290 to have a dialog. Otherwise I hope your summer is going well. I've seen you more at the Passaic meetings than I have seen you at USEPA ;)

Cheers

Eric

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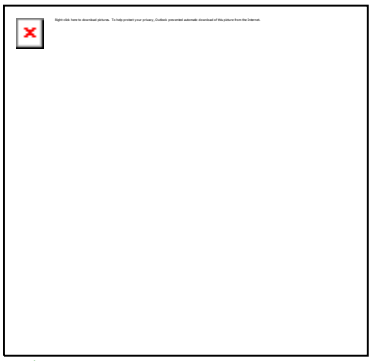

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MACCAFERRI

TECHNICAL DATA SHEET
Rev: 01, Issue Date 06.24.2011

BALLASTED FILTERING MATTRESS

PRODUCT DESCRIPTION

Maccaferri Ballasted Filtering Mattress (BFM) is a pre-fabricated composite marine mattress system used to provide durability and reduce costs for construction applications in and around water. Maccaferri BFM (fig. 1) is composed of the following:

- Filtration Geomat Composite
  - Filtering Bottom Geotextile
  - Three -Dimensional Polypropylene Geomat Mesh
  - Metallic Wire Mesh Reinforcement
- Natural Stone Ballast Material
- Filtering Top Closure Geotextile.

The BFM system is typically specified for the construction of submerged foundations for breakwaters, groins, jetties, dunes or dikes. Prefabricated per project specifications (filter design), easily shipped and delivered, installation friendly, extremely adaptable in irregular subgrade surfaces or soft subgrade soils; they simplify construction while providing for increased support over bottom soils prone to settlement and/or scour.

FILTRATION GEOMAT COMPOSITE (FGC)

Fabrication of the FGC includes a Bottom Filter Geotextile, Three-Dimensional Geomat and Metallic Wire Mesh Reinforcement. The Geomat is joined during production with both the Metallic Wire Mesh and Filtering Bottom Geotextile.

- **Filtering Bottom Geotextile** – 100% polypropylene, spun-bound, thermal bound, high tenacity, white (color), non-woven geotextile. The geotextile is UV stabilized, inert to biological degradation and resists naturally encountered chemicals, alkalis and acids. *Geotextile conforms to properties listed in Table 1.*
- **Three-Dimensional Geomat Mesh** – Three-dimensional geomat composed of 100% polypropylene, extruded mono-threads. *Three-Dimensional Geomat Mesh conforms to properties listed in Table 1.*
- **Metallic Wire Mesh Reinforcement** – Double torsion (twist), hexagonal 6x8 wire mesh, with Galfan coating (optional) and covered with PVC for protection. *Metallic Wire Mesh Reinforcement conforms to properties listed in Table 1.*

FILTERING TOP CLOSURE GEOTEXTILE

Nonwoven geotextile composed of 100% polypropylene staple fibers which are needle-punched to form a stable network for dimensional stability. The geotextile is white (color), UV stabilized, inert to biological degradation and resists naturally encountered chemicals, alkalis and acids. Site specific geotextiles (example: woven monofilaments) can be designed and specified to provide site specific filtration and/or durability performance. *Geotextile conforms to properties listed in Table 1.*

BALLASTING MATERIAL

The ballasting material is composed of a clean aggregate (fig. 2) with stones ranging in size between 3/16 - 5/16 inches (4 - 8 mm).

QUILTING

The connection between the BFM components (Closure geotextile to the ballast filled FGC and Lifting Straps) is provided by HDPE profiles (trapezoidal section strips) placed transversely across the BFM every 13 inches (33 cm) on the bottom side of the mattress and then screwed together from the top side of the mattress using screws and washers.

OVERLAP SIDE BAND

The side band is approximately 18 inches (45.7 cm) wide and continues down one complete length (right or left side) and one end (leading or trailing) of the mattress. The geotextile used for the Side Band is the same as used for the Top Closure Geotextile. *Geotextile conforms to properties listed in Table 1.*

LIFTING LOOPS

Two high strength lifting straps are strategically placed, beneath the entire length of the BFM in order to receive the lifting frame that allows for safe and proper lifting and placement of the BFM.

BFM DIMENSIONS AND WEIGHTS (Nominal)

Width x Length	6.5 ft. x 16 ft. (2 m x 5 m)
Thickness	2 in. (5 cm)
Unit Weight	10.24 lbs/ft^2 (50 kg/m^2)

Table 1

PROPERTY	MASS/UNIT WEIGHT	STRENGTH	PORE SIZE	PERMEABILITY
Testing Standard	EN-965 (Nominal)	EN-10319 (Nominal)	EN-12596 (Nominal)	EN-11058 (Nominal)
Units	oz/yd^2 (g/m^2)	lb/ft (kN/m)	µm	(m/sec)
Filtration Geomat Composite				
Bottom Geotextile	10.3 (350)	12.4 (26)	(60)	0.001
3-D Geomat Mesh	19.2 (650)	0.5 (1)	*	*
Metallic Wire Mesh Reinforcement	44 (1490)	2300 (33.6)[a]	*	*
PROPERTY	**MASS/UNIT WEIGHT**	**GRAB TENSILE**	**AOS**	**PERMITTIVITY**
Testing Standard	ASTM D 5261 MARV	ASTM D 4632 MARV	ASTM D 4751 MARV	ASTM D 4491 MARV
Units	oz/yd^2 (g/m^2)	lb/ft (kN/m)	U.S. Sieve (mm)	sec^{-1}
Top Closure Geotextile	8 (271)	205 (0.91)	80 (0.18)	1.4

(a) = Double Twist (DT) Mesh Strength in accordance to ASTM 975-97

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Maccaferri reserves the right to amend product specifications without notice and specifiers are requested to check as to the validity of the specifications they are using.

Figure 1

Figure 2

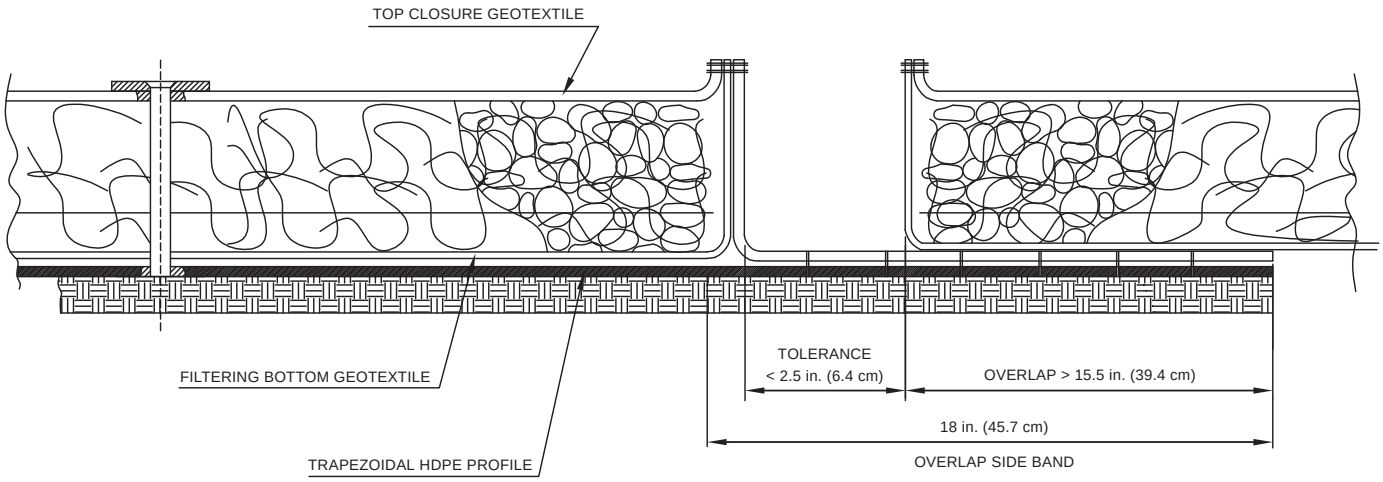

Figure 3

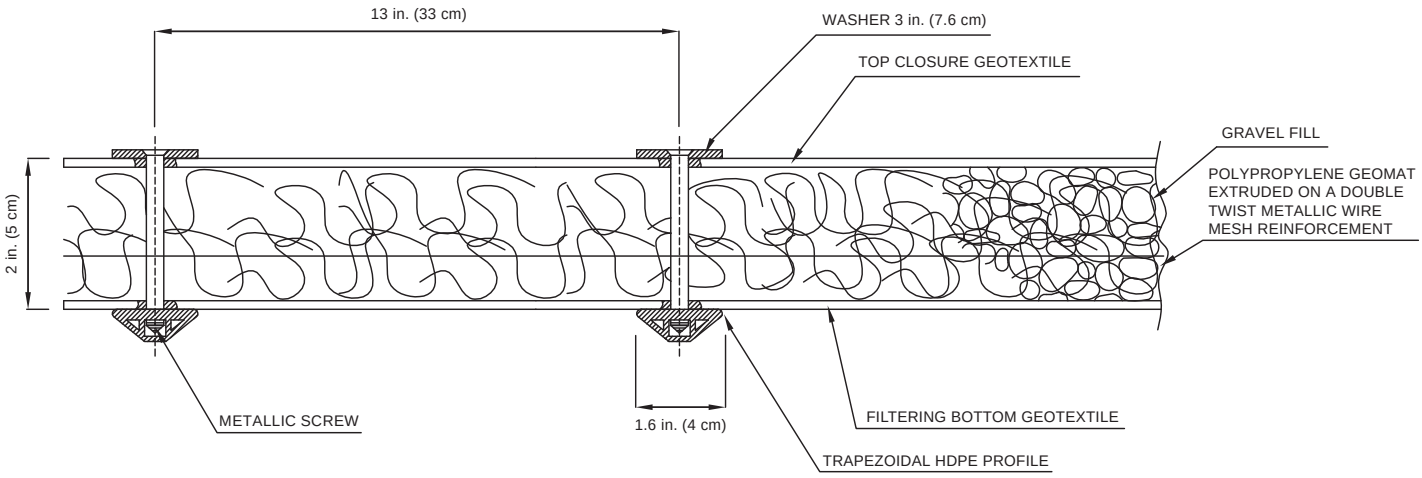

Figure 4

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BALLASTED FILTERING MATTRESS

Introduction

Coastal area construction has always been problematic concerning the many challenges that are present at each and every project site. The Maccaferri Ballasted Filtering Mattress (BFM) provides both the engineer and contractor with a tool to enhance design and construction concerns with a durable, cost-effective solution for applications in and around water.

The Maccaferri BFM provides solutions for the following applications:

- Foundations for breakwaters, groins, geo-containment tubes, etc.
- High strength fills built in submerged or emergent conditions.
- Embankments, causeways, levees, dikes, and bridge approach projects.
- Ballast/protection cover for submerged utility pipelines and cables.

Maccaferri BFM is produced utilizing high strength reinforced mesh, geotextile material and granular fill materials that creates a flexible, highly resilient mattress that comes to the site ready to install. (Figure 1) These performance characteristics provide for a system that will conform to uniform or irregular grade contours with ease while providing for a cost efficient installation deployment. Maccaferri BFM can substantially increase design performance for the engineer while providing for cost saving procurement and installation for the owner and contractor.

Required Tools

The Maccaferri BFM system comes to the project ready to install with BFM lifting frame. (Available upon request.) (Figure 3) This advantage allows the contractor to focus solely on the lifting and placement of the mattress.

Marine/Filter Mattresses

The Maccaferri BFM is designed for demanding conditions associated with challenging underwater installations including deep water and strong currents where the mattress serves as a revetment foundation and geotextile filter in a single unit; and for erosion control armoring and submerged/emergent foundation projects.

Lifting and Handling of Mattresses

1. The mattresses will arrive at the project or materials yard on flatbed trucks.

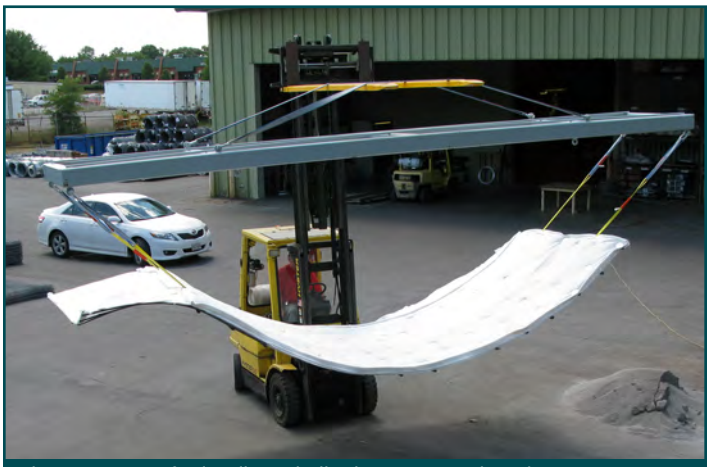

Figure 1: Maccaferri Ballasted Filtering Mattress (BFM)

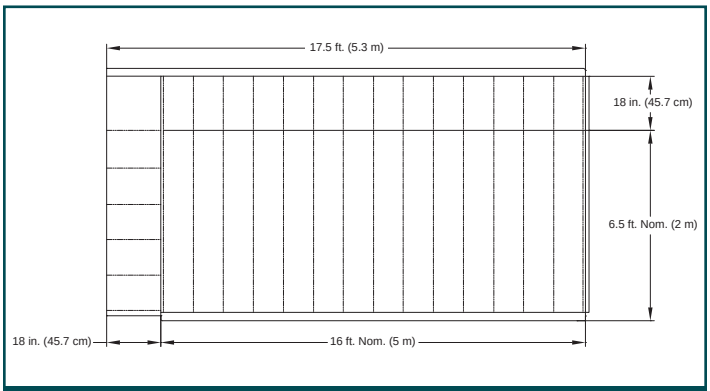

Figure 2: Maccaferri BFM Dimensions

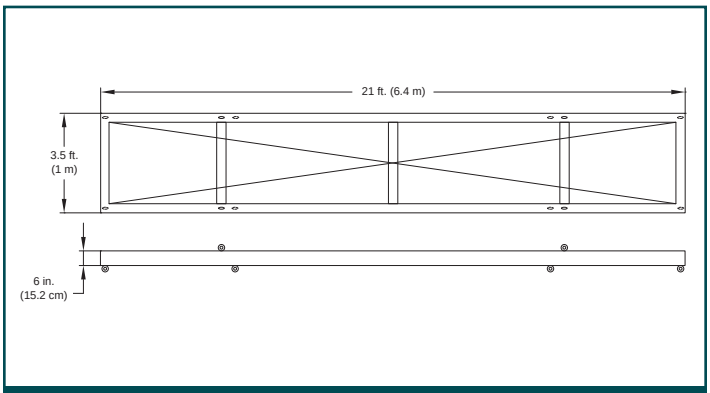

Figure 3: BFM Lifting Frame

2. A Maccaferri designed lifting frame is available upon request to aid in the unloading and placing of the BFM.
3. Attach lifting frame to lifting equipment and mattress to lifting frame. The mattresses come with attached lifting straps for easy attachment to the lifting frame. Lift a single mattress from the top of the stack on the flatbed truck and place on jobsite or storage area. (Figure 3)
4. The contractor is responsible for providing adequate lifting equipment and to use safe procedures in the lifting, handling and placement of the mattresses. Personnel must maintain a safe distance from the mats, rigging and equipment at all times during lifting. Personnel should never be in the area beneath a mattress during lifting. Tag lines should be used to assist in the guidance and positioning of the mattresses during lifting and placement.
5. Mattresses should not be left hanging in the lifting position for an extended period of time.

Placing of Mattresses

1. The mattresses shall be placed (typically on a prepared subgrade) as shown in the contract documents or as directed by the engineer.
2. When joining adjacent mattresses, utilize the attached overlap geotextile panels as a base for the next adjoining mattress. (Figure 4)
3. For steep sloping installations; soil anchors can be used to anchor the mattresses. Soil anchors can be installed directly through the mattress as directed shown in the contract drawings or as directed by the engineer.

Stacking for Stockpiling or Shipping

When stacking mattresses for stockpiling or shipping, the stockpile should not exceed a stable height, approximately 5 feet (1.5 meters) – or a safe stacking height as determined by the contractor. For shipping, loads must be secured to prevent sliding or tipping of the stack or individual mattresses. (Figure 5)

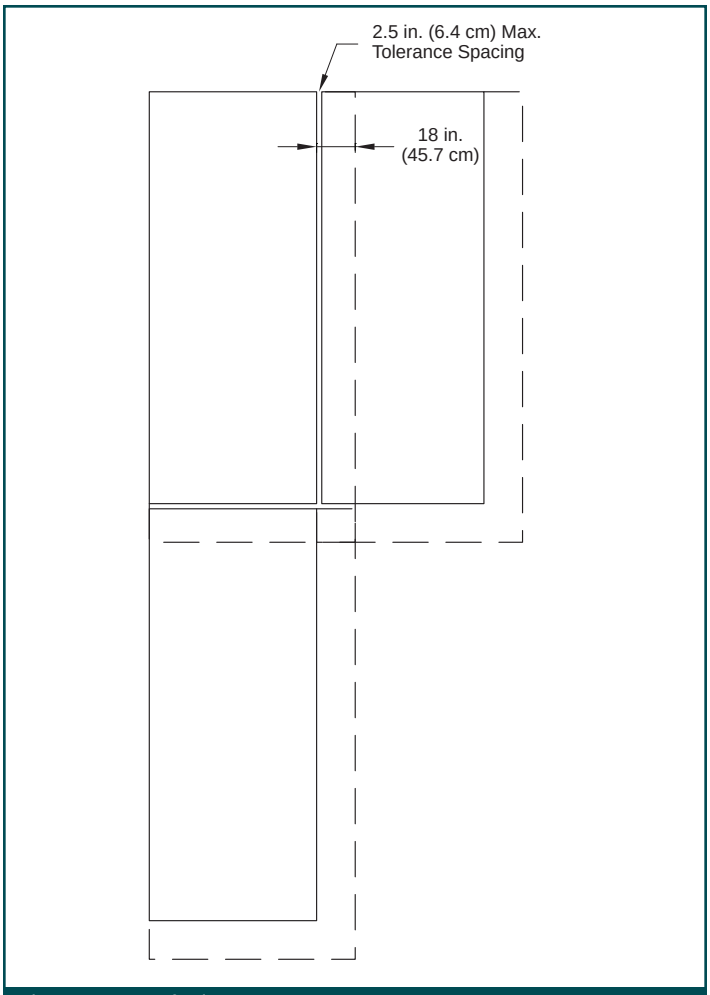

Figure 4: Maccaferri BFM Layout

Figure 5: Stacked BFM Mattresses

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THE USE OF A SPECIAL BALLASTED GEOCOMPOSITE FILTER FOR SEABED STABILISATION AND OTHER COASTAL ENGINEERING APPLICATIONS

M. Scotto, CEng.

Officine Maccaferri SpA

Italy

M. Vicari, CEng.

Officine Maccaferri SpA

Italy

The Venice problem

The lagoon is contended between the land and the sea. It is a mutable ecosystem. Interchange of typical and variable environments take place from the land to the sea

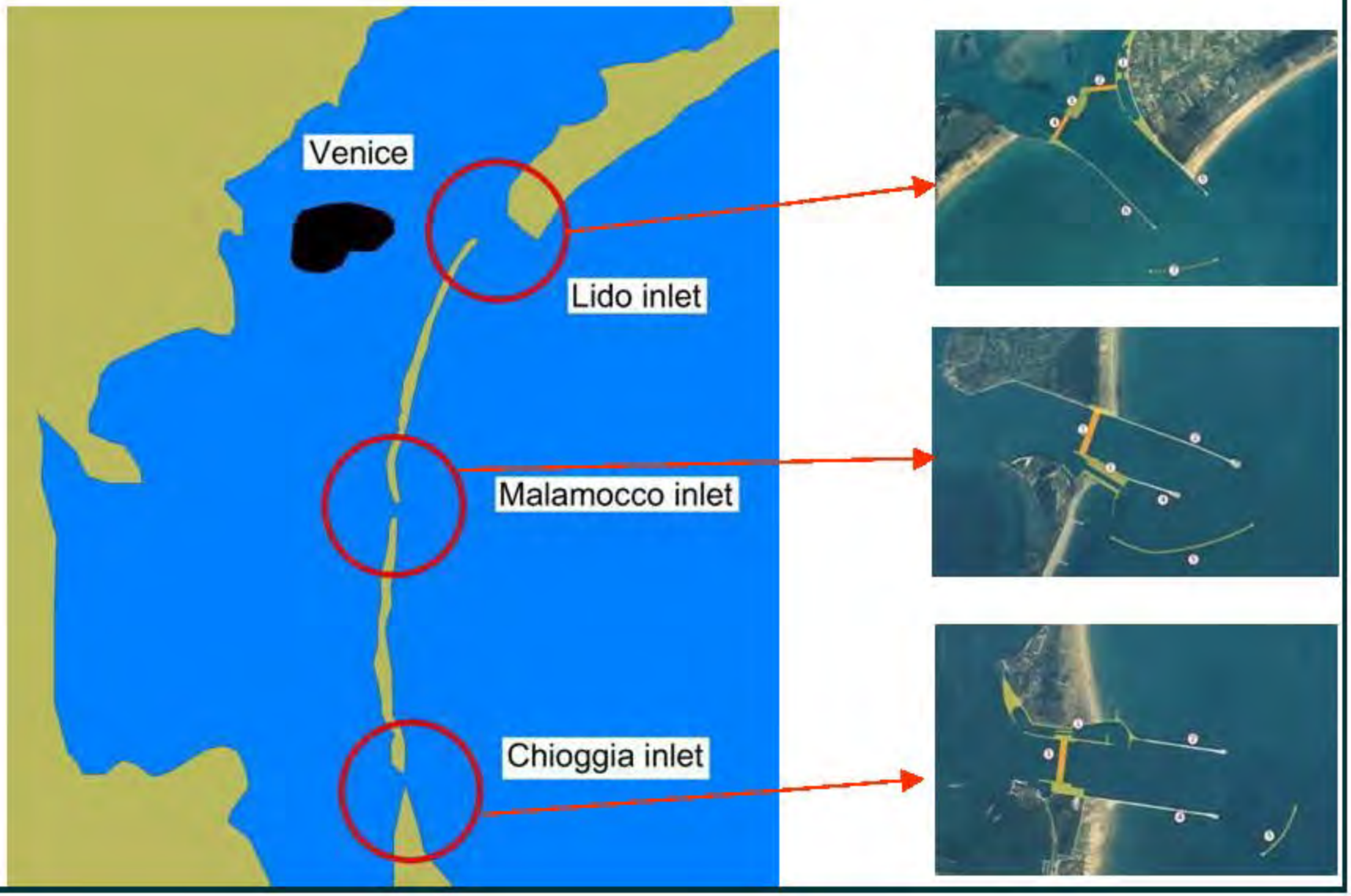
The Venice problem

In 1966 the greatest event never recorded:

+1.94 m

The MOSE project

PROTECTION WORKS IN PROGRESS AT THE 3 LAGOON INLETS

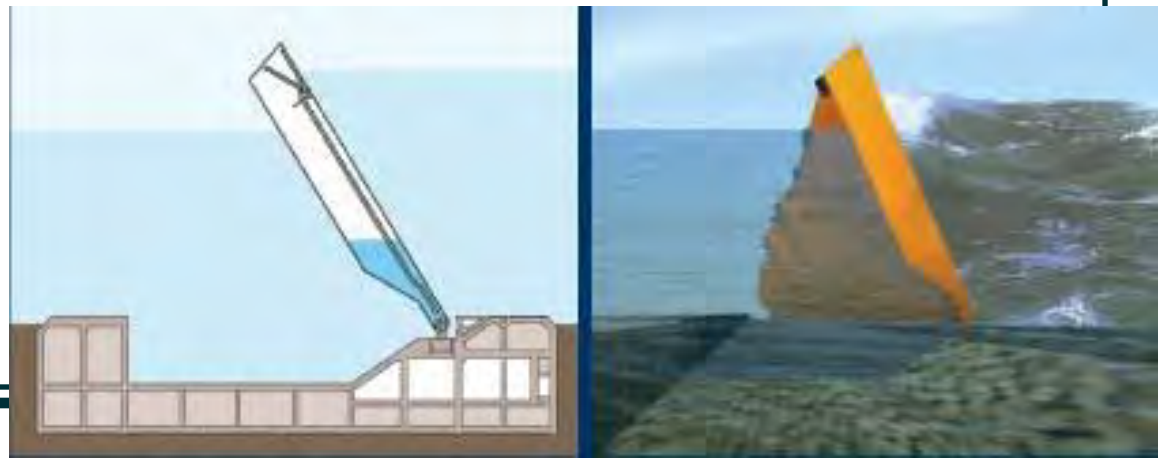


The MOSE project

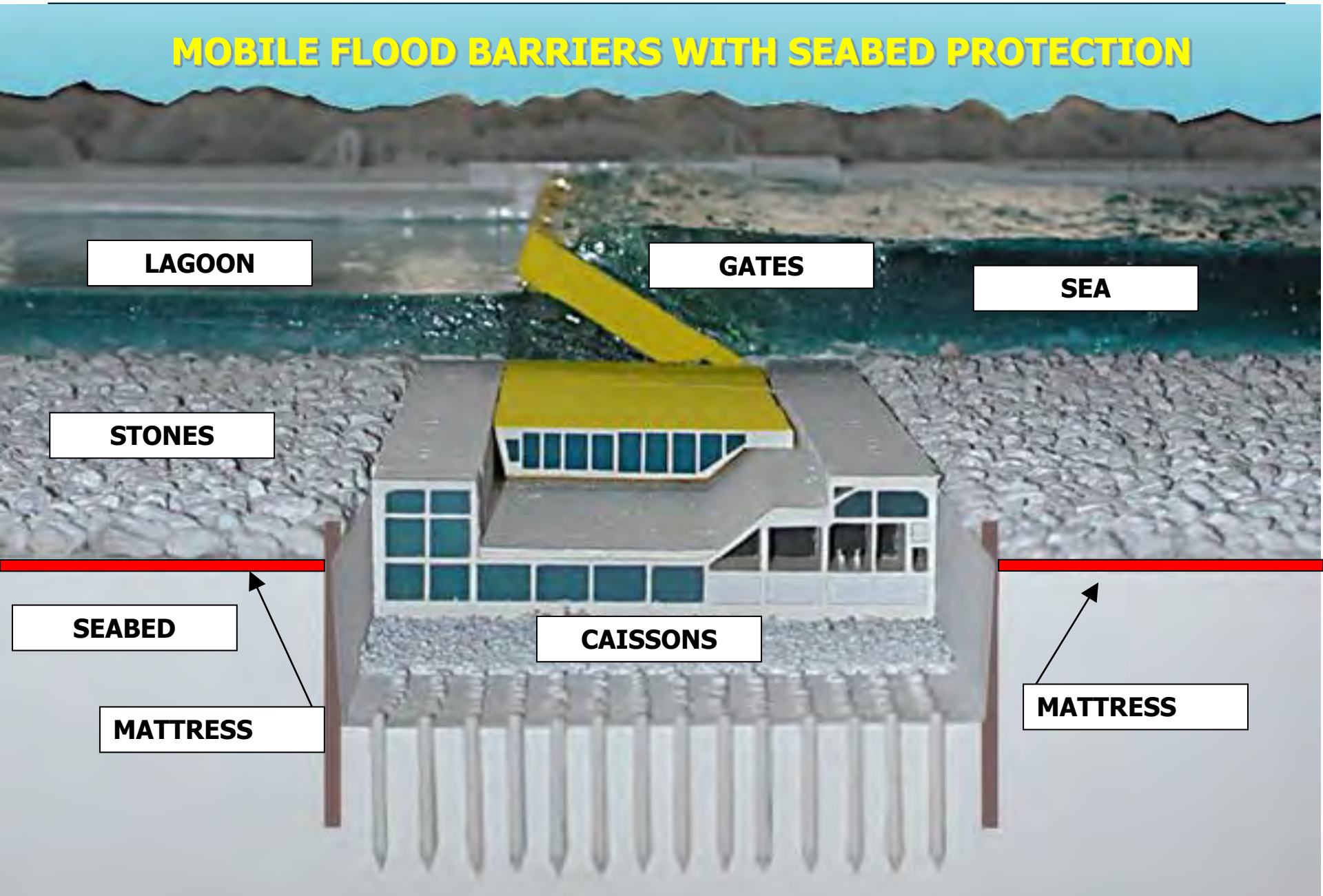
MOBILE FLOOD BARRIERS

The floodgates at rest are "folded-away" into their housings buried at the bottom of the lagoon inlets.

The housing consists of prefabricated concrete caissons which are dug into the lagoon bed so that they do not appear above the floor of the bed.

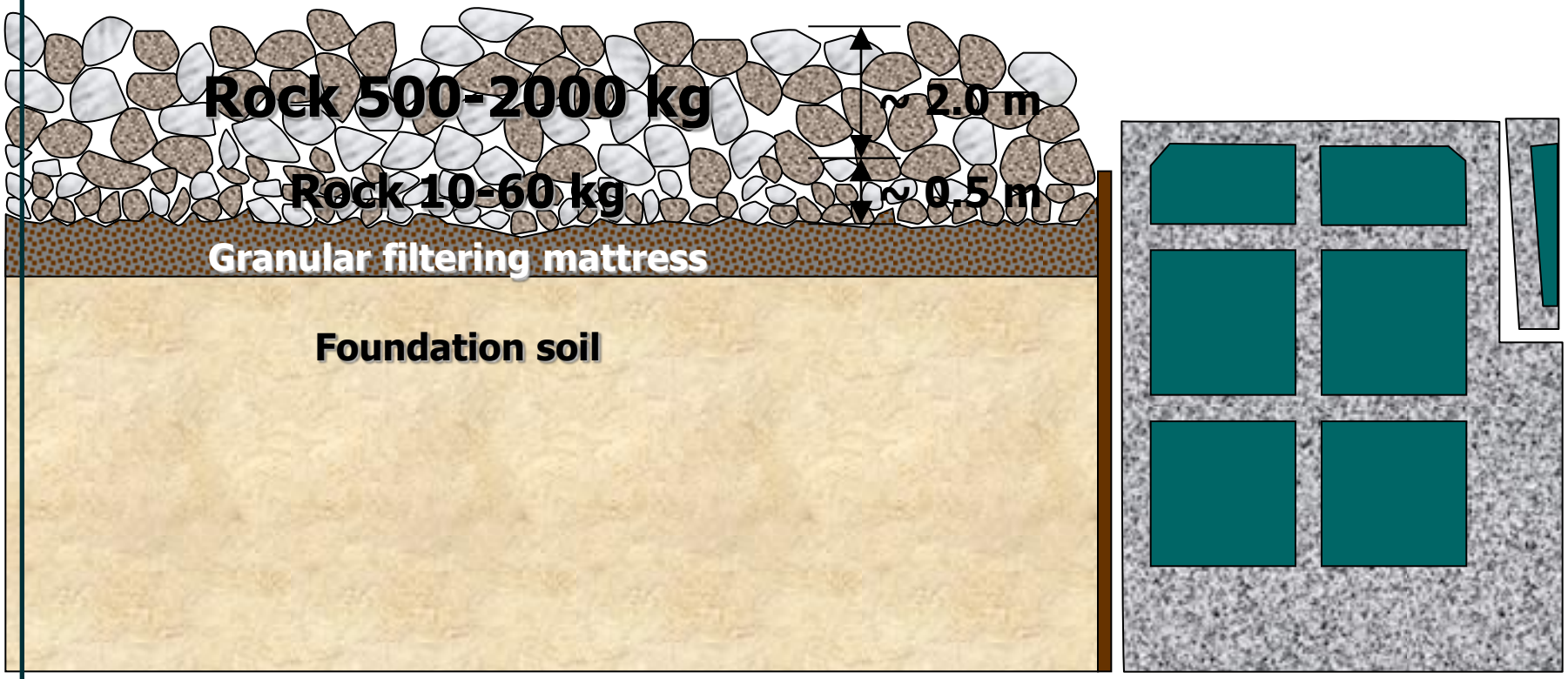


The MOSE project



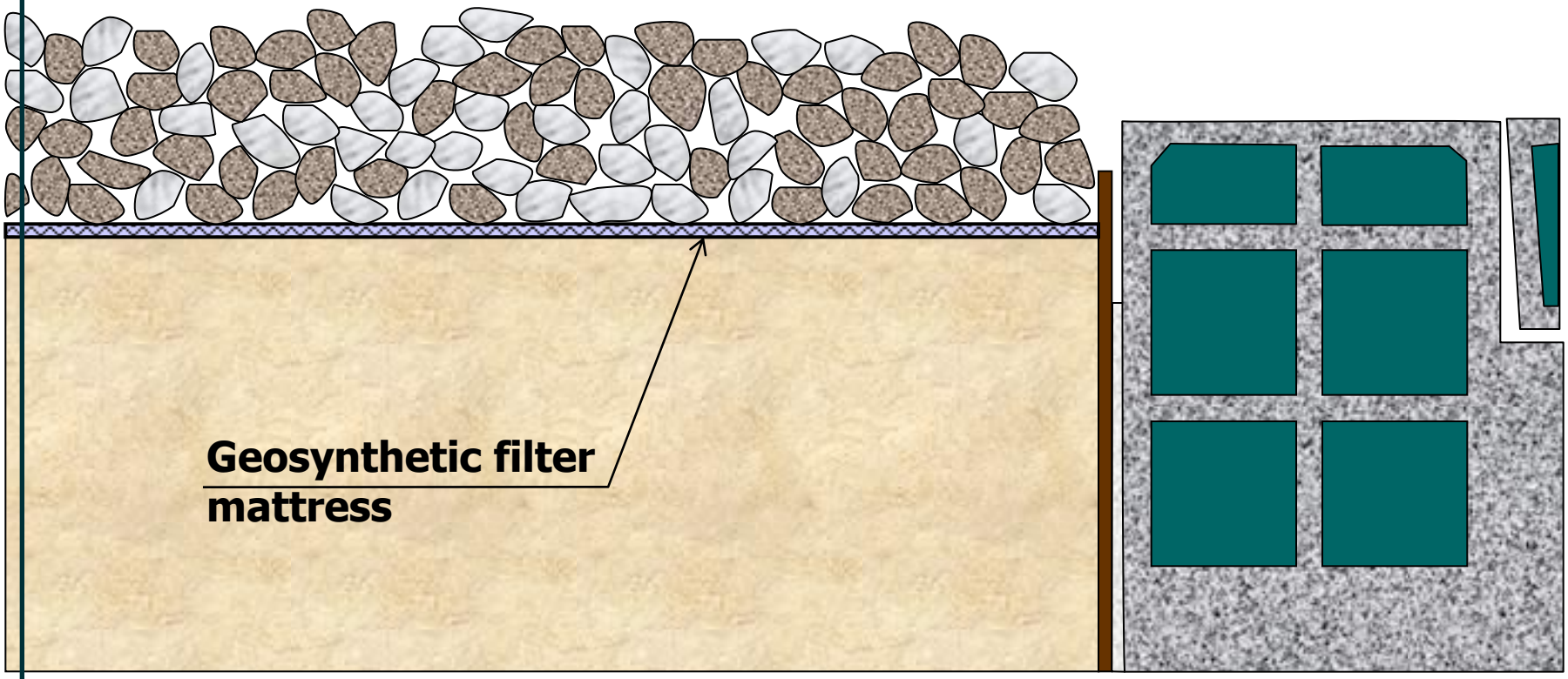
The Venetian BFM

Original protection system



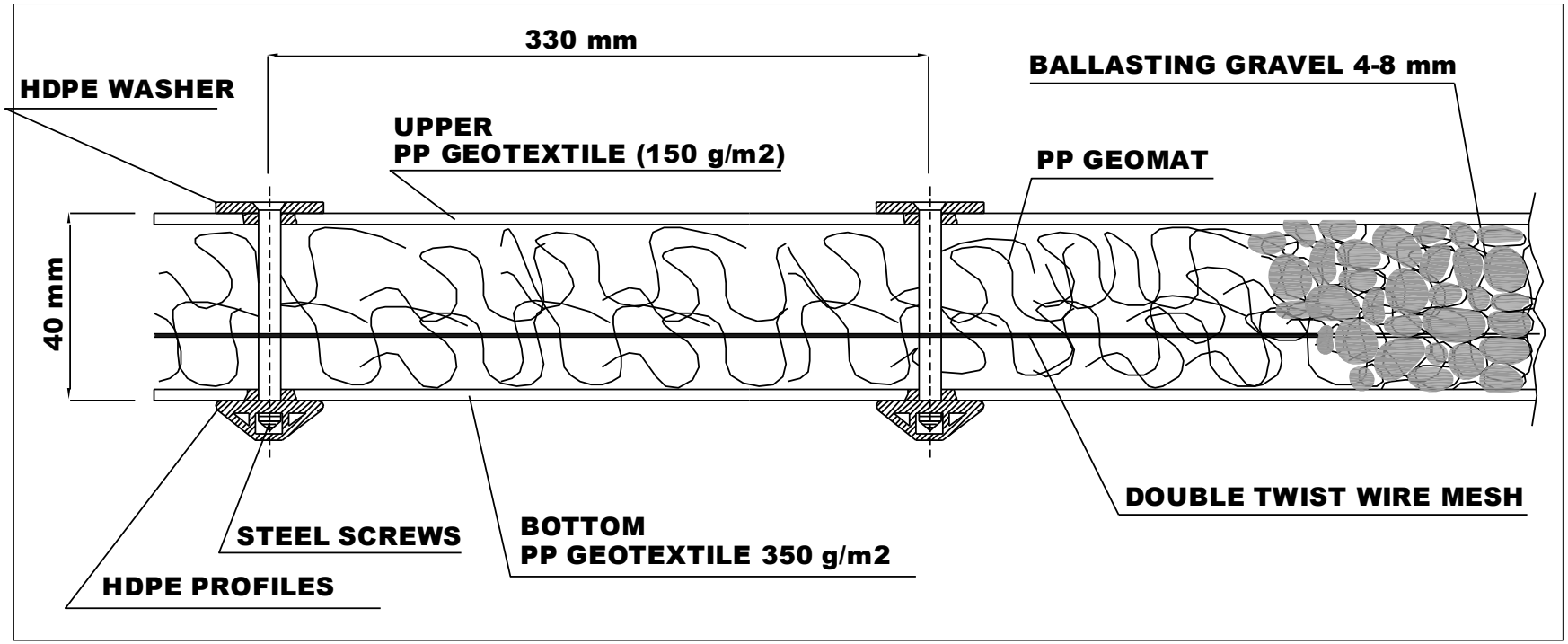
The Venetian BFM

Alternative protection system proposed by Maccaferri



The Venetian BFM

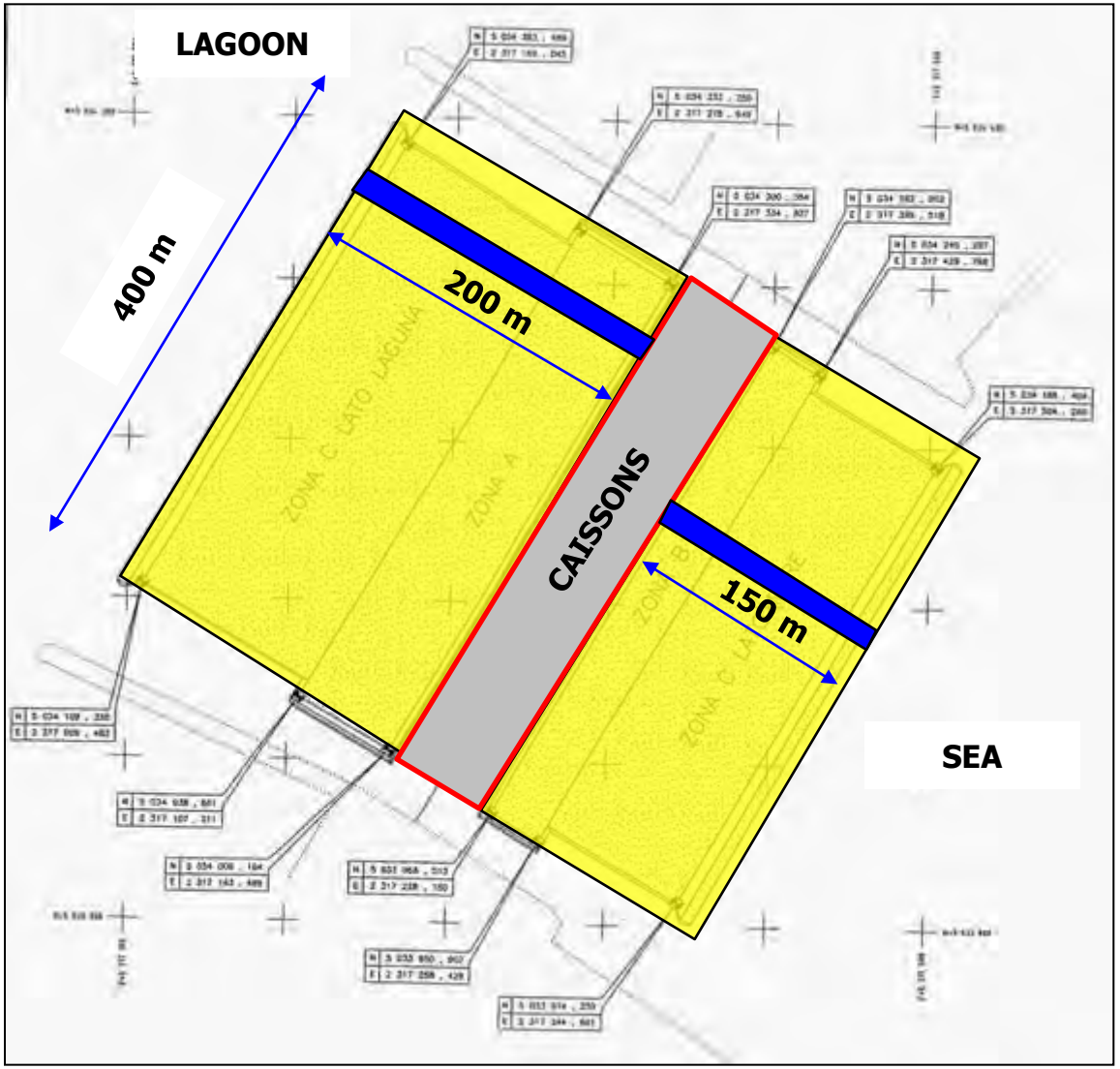
CROSS SECTION OF THE FILTER MATTRESS



The total weight of the mattress in air is approx. 50 kg/m2, (submerged weight > 25 kg/m2)

The filter mattresses are 11.20 m wide and their length is 150/200 m depending upon the inlet zone to be protected.

INSTALLATION EXAMPLE: LIDO INLET



The Venetian BFM: design properties

DESIGN REQUIREMENTS OF THE FILTER MATTRESS

The filter mattress has been designed to comply with the following main requirements:

1. ***Filter properties***
2. ***Resistance to uplift and drag forces***
3. ***Resistance to impact***
4. ***Resistance to installation forces***

The Venetian BFM: design properties

1 Filter properties

In order to verify the mechanical and hydraulic characteristics of the filter mattress, a series of laboratory and in-situ tests has been carried out, both on the single components and the whole mattress, covering the following aspects:

- hydraulic properties before and after different energy impact tests carried on two different soil types (silt and sand);
- tensile properties (MD, CMD) before and after different energy impact tests;
- lifting tests on assembled units, to verify the resistance of both longitudinal and transversal joints.

Main characteristics of the BFM components, as measured in the laboratory tests.

Layer	Mass per unit area	MD tensile strength	Permeability	Pore size
	EN ISO 9864	EN ISO 10319 (*)	EN ISO 11058	EN ISO 12956
	g/m^2	kN/m	m/s	μm
A	350	26.5	1.2×10^{-3}	59.5
B	650	1.8	n.r.	n.r.
C	1490	36.2	n.r.	n.r.
D	150	10.3	1.8×10^{-3}	76.5

n.r.: not relevant

(*) for the wire mesh a specific methodology has been used

Submerged weight

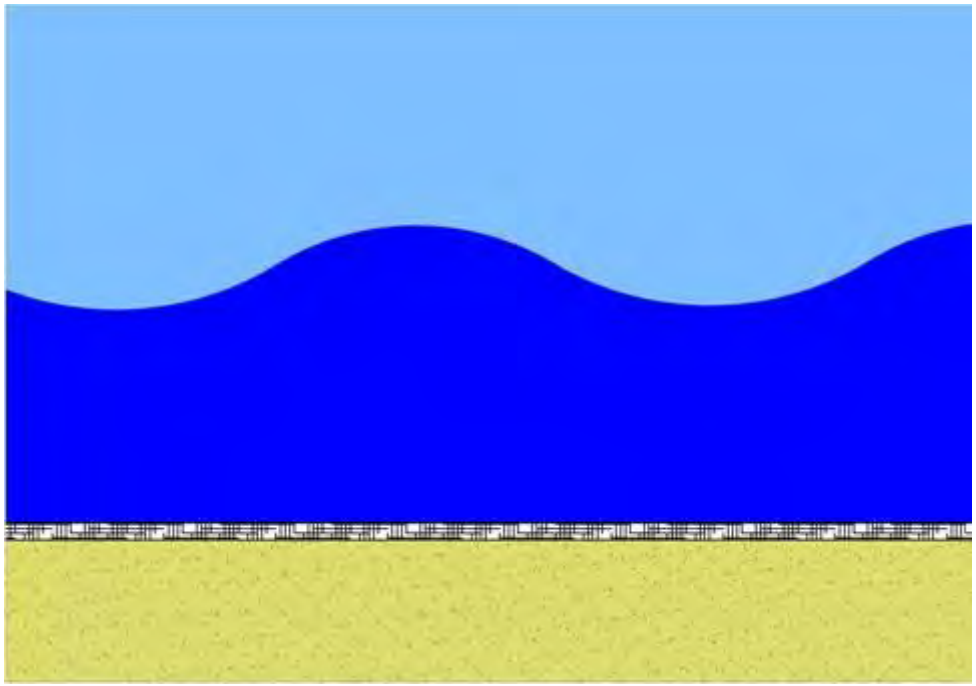
BFM samples 0.8 x 0.8 m have been weighed by immersing them in a water tank, to check their actual submerged weight, obtaining **28 kg/m2 and 48 kg/m2** respectively for the submerged and the dry conditions.

The Venetian BFM: design properties

2 Resistance to uplift and drag forces

To the base it is necessary a filter which guarantees the **maximum safety** it means **a constant contact** between the **filter** and the **sea bottom before and during** the **blocks placement**.
A basal filter could have this behaviour:

flapping and movement



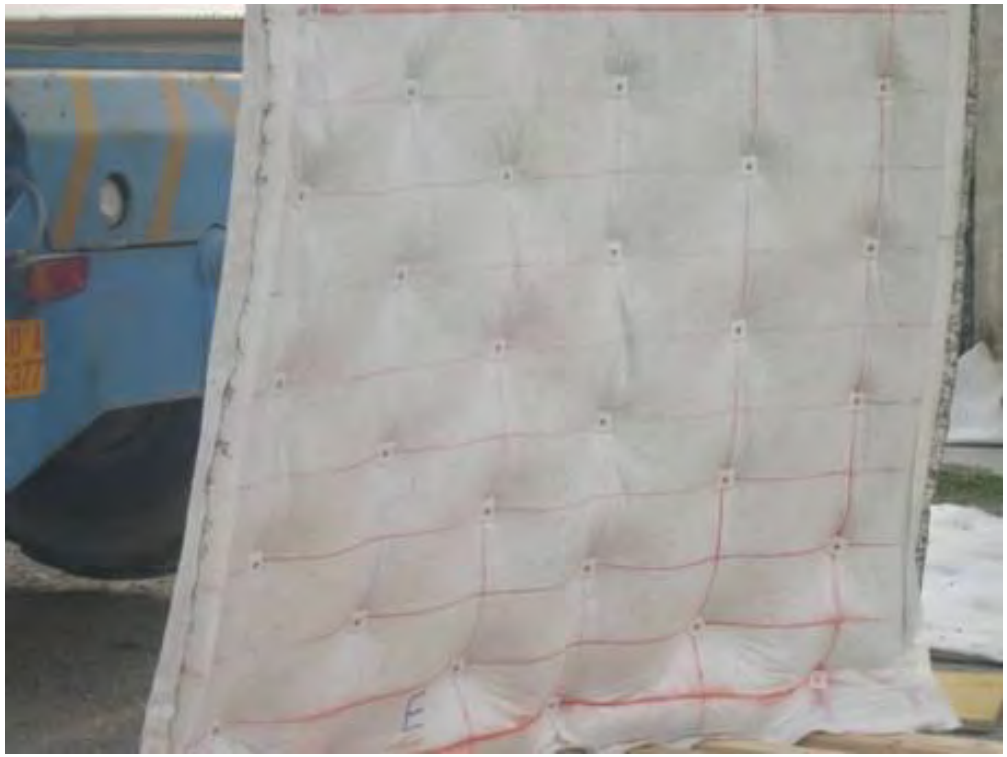
To **avoid this behaviour** and to guarantee a **perfect contact** before the rocks laying, an appropriate **ballasted filter** was chosen as the **best solution**.

The Venetian BFM: design properties

3 *Resistance to impact*: FIELD TESTS

The Venetian BFM: design properties

4 Resistance to installation forces



To verify both the resistance of the reinforcement and the stability of the ballasting gravel within the mattress when placed vertically, a 10x2 m sample has been completely lifted and subjected to shaking movements.

Manufacturing of the Venetian BFM

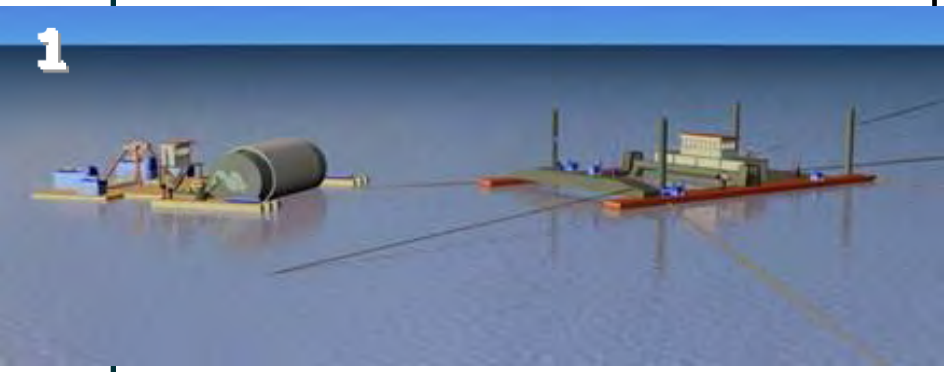
Manufacturing of the Venetian BFM

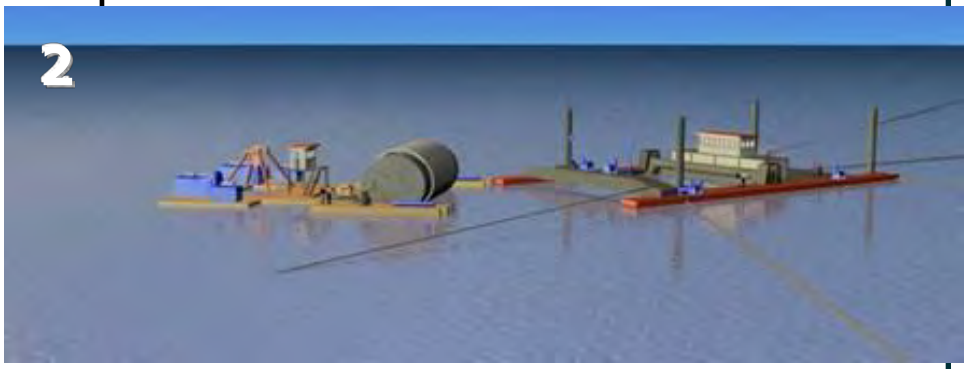
Installation of the Venetian BFM

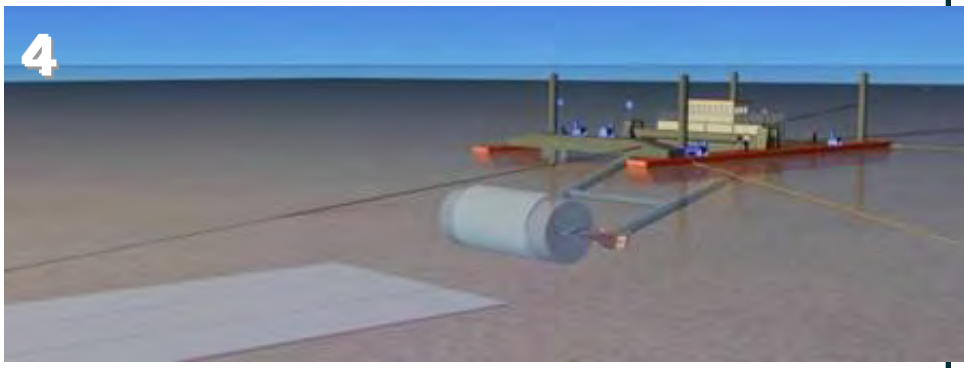
The first units have been installed in May 2006 by means of the special pontoon and the installation works on the total surface of 600˙000 m^2 will continue up to 2010 with an average installation of 1,500 m^2 per working day.

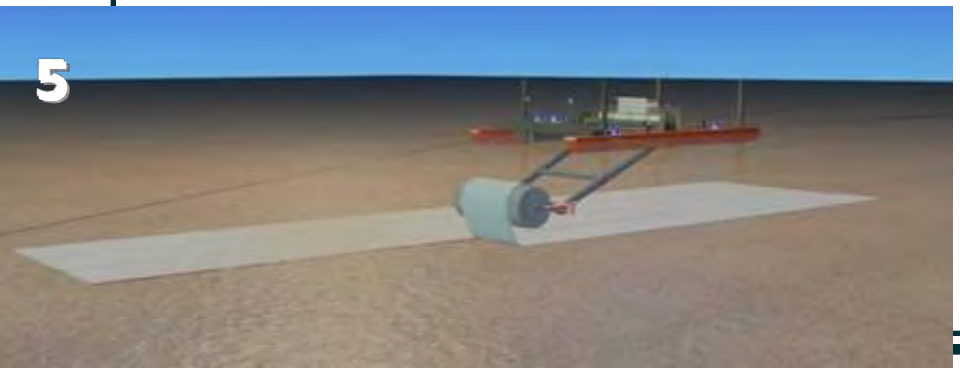
Installation of the Venetian BFM

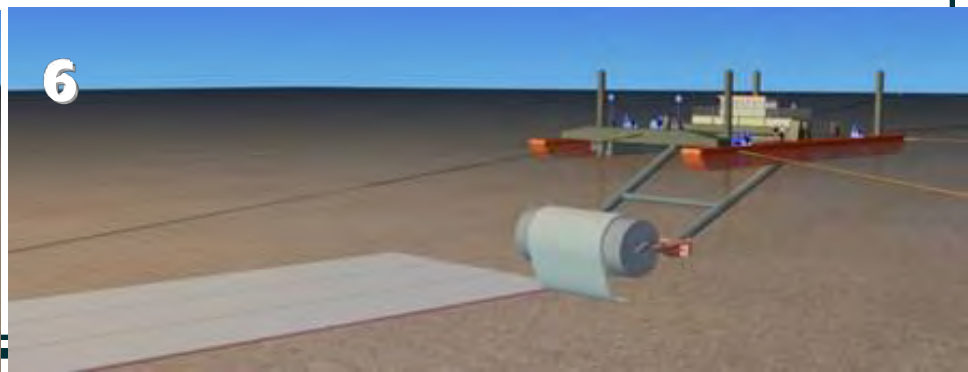
The pontoon was specifically designed to put the filtering mattress at a water depth up to 15 m





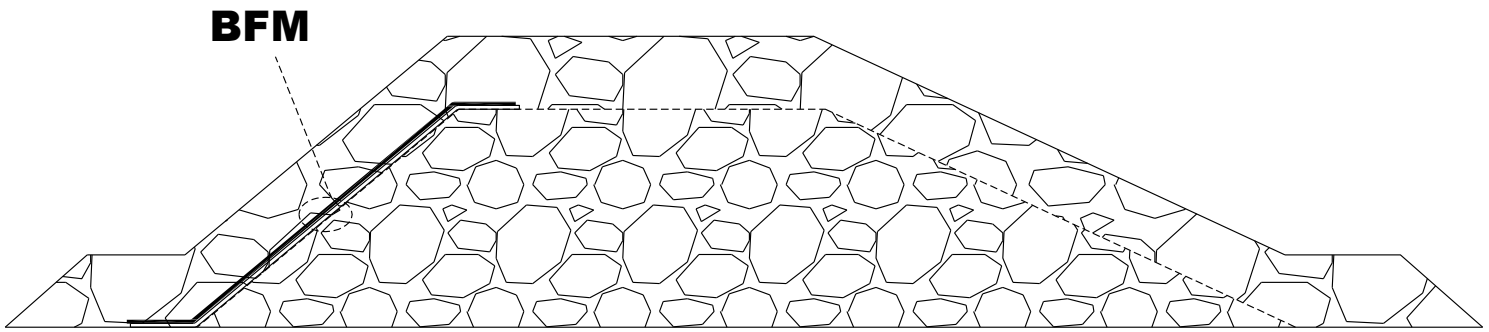


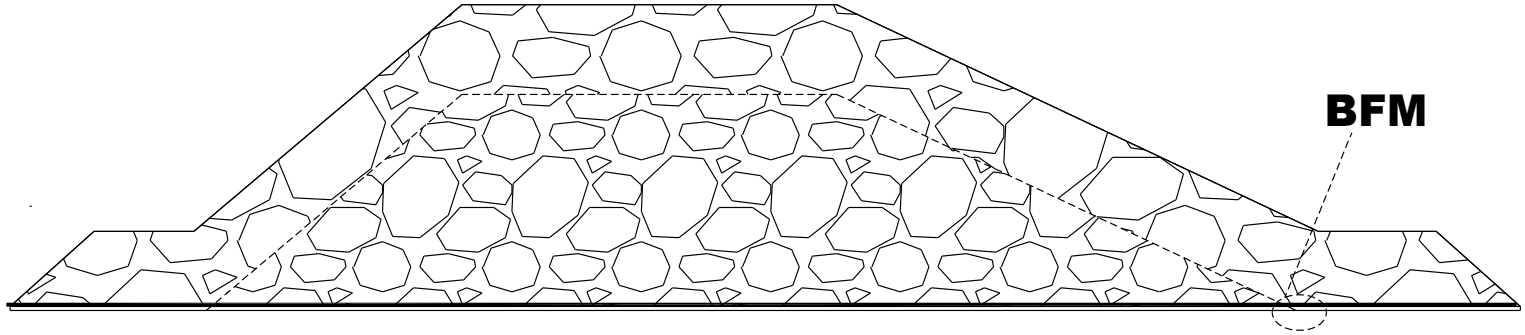




New applications of the BFM

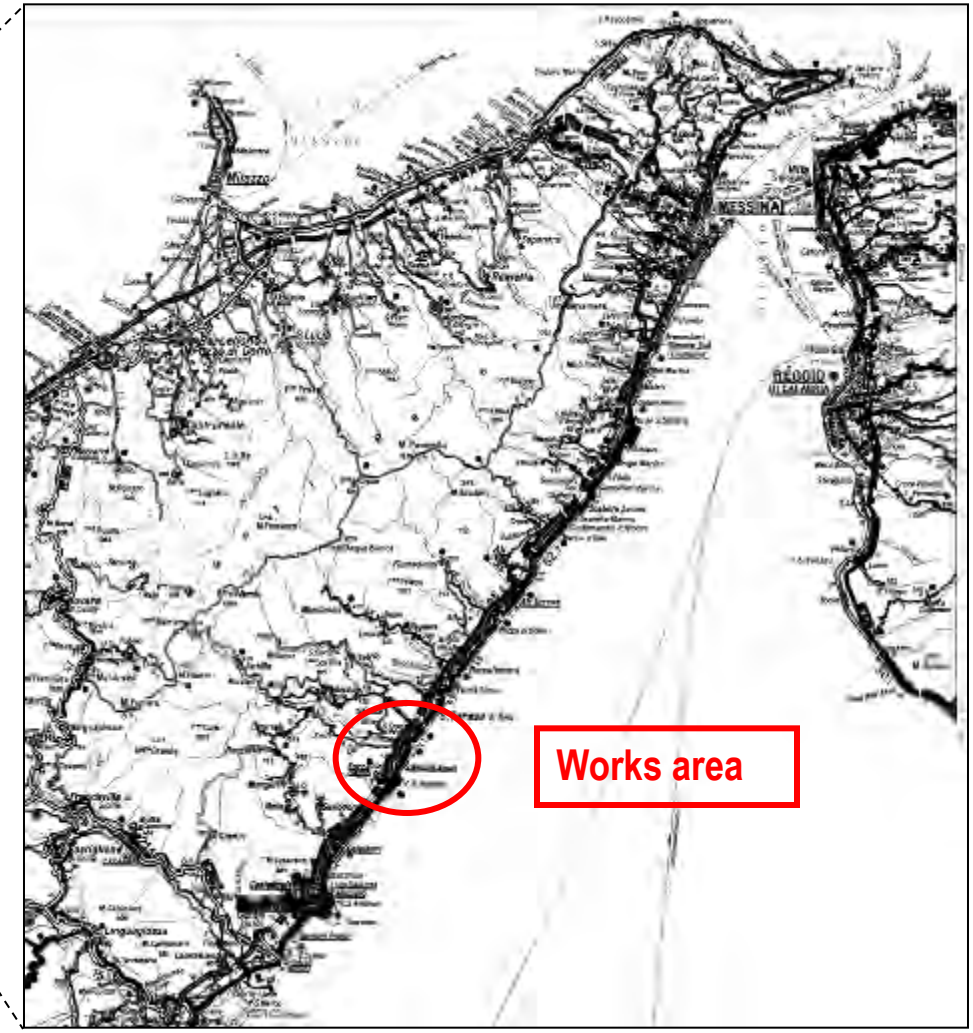
The experience of the Venice project has suggested the use of the BFM as an effective solution for the protection and stabilization of breakwaters foundations or the retaining of the nourishment material behind a breakwater.





The BFM in breakwater construction

LOCALISATION OF SANT'ALESSIO SICULO

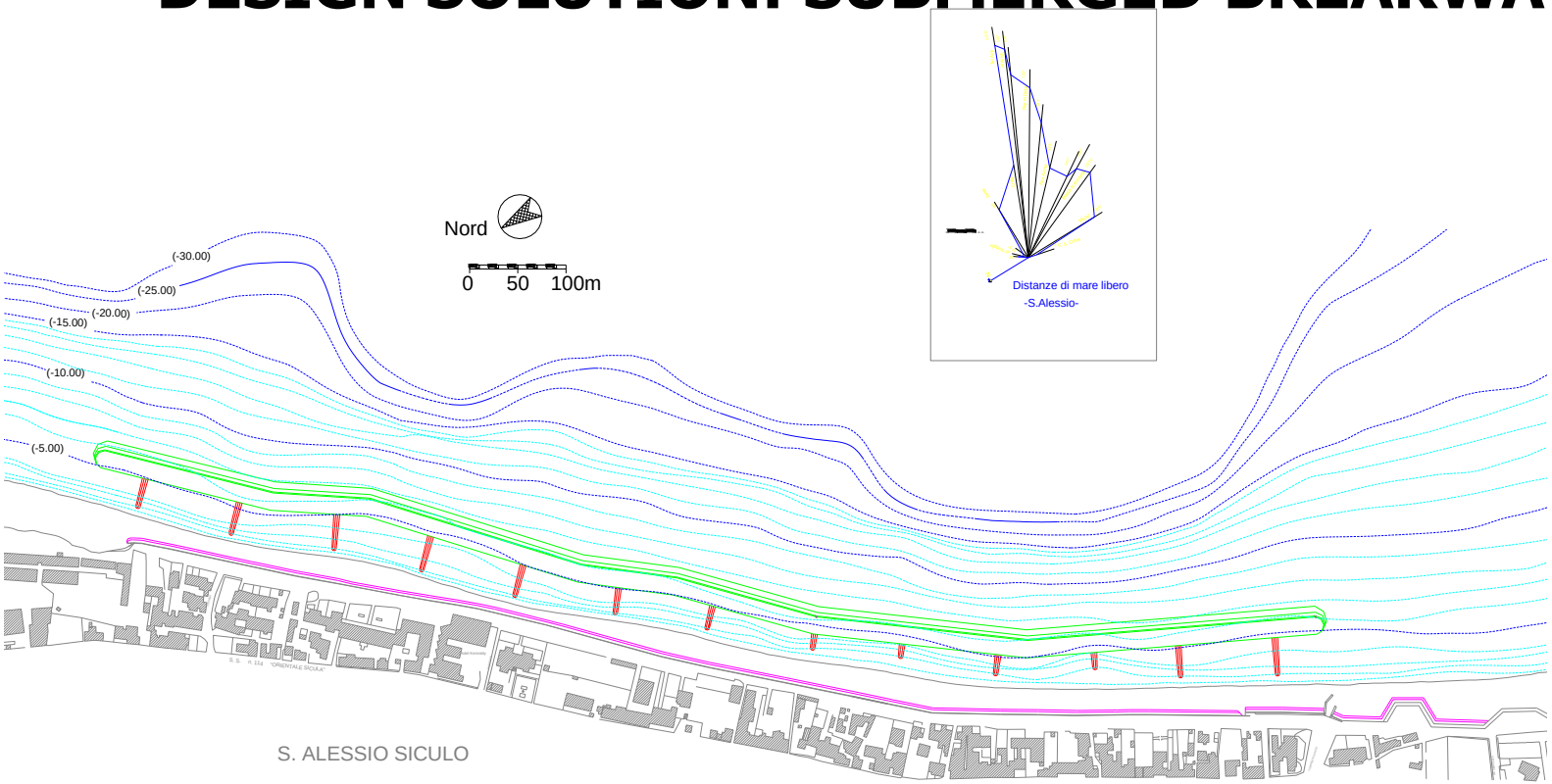


THE PROBLEM: EROSION OF THE SHORELINE

Following the heavy 2003 storms and a general reduction of beach width of approximately 70 m, the attraction of tourists and in some situations even the stability of building structures adjacent to the beach, has been adversely affected.

The BFM in breakwater construction

DESIGN SOLUTION: SUBMERGED BREAKWATER



1.3 Km submerged breakwater

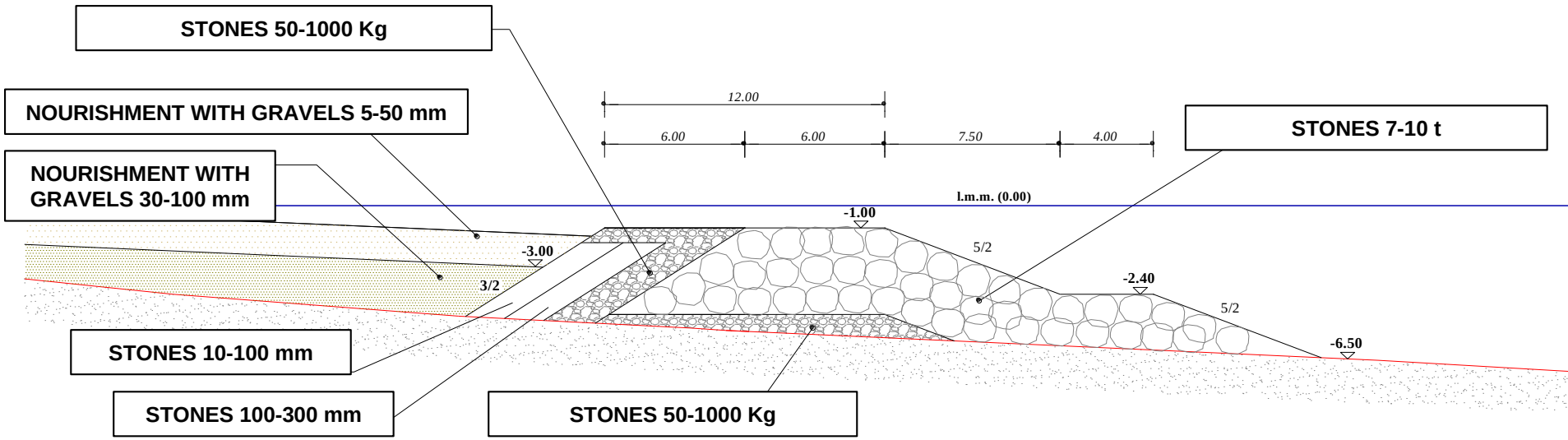
groynes every 100m

revetment to protect the seawall against scouring

beach recharge between the existing seawall and the breakwater

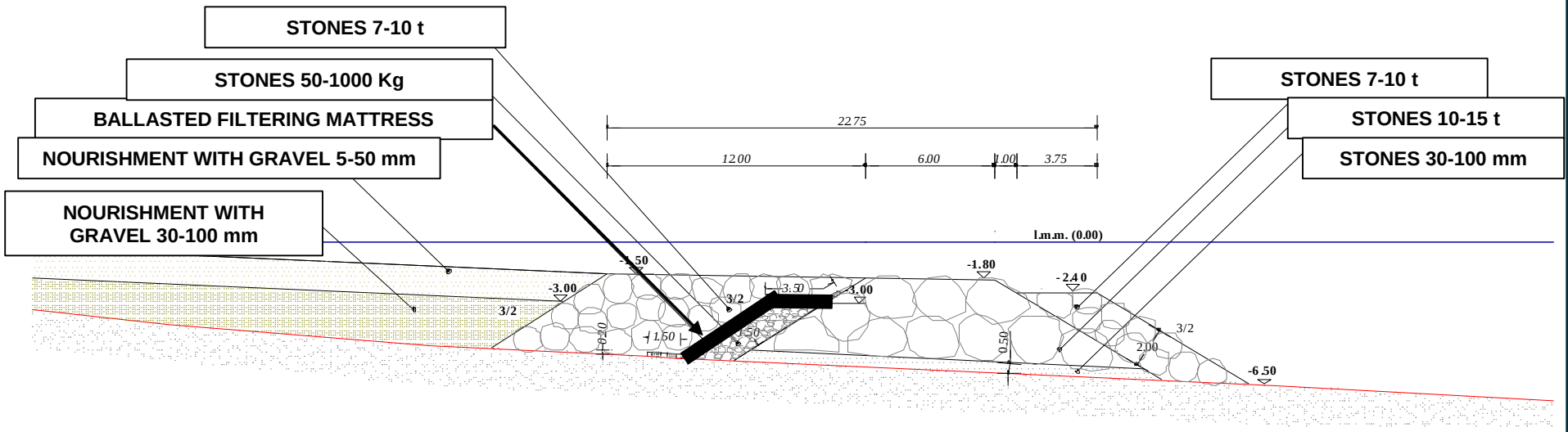
ORIGINAL SOLUTION: GRANULAR FILTER

The original breakwater design ensured the highest capacity of retention of the nourishment material, without affecting the permeability requirements of a graded rockfill



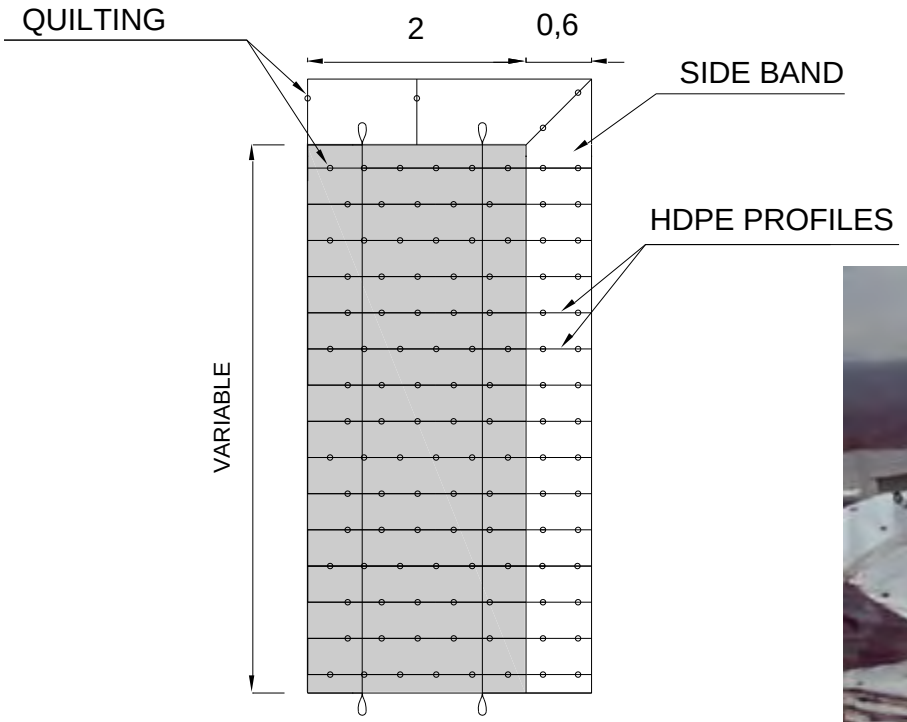
ADOPTED SOLUTION: BFM FILTERING LAYER

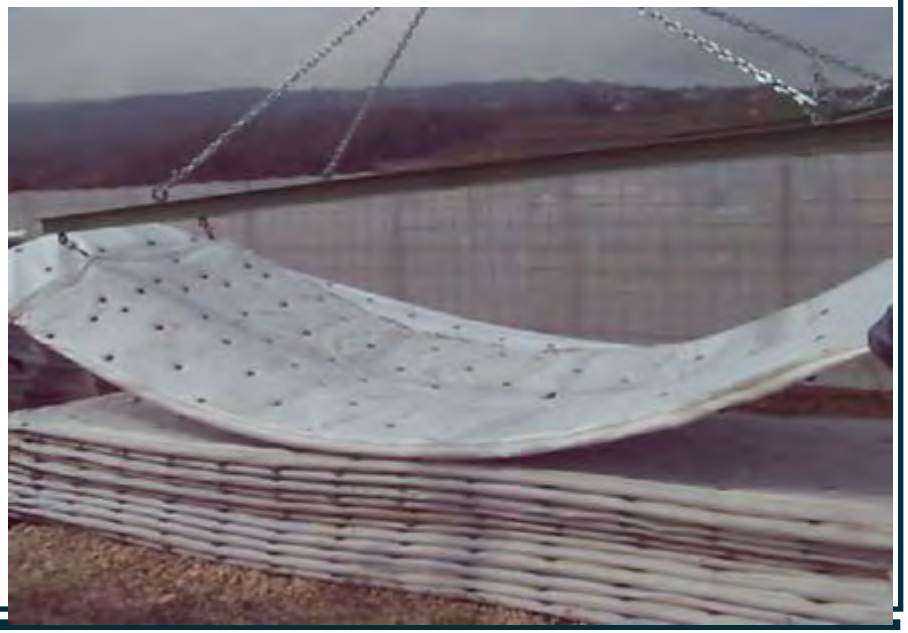
BFM units of 6x2.6 m have been inserted in the breakwater cross-section above the 50 – 1000 kg stone layer.



MANUFACTURING OF THE BFM UNITS

The BFM units are 6x2.6 m, including a 0.6 m of geotextile side band for the overlapping





INSTALLATION OF THE BFM UNITS

The installation is made by means of a pontoon on which the mattresses are stockpiled and then placed under water in position on the breakwater by utilising a simple frame, which lifts the BFM units on 4 polyester loops placed along the short sides

CONCLUSIONS

- The BFM experience on the Venice project, where 400,000 m2 have been installed to date and a further 200,000 m2 are scheduled during 2010, has shown the very good performances of the filtering mattress.

- An innovative application of the BFM is their use to assure retention of the beach nourishment material behind a submerged rockfill breakwater.

- Their rapid and proper installation is made possible by using traditional techniques and devices normally associated with maritime works of this nature.

Thank you for your attention. Any questions?

M. Scotto, CEng.

Officine Maccaferri SpA

Italy

M. Vicari, CEng.

Officine Maccaferri SpA

Italy

TECHNICAL BROCHURE

Rev: 00, Issue Date: May 2006

BALLASTED FILTER MATTRESS

INTRODUCTION

To assure the complete defense from the “acqua alta” (high water) of all the inhabited centers in the lagoon of Venezia, a solution based on the provisional closing of all the three mouths of the lagoon through a line
of mobile anti-flood barriers has resulted to be the only one which answers completely to the objectives.
This will be achieved with the MO.S.E. project (Modulo Sperimentale Elettromeccanico-Experimental electromechanical modulus). The situation before and after the realization of the works is shown in fig. 1 and 2. The mobile anti-flood barriers, composed by gates hinged at the base of the entry channel (fig. 3 and 4) are, in conditions of normal tide, full of water and lodged in the vane built on the bottom of the lagoon’s mouth. When tides that may exceed the predetermined levels are forecasted, the water fill is displaced with compressed air providing the necessary buoyancy to the gates which will raise vertically above water to temporarily prevent the increase of the lagoon’s level. The realization of MO.S.E., at present under way, requested, among others, the supply of a product which could substitute, with enhanced characteristics, the heavy geotextile with concrete blocks often used in the foundation of the sea works. The solution of the problem has requested the study, design, realization and verification-acceptance tests of a brand new product, suitable for the bathymetric and meteo-marine conditions of the Venetian site (depth 6÷15 m, wave with H_{max} 1,5 m).

For such scope, the Client had requested to Maccaferri a product with a optimal filtration capability, flexibility, resistance, durability etc., with a particular high horizontal stability on the bottom, also during the installation of the foundation blocks (see fig. 5 to 8).
In most cases, the heavy geotextiles ballasted with concrete blocks present a discontinuous permeability during the laying of the basement rocks and may get torn by the edges of the blocks. Since the installation of the rocks (whose average weight, in Venice, is 900 kg) takes place well after the laying of the filter, it is necessary to foresee a ballasting capable to maintain the filter stable on the bottom. The filter is in fact subject to the combined action of waves and tidal currents which can lift it from the bottom.
The filter is in fact subject to the combined action of waves and tidal currents which can lift it from the bottom.
The ballasting constitutes moreover a help for the installation. A further characteristic of the ballasting is correlated to a benefit secured to the geotextile in the final situation: the applied continuous and uniform ballasting on the surface of the geotextile avoids that, after the installation of the rocks, the geotextile is subject to "flapping", the fluttering between the fixed points in which the rocks are supported. The fluttering is caused by the passage of waves and currents, which produces cyclic loads which will deteriorate the geotextile.
These are the actions which more frequently cause differential

Figure 1

Figure 2

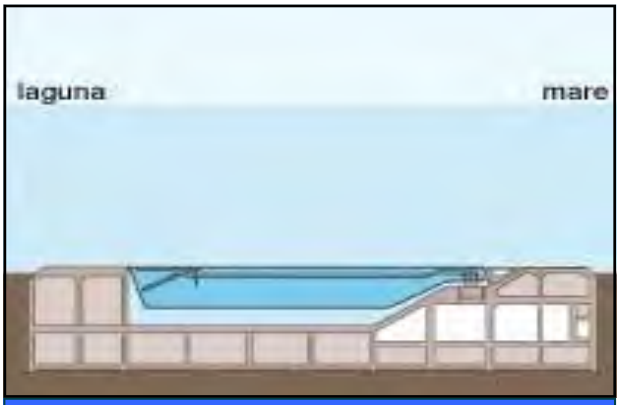


Figure 3

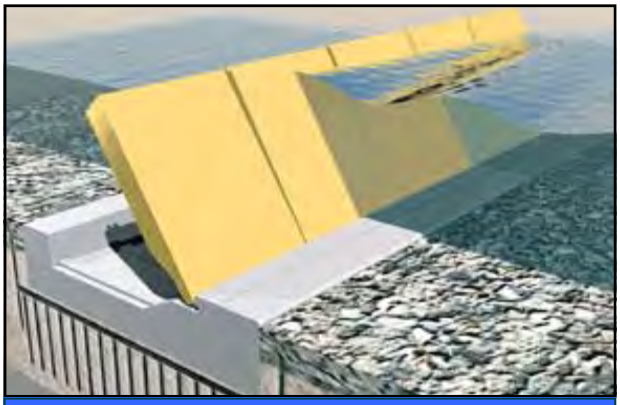


Figure 4

loads which will deteriorate the geotextile.
These are the actions which more frequently cause differential settlements and/or a rapid sinking of transversal groynes, submerged barriers and artificial reefs, built with rocks along the coasts, normally built on a geotextile or, as it often happens, without any type of filter or support. Such situation obliges the Owner or the Organization responsible for the installed facilities to a continuous maintenance and, in the worst cases, to the reinstatement of the works.

The equation used for the dimensioning of the ballasting of the filter layer is the one used for the calculation of the flow q_s through the
surface of the geotextile a_g:

$$\Delta H * k_g / t_g = \Delta H * \Psi = i * k_s = q_s / a_g$$

in which:
- ΔH is the head loss through the geotextile
- Ψ the geotextile permittivity.

In the case of the MOSE, the lifting force on the surface unit results:
$p_w(\ \ H) \sim 8.2$ kg/m^2;
$\rho_w(\Delta H) \sim 8.2$ daN/m^2; and applying a safety factor equal to 3 we obtain a value for the ballasting in submerged conditions equal to 25 daN/m2.

In relation to the long term performance of the geotextile, a verification has been conducted through a model of finite element calculation which allows to analyze the fields of motion of filtering under saturated and not saturated, both as steady or as transitory.

Considering a configuration in which the rocks
are sunk in the ground and that the filter settles as represented in figure 7, the tension induced by the settlement of the geotextile has been calculated assuming that the resultant one of the under-pressure ΔU produced by the passage of the wave is balanced by the stress generated in the geotextile N.

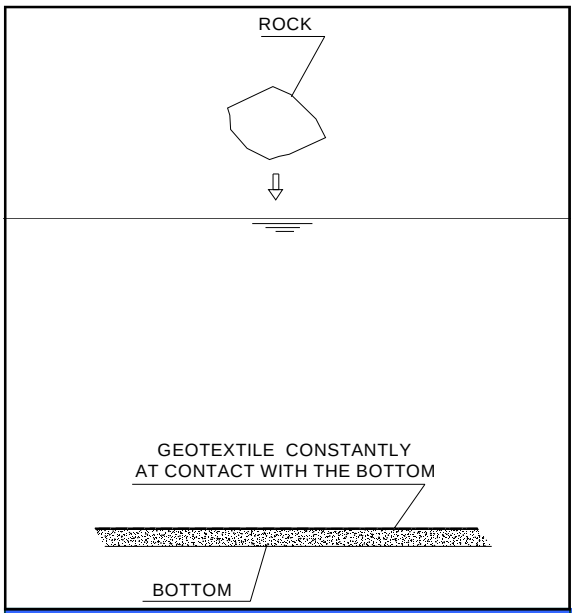


Figure 5

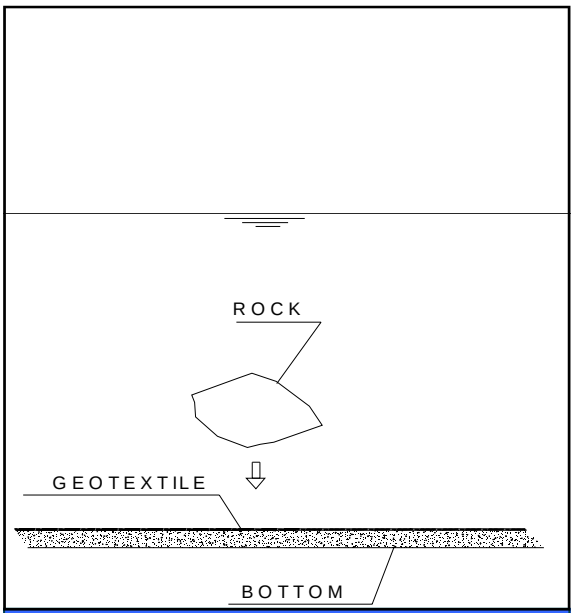


Figure 6

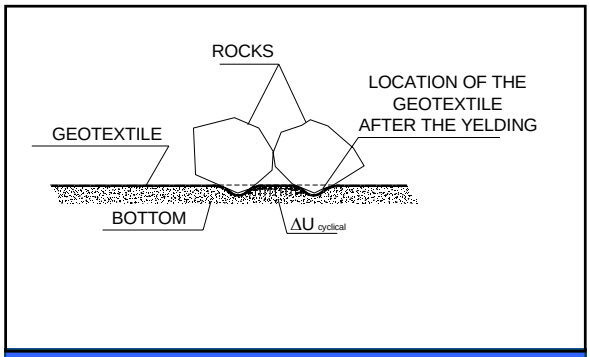


Figure 7

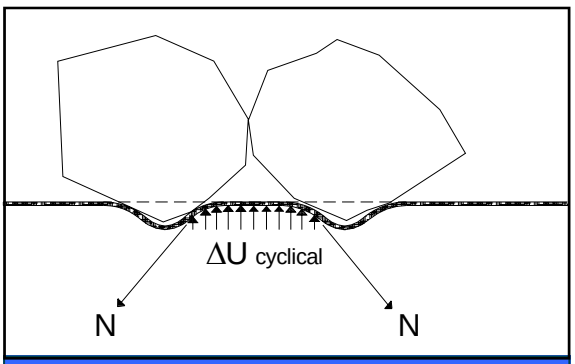


Figure 8

TECHNICAL DESCRIPTION

The filtering matt, internally ballasted with crushed rock, is a geocomposite with a maximum nominal thickness of 45mm due to manufacturing reasons. The thickness can vary according to the necessary ballast weight - in the case of MOSE it is 40mm.

The structure is formed with:

- A geotextile as bottom filter
- a central body consisting in a geomat in polypropylene filaments, strengthened internally with a double torsion wire mesh (fig. 9 and 10)
- a ballasting of the central body with small crushed rock with 4-8mm granulometry (fig. 11)
- a geotextile for the upper closure
- a side band in filtering geotextile
- a quilting with HDPE profiles and metallic screws.

In case of MOSE, the total weight of the mattress in air is of approximately 50 daN/m^2, therefore such to guarantee a submerged weight not less than 25 daN/m^2.

BOTTOM GEOTEXTILE

The bottom layer, with the main function of filtering element and of containment of the crushed rock, is constituted by a 350 g/m^2 spun-bonded, non woven, polypropylene geotextile with high tenacity, without added resins and adhesives, resistant to the attack of bacteria and fungi, and UV rays (technical characteristics in tab.1).

CENTRAL NUCLEUS

It has the function to contain the ballasting material, preventing its migration and is constituted by a geomat in polypropylene filaments extruded on a double torsion wire mesh, dimensions Zn/Al corrosion coating and protection in PVC (technical characteristics in
tab.1).

The pre-assembled product (fig. 8) used for the site production is constituted by
a geocomposite formed by the bottom geotextile, coupled, with thermal welding, to the above mentioned geomat (with a nominal thickness of 40mm) reinforced with the wire mesh.

The rolls of the geocomposite are protected from rain and UV by a cover with a black PE film both during the transportation to and the storage in the yard.

INERTS FOR BALLASTING

The inerts, whose principal function is the ballasting of the mat, is calcareous crushed rock with apparent specific weight and granulometry selected according to the requirements (for MOSE the granulometry is 4-8mm, but 8-20mm or others can be selected)

It responds to the requirements of penetrating easily inside the geomat and of
avoiding segregation during the installation.

GEOTEXTILE ON THE TOP SURFACE

The upper geotextile, with the same function of containment of the inerts, is a spun-bonded, non woven polypropylene geotextile with the same characteristics of the one in the bottom layer

QUILTING

The connection of the upper geotextile layer to the bal-

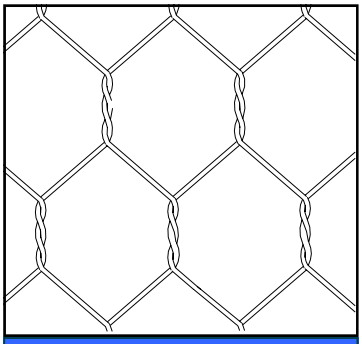


Figure 9

Figure 10

Figure 11

MATERIAL	AREIC MASS	TENSILE STRENGTH	PERMEABILITY	PORE SIZE
	(g/m^2)	(kN/m)	(m/sec)	(µm)
UNDER GEOTEXTILE	350	26	0.001	60
WIRE MESH 6x8 - 2.2/3.2	1490	36$^{(a)}$	*	*
GEOMAT PP	**650**	1	*	*
UPPER GEOTEXTILE	150	9	0.001	70
REFERENCE NORMATIVE	**EN-965**	**EN 10319**	**EN 11058**	**EN 12596**

Table 1

* = not applicable

(a) = measured by a special method

ballasted mat will be realized by profiles in HDPE with trapezoidal section, placed transversally every 33 cm on the lower side of the mat, with washers of the same material on the top side, and joined with metal screws (fig. 12 and 13).

SIDE BAND

The side band (fig. 11), with width 1,20m, is present for the whole length of the roll of mat and is realized with the same type of geotextile, with unit weight 350 g/m^2 used for the bottom filter layer and:

- guarantees the resistance to the impact due to the characteristics of resistance of the geotextile
- supplies a transversal rigidity against of the lifting actions through the transverse HDPE section placed with a 33 cm spacing
- avoids the need of doubling the thickness of the filtering mat at the overlaps
- reduces the weight of the mattress on the launching roll assembly (with equal surface), minimizing the loading problems.

The band can be placed on the right or left side of the roll of mat depending on the laying direction.

To minimize the stapling operations to the external edges and to a single internal one, the rolls of the upper geotextile are 5.20 m wide.

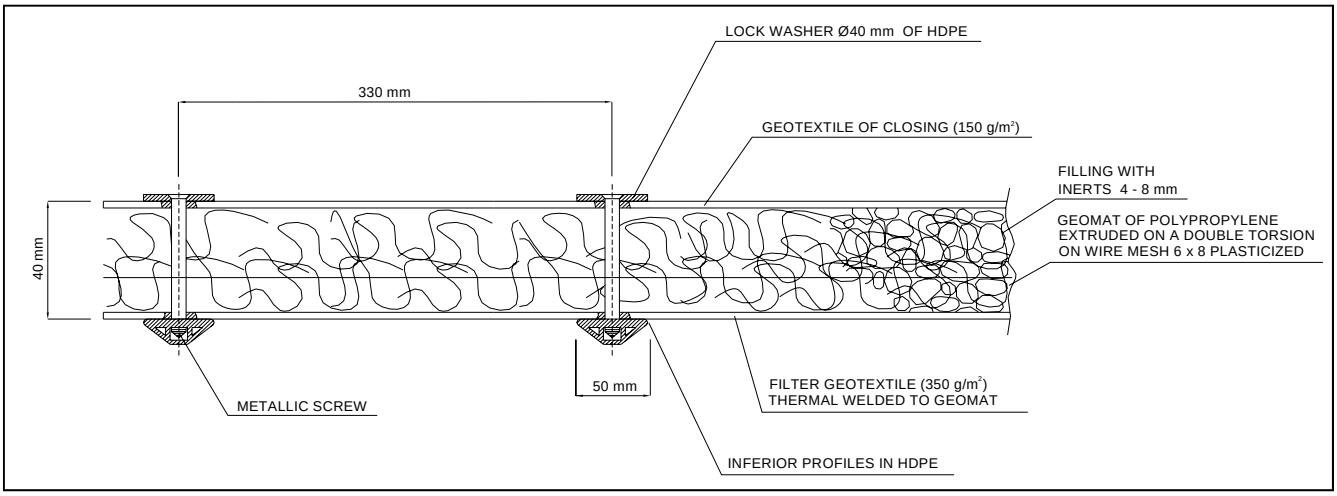


Figure 12

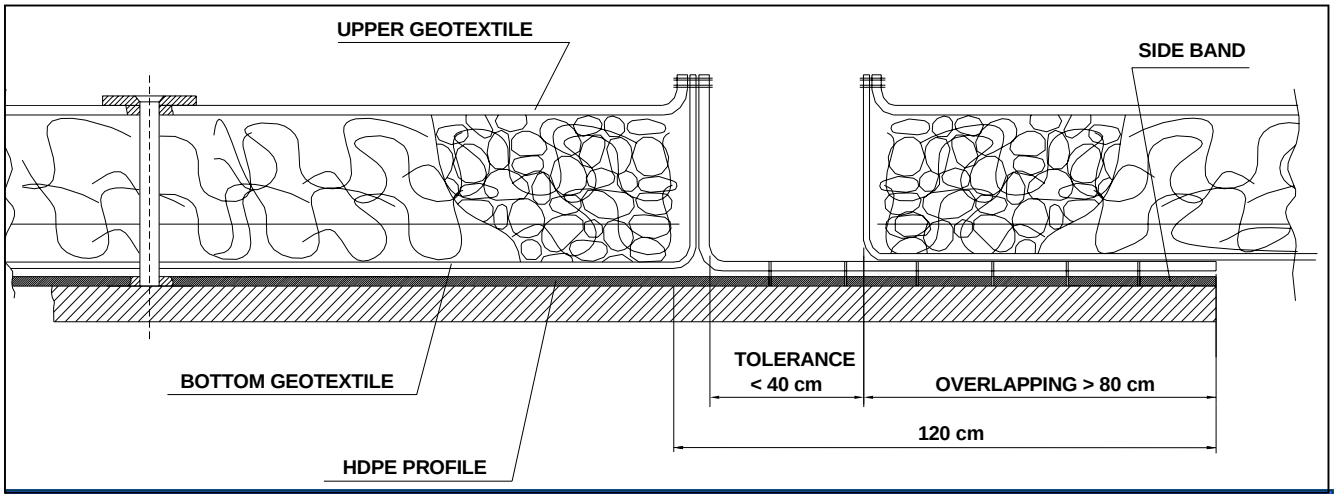


Figure 13

IMPACT TESTS

In addition to the laboratory tests on the each of the component of the mat, which have supplied the nominal values indicated in the table, additional traction, permeability and filtering tests have been performed on the same elements of a produced mat “disturbed” by practical lifting (fig. 13a), folding (fig. 13b) and impact (fig. 14) tests.

The lifting test is performed for verifying the stability of the fillers against segregation of the components.

The second is intended to verify the capability of folding, which positively influences the facility of installation.

The third is aimed to reproduce in air the same stresses occurring on the mat during the riprap installation in water.

Subsequently, the "disturbed" area of the mat has been cut out (fig. 15, 16) and on it have been performed again the traction, permeability and filtering tests

The effected tests have denoted losses in the efficiency around 10% in comparison to the undisturbed materials; this guarantees however an adequate safety margin for the product.

At the end of the performed tests, the geosynthetic materials composing the mat have been guaranteed for a 100 years life time, while for the PVC coated steel wire mesh the durability is 125 years.

Figure 13a

Figure 13b

Figure 14

Figure 15

Figure 16

APPLICATIONS

In addition to the protections of inlets (like in the case of the MO.S.E.) this filter can be used for all the works for coastal protection: groynes (fig. 17 and 18), emerged (fig.19 and 20) and submerged (fig. 21 and 22) barriers and geotubes (fig. 23 and 24) all structures with erosion problems to the base.

Figure 17

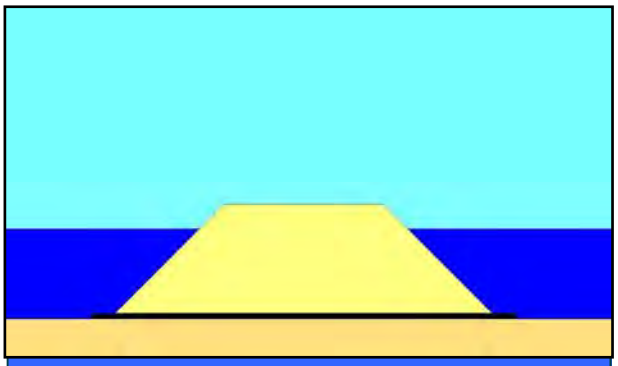


Figure 18 (groyn section)

Figure 19

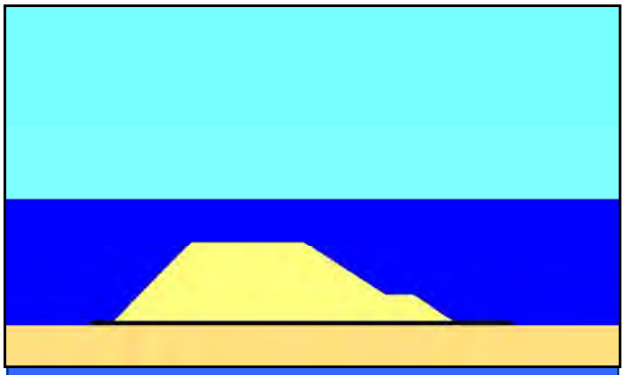


Figure 20 (barrier section)

Figure 21

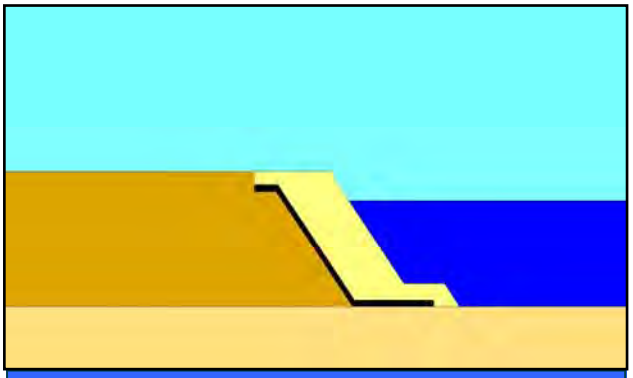


Figure 22 (littoral protection section)

Figure 23

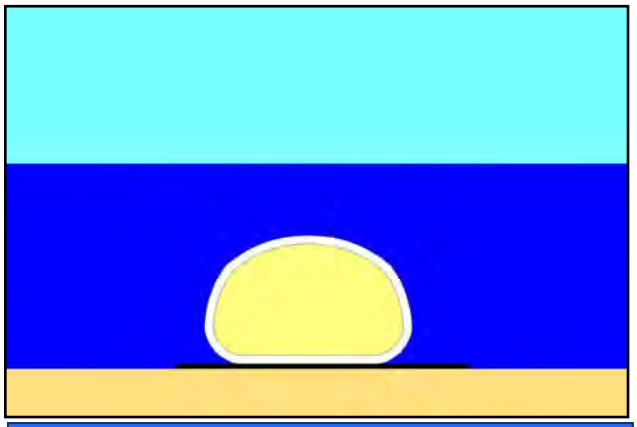


Figure 24 (geotube section)

The mattress it can be used also in the case of the stabilisation of the bottom of harbours (fig 26). . The product can be laid down in three ways:

- through a special pontoon as in the case of (MO.S.E.fig. 25 and 27);
- through a normal pontoon (fig. 28) or a crane located on the dock of the harbour the mat is equipped of button-holes with rings in polypropylene and attacked to a chassis (fig. 29).

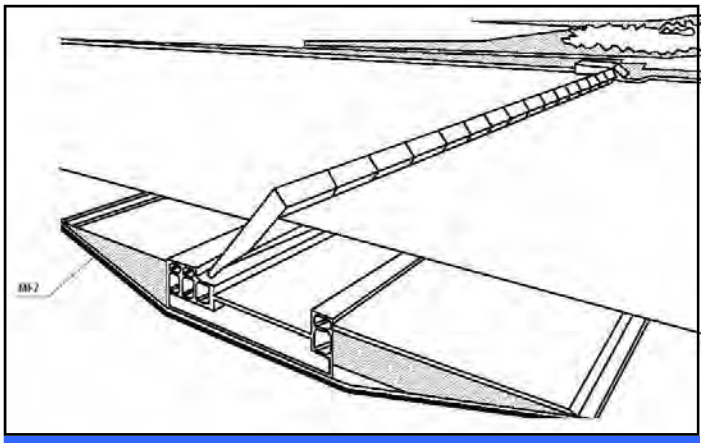


Figure 25

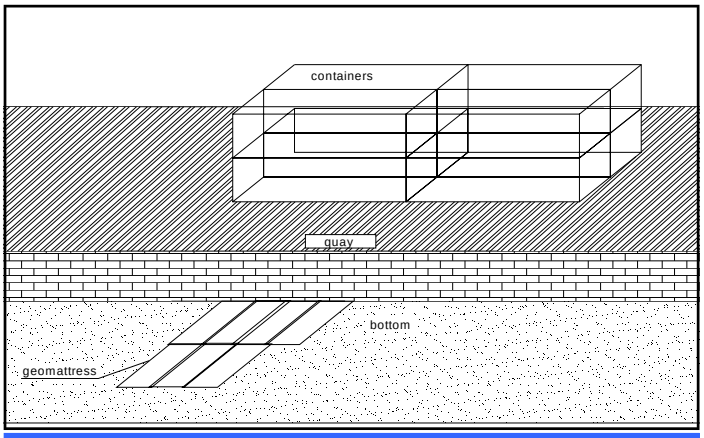


Figure 26

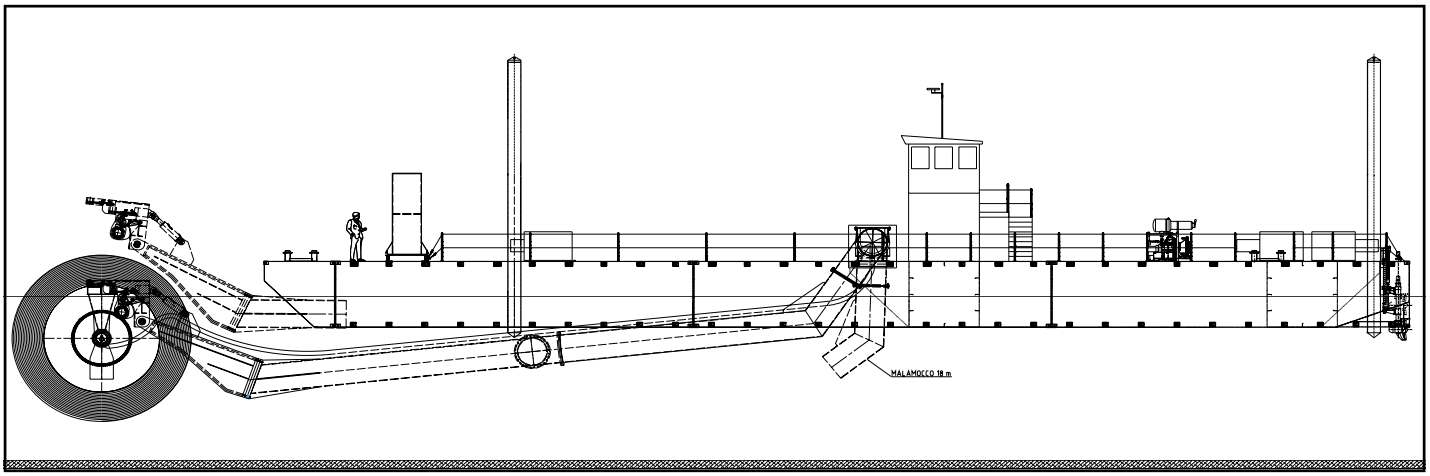


Figure 27

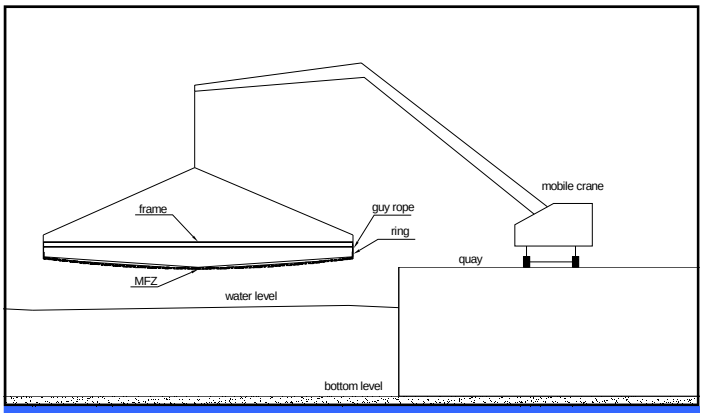


Figure 28

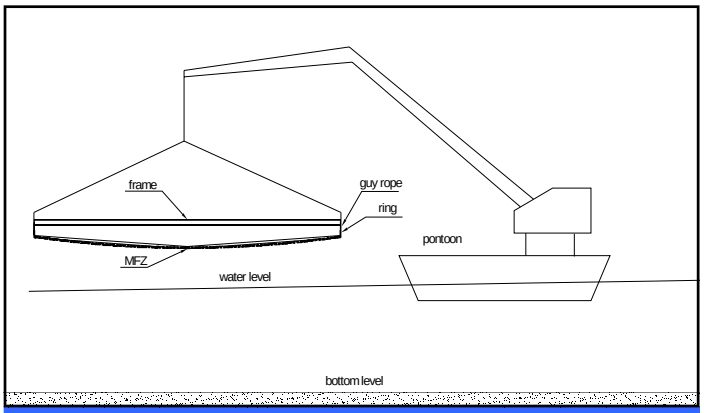


Figure 29

The producer, for the process optimization and the improvement of the technical characteristics of the products, reserves the faculty to modify the standards and the characteristics of the products without some warning. All the supplied information are given in good faith on the base of our experience; in any case no responsibility for a wrong utilize in projects of the same ones could be charged to the producer or its distributors.

Coastal Protection Systems S.r.l.
Via Kennedy, 10- 40069 Zola Predosa (Italy)
Tel. (+39) 051-64360111 - Fax (+39) 051-236507
E-mail: info@cpsystems.it - Web site: www.cpsystems.it

Yeh, Alice

From: josh stout <stoutjs@gmail.com>
Sent: Wednesday, August 13, 2014 11:37 AM
To: Region2 PassaicLower8MileComments
Cc: Tony Bianchini; Jessica Orth; Brendan Lynch; Marion McClary
Subject: lower Passaic

Dear Alice Yeh,

I would like to thank the EPA administrators, scientists and technicians for the excellent work they have done on the monumental task of planning the cleanup of the lower Passaic. In general the current EPA plan is an excellent balance between a mandated environmental cleanup and the physical realities of a densely populated area with an aging infrastructure.

Given the level of planning, I would like to ask if it is not possible to leave at least some portions of the lower Passaic without dredging or caps. I am not necessarily calling for the more limited "targeted dredging and capping", but it seems reasonable to use a more detailed approach to attempt to identify regions with less mobile sediments that could act as refuges for benthic organisms. Even a few areas left uncapped and un-dredged would greatly speed up the biological recovery of the lower river.

In addition, given the unique and historic opportunity for change that the cleanup represents, it would also seem reasonable to make some sort of community access to the river part of the overall plan. I understand that community access to resources is not part the EPA mission, but the EPA is certainly in a position to work with the businesses that will be funding the project. Without community access, the river may become relatively decontaminated, but will still offer little to the communities it flows through.

A truly functioning lower Passaic should not just be clean water running through a man-made trench. There needs to be aquatic life, much of which is dependent on benthic organisms, most of which could not survive on "hardened caps" or caps "maintained in perpetuity". I understand that there are no undisturbed regions of the lower river, but there are still benthic invertebrates that should be given refuges from which they can colonize regions that require dredging.

There also needs to be some benefit for the nearby communities that will be severely impacted as the work closes bridges and moves millions of tons of sediment on barges and trucks. River access that will benefit the communities would at least somewhat offset the large burden that will be placed upon them once the project commences.

Once again, I would like to say that the EPA is doing an excellent job, but in my opinion, on this project, too much focus is being placed on removing contaminants and not enough of the riverine community. The organisms in the river and the people around the river need to be considered in any plan for a healthy Passaic.

Thanks,
Josh
--
Dr. Josh Stout
School of Natural Sciences
Fairleigh Dickinson University

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 05, 2014 10:01 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Lisa Strug
lisastrug@yaho.com

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, July 29, 2014 1:11 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

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Thank you.

Bruno Tedeschi
brunortedeschi@gmail.com
738 Mountain Avenue
Westfield
NJ
07090

9085913631

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Tuesday, August 19, 2014 6:46 AM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Aaron Thompson
Aaron.thompson87@gmail.com
615 plainsboro rd
Plainsboro
New Jersey
08536

6092736702

Yeh, Alice

From: Kluesner, Dave
Sent: Thursday, May 01, 2014 6:07 PM
To: Region2 PassaicLower8MileComments
Subject: Action Alert - Passaic River Cleanup

From: nswc [mailto:nswcsibt@aol.com]
Sent: Thursday, May 01, 2014 5:32 PM
To: nswcsi@nswcsi.org
Cc: titonem@assembly.state.ny.us; savino@senate.state.ny.us; govcuomo.office@nygovoffice.gov; borellij@assembly.state.ny.us; lanza@senate.state.ny.us; cusickm@assembly.state.ny.us; malliotakisn@assembly.state.ny.us; drose@council.nyc.gov; jamesoddo@gmail.com; vignizio@council.nyc.ny.us; SMatteo@council.nyc.gov
Subject: Fwd: Action Alert - Passaic River Cleanup

Dear All,

We know that on the North Shore it is very difficult to see our waterfront let alone know what water bodies connect to one another. But in this case the Passaic River connects to the Lower Passaic River which connects to Newark Bay. Newark Bay connects to the Arthur Kill and the Kill Van Kull, where many of our people fish and harvest shell fish to feed themselves and their families.

Dioxin also known as Agent Orange cause cancer in humans.
Therefore Staten Islanders should say something in reference to the Passaic River Clean Up, scroll down for more information.

Beryl A. Thurman, Executive Director/President
NSWC
Creating Livable Communities

Credit and Debit Card Donations to NSWC can be made through the NSWC website below...
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The North Shore Waterfront Conservancy of Staten Island, Inc., P.O.Box 140502, Staten Island, NY. 10314

-----Original Message-----
From: NY/NJ Baykeeper <mail@nynjbaykeeper.org>
To: nswcsibt <nswcsibt@aol.com>
Sent: Thu, May 1, 2014 1:18 pm
Subject: Action Alert - Passaic River Cleanup

Call to Action: We Need Your Support to Cleanup the Passaic River

EPA Releases Proposed Passaic River Superfund Cleanup Plan
Make Your Voice Heard During the Public Hearings and Comment Period

For decades, polluters dumped dioxin and other harmful, cancer-causing contaminants into Passaic River in Newark, NJ. In an effort to remediate the abused Passaic River, the US Environmental Protection Agency proposed a historic cleanup plan on April 11,2014. The EPA's preferred cleanup method consists of bank to bank dredging of 4.3 million cubic yards of contaminated sediment from the lower 8.3 miles of the River, with a two foot cap.

We are in favor of EPA's plan with off-site disposal of the contaminants at a licensed facility. Burying and capping the contaminants in Newark Bay is NOT a viable clean option. The plan will be beneficial in long term effectiveness, will reduce toxicity, ecological impacts, and risk to human health and improve the environment and economy. It is time for the polluters to take responsibility and accountability for the murder of our River!

To learn more about the proposed cleanup plan, click here.

Make your voice heard during the public comment period.

April 21 - June 20, 2014. Submit comments to PassaicLower8MileComments.Region2@epa.gov supporting EPA's plan of a complete bank to bank cleanup and off-site disposal!

Attend a Public Meeting!

Wed., May 7, 2014 at 7:00pm

Portuguese Sports Club: 85 Congress St, Newark, NJ 07105

Thurs., May 21, 2014 at 6:00pm

Franklin School
100 Davis Avenue, Kearny, NJ 07032

To be determined: Belleville, NJ

Sign our online petition.

For more information, contact Sandra at sandra@nynjbaykeeper.org or 732-888-9870 x7.

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Yeh, Alice

From: Sean Jackson <Sean@RosemontAssocs.com>
Sent: Tuesday, August 19, 2014 6:35 PM
To: Region2 PassaicLower8MileComments
Subject: DOC081914-08192014181739.pdf
Attachments: DOC081914-08192014181739.pdf; ATT00001.txt

Dear Ms. Yeh - please see the attached comment letter from Robert G. Torricelli, the Special Master overseeing remediation of Roosevelt Drive In site in Jersey City as it relates to the Passaic Lower 8 Mile Clean Up.

Thank you for your attention to this matter.

Office of the Special Master
P.O. Box 216
Rosemont, NJ 08556
609-773-0335

August 19, 2014

VIA ELECTRONIC MAIL
Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

Re: Lower Eight Miles of the Lower Passaic River Superfund Site
Proposed Cleanup Plan

Dear Ms. Yeh:

For the past ten years I have served as U.S. District Court's Special Master overseeing the implementation of a federal court ordered remediation at the former Roosevelt Drive-in property in Jersey City, New Jersey. As one of the largest remediation projects in the nation's history, this project has involved removal of over a million cubic yards of chromium contaminated soils followed by site restoration with clean fill, performance of groundwater remediation. It further involved a comprehensive dredging and capping project in the Hackensack River to address contaminated sediments.

I am writing to you as the EPA considers comments regarding the proposed plan to remediate the Lower Passaic River. This is of particular interest to me as Special Master, as well as the responsible party performing the cleanup, Honeywell, and the Interfaith Community Organization and Hackensack Riverkeeper, Inc., the entities whose litigation led to the court-ordered remediation of the site, and the City of Jersey City. The Hackensack River Riverkeeper is also affiliated with the Interfaith Community Organization.

The site is located just above Newark Bay where the Hackensack River begins and from the site, one can see the Lower Passaic's starting point. Thus, as you can imagine, all the Parties related to the Roosevelt Drive-in cleanup are eager to ensure that the work done to clean up the Lower Passaic does not negatively impact the Hackensack remediation efforts.

The federal court-ordered remediation involved excavating and removing in excess of a million cubic yards of (hexavalent) chromium contaminated soil from the 100 acre site. The river based remediation in the Lower Hackensack River had two main components on which

Sevenson Environmental Services, Inc. was the lead contractor. Senior staff at Region Two may recall that Honeywell, ICO, and the Special Master staff briefed EPA on this remedy prior to implementation.

The first component of the river clean up started in the immediate area off the industrial site, where over 2,000 cubic yards (CY) of contaminated sediments were dredged and an 18-inch cap placed over the dredged area. Second, surface sediments were capped within delineated areas over an area of approximately 38 acres of the Hackensack River with design thicknesses between 6 and 12 inches. A six-inch cap was placed over a total of 19 acres and a twelve-inch cap placed over a total of 18 acres. Generally, the placement of capping material in these areas achieved at least a one foot layer of natural sediments and/or cap material with a concentration of less than 370 ppm total chromium. In all, approximately 192,000 tons of cap material was placed to encapsulate the chromium contaminated sediments in the river. Monitored natural recovery (MNR) was also implemented in a total of 33 acres of the Hackensack River.

Long term monitoring of the remediation area is now being performed to assess the ongoing effectiveness of the sediment remedy (i.e., maintenance and/or verification of cap integrity, data collected on the nature of benthic community following implementation, erosion monitoring of MNR areas). The cap included sand and filter layers followed by an armoring layer to help keep the cap in place given the tidal forces at play in the River, as well as the on-going shipping activity along the Hackensack, and to protect against serious storm surge related tides. Indeed, these tidal forces, and shipping traffic, are of significant concern as the EPA considers how it will proceed with determining the appropriate remedy for the Lower Passaic.

I am certain that the Agency is focused on protecting the water quality and marine life by preventing the contamination from the remediation area being released out of the Lower Passaic area. I write to make clear that in addition, there is also the newly remediated sediments in the Hackensack River that further underscores the need for containing any spillover of contamination. I urge the Agency to employ all appropriate techniques to contain the Passaic River contamination as it is remediated.

Thank you for your consideration of these issues.

Sincerely,

Robert G. Torricelli
Special Master, Federal District Court of
New Jersey

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Wednesday, August 06, 2014 2:20 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Tom Townes
tstownes@gmail.com
135 Treymore Court
Pennington
New Jersey
08534

6097308626

Yeh, Alice

From: Laura Tracey-Coll <lauratraceycoll@hotmail.com>
Sent: Monday, August 11, 2014 10:23 PM
To: Region2 PassaicLower8MileComments
Subject: Passaic River Restoration

Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor

New York, NY 10007-1866

I think that completely clean out all the contaminated soil needs to be removed from the area. Capping would not be permanent. I also believe that the sludge should not be incinerated in the area. THe sludge should be removed and decontaminated and processed away from our area. ALternative 2 is the best way to handle the Passaic River cleanup.

Alternative 2 is a full bank to bank dredging of the lower 8.3 miles to depths of 20-30' that would totally remove the contaminants and permit boating to return to its pre-1950 levels.

Alternative 2 would permit new docks, boat ramps, and bulkheads to be built. No maintenance is required with Alternative 2.

Alternative 2 holds the polluters fully responsible and is truly a Restoration of the Passaic River.

Alternative 3 would cap the river and not dredge the bottom. This will not work because of flooding and scouring of River. It is being proposed because it is cheaper, but will not last since ultimately the caps will fail. Bank to bank capping has never been done before. This Alternative would also require regular costly maintenance.

The Alternative 3 capping results in no Improved Boating, a no wake policy and a no anchor policy. The River would be capped after 80 years of silting, leaving the mud flats that prevent boats to reach the shore line, except at high tide. New docks, boat ramps, bulkheads, and shoreline development would be prohibited.

Alternative 3 would prohibit yachts, passenger and sightseeing boats from bringing fans to Red Bull Stadium, the Gateway Center, NJPAC, Hampton Hotel, and nearby restaurants. The unimproved depth would prohibit the return of commercial shipping to North Newark. Capping leaves the bulk of the contaminated sediment in the River.

Dioxin is one of the most deadly substances known to man that bio accumulates in people and is known to be the most carcinogenic. Dioxin is an extremely harmful substance not only to humans, but to the ecosystem as well. The

Diamond Alkali plant manufactured pesticides, weed killers, and Agent Orange, the defoliant used during the Vietnam War.

Under both state and federal law companies that discharge toxic chemicals into the environment that cause a loss of public use are assessed with Natural Resource Damages. The public fisheries, aquatic ecosystems, wetlands, rivers, and estuaries belong to all of us. When a company contaminates and prevents the use of that resource they have to pay damages.

Rivers should not be Superfund sites they should be places where people can walk along the river bank or kayak.

Sincerely,

Laura Tracey-Coll

41 Washington Ave

Elmwood Park NJ 07407

NEW JERSEY GENERAL ASSEMBLY

CLEOPATRA G. TUCKER
ASSEMBLYWOMAN, 28TH DISTRICT
400 LYONS AVENUE
NEWARK, NJ 07112
(973) 926-4320
FAX: (973) 926-5736
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COMMITTEES
CHAIR
MILITARY AND VETERAN'S AFFAIRS
VICE CHAIR
HUMAN SERVICE
MEMBER
REGULATORY OVERSIGHT

August 1, 2014

Alice Yeh, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

Dear Ms. Yeh:

Serving as an Assemblywoman in the 28th Legislative District, I extend my support in the United States Environmental Protection Agency Region 2's (EPA) preferred cleanup plan of the Passaic River, part of the Diamond Alkali Superfund site. I understand that the cleanup plan will consist of a complete bank to bank removal of contaminated sediment in the lower eight miles of the Passaic River. According to the Proposed Plan, contaminants within the sediment can cause high human health and ecological risks and therefore, must be removed entirely from the River and disposed off-site at a licensed facility. The proposed cleanup plan will not only reduce the dangerous toxicity of the Passaic River, but will also create jobs, reduce risk to human health, and provide beneficial long term effectiveness. I thank EPA Region 2 for all of its work on this Superfund Site. I look forward to the restoration of the Passaic River my constituents deserve and demand.

Sincerely,

Cleopatra G Tucker

Assemblywoman Cleopatra G. Tucker
28th Legislative District

Yeh, Alice

From: Kluesner, Dave
Sent: Thursday, June 19, 2014 5:47 PM
To: Region2 PassaicLower8MileComments
Subject: FW: River parties critical of EPA plan timeline

Please consider Mr. Van Der Tuin's comment below as a comment on the Proposed Plan.

David W. Kluesner
U.S. Environmental Protection Agency
Public Affairs
290 Broadway, 26th Floor
New York, NY 10007
212.637.3653 (Office)
347.330.9439 (Cell)

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From: John Van Der Tuin [mailto:JVandertuin@balberpickard.com]
Sent: Thursday, June 19, 2014 5:35 PM
To: Kluesner, Dave
Subject: RE: [Possible SPAM] River parties critical of EPA plan timeline

I guess so. I make an oral comment at one of the community hearings to the same effect, but don't think anyone was interested in any issue other than whether to dump in Newark Bay or dispose off-site. Everything else appeared to be a foregone conclusion.

From: Kluesner, Dave [mailto:kluesner.dave@epa.gov]
Sent: Thursday, June 19, 2014 5:33 PM
To: John Van Der Tuin
Subject: RE: [Possible SPAM] River parties critical of EPA plan timeline

Hi John, would you like for me to consider your email as a comment on the EPA's Proposed Plan? If yes, I will forward it to the official email address for capturing public comments. Thanks.

David W. Kluesner
U.S. Environmental Protection Agency
Public Affairs
290 Broadway, 26th Floor
New York, NY 10007
212.637.3653 (Office)
347.330.9439 (Cell)

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https://twitter.com/EPAregion2
https://www.facebook.com/eparegion2

From: John Van Der Tuin [mailto:JVandertuin@balberpickard.com]
Sent: Thursday, June 19, 2014 5:30 PM
To: Kluesner, Dave
Subject: RE: [Possible SPAM] River parties critical of EPA plan timeline

You know Dave – you've got to talk to your technical and policy folks and get them to back off the bank to bank option and move towards some combination of the Option #4 and the Sustainable Remedy. EPA's preferred option is going to be just a god-awful mess and boondoggle that doesn't create an attractive, usable river.

John Van Der Tuin

From: Kluesner, Dave [mailto:kluesner.dave@epa.gov]
Sent: Thursday, June 19, 2014 5:13 PM
Subject: [Possible SPAM] River parties critical of EPA plan timeline
Importance: Low

http://www.northjersey.com/community-news/citing-lessons-learned-parties-critical-of-epa-plan-for-cleanup-1.1037905?page=all

River parties critical of EPA plan timeline

JUNE 19, 2014 LAST UPDATED: THURSDAY, JUNE 19, 2014, 12:32 AM
BY MEGHAN GRANT
MANAGING EDITOR
SOUTH BERGENITE

STAFF PHOTO/ELIZABETH LARA

Project manager John Rolfe (left) and spokesperson Jonathan Jaffe tour the banks of the river in Riverside County Park.

Representatives of parties responsible for the recent dredging and capping operations on the Passaic River by Riverside County Park are critical of the historically large plan put forth by the Environmental Protection Agency (EPA) for the lower eight miles of the river, saying from what they've learned from working in Lyndhurst, the project just cannot be carried out as planned. The Lower Passaic Cooperating Parties Group (CPG), an organization of 70 parties believed responsible for contamination in the river, have been promoting their own cleanup plan, Sustainable Remedy, which promises to be a cheaper and more targeted approach than the bank-to-bank plan favored by the EPA.

The EPA has expanded its public hearing window until July 21 for the estimated $1.7 billon preferred alternative project to clean the lower eight miles of the Passaic River sullied by years of dumping. The stretch of river is a federally recognized Superfund site due to the levels of dioxin, PCBs, heavy metal and similar contamination identified in the sediment. As reported earlier, South Bergen's portion of the river isn't included in this phase, with a plan targeting that section not scheduled to be released for almost another year.

Upriver at River Mile 10.9, an undertaking to remove contaminated sediment and cap the 5.5-acre site was completed on May 30, funded by the CPG. Operation representatives say the lessons learned in Lyndhurst proved to be a kind of "pilot" for sediment removal going forward. Remedial action was conducted at the site due to the high concentration of contaminants in the mudflats near the park and neighborhood, which are routinely exposed during low tides.

The CPG was also critical of the EPA's logistics, saying its experience suggests the timeline and productivity contained in the plan is unrealistic.

An inoperable bridge in Newark and uncooperative weather turned a four-month plan into a ten-month operation, said John Rolfe, project manager for environmental firm De Maximis, Inc. Workers had to coordinate nearly a thousand openings of the 10 bridges between the work site and disposal facility in Kearny to accommodate barges. Factors to consider included Red Bulls games in Harrison, NJPAC events, tides and peak traffic times. Project managers said the Lyndhurst operation netted no traffic complaints to them.

Forty-five days were lost due to weather delays and 21 days due to bridge failures, and the dredging took 40 days, De Maximis reported.

Given the scale of the preferred alternative plan by the EPA, it's possible multiple bridges would need to be opened at once, creating traffic congestion, the project managers said.

The Lyndhurst remedial action to remove 16,020 cubic yards of sediment pales in comparison to the EPA's proposal – to remove a total of 4.3 million cubic yards of contaminated sediment – enough to fill MetLife Stadium twice – from between River Mile 8.3 on the Belleville-Newark border and River Mile 0 in the Newark Bay, billed as a bank-to-bank remedy.

In 2012, the EPA completed removal of 40,000 cubic yards of the most highly contaminated sediment in the Passaic River, adjacent to the former Diamond Alkali facility in Newark.

"Dredging was the easy part, it was moving the stuff," said Bill Potter, senior project director for De Maximis Inc. Water depth also limits how much equipment can be stored on the river, and at times, vessels became beached. Operating with four barges, extra barges could not be parked in Lyndhurst as it would block river traffic, he said.

Going into the project, officials were aware of the horizon limit posed by low tides, but discovered vertical limits were soon realized, Potter said.

Navigating barges through narrow channels under the swing bridges means tugboats with more horsepower were needed and depending on the tide, barges would travel half empty. A few times, barges "kissed" bridges during their travels, he added.

"There are a lot of moving parts," Rolfe said. On some days, the tides did not match the work schedule, since workers could not operate safely in the dark, and bridges could not be raised during rush hours, he added.

Cold weather also caused delays. Summer work days were lost due to repeated instances of the Bridge Street Bridge being inoperable. This pushed the timeline into the winter, meaning equipment needed warm-up time to operate, and employees had to wear cumbersome suits for safety, Potter recalled.

Another lesson learned was placing of the fabric layer of the cap. Unspooled from roll on the shore, setting it was difficult due to the tide, the first time the team attempted to place such a layer on a tidal river, Rolfe said.

Similar to River Mile 10.9, the EPA intends to install a cap following dredging of the lower eight miles. De Maximis managers assured the cap would protect against the shifting of sediment during strong storms.

During the Lyndhurst mudflat dredge, the crews worked around a 60-foot span of the river containing a water pipeline, which was difficult to locate as it was underground, and workers were limited as to what tools they could use to find it, Potter said.

The lower eight miles would contain all kinds of utility lines and pipes, and not all can be located with accuracy, Potter said. In Lyndhurst during the project, the crew worked around a 60-foot span of the river containing a nearly 100-year old water pipeline, which was difficult to locate as it was underground, and workers were limited in which survey tools could be used on it.

Removing the nearly 23,736 tons of sediment translated to 55,000 man hours, De Maximis reported. Despite the delays, the project itself was only about $30,000 over budget, Rolfe said.

While the monitoring buoys deployed in the river never picked up enough turbidity to warrant pausing the operation, they did net some "confounding data," possibly sediment being kicked up from work upriver near the Route 3 bridge, Potter said. Turbidity, not chemical substances, was monitored.

The CPG is in negotiations with the EPA about how the site will be monitored in the future.

De Maximis reps also questioned if the EPA's intended bank-to-bank approach would mean dredging next to the foundation of Route 21 on the Essex County side of the river, potentially destabilizing it.

EPA officials announced previously that finalization of logistics such as exact volume of sediment removal, dredging technology, rail routes and other elements would come at the close of the public comment portion, anticipating a start date of March 2018.The criticism of the EPA's plan also comes as the CPG seeks to promote its own cleanup plan, dubbed Sustainable Remedy. As the CPG has proposed, the Sustainable Remedy seeks to address the entire 17-mile span, with a model that targets "hot spots" of concentrated contamination and includes out-of-river components such as community grants. The estimated cost would be in the "hundreds of millions," significantly less then the billions estimated for the EPA's plan.The feasibility study for the lower eight-mile project did not include Sustainable Remedy, as the plan was not formally submitted by the CPG, EPA officials have said. Federal environmental officials have been vocal about their doubts toward Sustainable Remedy.

CPG representatives have courted Passaic River municipalities and residents for support of this plan over the past year, holding information presentations on Sustainable Remedy.Funding will not stem from the CPG alone, as state environmental officials have announced they intend to pursue remaining liability claims against Occidental Chemical, identified as a lead polluter, to get the company to pay for its share. Late last year, two settlements between state agencies, third parties and several "non-discharging" defendants were finalized. First, $130 million will be paid to the state by these defendants. Also party to the settlement are Maxus International Energy Company, Maxus Energy Corporation and Tierra Solutions, Inc. Several third parties are included in the second settlement, as municipalities named agreed to commit $95,000 each toward the agreement negotiated with the New Jersey Department of Environmental Protection. Forty million of that amount will be used to reimburse the department for funds already spent.A study of the 17 miles of the lower Passaic River is being drafted by the CPG and will be reviewed by the EPA by late 2014 or early 2015, EPA spokesperson Elias Rodriguez said in April.

"Even though the 17-mile study may be completed in that time frame, that study is being drafted by the Cooperating Parties Group and will have to be reviewed by EPA," Rodriguez said. "Pertinent data and modeling information from the 17-mile study, when available, will be considered and integrated into the design of the lower eight-mile cleanup."

Email: grantm@northjersey.com

David W. Kluesner
U.S. Environmental Protection Agency
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Yeh, Alice

From: John Van Der Tuin <JVandertuin@balberpickard.com>
Sent: Friday, August 15, 2014 12:11 PM
To: Region2 PassaicLower8MileComments
Cc: Kluesner, Dave; Tony Bianchini
Subject: Clean Up Plans
Attachments: 2013 03 13 vdt-enck.pdf

Sirs/Madams:

Last year, I submitted the annexed letter/comment with respect to the EPA's Passaic River Restoration Project.

Since then, I have also reviewed the four options issued for public comment, reviewed the Cooperating Parties' Sustainable Remedy and attended one of the public hearings to hear your presentation and the comments/questions of other community members.

I have grave concerns as to whether the EPA options 1-3 are practically achievable, will result in a more usable or attractive Passaic River or are prudent in terms of costs and benefits. I would strongly urge that you meld your option 4 and the Cooperating Parties Alternative Sustainable Remedy.

My concern as to whether options 1-3 are practically achievable stem from the very difficult and unpredictable logistics of dredging and barging out those quantities of material. Too many old bridges, too many barges, too much risk to disruption of rail and auto commuters and transportation over the river; too much disruption to current use of the river and adjacent riverbanks. All the makings of one giant mess that grinds to a halt.

My concern as to whether the end result would be a more usable or attractive Passaic River are largely those set forth in my earlier letter. The river is never going to be fishable/swimmable. Let's not kid ourselves. Boating or streamside recreation is achievable, but is presently deterred less by the contaminants in the sediment than by the smells from current dumping/runoff/sewage and the sights of lumber, garbage bags, bottles and general refuse floating down the river. You need more focus on the sewage and floatables and less on the sediment. More on achievable recreational uses and less on the Holy Grail of swimmable/fishable. More focus on the four goals of the Restoration Project other than sediment remediation.

Finally, costs/benefits. You're proposing to spend an ungodly amount of public money on a plan that is not going to achieve your goals or make the river a more usable and attractive resource. Rethink it. Refocus. Apply some prudence. There is merit to both your alternative 4 and to the Cooperating Parties Alternative Sustainable Remedy. I would urge you to take the best from both and meld them into an achievable, beneficial, cost-effective plan.

I appreciate your efforts – really – but question the value judgments, the practical sense of how you propose to proceed and the extent to which most of the goals of the Restoration Project are being sacrificed to the single focus on sediment remediation.

John Van Der Tuin

JOHN T. VAN DER TUIN
16 Elsway Rd.
Short Hill, New Jersey 07078

March 14, 2013

Judith A. Enck
Regional Administrator, Region 2
U.S. Environmental Protection Agency
290 Broadway
New York, New York 10007-1866

Re: Lower Passaic River Restoration Project

Dear Administrator Enck:

I have spent, literally, thousands of hours on the lower Passaic River, from roughly mile 7 to mile 15, over the last decade rowing my shell and working with other masters and youth rowers on regattas and river improvement projects.[1] So, I enthusiastically endorse the Restoration Project you are engaged in to remediate the lower Passaic and make it a valuable recreational asset for all of us in the metropolitan area. I hope it bears fruit in my lifetime.

I do have a concern, however. Sometimes it is just beautiful to see the dozens of shells out on the river; other times it just, literally, stinks or is so clogged with floatables as to be unrowable. I am thus, concerned, that in addition to, and of equivalent importance to, the effort to remove contaminated sediments, there must be an effort to address CSO's, clean up floatables, restore the riverbanks and improve and regulate adjacent development. I fear that a single-minded focus on sediment dredging and removal – in addition to being extraordinarily expensive and disruptive to the use of the river – will neglect these other, and equally important, efforts. In this regard, I note that the goals of the Lower Passaic River Restoration Project are five, and extend beyond sediment removal:

- remediation of contaminated sediments
- improve water quality
- restore degraded shorelines
- restore and create new habitats
- enhance human use.

I understand that the Lower Passaic River Study Area Cooperating Parties Group has nearly completed a study and alternative plan that would address all of the goals of the Restoration Project. I haven't seen it, and thus can't yet endorse its details, but I would urge that the EPA Focused Feasibility Study not be advanced until the CPG study is complete and can be considered, with open minds, as an alternative or complement to the Focused Feasibility Study.

Thank you.

Very truly yours,

John Van Der Tuin

---

[1] In my professional life, I have also represented community groups and companies to enforce the provisions of environmental statutes and regulations. *See, e.g., Coalition for a Liveable West Side, Inc., et al. v. New York City Dep't. of Environmental Protection,* 830 F.Supp. 194 (S.D.N.Y. 1993); *Coalition Against Columbus Center, et al. v. City of New York,* 769 F.Supp. 478 (S.D.N.Y. 1991); *In the Matter of Coca-Cola Bottling Co. of New York v. Bd. of Estimate*, 72 N.Y.2d 674 (1988). I am not an apologist for corporate polluters.

cc: kluesner.dave@epa.gov
vaughn.stephanie@epa.gov
rgermann@lowerpassaiccpg.com

Yeh, Alice

From: Tirza Wahrman <twahrmanesq@gmail.com>
Sent: Tuesday, August 19, 2014 6:46 PM
To: Region2 PassaicLower8MileComments; Douglas Adams; Yeh, Alice
Subject: Comments on behalf of the Metropolitan Waterfront Alliance
Attachments: mwacommentslowerpassaicriver.docx

Dear Alice:

Please find the attached comments of the Metropolitan Waterfront Alliance on EPA's proposed remedial plan for the Lower Eight Miles of the Passaic River.

I will call your office to confirm receipt of this document.

Best regards,

Tirza

--
Law Office of Tirza S. Wahrman, LLC.
5 Stonelea Drive
Princeton Junction, NJ 08550
phone (973) 222-8394
fax (866) 476-3270

This information is subject to attorney-client privilege and other claims of privilege. It is intended for the named recipient only. If you are not the named recipient, please disregard this communication.

Submitted on behalf of the Metropolian Waterfront Alliance, by Tirza S. Wahrman, Esq.

August 19, 2014

COMMENTS ON U.S. EPA'S RECOMMENDATION OF A REMEDIAL ACTION PLAN FOR THE LOWER EIGHT MILES OF THE PASSAIC RIVER

The Metropolitan Waterfront Alliance ("MWA") has a longstanding commitment to restoring the health of the New York-New Jersey harbor. Consistent with its mission, MWA is pleased to submit the following comments in support of U.S. EPA's proposed remedy of bank-to-bank dredging of approximately 4.3 million cubic yards of the lower 8.3 miles of the Lower Passaic River which runs through Newark and empties into Newark Bay.

MWA recognizes the importance of promoting environmental justice and sustainability throughout the region. Newark is one of the nation's poorest cities. The per capita income of Newark residents is $17,367; by contrast, the per capita income of New Jersey residents is $36,937. Newark's per capita income is 53% less than the New Jersey average, and 32.7% less than the national average. EPA's proposal, if implemented, would be consistent with the agency's stated goal of treating all people fairly, and reducing the disproportionate burden of environmental harm long endured by Newark residents.

One of the first designated Superfund sites in the country, the Diamond Alkali site, is located in on the lower Passaic River in downtown Newark. Newark

residents face assaults of living along side a port with heavy truck traffic, and a resource recovery plant that is also the source of particulate and other emissions.

How many communities would have to wait for almost twenty years for the government to propose a final clean-up for a river with such high and persistent levels of contamination? Studies of the sediment were first undertaken in the early 1990's. The time for action is long past.

The proposed remedy is the product of many years of high-caliber, peer-reviewed and intensive study dating back to the mid 1990's, including data collected from the lower 17 miles of the river. The proposed remedy of the bank-to-bank dredging and off-site disposal of 4.3 million cubic yards from the river's lower 8 miles, based on data finding it to be the most contaminated stretch of the river, should be adopted and implemented without delay.

The Lower Passaic River is part of the Diamond Alkali Superfund Site, which was placed on the National Priorities List in 1984; Occidental Chemical (a successor corporation which had purchased Diamond Alkali) at EPA's request undertook an early investigation of the river in 1994. In the years that followed, EPA also identified approximately seventy companies that also contributed to the contamination issues on the river. The leading hazardous substances found in the Study Area sediments, which pose the greatest potential risks to human health and the environment include 1. Dioxins and furans; 2. PCB's; 3. Mercury; 4. DDT; 5. Copper; 6. Dieldrin; 7. PAH'S and 8. Lead.

Studies show convincingly that the concentrations of contaminants of concern (COC's), like dioxins and furans, PCB's and mercury, have not declined over

the past fifteen years. The proposed bank-to-bank dredging is required to address the ongoing and persistent contamination in the sediment by removing it from the lower eight miles of the river. The other alternatives studied by EPA—a no-action alternative or "hot spot" dredging of some of the most contaminated spots—will not address the persistent contamination which characterizes the river.

The goals of the remedial action objectives set forth in the study document are: 1. To reduce cancer risks and non-cancer health hazards for people eating fish and shellfish by reducing the concentration of COCs in the sediments of the FFS study area; 2. To reduce the risks to ecological receptors by reducing the concentrations of COC's in the sediments of the FFS Study Area; and 3. To reduce the migration of COC-contaminated sediments from FFS Study Area to upstream portions of the Lower Passaic River and to Newark Bay and the New York-New Jersey Harbor Estuary. Reducing cancer risks and other health hazards, reducing risks to ecological receptors, and reducing the migration of contaminated sediments can only be attained by the proactive remedy of extensive dredging of the highly contaminated site. Removing these sediments will reduce contaminant concentrations in biota including fish and crab tissue, thereby significantly reducing potential human health and ecological risks. The remedy includes the placing of an engineered cap to sequester the extensive inventory of contaminants that would remain after the dredging is completed.

The Metropolitan Waterfront Alliance does not take a position on the relative merits of a more extensive dredging program than the preferred remedy endorsed by EPA—the 9.7 million cubic yard proposal contained in alternative 2, compared to

the 4.3 million cubic yard proposal contained in the remedy preferred by EPA (alternative 3). At the same time, the MWA is mindful that cost considerations can be weighted in the selection of a remedy under Superfund, and defers to EPA's expertise in selecting alternative 3, which calls for the removal of 4.3 million cubic yards, with the placement of an engineered cap and off-site disposal of the dredged material.

Tirza S. Wahrman, Esq.

On behalf of The Metropolitan Waterfront Alliance
241 Water Street
3rd Floor
New York, New York 10038
212 935 9831

****

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 5:28 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jasmine Walden
jasmine@jaffecom.com
25 Brokaw Blvd.
Plainfield
New Jersey
07063

9087697739

Yeh, Alice

From: Yeh, Alice
Sent: Wednesday, April 23, 2014 4:12 PM
To: Region2 PassaicLower8MileComments
Subject: FW: Passaic River Proposed Plan Comments (016071214, WI No. 60, RPL No. 14361)

From: Zachos, George
Sent: Wednesday, April 23, 2014 2:03 PM
To: sensitivewoman@verizon.net
Cc: Yeh, Alice; Kluesner, Dave; Boykin, Danla; Ramadhin, Lee; Murphy, Tom
Subject: Passaic River Proposed Plan Comments (016071214, WI No. 60, RPL No. 14361)

Dear Ms. Wall:

Thank you for your comments on the Proposed Plan and Remedial Investigation/Focused Feasibility Study for the lower 8 miles of the Lower Passaic River. EPA is accepting written comments at PassaicLower8MileComments.Region2@epa.gov, or the following address:

Alice Yeh, Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

EPA will also host a series of public meetings at which oral and written comments will be accepted. The first will be on May 7, 2014 at 55 Prospect Street, Newark, NJ, at 7 pm. The other two will be in Kearny in May 2014 and Belleville in June 2014, at dates and locations to be determined.

By this e-mail, your April 16 comments below are being forwarded for Region 2 to consider before making the final cleanup decision for the lower 8 miles. It will be addressed in the Responsiveness Summary, which will be made available with the Record of Decision, the document identifying the EPA's selected cleanup plan.

Sincerely yours,

George H. Zachos
Accelerated Cleanup Manager and Regional Public Liaison
Emergency and Remedial Response Division
Edison, NJ

You are very wrong in your decision regarding the dredging of the Passaic River in the Newark Bay area. Did you not think that when the river overflows into our houses we do not get the pollution also? The initial plan was to dredge from the Garfield Dundee Dam and then on to Newark. Why change the initial decision? I think the people who reside along the river are not being considered in regard to the pollution we get in our homes when it does overflow its banks. I strongly urge you to reconsider the danger to people and start dredging according to the initial 2013 proposal and start SOON - not 10 years from now.
EMAIL_OF_REQUESTOR
sensitivewoman@verizon.net
NAME_OF_REQUESTOR
Linda Wall

Yeh, Alice

From: Judith S. Weis <jweis@andromeda.rutgers.edu>
Sent: Tuesday, April 22, 2014 6:11 PM
To: Region2 PassaicLower8MileComments
Subject: comments on the plan
Attachments: epaPassaic.doc

Attached is a brief comment on the remediation plan.

Judith Weis

Department of Biological Sciences
Faculty of Arts and Sciences-Newark
Rutgers the State University of New Jersey
Boyden Hall
195 University Avenue
Newark, NJ 07102-1814

www.rutgers.edu
http://runewarkbiology.rutgers.edu

973-353-5347
Fax: 973-353-5518

jweis@andromeda.rutgers.edu

Dear. Ms Yeh,

As an estuarine ecotoxicologist who works very close to the dioxin site (although I haven't directly studied it), I commend you and the team for coming up with an excellent remediation plan. I have been waiting over 30 years for this!

Sincerely,

Judith S. Weis, Ph.D.
Professor of Biology (emerita)

Yeh, Alice

From: churchrose@optonline.net
Sent: Monday, July 21, 2014 8:30 PM
To: Region2 PassaicLower8MileComments
Cc: Hackensack Riverkeeper
Subject: Passaic River Cleanup

Ms Yeh . . .Come on - - this is a no-brainer! Of the three remediation options, Number 1 is the
only viable option! And, inasmuch as it is the most thorough one (read: permanent!), in the long-run, it will likely prove to be the least-expensive one too.

Charley & Carole West Allendale, NJ Dedicated birders and pragmatists!

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Thursday, August 07, 2014 2:37 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Gary Wien
garywien@gmail.com
401 14th Avenue
Belmar
NJ
07719

732-280-7625

Yeh, Alice

From: Peter Willcox <peterwillcox@gmail.com>
Sent: Tuesday, August 19, 2014 12:40 PM
To: Region2 PassaicLower8MileComments
Subject: Passaic River Lower 8.3 Mile Project - Public Comment
Attachments: Passaic EPA Ltr 08-19-2014 Signed.pdf

Attached is a letter containing my comments on the proposed Passaic River clean-up project.
Thank you for your consideration.

--
Peter Willcox

Peter Willcox
206 Fernwood Avenue
Upper Montclair, New Jersey 07043

August 18, 2014

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866
Fax: (212) 637-4439
E-mail: PassaicLower8MileComments.Region2@epa.gov

Dear Ms Yeh:

As a member and former president of the Nereid Boat Club, and as an avid rower on the Lower Passaic River, I'm writing to you today to express my concern about the Environmental Protection Agency's plans for the lower 8-mile cleanup.

I attended a public information session in Kearney on May 21 where representatives from the EPA presented their proposal to dredge and cap 4.3 million cubic yards of sediment from bank to bank over the entire lower 8.3 miles of the Passaic. I came away from the meeting with two major concerns.

First, the EPA estimated a 5-year time period to complete the project which does not make sense when you run the numbers. The DEP is proposing to remove and cap 4.3 million cubic yards of sediment in five years while the RM 10.9 project took 10 months to remove just 16,000 cubic yards of material. Even considering that the project is scheduled to be conducted 24 hours a day, 6 days a week, for 40 weeks of the year the project will need to remove and cap over 50 times as much material per week as the RM 10.9. I was present on the site at 10.9 and it was a major undertaking. I cannot imagine a project 50 times as large progressing night and day for 5 years. It does not seem responsible to assert that the project can be completed in that time frame. The public needs to know now that they are going to be dealing with - ten to fifteen years of open bridges clogging traffic and barges and dredges clogging the river.

Second, even if the project could be completed I five years, I still question the wisdom of putting all the efforts into a full sediment dredge of the lowest eight miles without considering the other nine miles of the lower Passaic as well as all the other ongoing forms of contamination that plague the river. The issues of storm and sewer runoff and floatables have a major impact on the use and enjoyment of this important resource. The Cooperating Party's alternate plan takes these other issues in to account and the EPA should as well. I worry that the huge cleanup effort will drain all of the EPA's energy and budget and there will be nothing left to protect and revitalize the rest of the lower Passaic River.

Sincerely,

Yeh, Alice

From: Amy Witryol <amyville@roadrunner.com>
Sent: Wednesday, August 20, 2014 6:52 PM
To: Region2 PassaicLower8MileComments
Cc: Yeh, Alice
Subject: Passaic Comments - Witryol
Attachments: EPA-Passaic-Witryol.pdf

Comments, attached.

Thank you.

Amy Witryol
Lewiston, NY

Amy H. Witryol
4726 Lower River Rd.
Lewiston, NY 14092
phone (716) 754-1434 email: amyville@roadrunner.com

August 20, 2014

EPA Region 2
Via email: PassaicLower8MileComments.Region2@epa.gov

RE: **Proposed Plan for the Lower Eight Miles of the Lower Passaic River Part of the Diamond Alkali Superfund Site in Essex and Hudson Counties, NJ**

Dear EPA Region 2,

The following comments are offered absent the benefit of notice, time and opportunity to review all of or even most of the project documents.

Communities potentially impacted directly or indirectly by the remedial options for the Passaic project were not notified nor invited to participate in any manner, whether in person or remotely.

This is not the first time EPA Region 2 Superfund has heard disappointment expressed about neglect of what could be described as, "remedial stakeholders," i.e., those residents near treatment or disposal facilities that will face exposure risks short and/or long term as the result of significant hazardous waste volumes to land disposal or incineration. If land disposal is part of a remedial action, the contamination, not the remedy, is permanent to the environment.

Region 2 Administration is also well aware of intense opposition, at every level of local and county government, to the proposed expansion of a RCRA C landfill in Niagara County.

Projects of this magnitude have the potential to adversely promote private sector investment in undesirable/unsustainable hazardous waste landfill capacity, somewhere at some point in the future. Therefore, all existing host communities and related environmental organizations should be considered remedial stakeholders – even if capacity risk is greater than 20-30 years away.

Every hazardous waste landfill in Niagara County, NY has already leaked and is very likely to do so in the future, *into a Class A waterway*. The permanent risks of land disposal were wholly ignored in the Passaic Focused Feasibility Study, including the Cost Estimates.

We cannot predict to what, if any, extent remedial stakeholders may have influenced the development of the remedial options presented for Final Decision-making at this time. However, the public outreach process for such a massive proposal was clearly unfair to remedial stakeholders.

Please extend the public comment period as long as necessary for EPA to address the following requests, plus an additional 14 days to draft and submit comments based on the information:

1. Explanation and rationale for the projected timeframes (number of years and expenditures in each year) for each remedial Option presented except "No Action."

2. Please furnish each of the Present Value scenarios (Appendix H of the Focused Feasibility Study) using a 3% discount rate. In 1996, the federal Office of Management and Budget recommended a pretax discount rate of 3%-7%. The Passaic project documents referred to a 7% discount rate per 1993 EPA guidance. A 3% rate should be run to determine whether the sensitivity of the discount rate range is worth debating from a financial perspective.

2b. For the Present Value scenarios at 7% and the requested 3%, please add a category for O&M at land disposal facilities. This additional category should include the costs of O&M as well as regulatory oversight by state and federal environmental regulators and state/county health departments for 30 years.

3. Please indicate what portion of the 3,310,000 cubic yards designated for land disposal in a RCRA C facility in option 3B (the EPA preferred alternative) may be eligible for incineration, or, an existing thermal desorption method employed at remedial clean ups.

4. If thermal desorption is a remedial alternative to land disposal under current regulation, please indentify or indicate whether any project documents evaluated the (private sector) feasibility or projected cost/benefit of constructing and operating a stationary thermal desorption facility at or near a sediment staging facility. (If potential vendors have made such proposals, please indicate if descriptions are available.)

5. Please indicate whether, in advance of Final decision-making, EPA can arrange for remedial stakeholders to meet or conference with regulators, technical advisory/peer review committees and community advisory group members involved in developing the remedial options currently proposed. Proper evaluation of the relative costs and insecurity of additional capping vs. relocation (land disposal) is important.

Thank you.

Sincerely,

AmyHWitryol

Amy H. Witryol

Yeh, Alice

From: Conserve <jonathan@jaffecom.com>
Sent: Friday, August 08, 2014 4:43 PM
To: Region2 PassaicLower8MileComments
Cc: jonathan@jaffecom.com
Subject: Help Save the Lower Passaic - Email to EPA

Ms. Alice Yeh

Remedial Project Manager, EPA
290 Broadway, 19th floor
New York, NY 10007-1866

Dear Ms. Yeh,

The EPA should more seriously review and consider other alternatives to its proposed 4.3 million cubic yard "bank to bank" dredge, such as a targeted "Sustainable Remedy" that would clean the entire River faster, with results comparable to those promised by the EPA's bank-to-bank proposal and with reduced impact on the host communities.

Thank you.

Jeff Worden
jeff@worden-pr.com
19 Iroquois Drive
Mt. Lebanon
Pa.
15228

412.253.0816

Yeh, Alice

From: Meiyin Wu <wum@mail.montclair.edu>
Sent: Monday, August 18, 2014 11:09 AM
To: Region2 PassaicLower8MileComments
Cc: Kluesner, Dave; Yeh, Alice
Subject: Passaic River FFS Comment
Attachments: PRI letter to EPA on FFS August 2014.pdf; ATT00001.htm

Dear Administrator Enck,

Attached please find a letter from Montclair State University's Passaic River Institute on the Lower 8 Miles Passaic River Focused Feasibility Study. We congratulate you and USEPA for the release of the proposed plan and applaud your effort and dedication on enhancing the quality of the river and its watershed.

Sincerely,
Meiyin Wu

Meiyin Wu, Ph.D
Director, Passaic River Institute
Professor, Department of Biology & Molecular Biology
Montclair State University
1 Normal Avenue, Montclair, NJ 07043
Phone: 973-655-7117
Fax: 973-655-6810
website: http://www.montclair.edu/csam/wu-lab/

MONTCLAIR STATE UNIVERSITY
PASSAIC RIVER INSTITUTE
The College of Science and Mathematics

August 18, 2014

Ms. Judith A. Enck
Regional Administrator
U.S. Environmental Protection Agency, Region 2
290 Broadway, 26th Floor
New York, NY 10007-1866

Dear Regional Administrator Enck:

Montclair State University's Passaic River Institute (PRI) houses a scientific community that takes an interest in examining all potential approaches to better manage the Passaic River. On behalf of the over 45 scientists and engineers from Montclair State University and partner institutions, I would like to first congratulate you and the U.S. Environmental Protection Agency (USEPA) for the release of the Lower Passaic River Focused Feasibility Study, a cleanup proposal that communities along the River have long been looking forward to. Additionally, we applaud the effort and dedication of USEPA Region 2 staff for tirelessly explaining the proposed plan to the scientific community, the general public, and other stakeholders.

The Lower Passaic River Restoration Project is one of the largest restoration projects in U.S. history. The project area is situated within the highly developed New Jersey urban area with approximately 1.4 million residents, which made the project much more complex and its potential impacts much greater. PRI would like to urge USEPA to develop a comprehensive monitoring plan to assess environmental condition and ecosystem integrity on the project impacted area prior to, during and post restoration. Collected data not only can be used to assess the success of the restoration project but can also allow development of data driven methodologies and adaptive management approaches for future Superfund projects at the national level. Additionally, special attention should be paid to the long-term stability and integrity of the sediment cap to ensure public safety and long-term success of the restoration project that meets sustainability goals to promote social, economic and ecological benefits.

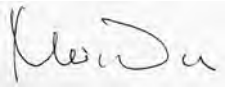
As an environmental education resource for the Passaic River Basin, on June 2, 2014, PRI hosted a "Morning Dialogue on the Lower 8 Miles Passaic River Focused Feasibility Study" on the Montclair State University campus in response to the proposed cleanup plan. The target audience of the event was elected officials of towns and counties along the Lower Passaic River and Newark Bay. The goal was to provide an opportunity for participants to gain a better understanding about the proposed plan as well as potential impacts (environmental, public health, social and economic) to the communities. The event attracted more than 100 attendees from 49 entities. Congressman Pascrell and experts from USEPA, New Jersey Department of Environmental Protection, and PRI reviewed the history of the Passaic River, the proposed dredging and capping plan, alternatives and risks associated with disposal of contaminated sediments, long term monitoring and maintenance of the

sediment cap, future cleanup plan for the rest of the Lower Passaic River, and overall potential impacts of the cleanup plan. Representatives from ten cities/townships/counties participated in this event and shared their concerns on the plan's potential impacts to communities along the Lower Passaic River and Newark Bay.

Communication is essential as this long awaited plan takes form, and here again we appreciate the past and ongoing efforts of USEPA. In the future, during the construction planning process, we strongly urge USEPA to continue communicating with local communities, informing all interested parties on what to expect, and in a very remote scenario, how to respond to hazardous situations. It will also be critical for the EPA to continue coordinating among levels of governments (federal, state, county, and municipal), and carefully listening to and, where appropriate, incorporating local and regional input into construction planning. By doing so, it will also allow local communities opportunities to align regional planning and policies at the municipal level with the directions of the cleanup plan to prevent/reduce potential impacts during construction.

PRI, as a research institute, pledges to continue working with USEPA and other stakeholders to undertake long-term, multi-disciplinary studies in the Passaic River basin, provide a neutral forum for examining and discussing all aspects of environmental management challenges and solutions, and serve as an environmental education resource for the Basin. The next event hosted by PRI is the upcoming Passaic River Symposium in October 2014. We look forward to a highly productive exchange of information that will advance the understanding and management of the Passaic River.

Sincerely,



Meiyin Wu, Ph.D.
Director
Passaic River Institute
Montclair State University
Montclair, NJ 07039

Yeh, Alice

From: Yeh, Alice
Sent: Thursday, August 07, 2014 2:27 PM
To: Region2 PassaicLower8MileComments
Subject: FW: Request to extend the Public Comment Period on the Passaic River Restoration ending August 20th for two months

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From: David Yennior [mailto:dyennior@yahoo.com]
Sent: Wednesday, August 06, 2014 4:40 PM
To: Mugdan, Walter
Cc: Enck, Judith; Yeh, Alice; Harvey Morinstin; Jay N. Meegoda; Jeff Tittel
Subject: Re: Request to extend the Public Comment Period on the Passaic River Restoration ending August 20th for two months

Dear Mr Mugdan:

Thanks to Regional Director Enk for her prompt reply through you. However, I would respectfully request a reconsideration of the 60 day extension for the CAG to complete its work.

Does the EPA have an engineering report regarding the rocks protruding at 10.9 only months after the capping was completed?

Has the EPA analyzed the implication for capping 6 more miles of viable River, thus rendering it impaired forever? Has bank to bank capping of this magnitude been done before?

The CAG had one meeting in June before 10.9's dangerous revelations were exposed. We did NOT have a quorum in July, nor did the EPA provide an engineering report about 10.9, nor could staff answer many questions the CAG has about bank to bank capping, which has never been done before.

Capping 12-30' of toxic waste is NOT Restoration. If the EPA chooses Alternative 3, that is a dangerous precedent, and a clear signal to polluters across America that they may never be held accountable.

That the EPA is trying to RUSH this decision is very suspect and disrespectful of the CAG who has expending so much time through this process and who you should be continuing to consult through Phase 2.

Do you really have so little regard for the Sierra Club, the Passaic River Boat Club, the Passaic River Coalition, and the community surrounding the Passaic River?

Do you really want a rushed decision, bad precedent, and no real restoration be the Legacy of the EPA regarding the Passaic River?

In that the CAG cannot meet in August, a request for a 60 day extension is very reasonable. Perhaps you can give just the CAG an additional 60 days to meet and finalize our recommendation.

Thank you.

David Yennior
Gateway Group Chair
Passaic River Issues
NJ Sierra Club
973-818-6668

On Aug 6, 2014, at 3:56 PM, "Mugdan, Walter" <Mugdan.Walter@epa.gov> wrote:

Dear Mr. Yennior:

Regional Administrator Judith Enck has asked me to respond to your August 6, 2014 e-mail (copied below) requesting an extension of the public comment period on the U.S. Environmental Protection Agency's Proposed Plan for the lower eight miles of the Lower Passaic River.

When the EPA released the Proposed Plan on April 11, 2014, the agency announced a public comment period starting on April 21, 2014 and ending on June 20, 2014. In response to several requests for extensions, EPA extended the public comment period first until July 21, 2014 then until August 20, 2014. This is a 61-day extension from the end date of the original comment period and provides a total of over 120 days for public comments.

With regard to the New Jersey Institute of Technology Forum on July 22, 2014, EPA has posted a summary of the forum along with presentations made at the forum on the web site ourPassaic.org, in the Digital Library, under the "Passaic River Lower 8 Mile Action" folder.

The Community Advisory Group has met on multiple occasions during the public comment period. It is my understanding, based on EPA's communications with the CAG facilitator, that the CAG is ready to finalize its comment document with accommodations for minority opinions.

EPA has determined that the 120-day comment period provides sufficient opportunity for interested members of the public to submit their comments.

If you have any questions, please contact Alice Yeh, Project Manager for the lower eight miles of the Lower Passaic River, at 212-637-4427.

Sincerely yours,

Walter Mugdan, Director
Emergency and Remedial Response Division

From: David Yennior [mailto:dyennior@yahoo.com]
Sent: Wednesday, August 06, 2014 2:26 AM
To: Enck, Judith
Cc: jeff.tittel@sierraclub.org; debbie@nynjbaykeeper.org; Ana Baptista; doug@forumfg.com; Yeh, Alice; Harvey Morinstin; Thomas Pietrykoski; Jay N. Meegoda; Lenny Thomas; Jeff Weiss; Kirk Barrett; Ben Delisle; Joe Nardone; Arnold Cohen; Robin Dougherty; Roger Ellis; Massiel Ferrara; Maribel Jusino-Iturralde; James Mack
Subject: Request to extend the Public Comment Period on the Passaic River Restoration ending August

20th for two months
Importance: High

Dear Regional Director Enck:

I have been a member of the Lower Passaic River Restorations Citizens Advisory Group (CAG) for several years. I am also the Passaic River Issues Coordinator for NJ Sierra and the Chair of the Gateway Group representing the greater Newark area. I have also been a member of the Passaic River Alliance, formerly chaired by Thomas Pietrykoski, now working with Congressman Pascrell.

As a 17 year resident of Belleville, I see the Passaic River every day, and feel very attached to it, have attended Passaic River conferences, seminars, and have studied the history of the Passaic River. I rode the River with the late Dr Ella Fillapone (Passaic River Coalition founder), participated in Passaic River Clean Ups, and I am committed to a thorough and complete Passaic River Restoration.

I have attended numerous Superfund Site announcements with the late Senator Frank Lautenberg, Congressman Pascrell, Senator Cory Booker, the late Congressman Donald Payne, and a number of municipal elected official. I have always been impressed with your dedication and leadership. However, regarding the Passaic River Restoration, the CAG is being rushed to submit a Recommendation by August 20.

For several years the CAG has received a great deal of information from your staff at the EPA. The CAG, under the leadership of Ana Baptista and Debbie Mans, has written a Draft Recommendation. However, the NJ Chapter of the Sierra Club and the Passaic River Boat Club are NOT in agreement with the Draft recommendation. Very few people could attend our July 9th meeting to review and discuss the Draft Recommendation.

There was an excellent Passaic River Restoration Forum at NJIT, cosponsored by the Passaic River Coalition, on July 22nd with 80 people in attendance to discuss the impact of Alternative 3, bank to bank capping of six miles of the River through Newark, Harrison, and Kearny, on boating. The CAG has not had an opportunity to hear a report on that Forum. The Passaic River Coalition is still preparing their recommendations.

Emergency Capping was completed at 10.9 mile this past year and as of June 2014 rocks are protruding creating a danger to the hulls of boats. The CAG has NOT received complete information about this problem from the EPA.

There are many unanswered questions that the CAG and individual members need to ask your staff. The decision on the Lower 8 miles will be FINAL and will impact Phase 2, the Restoration of the upper 9 miles of the Passaic River.

I asked that the CAG meet again in person to discuss these issues. However, I was informed by Co-Chair Ana Baptista yesterday that our facilitator Doug Sarno and Co-Chair Debbie Mans are NOT available for our regular August 14th meeting.

Therefore, to discuss the NJIT Forum, to receive a report on the protruding rocks at 10.9, and out of respect for the dedicated volunteers on the CAG, NJ Sierra Club, Passaic River Boat Club, and Passaic River Coalition, **a two month extension is requested**.

“Anything worth doing, is worth doing right.”— Hunter S. Thompson

Thank you very much,

David Yennior, MA

David Yennior, MA
Sierra Club, NJ Chapter
Gateway Group Chair
Passaic River Issues Coordinator
6 Essex Street #40
Belleville, NJ 07109
973-818-6668
dyennior@gmail.com
http://newjersey.sierraclub.org/Gateway/

Gateway Group of NJ Sierra
6 Essex Street H40
Belleville, NJ 07109

19 August 2014

Alice Yeh, Remedial Project Manager

U.S. Environmental Protection Agency

290 Broadway, 19th Floor

New York, NY 10007-1866

Re: Passaic River Restoration

Dear Ms Yeh:

The Gateway Group of the New Jersey Sierra Club represents some 1,500 members along the Passaic River. Our goal is to advocate for the environment, while the goal of the Environmental Protection Agency goes further. The Gateway Group opposes the EPA's "preferred" Alternative 3 regarding the lower 8 miles of the Passaic River, which dredges the first 2 miles and caps the next 6 miles of the River. To our knowledge bank to bank capping of a tidal river connected to the Atlantic Ocean has never been done. We believe capping will not work because of flooding, scouring of the River, underwater springs and tidal influences will undermine the caps. Capping is being proposed because it is cheaper, but will not last since ultimately the caps will fail. Capping also will require expensive maintenance.

The capping will be very fragile and will not safely contain the toxins. The recent experience at 10.9 mile in Lyndhurst reveals that capping will not work as sand washed away exposing rocks that are dangerous to boats and boaters. Capping results in No Wake, No Anchor, and No Development Policies and therefore impedes the usage of the Passaic River. Capping the Passaic River after 50 years of sedimentation with no dredging dooms the river from ever being the great waterway it was. Alternative 3 sets a bad precedent and is a clear message to polluters that they will never be held fully responsible for destroying our environment. Choosing Alternative 3 assures that the next 9 miles of the Passaic River will be capped.

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Under both state and federal law companies that discharge toxic chemicals into the environment that cause a loss of public use are assessed with Natural Resource Damages. The public fisheries, aquatic ecosystems, wetlands, rivers, and estuaries belong to all of us. When a company contaminates and prevents the use of that resource they have to pay damages.

For more than 50 years, pollution has robbed us of the Passaic River. Rivers should not be Superfund sites they should be places where people can walk along the riverbank, kayak, fish, and swim. We need to clean the river edge to edge to remove all the dioxin as well as PCBs, heavy metals, mercury, and toxins. We need a thorough clean up that will help return the River back to the community and right now EPA's preferred proposal will not do that. Only Alternative 2 will fully restore the Passaic River.

Yours truly,

David Yennior, MA

David Yennior, MA
Sierra Club, NJ Chapter
Gateway Group Chair
Passaic River Issues Coordinator
6 Essex Street #40
Belleville, NJ 07109
973-844-1384
dyennior@gmail.com
http://newjersey.sierraclub.org/Gateway/

Yeh, Alice

From:	DAVID YENNIOR <dyennior@gmail.com>
Sent:	Tuesday, August 19, 2014 1:38 PM
To:	Region2 PassaicLower8MileComments
Cc:	Yeh, Alice; doug@forumfg.com; debbie@nynjbaykeeper.org; Ana Baptista; Jay N. Meegoda; Harvey Morinstin; jeff.tittel@sierraclub.org
Subject:	Passaic River Restoration
Attachments:	Gateway Group, New Jersey Sierra Club Passaic River Restoration 8-19-14.docx; ATT00001.htm

Gateway Group of NJ Sierra
6 Essex Street H40
Belleville, NJ 07109

19 August 2014

Alice Yeh, Remedial Project Manager

U.S. Environmental Protection Agency

290 Broadway, 19th Floor

New York, NY 10007-1866

Re: Passaic River Restoration

Dear Ms Yeh:

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Yours truly,

David Yennior, MA

David Yennior, MA
Sierra Club, NJ Chapter
Gateway Group Chair
Recycling Issues Coordinator
Passaic River Issues Coordinator
6 Essex Street #40
Belleville, NJ 07109
973-844-1384
dyennior@gmail.com
http://newjersey.sierraclub.org/Gateway/

New Jersey Sierra Club
145 West Hanover Street
Trenton, NJ 08618

19 August 2014

Alice Yeh, Remedial Project Manager

U.S. Environmental Protection Agency

290 Broadway, 19th Floor

New York, NY 10007-1866

Re: Passaic River Restoration

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Gateway Group Chair
Passaic River Issues Coordinator
6 Essex Street #40
Belleville, NJ 07109
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dyennior@gmail.com
http://newjersey.sierraclub.org/Gateway/

Yeh, Alice

From: DAVID YENNIOR <dyennior@gmail.com>
Sent: Tuesday, August 19, 2014 1:24 PM
To: Region2 PassaicLower8MileComments
Cc: Yeh, Alice; doug@forumfg.com; debbie@nynjbaykeeper.org; Ana Baptista; Jay N. Meegoda; Harvey Morinstin; jeff.tittel@sierraclub.org
Subject: Passaic River Restoration
Attachments: New Jersey Sierra Club Passaic River Restoration 8-19-14.docx; ATT00001.htm

New Jersey Sierra Club

145 West Hanover Street

Trenton, NJ 08618

19 August 2014

Alice Yeh, Remedial Project Manager

U.S. Environmental Protection Agency

290 Broadway, 19th Floor

New York, NY 10007-1866

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David Yennior, MA

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Sierra Club, NJ Chapter
Gateway Group Chair
Passaic River Issues Coordinator
6 Essex Street #40
Belleville, NJ 07109
973-844-1384
dyennior@gmail.com

http://newjersey.sierraclub.org/Gateway/

Yeh, Alice

From: brook zelcer <huxleycollege@hotmail.com>
Sent: Monday, August 11, 2014 11:19 AM
To: Region2 PassaicLower8MileComments
Subject: Passaic river

Please do all you can to ensure a thorough cleanup of the Passaic river. My grandparents lived on and fished the river in the forties and fifties when it still contained a variety of clean water fish species. The condition of the river I love is today just awful. Thank you.
Brook Zelcer
River Vale NJ

Sent from my iPhone

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Deborah A Kath

Address: 24 Riverview Ter

Hillsborough NJ 08844

Date: 7/19/2014

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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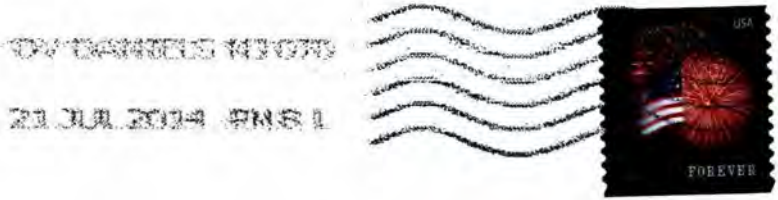
Name: Todd Katz

Address: 199 Union Ave, 2D Rutherford, NJ

Date: 7/19/14



Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am concerned that a bank-to-bank dredge of the Lower Passaic River will adversely impact the business community for the foreseeable future. This approach could discourage new development and future investment by existing businesses in communities along the River. Please consider a remedy that will have less adverse impacts on the Northern New Jersey business community.

Name: Jane Asselta

Address: 226 Morgan, Collingswood

Date: 7/25/14

PV DRIMBO NJ 070

25 JUL 2014 PM 1 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

7186699

Dear Ms. Yeh,

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Name: KATHY FARINACCIO

Address: PO BOX 565, MINOTOLA NJ 08341-0565

Date: 7/25/14

DY DANIELS RD 07

25 JUL 2014 PM 4 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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Name: Elizabeth Peterson

Address: 1023 Ohio Ave, Cape May NJ

Date: 7/25/14

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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Name: Patricia Saulino

Address: 47 Pennia Willingboro

Date: 7/25/14

DANIELS MD 210

25 JUL 2014 PM 3 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

Dear Ms. Yeh,

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Name: Ms. Mary Royal

Address: 11 Derby St, Unit F

Date: E. Orange, N.J. 07018

DW DANIELS NJ 070

07 AUG 2014 PM 3 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA-REGION
-ARD-DIRECTOR'S OFF
2014 AUG 12 AM 11:

Dear Ms. Yeh,

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Name: Sali Vlash

Address: 19-01 Saddle River Road, Fair Lawn

Date: 8/1/14

PHILADELPHIA PA 190

02 AUG 2014 PM 4 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA REGION
CORD-DIRECTOR'S OF
2014 AUG 12 AM 11:

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Name: Benito Calcado

Address: 8 Lombardy Pl Maplewood N.J.

Date: 8/1/14

PHILADELPHIA PA 190

02 AUG 2014 PM 4 L

U.S. EPA, REGION
ERRD-DIRECTOR'S O
2014 AUG 12 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

0071866

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Name: Stanley E. Terrell

Address: 10 Hill St. #21X, Newark, NJ 07102

Date: Aug. 5, 2014

DEW DRIVER BLDG

07 AUG 2014 PM 1 L

U.S. EPA, REGION
OFFICE OF REGIONAL DIRECTOR'S OFFICE
2014 AUG 12 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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Name: Wilda Terrell

Address: 734A Hunterdon St., Newark 07108

Date: Aug. 5, 2014

07 AUG 2014 PM 1 L

U.S. EPA, REGION
ORRD-DIRECTOR'S O
2014 AUG 12 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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Name: Mr. Diego Holmes

Address: 162 Park Ave, 1st. Fl Apt A-2

Date: East Orange, N.J. 07017

BY DANIELS 10000

07 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA, REGION 2
RRD-DIRECTOR'S OF
2014 AUG 12 AM 11:

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Yes this is important for our community. Cleaning of vacant lots needed

Name: C. Hinton

Address: 117 Park Place IW. NJ

Date: 8/8/14

DW DANIELS NJ 030

11 AUG 2014 PM 10 L

2014 AUG 13 PM 4:

U.S. EPA REGION
RD-DIRECTOR'S OFF

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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Name: LEE B. FISHER

Address: 1-7 Belmont TERRACE - Nwk 07112

Date: August 8, 2014

DV DANIELS NJ 070

11 AUG 2014 PM 5 L

U.S. EPA, REGION
ERRD-DIRECTOR'S OFF
2014 AUG 13 PM 4:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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Name: MARINA ROBERTS

Address: 37 Colts Lane Flemington

Date: 8/9/14

DW DANIELS NJ 070

11 AUG 2014 PM 6 L

U.S. EPA REGION
ERRD-DIRECTOR'S OF
2014 AUG 13 PM 4:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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Name: Megan Schilling

Address: 1061 Old York Rd 08551

Date: 8/9/14

DV DANIELS NJ 070

11 AUG 2014 PM 6 L

U.S. EPA-REGION
ERRD-DIRECTOR'S OFFICE
2014 AUG 13 PM 4:

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290 Broadway, 19th Floor
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Name: MARK WESTPY

Address: 41 COLTS LANE FLEMINGTON, NJ 08822

Date: 8-9-2014

DY DANIELS NJ 070

11 AUG 2014 PM 6 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA, REGION 2
ERRD-DIRECTOR'S OFF
2014 AUG 13 PM 4:

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Name: Calvin Ledford

Address: 30 Donald Cir Matawan, NJ 07747

Date: 8-10-14

DV DANIELS ND 070

11 AUG 2014 PM 5 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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Name: Thelma Jones

Address: 224 Myrtle Ave. Westfield NJ 07090

Date: Aug. 10, 2014

DV DANIELS NJ 070

11 AUG 2014 PM 5 L

U.S. EPA, REGION 2
ERRD-DIRECTOR'S OFF
2014 AUG 13 PM 4:

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Name: Gloria James

Address: 40 Clinton Terrace, Irvington, NJ 07111

Date: 8/10/14

DV DANIELS NJ 070

11 AUG 2014 PM 1 1

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA, REGION
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2014 AUG 13 PM 4:

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Name: Danyse Ryan

Address: 275 8th Street #4 Jersey City, NJ 07302

Date: Aug 10, 2014

DV DANIELS
NJ 070
11 AUG '14
PM 1 L

U.S. EPA REGION 2
ERRD-DIRECTOR'S OFFICE
2014 AUG 13 PM 4:

Alice Yeh, Remedial Project Manager
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290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Ray Imes

Address: 59 Berkeley Terr
Irvington NJ 07111

Date: 8/10/14

DW DANIELS NJ 070

11 AUG 2014 PM 1 L

U.S. EPA, REGION
RRO-DIRECTOR'S OFF

2014 AUG 13 PM 4:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Anthony J. Mauri

Address: 269 Park Ave Lyndhurst NJ 07071

Date: 8/11/2017

DN DANIELS NJ 070

11 AUG 2014 PM 6 L

U.S. EPA, REGION
LRRD-DIRECTOR'S OF
2014 AUG 13 PM 4:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

71086699

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Magdalena Caceres

Address: 269 Park Avenue Lyndhurst NJ 07071

Date: August 11, 2014

DW DARRELS NJ 070

14 AUG 2014 PM 7 L

U.S. EPA: REGION
EXRD-DIRECTOR'S OF
2014 AUG 13 PM 4:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. _____

_____

_____

Name: Kevin Green Sr

Address: 32 Ellis Ave

Date: 8/10/14

DV DANIELS NJ 08

11 AUG 2014 PM 10 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Doug Krampel

Address: 35 COLTS LANE, Flemington, NJ 08822

Date: 8-9-14

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Rose Marie Jefferson

Address: 220 Sterling Avenue
Orange, N.J. 07050

Date: 8/10/14

DV DANIELS NJ 070

12 AUG 2014 PM 4 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Linda Rhim

Address: 81, Kenmore Avenue, Newark, NJ 07106

Date: 8/10/14

OV DANIELS NJ 070

12 AUG 2014 PM 4 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. _____

_____

_____

Name: MICHAEL ECHOIS

Address: 1 COURT ST NWK NJ 11P

Date: 07102 8-11-14

DV DANIELS ID 070

12 AUG 2024 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: José Sánchez

Address: 81 W KINNEY ST APT. 2B

Date: 8-12-14.

DANIELS NJ 070

12 AUG 2024 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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Name: Victoria Wallace

Address: 91-19 Roseville Ave Apt 303
Newark NJ 07107

Date: 8/12/14

DV DANIELS NJ 070

12 AUG 2014 PM 4 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Darius Johnson

Address: 130 chancellor Ave Newark NJ 07112

Date: 8/12/14

DANIELS 10 [illegible]

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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Name: Alphonso Walker

Address: 103 PRINCE St apt. 3D

Date: 8/12/14

IN DANIELS 10000

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Charles Foster

Address: 638 Grove St., Irvington

Date: 8/12-14

DV DANIELS MD 0810

12 AUG 2024 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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Name: SERNETTA BOUIE

Address: 220 PROSPECT ST. E. O. NJ. 07017

Date: 8-12-2014

DV DANIELS RD 070

22 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. _____

_____

_____

Name: Tahisha Pafls

Address: 63 N 6th 6th st Newark NJ 07107

Date: 8-12-14

DY DANIELS ID 870

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: VALERIE TILLMAN

Address: 624 DR. M.L.K. BLVD Apt 21 N. NJ

Date: 8/12/14

DV DANIELS NJ 070

22 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

D07186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Cynthia Cherry

Address: 25 Summit Street #204

Date: 8/12/14

DV DANIELS ID 000

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

I think it would benefit to Essex County

Name: Bernice Dunlap

Address: 69 Ninth Street Newark, NJ

Date: 8-12-14

DV DANIELS TODD

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Valeria Nash-Bey

Address: 140 So. Orange ave. Apt. 1213

Date: 8-12-14

BW DANIELS 10000

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Ruth Stuck

Address: 179 Pennington ST

Date: 8/12/14

DV DANIELS ND 0[illegible]

12 AUG 2024 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Katherine Stokes

Address: 2 ~~Hoa~~ Nevada St APT 1F.B

Date: 8-12-14

DV DANIELS ID 08

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

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_____

_____

Name: Ms Frankie Pearson

Address: 59 Lincoln Street, Newark, NJ

Date: 8-12-14

DV DANIELS NJ 070

22 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

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_____

_____

Name: Eulojia Torres

Address: 1060 Boeste. Apt. 601

Date: 862-241-9856. NJ 07

DV DANIELS RD 100

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Carmen Casilla

Address: 369 Parkside Pl

Date: Newark NJ 07114

DV DANIELS NJ 070

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

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_____

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Name: Minerva Torres. 07-108

Address: 131 Elizabet Ave. APT-3

Date: 973-978-7590

DV DANIELS NJ 07

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

D07186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Marie C. Jean Paul

Address: 1145 Central Ave

Date: 8-12-14

BY DANIELS NJ 07

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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_____

_____

Name: Francis Wiggins

Address: 140 S Orange AVE Apt 1009-10E

Date: 8-12-2014

BY DANIELS NJ 070

12 AUG 2014 PM 1 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Elouise Carson

Address: 2 NEVADA ST 17G

Date: Newark NJ

DV DANIELS NJ 070

12 AUG 2014 PM 4 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Vet - Needs Employment

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. _____

_____

_____

Name: Donald Rankin

Address: 175 Myette Ave

Date: 973-351-5929

CALL - ASAP please

BW DANIELS NJ 070

12 AUG 2014 PM 1 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

7186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Karen Moses

Address: 79 Lincoln St 6I

Date: August 12, 2014

BY DANIELS MD 0070

12 AUG 2014 PM 1 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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_____

_____

Name: Miss Esther Williams

Address: 172 Eastern Parkway NW Kn NJ 07106

Date: 8/12/14

BAYONNE, NJ 07002

12 AUG 2014 PM 1 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

7186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Adonis H. Crowley

Address: 84 Forest Hill Parkway Apt. 3-D

Newark, NJ 07104

Date: 8-12-2014

DV DANIELS NJ 070

12 AUG 2014 PM 2 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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Name: Sheron Jefferson

Address: 220 Stirling Avenue

Date: August 12, 2014

DV DANIELS NJ 070

12 AUG 2014 PM 1 1

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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Name: FRANCINE HORNE

Address: 180 So ORANGE Ave

Date: 8/12/4

BY DANIELS NJ 07

12 AUG 2024 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: CLEMON COLTER III

Address: 1 SO. 8th STREET APT 202

Date: 8/12/2014

NEWARK, N.J. 07107

DANIELS NY 000

12 AUG 2009 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: WANDA Goodman

Address: 123 So Mun Ave Apt 95 EO 07018

Date: 8-18-14

DV DANIELS RD 070

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: ABE TILLMAN

Address: 624 MARTIN L. KING BLVD 8A

Date: 8-12-14

BY DANIELS NJ 07950

12 AUG 2024 PM 9:1

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

D07186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Henry Williams

Address: 25 Summit Street #206

Date: 8/12/14

BY DANIELS TODD

12 AUG 2024 PM 9 1

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Ianthee Alabi

Address: 80 Rose Terrace 1 fl. Nutley, NJ.

Date: 08/12/2014

DW DANIELS NJ 070

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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_____

_____

Name: THOMAS BAYLEY APT 2F

Address: 79 Lincoln St., Nwk, NJ.

Date: 8/12/14

BY DANIELS FORD

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. _____

_____

_____

Name: Don Fisher

Address: 317D Broadway, Nwk NJ

Date: 8/12/14

DV DANIELS NJ 07

12 AUG 2014 PM 9 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

D07186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. _____

_____

_____

Name: _____

Address: _____

Date: _____

DW DANIELS NJ 070

12 AUG 2014 PM 1 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

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Name: Sharon Knight

Address: 1018 Franklin Ave Newark N.J. 07107

Date: 8/12/14

DV DANIELS NJ 070

12 AUG 2014 PM 1 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

THANK YOU,

Name: ELLIS M. DANIELS

Address: P.O. BOX 6421

Date: 8/12/14

DW DANIELS NJ 070

13 AUG 2014 PM 6 L

U.S. EPA, REGION
ARD-DIRECTOR'S OF
2014 AUG 18 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. YES

It's good for the community. People need JOBS

Name: Min ELLIS M. DANIELS

Address: P.O Box 6421

Date: 8/7/14

DY DANIELS NJ 070

13 AUG 2014 PM 9 L

U.S. EPA, REGION
ORD-DIRECTOR'S OFF
2014 AUG 18 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

00718669 9

Dear Ms. Yeh,

I am concerned that a bank-to-bank dredge of the Lower Passaic River will adversely impact the business community for the foreseeable future. This approach could discourage new development and future investment by existing businesses in communities along the River. Please consider a remedy that will have less adverse impacts on the Northern New Jersey business community.

Name: Stephanie Iring

Address: 124 Gordon Street Clifton NJ 07011

Date: Aug. 13 2014

PHILADELPHIA PA 190

14 AUG 2014 PM 5 L

U.S. EPA, REGION 2
ERRD-DIRECTOR'S OF
2014 AUG 19 AM 11:5

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Edrich Kemper

Address: 150 fairview Ave. So. Orange, NJ 07079

Date: 8/13/2014

DW DANIELS NJ 070

14 AUG 2014 PM 4 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA, REGION 1
ERRD-DIRECTOR'S OF
2014 AUG 19 AM 11:5

07186699

Dear Ms. Yeh,

I am concerned that a bank-to-bank dredge of the Lower Passaic River will adversely impact the business community for the foreseeable future. This approach could discourage new development and future investment by existing businesses in communities along the River. Please consider a remedy that will have less adverse impacts on the Northern New Jersey business community.

Name: Adrian Sabatier

Address: 11 Patrick Ave Emerson NJ

Date: Aug 13 2014

PHILADELPHIA PA 190

14 AUG 2014 PM 4 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA, REGION
ERRD-DIRECTOR'S OF
2014 AUG 19 AM 11:5

Dear Ms. Yeh,

I am concerned that a bank-to-bank dredge of the Lower Passaic River will adversely impact the business community for the foreseeable future. This approach could discourage new development and future investment by existing businesses in communities along the River. Please consider a remedy that will have less adverse impacts on the Northern New Jersey business community.

Name: Jennifer Marel

Address: 338 6th Ave Paterson, NJ

Date: 8.13.14

PHILADELPHIA PA 190

14 AUG 2014 PM 7 L

U.S. EPA, REGION 2
RRD-DIRECTOR'S OFFICE
2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

0007186699

Dear Ms. Yeh,

I am concerned that a bank-to-bank dredge of the Lower Passaic River will adversely impact the business community for the foreseeable future. This approach could discourage new development and future investment by existing businesses in communities along the River. Please consider a remedy that will have less adverse impacts on the Northern New Jersey business community.

Name: Wendy P.

Address: Jersey City NJ 07307

Date: 8/13/14

PHILADELPHIA PA 190

14 AUG 2014 PM 7 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA, REGION
EARD-DIRECTOR'S OFF
2014 AUG 19 AM 11:

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Lisa McDonough

Address: 25 Melissa Lee Drive, Jackson NJ

Date: 8/13/14

PHILADELPHIA PA 190

14 AUG 2014 PM 9 L

U.S. EPA, REGION
CARD-DIRECTOR'S OF
2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

0007186693

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Jeff Alburtus

Address: 11 Flakes Drive Atlantic Highlands

Date: 8/13/14

PHILADELPHIA PA 190

14 AUG 2014 PM 10 L

U.S. EPA, Region 2
ERRD-DIRECTOR'S OFF

2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

0007186699

Dear Ms. Yeh,

I am concerned that a bank-to-bank dredge of the Lower Passaic River will adversely impact the business community for the foreseeable future. This approach could discourage new development and future investment by existing businesses in communities along the River. Please consider a remedy that will have less adverse impacts on the Northern New Jersey business community.

Name: Ruddys Andrade

Address: 2018 West St Union City, NJ 07087

Date: 8.13.14

PHILADELPHIA PA 190

14 AUG 2014 PM 5 L

U.S. EPA, REGION 2
ORRD-DIRECTOR'S OFF.
2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Diane Alburtus

Address: 489 Walnut St, Ridgefield NJ

Date: 8/13/14

PHILADELPHIA PA 190

14 AUG 2014 PM 5 L

U.S. EPA, REGION 2
ERRD-DIRECTOR'S OFF
2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Dana Tavano

Address: 535 Otto Place Paramus NJ

Date: 8/13/14

PHILADELPHIA PA 190

14 AUG 2014 PM 4 L

U.S. EPA, REGION
LARD-DIRECTOR'S OFF

2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Patrick Brady

Address: 9004 Durham Ave North Bergen NJ

Date: 8/13/14

PHILADELPHIA PA 190

14 AUG 2014 PM 5 L

U.S. EPA, REGION 2
CRRD-DIRECTOR'S OFF.

2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Thomas McDonough

Address: 25 Melissa Lee Drive. Jackson NJ

Date: 8/13/14

PHILADELPHIA PA 190

14 AUG 2014 PM 7 L

U.S. EPA, REGION 2
ERRD-DIRECTOR'S OFF

2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am concerned that a bank-to-bank dredge of the Lower Passaic River will adversely impact the business community for the foreseeable future. This approach could discourage new development and future investment by existing businesses in communities along the River. Please consider a remedy that will have less adverse impacts on the Northern New Jersey business community.

Name: Charlie Fromato

Address: 2018 West St Union City, NJ 07087

Date: 8-13-14

PHILADELPHIA PA 190

14 AUG 2014 PM 5 L

U.S. EPA, REGIO
CARD-DIRECTOR'S OF

2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Joe Tavano

Address: 535 Otto Place Paramus NJ

Date: 8/13/14

PHILADELPHIA PA 190

14 AUG 2014 PM 5 L

U.S. EPA, REGIO
DIRECTOR'S OF
2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

0007186699

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: SCOTT Lennox

Address: 284 Riverside AVE LYNDHURST NJ

Date: Aug 14 2014

DW DANIELS 103 GRD

14 AUG 2014 PM 1 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA: REGION
CRRD-DIRECTOR'S OFFICE
2014 AUG 19 AM 11:

07186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: James W Allen

Address: 91 Newfield St East Orange

Date: Aug 14

BY DANIELS RODD

12 AUG 2024 PM 9:1

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremend[redacted] traffic problems on local roads, Routes 3, 21, 78, 280 an[redacted]e New Jersey Turnpike, thereby lengthening my daily com[redacted]ute and adversely impacting my quality of life. Please rec[redacted]ider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Anna Matera

Address: 273 Park Avenue
Lyndhurst NJ 07071

Date: 8/15/2014

DW DANIELS NJ 070

16 AUG 2014 PM 1 L

U.S. EPA, REGIO
ERRD-DIRECTOR'S OF

2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am concerned that a bank-to-bank dredge of the Lower Passaic River will adversely impact the business community for the foreseeable future. This approach could discourage new development and future investment by existing businesses in communities along the River. Please consider a remedy that will have less adverse impacts on the Northern New Jersey business community.

Thank you.

Name: Russ Terry

Address: 93 Magnolia Ave #3

Date: Jersey City, NJ 07306

8.15.14

BR DANIELS NJ 070

15 AUG 2014 PM 1 L

U.S. EPA, RECEIVED
ERRD-DIRECTOR'S OFFICE
2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Diana Brillo-DiMascio

Address: 273 Park Ave Lyndhurst NJ 07071

Date: 8/16/14

DWD P&DC
KEARNY NJ 070
AUG 2014 PM 23 1

U.S. EPA, REGION 2
ERRD-DIRECTOR'S OF
2014 AUG 19 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

DV DANIELS
08070

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: MARK ROBERTS

Address: 37 COLTS LANE FLEMINGTON

Date: 8/9/14

U.S. EPA, REGION 2
ERRD-DIRECTOR'S OFF
2014 AUG 19 AM 11:5

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Timothy Huff

Address: 454th St Newark NJ 07107

Date: 8-18-2014

DW DANIELS NJ 070

25 AUG 2014 PM 4 L

U.S. EPA Region 2
ERRD-DIRECTOR'S OFF
2014 AUG 25 AM 11:2

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

07186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: MORA JACKSON

Address: 64 PINE GROVE TER NWK

Date: 8/19/14

DW DANIELS NJ 070

20 AUG 2014 PM 4 L

U.S. EPA, R-2
OARD-DIRECTOR'S OFF

2014 AUG 25 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will s[illegible]gly consider this remedy and more community-based ecolog[illegible]rograms as you weigh your options for cleaning up the Lower Passaic River.

Name: Mr. Bruce Anderson

Address: 59 No. Maple Ave / #9 / EON J. 07017

Date: 8-19-14

DW DANIELS NJ 070

20 AUG 2014 PM 4 L

U.S. EPA, REGION 2
ORD-DIRECTOR'S OFF
2014 AUG 25 AM 11:2

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Nicole Robinson

Address: 257 Stanley Pl Hackensack NJ 07601

Date: 8-17-14

EW DANIELS ND 070

20 AUG 2014 PM 4 L

U.S. EPA, REGION
CORD-DIRECTOR'S OFF
2014 AUG 25 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Nancy Robinson

Address: 257 Stanley Pl Hackensack NJ 07107

Date: 8-18-2014

DW DANIELS NJ 070

25 AUG 2014 PM 4 L

U.S. EPA
ERRD-DIRECTOR'S OF
2014 AUG 25 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. _____

_____

_____

Name: Donoven Gandy

Address: 45 4th st #2 Newark, NJ 07107

Date: 8-18-2014

DW DANIELS NJ 070

20 AUG 2014 PM 4 L

U.S. EPA, Region 2
ORD-DIRECTOR'S OFF
2014 AUG 25 AM 11:2

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. _____

_____

_____

Name: Donna Perryear

Address: 74 S Munn Ave EO NJ 07018

Date: 8-19-14

DW DANIELS NJ 070

25 AUG 2014 PM 4 L

U.S. EPA, REGION 1
2014 AUG 25 AM 11:
ERRD-DIRECTOR'S OFF

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will s[illegible] consider this remedy and more community-based ecolog[illegible]ns as you weigh your options for cleaning up the Lower Passaic River.

Name: Bryant Christmas

Address: 45 4th St#h Newark, NJ 07107

Date: 8-18-2014

DW DANIELS NJ 070

28 AUG 2014 PM 4 L

U.S. EPA, R2
HQ-DIRECTOR'S OFF

2014 AUG 25 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Stephon Davis

Address: 45 4th St Newark, NJ 07107

Date: 8-18-2014

DW DANIELS NJ 070

28 AUG 2014 PM 4 L

U.S. EPA
RECEIVED
OFFICE OF REGIONAL ADMINISTRATOR
2014 AUG 25 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

07186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strong .sider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: DeLois Hudson Huff

Address: 45 4th St #2 Newark NJ 07107

Date: 8-17-2014

DW DANIELS NJ 070

20 AUG 2014 PM 4 L

U.S. EPA - REGIO
2014 AUG 25 AM 11:
ARD-DIRECTOR'S OF

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. _____

_____

_____

Name: Unique Christmas

Address: 45 4th St #2 Newark NJ 07107

Date: 8-17-2014

DW DANIELS NJ 070

20 AUG 2014 PM 5 L

U.S. EPA - REGION 2
ORD - DIRECTOR'S OFF
2014 AUG 25 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

07186699

Dear Ms. Yeh,

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Name: Nicole Christmas

Address: 45 4th St #1 Newark NJ 07107

Date: 8/19/2014

DV DANIELS MOOD

20 AUG 2014 PM 8 L

U.S. EPA, REGION 1
LRRD-DIRECTOR'S OFF

2014 AUG 25 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

Dear Ms. Yeh,

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Name: JAMES JACKSON

Address: 64 PINE GROVE TER

Date: 8/19/14

DY DANIELS, NEWTO

20 AUG 2014 PM 8 L

U.S. EPA, REGION
ORD-DIRECTOR'S OFF

2014 AUG 25 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

007186699

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River. I Strongly consider this opportunity

Name: Mariah Freeman

Address: 382 Peshine ave 1st FL

Date: 08/19/14

DN DANIELS NJ 070

20 AUG 2014 PM 8 L

U.S. EPA, REGION 2
ORA-DIRECTOR'S OFFICE
2014 AUG 25 AM 11:

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Nyoka Baker

Address: 527-20th STREET

Date: 8/10/2014

DV DANIELS NJ 070

26 AUG 2014 PM 10 L

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

U.S. EPA, REGION II
ERRD-DIRECTOR'S OFFICE
2014 AUG 28 PM 2:30

Dear Ms. Yeh,

I am happy to have a new Veterans Training Center here in Newark. The center is employing local veterans, teaching green landscaping practices and also helping to supply our food programs. It's also part of the Sustainable Remedy for the Lower Passaic. I hope you will strongly consider this remedy and more community-based ecology programs as you weigh your options for cleaning up the Lower Passaic River.

Name: Zelma H Edwards

Address: 38 S. 17th St EDNJ 07201

Date: 8/19/14

DW DANIELS ND 070

20 AUG 2014 PM 4 L

U.S. EPA, REGION 1
ERRD-DIRECTOR'S OFFICE
2014 AUG 25 AM 11:20

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866

Dear Ms. Yeh,

I live in New Jersey and travel on our State's major highways and bridges on a daily basis for both business and pleasure. I am concerned that a bank-to-bank dredge of the Lower Passaic River will create tremendous traffic problems on local roads, Routes 3, 21, 78, 280 and the New Jersey Turnpike, thereby lengthening my daily commute and adversely impacting my quality of life. Please reconsider your plans for the bank to bank dredge and consider a remedy that will have less adverse impacts on New Jersey residents and commuters.

Name: Gregg Novek

Address: 85 Old Smallegtown Rd Warren, NJ

Date: 9/10/14

Alice Yeh, Remedial Project Manager
Environmental Protection Agency
290 Broadway, 19th Floor
New York, New York 10007-1866