



GIS Gives Port a Common Operating Picture

New users and data reuse optimize port activities

By Karen Richardson, ESRI Writer

A server-based enterprise GIS implementation created by the San Diego Port Authority has empowered staff across the organization by centralizing the maintenance of and access to GIS data and CAD drawings.

“Our vision of creating a common operating picture with a geographic perspective gives everyone the information they require along with the basic GIS functionality necessary to do their jobs in the best way they can.”

Malcolm Meikle, GIS Coordinator for the San Diego Port District

The Port of San Diego maintains a diverse facility spread across 6,000 acres. With the exception of the San Diego Convention Center, the San Diego Port Authority is responsible for the port: park and concessionaires, the walkway, large public art installations, the commercial shipyards and ports, and the recreational boating marinas surrounding San Diego Bay. Operating these assets generated revenues of \$133.7 million in 2007. The port, which uses information technology (IT) enterprise systems, such as SAP and a document system to manage business information, realized that applying the same concept to space management would be advantageous. The system the port envisioned would be accessed by every department and used by anyone from summer interns to the CEO.

The port had been using GIS since the 1990s in the engineering and real estate departments. Although both departments were essentially creating and using the same data, this data was not shared and efforts were duplicated. However, there was no easy way to share data.

“Our vision of creating a common operating picture with a geographic perspective gives everyone the information they require along with the basic GIS functionality necessary to do their jobs in the best way they can,” explained Malcolm Meikle, geographic information systems coordinator for the San Diego Unified Port District.

Making GIS Part of the Daily Workflow

Three years ago the port’s information technology department added ArcGIS Server, a complete and integrated server-based GIS, to its ArcGIS Desktop software. This change made facilities data accessible to the departments that needed it. The goal was to streamline workflows by identifying tasks, questions, and requests that were best answered using a geographic approach. This approach paid off.

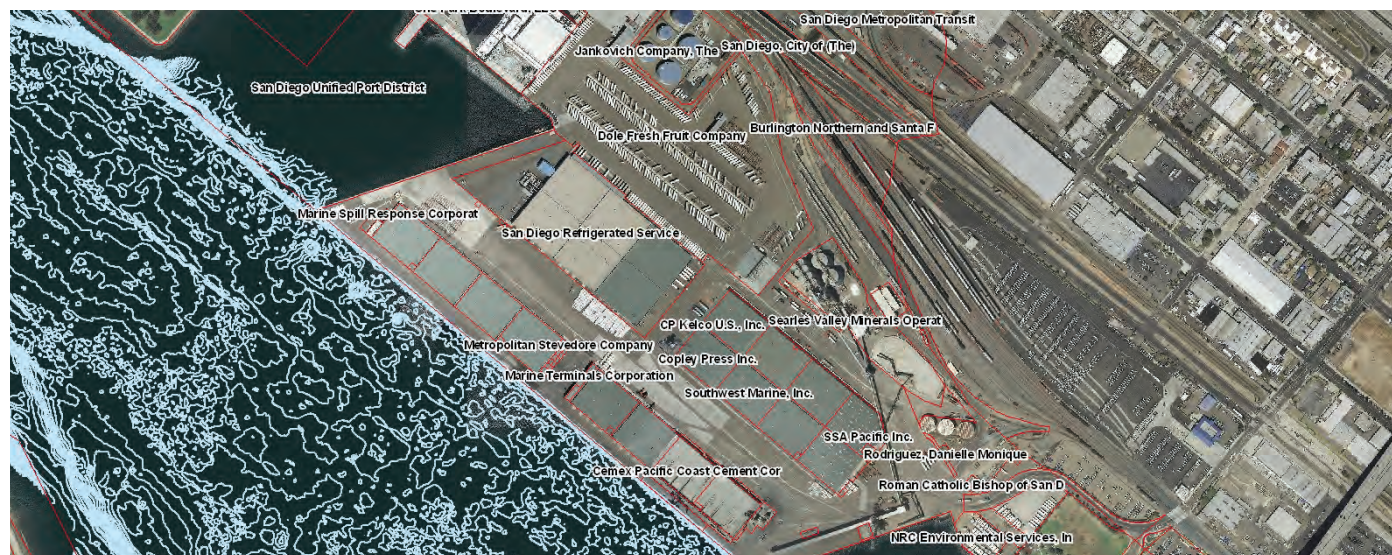
“Using GIS, the time it takes to access critical information went from seven to eight hours to mere minutes because the data is now located in one location and it is up-to-date,” said Meikle. “Just this change has sped up our workflow and is driving faster, more informed decision making.”

The port worked with various departments to customize interfaces using ArcGIS Desktop and generic Web browsers to give access to port data that now resides in a single location: a geodatabase. The geodatabase is the common data storage and management framework for ArcGIS Server. Source data is also managed in the geodatabase, which minimizes redundant copies and eliminates the possibility of varying versions of data.

Adopting new technology to improve business processes can be a daunting task. The port found it needed to keep daily tasks as unchanged as possible while incorporating tools for bringing real benefits to the users. CAD has continued as the technology used in the data production environment for creating drawing files for structures around the port. Designers use the ArcGIS for AutoCAD extension, a free tool from ESRI, to bring GIS data into the CAD environment. Using this extension, engineers can continue working with familiar software while gaining access to GIS data. It can be GIS data created in-house or GIS data from ArcGIS Online, an ESRI-hosted repository of GIS maps, layers, and tools.

ArcGIS for AutoCAD has proven to be a valuable tool since it allows operators to see the GIS basemap in their native CAD environment and find answers to questions because all the information is accessible through the basemap. “AutoCAD users are drawn to this tool because it gives them a window into GIS information while still allowing them to work in their familiar AutoCAD environment,” said

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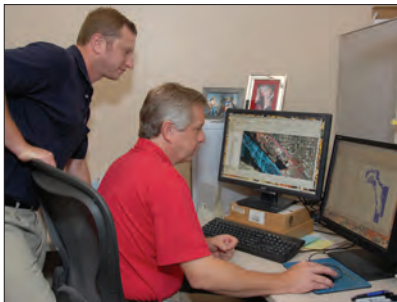


With GIS, the Port of San Diego can efficiently manage assets located on 6,000 acres surrounding San Diego Bay in California.

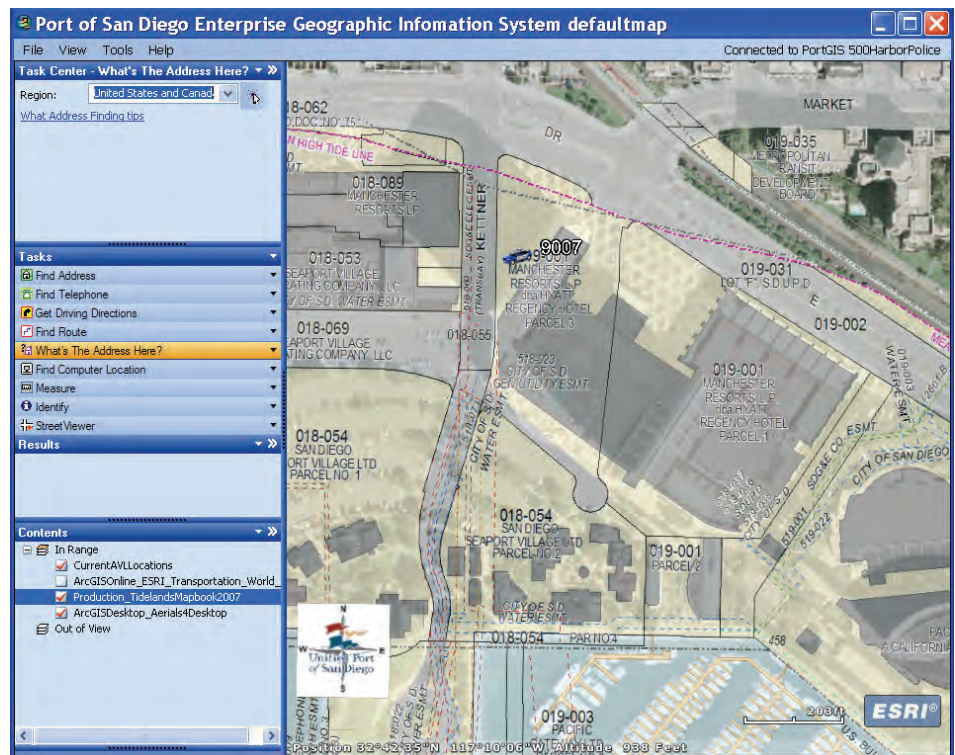
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PortGIS Explorer is the most widely used GIS Web application. It gives staff access to high-resolution aerial photos and TideLands Mapbook.



GIS analyst Ari Isaak (left) and GIS coordinator Malcolm Meikle (right) review updates to the Port of San Diego's online GIS portal.



Ari Isaak, a GIS analyst for the San Diego District Port.

Creating an enterprise GIS has driven the implementation of data and file structure standards in the engineering department so CAD data can be seamlessly displayed and analyzed through the wide variety of ArcGIS Server clients. Web-based clients, accessible to all port employees, provide new tools for understanding the infrastructure the port manages and maintains. Users in engineering management and general services and asset managers in the real estate department also use these tools.

Moving data from CAD to GIS, CAD operators must follow naming conventions for drawings, layers, objects, and attribute blocks. The port adopted the United States National CAD Standard—which is used by organizations throughout the United States for exchanging building design and construction data—as a guideline for its own CAD data standards. The Department of Homeland Security Geospatial Data Model is used as a data model guide.

All scanned paper plat and record drawings are accessed by an intermediate table that contains relevant information about the documents that are stored in the geodatabase. Standardizing layer naming conventions for new drawings, as well as the creation of a master CAD drawing, means that engineering staff update those files instead of storing these drawings on local drives. This ensures that every department can understand and use GIS data. This has made attribution much easier, and CAD operators no longer need to guess how to describe features in the drawings.

Just Add Imagery

Another advantage of this system is the ability to view and use imagery in the CAD stations using the ArcGIS for AutoCAD tool. In the past, when engineers added TIFF images to AutoCAD—one at a time—the draw time was lengthy. If a drawing spanned more than one image,

each image had to be loaded separately. This process was time consuming and frustrating for operators. “CAD designers love ArcGIS for AutoCAD if for no other reason than they finally have access to very high-resolution aerial [photos] quickly,” said Isaak.

The port has two sources for imagery: 3-meter resolution aerial photographs from ArcGIS Online and 4-inch pixel resolution aerial photos flown in April 2009 by the port. The 4-inch resolution photos are used for quality control and as a source for creating new data. To use the aerials for these purposes, engineers must follow strict standards and use the same coordinate system employed by the GIS operators.

This simple change has been advantageous. Now, drawings can be viewed in the correct geographic space even if an image is not used as a backdrop. Drawings can also be located by performing a spatial search rather than by the name of a drawing. Now drawings can be used for more than one project. Previously, drawings had to be copied and pasted into work projects. These changes have cut down on the errors inherent in copying data and the amount of file space needed to store the drawings. Because the source data is managed in the GIS database, it can be used more than once. Now, everyone in the port is using the most accurate data.

Web-Based Enterprise GIS throughout the Port

“By using geographic data and systems, the port is able to use geography as the common factor to bring together data that otherwise is difficult to integrate,” said Meikle. In 2007, when ArcGIS was adopted, the GIS group moved from the real estate to the information technology (IT) department. This allowed IT to manage and disseminate GIS data throughout the port. Access to the GIS data and system has empowered the port’s employees to integrate their own independently developed workflows for managing spatial data and

accomplishing their work using the information they need.

Departments that traditionally hadn't thought about using the port's facility information, such as the harbor police, are now users. Today, the harbor police employs two applications for tracking vehicles around port property—one desktop application built with ArcGIS Explorer and an in-car application that displayed map data in Web browsers that was created with OpenLayers, an open source JavaScript library.

Staff throughout the port can access the GIS through the PortGIS Resource Center. This central gateway to GIS information is accessed by clicking an icon on the port's internal Web home page. Here, staff can choose one of three Web applications—PortGIS Explorer, PortGIS Utilities, or PortGIS Projects—designed for various tasks and departments.

The most used GIS Web application is PortGIS Explorer. Staff can access high-resolution aerial photos and the port's TideLands Mapbook, which represents the port's overall geographic interests at the Port of San Diego. A user can navigate around the map to see exactly the information they need, turn on and off layers, and create maps to include in reports and e-mails. Data can be queried and measurements between two or more points obtained.

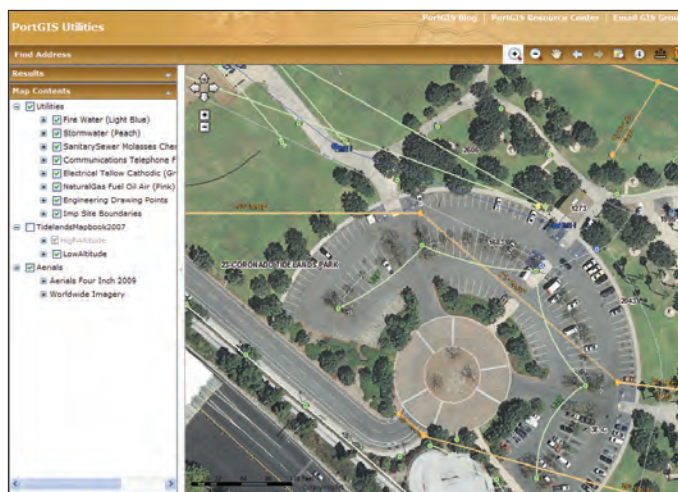
The PortGIS Utilities application focuses on current conditions. End users can view utility line work and access PDFs of official engineering drawings by location. This application furnishes all the functionality of PortGIS Explorer as well as georeferenced maps from important documents. PortGIS Utilities brings together the port's development effort affecting all the managed land and creates a common operating picture for departments as they move forward in their planning efforts. The PortGIS Projects application deals with future developments, the regulatory process, and obligations to which the port is committed.

Standards Make Workers More Efficient

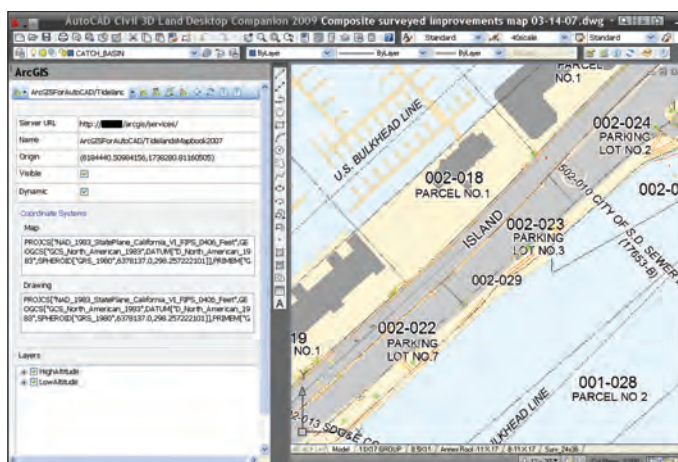
PortGIS Utilities is the central clearinghouse for the port's utilities data, including electrical, fire, natural gas, fuel, sanitary sewer, storm drain, telephone, water, chemical, fiber optics, and communication lines. The data is converted to ESRI feature classes using a batch file, which runs nightly. Instead of the engineers working with a traditional file system to structure the data, the data is spatially indexed so it can be more easily located. This also allows engineers to share data with the rest of the port. Simply having the data created using standards that are managed and shared from one location makes it much easier for staff to find answers.

The entire system was built using the Microsoft .NET framework, a file geodatabase, and Windows Server 2008 on a 64-bit machine. Clients were created using the .NET Web Application Development Framework (ADF) that comes with ArcGIS Server, which was customized using Visual Studio and incorporated many ideas from the .NET ADF Code gallery at the ESRI Web site. The IT department also created a streamlined method that assists users by installing software remotely. If staff members have questions, they can send e-mails to the IT department or check out a `%scrachworkspace%` (`posdgis.wordpress.com`), a blog maintained by the port GIS professionals.

Today port staff can not only ask questions like How much square footage is available? but also reach further into the data by gaining access to official record drawings and viewing the relationship between a developer's plans and the geographic interests of the port. GIS is used in every department. It helps the harbor police track police cars. The general services department uses it for engineering data accumulation and maintenance. The finance department uses GIS to track money coming into the port by tracking corporate leases, maintaining parking meters, and other activities. Today the more than 600 employees at the



The central clearinghouse for the port's utilities data, PortGIS Utilities, enables engineers to find electrical, fire, natural gas, fuel, sanitary sewer, storm drain, telephone, water, chemical, fiber optics, and communications lines more easily and share the information with the rest of the port.



Using the ArcGIS for AutoCAD extension, engineers can bring GIS data into a familiar CAD environment and access GIS data whether it is created in-house or is accessed from ArcGIS Online.

port can use GIS data and Web-based applications.

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Visit the CAD Integration Resource Center (resources.esri.com/caddata). For more information on on ArcGIS for AutoCAD and to download the free extension, visit www.esri.com/arcgisforautocad.



E X T E R N A L M E M O R A N D U M

TO: T. Michael Chee
FROM: Rick Bodishbaugh
DATE: June 23, 2011
PROJECT: PH10719.001
SUBJECT: Summary of Need to Remediate NASSCO Stations, REVISED

At your request, Exponent has reviewed the findings of the September 15, 2010 Tentative Cleanup and Abatement Order, as well as all lines of evidence presented therein for the proposed cleanup project. Our technical opinion remains unchanged from the one we reached in our 2003 Detailed Sediment Investigation Report. There is presently no evidence of significant impairment of beneficial uses due to NASSCO sediment contamination, and active remediation would not produce any clear long-term improvement in beneficial uses relative to current conditions. Current impacts to the benthic community are extremely limited in extent and severity, and are more likely the result of physical disturbance than chemical toxicity. There is presently no significant risk to aquatic dependent wildlife or human receptors, under realistic and reasonable exposure scenarios. Monitored natural recovery is therefore equivalent to or better than all other alternatives, and should be the preferred alternative of any remedial decision-making process.

A station-by-station summary for NASSCO stations of the primary lines of evidence concerning risk, beneficial use impairment, and the need for remediation follows.

This memorandum updates our memorandum of May 25, 2011, by adding additional data for NA23 and NA24, which was gathered in the 2009 NOW testing, and is intended to rebut comments submitted by both the San Diego Unified Port District and San Diego Gas & Electric on May 26, 2011.

Glossary of Key Terms in Summary

Primary COCs – The five principle contaminants of concern addressed in the Tentative Cleanup and Abatement Order, including copper, mercury, High Molecular Weight Polynuclear Aromatic Hydrocarbons (HPAHs), polychlorinated biphenyls (PCBs), and tributyltin (TBT).

Composite SWAC – The spatially weighted average concentration (SWAC) in sediments, calculated using Thiessen polygon areas. Thiessen polygons are areas whose boundaries define the area that is closest to each sample station relative to all other stations, and are mathematically defined by the perpendicular bisectors of the lines between adjacent points. Each Thiessen polygons is interpreted to be the area represented by a single sediment sample.

60% LAET – The lowest adverse effects threshold (LAET) is the lowest concentration of any of the seven apparent effect thresholds (AETs) developed from the Triad study. An AET is the concentration above which adverse effects to benthic invertebrates always occur. AETs were developed for the three toxicity tests and four benthic community parameters assessed in the DTR Triad analysis. The 60% LAET was selected as a highly protective site-specific benchmark of potential benthic community impairment.

SS-MEQ – Site-Specific Median Effects Quotient (SS-MEQ) is a multiple chemical benchmark calculated from the median sediment concentration of the five primary chemicals of concern (COCs) at six stations that were scored as “likely impaired” in the DTR Triad analysis. These stations are NA19, NA22, SW04, SW13, SW22 and SW23. For each station, the effects quotients (the ratio of measured concentration to the median “likely impaired” concentration) were calculated for each of the primary COCs, and these were averaged to yield the multi-chemical SS-MEQ. A benchmark of 90% of the SS-MEQ was used as a protective site-specific benchmark of benthic community impairment.

Triad Station – Of the 66 stations in the Shipyard Site, 30 Triad station were established where all three lines of evidence were collected, including benthic community conditions data, sediment chemistry data, and sediment toxicity data.

DTR – Draft Technical Report. The technical document supporting the conclusions reached in the Tentative Cleanup and Abatement Order.

SQGQ1 – Sediment Quality Guideline Quotient 1 (SQGQ1) as defined in Fairey et al. (2001). The SQGQ1 is the mean sediment quality guideline quotient chemical combination using the effects median probable effects level and other individual sediment quality guideline values. The chemicals included in the SQGQ1 mean calculation are cadmium, copper, lead, silver, zinc, total chlordane, dieldrin, total PCBs and total PAHs.

BRI – Benthic Response Index (BRI) is a metric developed by scientists at the Southern California Coastal Water Research Project (SCCWRP) to measure the relative likelihood of benthic community degradation in coastal marine environments in California.

Shannon-Weiner Diversity Index – Shannon-Weiner Diversity Index (Diversity Index) is a measure of both the number of species and the distribution of individuals among species; higher

values indicate that more species are present or that individuals are more evenly distributed among species.

Reference LPL and UPL – the reference lower prediction limit (LPL) and upper prediction limit (UPL) are the one-tailed 95% prediction limits of the reference pool of stations. Site biological indicators outside the prediction limits (below LPL or above UPL) are judged to be significantly different from the reference condition.

SPI – sediment profile imaging (SPI) is a photographic method of assessing benthic community structure. Photographs are taken with a probe-mounted camera mounted above a prism that penetrates into the sediment and photographs a vertical cross-section of the sediment. The resulting photographs provide information on physical conditions in the sediment as well as a direct assessment of the presence condition of the benthic fauna.

Stage 1 - refers to the succession of benthic colonization and interaction with sediment soon after disturbance or defaunation of the soft-bottom marine sediment. Stage 1 represents the first stage at which small tube-dwelling polychaetes that feed at the sediment surface colonize the sediment soon after disturbance in the sediment.

Stage 2 – refers to the benthic colonization phase after Stage 1, in which the succession is characterized by organisms that burrow shallowly into the sediment but nevertheless feed at or near the sediment surface. Burrowing activity loosens and aerates the sediment, a process that makes it more suitable for further colonization.

Stage 3 – refers to the climax phase of benthic colonization, which is characterized by organisms that burrow well into the anaerobic sediment and feed at depth off of organic matter and microbial decomposers. These deep burrowing organisms typically irrigate their burrows with oxygenated surface water. This community is regarded as the mature stage of a fully developed benthic community.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA01

SUMMARY OF STATION CONDITIONS

1. **Primary COCs are relatively low:**
 - Composite SWAC ranking = 28 of 66 polygons
 - Copper ranking = 26 of 66 polygons
 - Mercury ranking = 19 of 66 polygons
 - HPAH ranking = 25 of 66 polygons
 - PCB ranking = 30 of 66 polygons
 - TBT ranking = 31 of 66 polygons

2. **Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.69 (less than 0.90 benchmark)

3. **No impacts to benthic community:**
 - **Triad Station: “Unlikely” benthic impacts**

 - **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only 2 chemicals exceed both DTR SQG and UPL.

 - **DTR toxicity score = low**
No evidence of toxicity. Amphipod, urchin, and bivalve tests all scored above reference LPL.

 - **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.

 - **SPI data indicate Stage I and III successional stages present**

CONCLUSION

Based on relatively low chemistry, and the absence of benthic impacts, NA01 was properly excluded from the proposed remedial footprint in the DTR

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA02

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 46 of 66 polygons
 - Copper ranking = 44 of 66 polygons
 - Mercury ranking = 46 of 66 polygons
 - HPAH ranking = 44 of 66 polygons
 - PCB ranking = 41 of 66 polygons
 - TBT ranking = 46 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.41 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **SPI data indicate Stage I and III successional stages present**

CONCLUSION

Based on relatively low chemistry, and a lack of evidence for benthic impacts, NA02 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA03

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 32 of 66 polygons
- Copper ranking = 36 of 66 polygons
- Mercury ranking = 13 of 66 polygons
- HPAH ranking = 26 of 66 polygons
- PCB ranking = 31 of 66 polygons
- TBT ranking = 24 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.67 (less than 0.90 benchmark)

3. No impacts to benthic community:

- **Triad Station: “Unlikely” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only 2 chemicals exceed both DTR SQG and UPL.
- **DTR toxicity score = low**
No evidence of toxicity. Amphipod, urchin, and bivalve tests all scored above reference LPL.
- **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.
- **SPI data indicate Stage I and III successional stages present.**

CONCLUSION

Based on relatively low chemistry, and the absence of benthic impacts, NA03 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA04

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 34 of 66 polygons
- Copper ranking = 22 of 66 polygons
- Mercury ranking = 13 of 66 polygons
- HPAH ranking = 34 of 66 polygons
- PCB ranking = 39 of 66 polygons
- TBT ranking = 13 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.69 (less than 0.90 benchmark)

3. No impacts to benthic community:

- **Triad Station: “Unlikely” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only 1 chemical exceeds both DTR SQG and UPL.
- **DTR toxicity score = low**
No evidence of toxicity. Amphipod, urchin, and bivalve tests all scored above reference LPL.
- **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.
- **SPI data indicate Stage I and III successional stages present.**

CONCLUSION

Based on relatively low chemistry, and the absence of benthic impacts, NA04 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA05

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 47 of 66 polygons
- Copper ranking = 44 of 66 polygons
- Mercury ranking = 50 of 66 polygons
- HPAH ranking = 44 of 66 polygons
- PCB ranking = 47 of 66 polygons
- TBT ranking = 40 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.40 (less than 0.90 benchmark)

3. No impacts to benthic community:

- **Triad Station: “Unlikely” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. No chemicals exceed both DTR SQG and UPL.
- **DTR toxicity score = low**
No evidence of toxicity. Amphipod, urchin, and bivalve tests all scored above reference LPL.
- **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.
- **SPI data indicate Stage I and III successional stages present.**

CONCLUSION

Based on relatively low chemistry, and the absence of benthic impacts, NA05 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA06

SUMMARY OF STATION CONDITIONS

- 1. Only mercury and copper are relatively high:**
 - Composite SWAC ranking = 19 of 66 polygons
 - Copper ranking = 9 of 66 polygons
 - Mercury ranking = 2 of 66 polygons
 - HPAH ranking = 31 of 66 polygons
 - PCB ranking = 15 of 66 polygons
 - TBT ranking = 18 of 66 polygons

- 2. Chemistry is below or slightly exceeds conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 1.11 (greater than 0.90 benchmark)

- 3. No impacts to benthic community:**
 - **Triad Station: “Unlikely” benthic impacts**

 - **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only 3 chemicals exceed both DTR SQG and UPL.

 - **DTR toxicity score = low**
No evidence of toxicity. Amphipod, urchin, and bivalve tests all scored above reference LPL

 - **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.

 - **SPI data indicate Stage I and III successional stages present**

CONCLUSION

There are no impacts to the benthic community at this station. NA06 was included in the DTR proposed remedial footprint because of relatively high mercury and copper, which are potential food web risk drivers. However, a realistic analysis of food web risks to wildlife and human receptors shows that there are no significant risks. Therefore, no risk-based justification for remediating NA06 exists.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA07

SUMMARY OF STATION CONDITIONS

- 1. Only mercury and HPAH are relatively high:**
 - Composite SWAC ranking = 17 of 66 polygons
 - Copper ranking = 35 of 66 polygons
 - Mercury ranking = 7 of 66 polygons
 - HPAH ranking = 6 of 66 polygons
 - PCB ranking = 21 of 66 polygons
 - TBT ranking = 39 of 66 polygons

- 2. Chemistry is below or slightly exceeds conservative biological benchmarks:**
 - Only slight exceedance of 60% HPAH LAET (63%)
 - SS-MEQ = 0.91 (slightly more than 0.90 benchmark)

- 3. No impacts to benthic community:**
 - **Triad Station: “Unlikely” benthic impacts**
 - **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only 2 chemicals exceed both DTR SQG and UPL.
 - **DTR toxicity score = low**
No evidence of toxicity. Amphipod, urchin, and bivalve tests all scored above reference LPL.
 - **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.
 - **SPI data indicate Stage III successional stage present.**

CONCLUSION

HPAH and mercury are relatively elevated at this station. HPAH is a potential benthic and food web risk driver, while mercury is a potential food web risk driver. There are no impacts to the benthic community at this station, and a realistic analysis of food web risks to wildlife and human receptors shows that there are no significant risks. Therefore, no risk-based justification for remediating NA07 exists, and NA07 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA08

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 40 of 66 polygons
 - Copper ranking = 18 of 66 polygons
 - Mercury ranking = 36 of 66 polygons
 - HPAH ranking = 34 of 66 polygons
 - PCB ranking = 35 of 66 polygons
 - TBT ranking = 40 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.56 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and a lack of evidence for benthic impacts, NA08 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA09

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 38 of 66 polygons
- Copper ranking = 22 of 66 polygons
- Mercury ranking = 10 of 66 polygons
- HPAH ranking = 44 of 66 polygons
- PCB ranking = 37 of 66 polygons
- TBT ranking = 36 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.62 (less than 0.90 benchmark)

3. No clear indication of impacts to benthic community:

- **Triad Station: “Possible” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only 2 chemicals exceed both DTR SQG and UPL.
- **DTR toxicity score = moderate**
Bivalve test scored below reference LPL. Amphipod and urchin tests scored above reference LPLs.
- **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.
- **SPI data indicated Stage I and III present.**

CONCLUSION

There are no clear impacts to the benthic community at this station. NA09 was included in the DTR proposed remedial footprint because of a “possible impacts” score in the DTR Triad analysis and relatively high mercury levels. However, none of the four benthic community indicators evaluated is significantly different from reference conditions. Only one of the three toxicity tests (bivalve larval development) was different from reference, and this is the least reliable of the three tests performed. Mercury is a potential food web risk driver. However, a realistic analysis of food web risks to wildlife and human receptors shows that there are no significant risks. Therefore, no risk-based justification for remediating NA09 exists.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA10

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 54 of 66 polygons
 - Copper ranking = 48 of 66 polygons
 - Mercury ranking = 51 of 66 polygons
 - HPAH ranking = 54 of 66 polygons
 - PCB ranking = 54 of 66 polygons
 - TBT ranking = 44 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.35 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **SPI data indicate Stage III successional stage present.**

CONCLUSION

Based on relatively low chemistry, and a lack of evidence for benthic impacts, NA10 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA11

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 49 of 66 polygons
- Copper ranking = 43 of 66 polygons
- Mercury ranking = 34 of 66 polygons
- HPAH ranking = 44 of 66 polygons
- PCB ranking = 45 of 66 polygons
- TBT ranking = 56 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.42 (less than 0.90 benchmark)

3. No clear indication of impacts to benthic community:

- **Triad Station: “Possible” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only 1 chemical exceeds both DTR SQG and UPL.
- **DTR toxicity score = moderate**
Amphipod test scored slightly below reference LPL. Bivalve and urchin tests scored above reference LPLs.
- **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.
- **SPI data indicate Stage I and III successional stages present.**

CONCLUSION

There are no highly elevated COPC levels at this station. There are no clear impacts to the benthic community. None of the four benthic community indicators evaluated is significantly different from reference conditions. Only one of the three toxicity tests (amphipod survival) was lower than reference. Due to a lack of high chemistry and no clear indication of benthic impacts, NA11 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA12

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 55 of 66 polygons
- Copper ranking = 50 of 66 polygons
- Mercury ranking = 49 of 66 polygons
- HPAH ranking = 52 of 66 polygons
- PCB ranking = 57 of 66 polygons
- TBT ranking = 47 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.35 (less than 0.90 benchmark)

3. No direct evidence of impacts to benthic community:

- **Triad Station: “Possible” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. No chemicals exceed both DTR SQG and UPL.
- **DTR toxicity score = moderate**
Bivalve test scored below reference LPL. Amphipod and urchin tests scored above reference LPLs.
- **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.
- **SPI indeterminate, due to poor probe penetration.**

CONCLUSION

There are no highly elevated COPC levels at this station. There are no clear impacts to the benthic community. None of the four benthic community indicators evaluated is significantly different from reference conditions. Only one of the three toxicity tests (bivalve larval development) was lower than reference, and this is the least reliable of the three tests performed. Due to a lack of high chemistry and no clear indication of benthic impacts, NA12 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA13

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 53 of 66 polygons
- Copper ranking = 42 of 66 polygons
- Mercury ranking = 48 of 66 polygons
- HPAH ranking = 54 of 66 polygons
- PCB ranking = 52 of 66 polygons
- TBT ranking = 48 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.38 (less than 0.90 benchmark)

3. No direct evidence of impacts to benthic community:

- **Non-Triad Station**
- **SPI data indicate Stage I and III successional stages present.**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA13 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA14

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 60 of 66 polygons
 - Copper ranking = 55 of 66 polygons
 - Mercury ranking = 53 of 66 polygons
 - HPAH ranking = 59 of 66 polygons
 - PCB ranking = 59 of 66 polygons
 - TBT ranking = 54 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.28 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA14 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA15

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 22 of 66 polygons
- Copper ranking = 28 of 66 polygons
- Mercury ranking = 24 of 66 polygons
- HPAH ranking = 38 of 66 polygons
- PCB ranking = 34 of 66 polygons
- TBT ranking = 7 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.87 (less than 0.90 benchmark)

3. No impacts to benthic community:

- **Triad Station: “Unlikely” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only 2 chemicals exceed both DTR SQG and UPL.
- **DTR toxicity score = low**
No evidence of toxicity. Amphipod, urchin, and bivalve tests all scored above reference LPL.
- **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.
- **SPI data indicate Stage I and III successional stages present.**

CONCLUSION

There are no impacts to the benthic community at this station. NA15 was included in the DTR proposed remedial footprint because of relatively TBT, which can potentially impact gastropods and pose a food web risk. However, a realistic analysis of food web risks to wildlife and human receptors shows that there are no significant risks, and there is no evidence of an impacted gastropod population at the shipyard. Therefore, no risk-based justification for remediating NA15 exists.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA16

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 30 of 66 polygons
- Copper ranking = 26 of 66 polygons
- Mercury ranking = 18 of 66 polygons
- HPAH ranking = 39 of 66 polygons
- PCB ranking = 17 of 66 polygons
- TBT ranking = 25 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.69 (less than 0.90 benchmark)

3. No direct evidence of impacts to benthic community:

- **Triad Station: “Possible” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only 2 chemicals exceed both DTR SQG and UPL.
- **DTR toxicity score = moderate**
Bivalve test scored below reference LPL. Amphipod and urchin tests scored above reference LPLs.
- **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.

CONCLUSION

There are no highly elevated COPC levels at this station. There are no clear impacts to the benthic community. None of the four benthic community indicators evaluated is significantly different from reference conditions. Only one of the three toxicity tests (bivalve larval development) was lower than reference, and this is the least reliable of the three tests performed. Due to a lack of high chemistry and no clear indication of benthic impacts, NA16 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA17

SUMMARY OF STATION CONDITIONS

- 1. Only copper and TBT were relatively high:**
 - Composite SWAC ranking = 10 of 66 polygons
 - Copper ranking = 7 of 66 polygons
 - Mercury ranking = 35 of 66 polygons
 - HPAH ranking = 42 of 66 polygons
 - PCB ranking = 18 of 66 polygons
 - TBT ranking = 3 of 66 polygons
- 2. Chemistry is below or slightly exceeds conservative biological benchmarks:**
 - Only TBT exceeds the 60% LAET
 - SS-MEQ = 1.41 (greater than 0.90 benchmark)
- 3. No direct evidence of impacts to benthic community:**
 - **Triad Station: “Possible” benthic impacts**
 - **DTR chemistry score = high**
SQGQ1 is greater than 1.0 and 4 chemicals exceed both DTR SQG and UPL.
 - **DTR toxicity score = low**
No evidence of toxicity. Amphipod, urchin, and bivalve tests all scored above reference LPL.
 - **DTR benthic disturbance score = low**
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.
 - **SPI data indicate Stage I and III successional stages present.**

CONCLUSION

There are no clear impacts to the benthic community at this station. NA17 was included in the DTR proposed remedial footprint because of a “possible impacts” score in the DTR Triad analysis and relatively high TBT and copper levels. However, none of the four benthic community indicators evaluated is significantly different from reference conditions, and none of the three toxicity tests was different from reference. In other words, the “possible” disturbance score was due solely to high chemistry, not to any biological indicator. TBT can potentially impact gastropods and pose a food web risk. However, a realistic analysis of food web risks to wildlife and human receptors shows that there are no significant risks, and there is no evidence of an impacted gastropod population at the shipyard. Copper is primarily a benthic risk driver, and can pose a food web risk. Again, there is no evidence of either benthic impacts or food web risk from copper, based on a realistic analysis of risk to wildlife and human receptors. Therefore, no risk-based justification for remediating NA17 exists.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA18

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 39 of 66 polygons
 - Copper ranking = 31 of 66 polygons
 - Mercury ranking = 37 of 66 polygons
 - HPAH ranking = 49 of 66 polygons
 - PCB ranking = 32 of 66 polygons
 - TBT ranking = 19 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.56 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA18 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA19

SUMMARY OF STATION CONDITIONS

1. Only PCB and TBT are relatively high:

- Composite SWAC ranking = 18 of 66 polygons
- Copper ranking = 18 of 66 polygons
- Mercury ranking = 38 of 66 polygons
- HPAH ranking = 40 of 66 polygons
- PCB ranking = 10 of 66 polygons
- TBT ranking = 8 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.92 (slightly greater than 0.90 benchmark)

3. No direct evidence of impacts to benthic community:

- Triad Station: “Likely” benthic impacts

- DTR chemistry score = high
SQGQ1 is greater than 1.0 and 4 chemicals exceed both DTR SQG and UPL.

- DTR toxicity score = moderate
Bivalve test scored below reference LPL.

- DTR benthic disturbance score = low
No evidence of disturbance. BRI is below reference UPL. Abundance, # taxa, and diversity index are all above reference LPL.

- SPI data indicate Stage I and III successional stages present.

CONCLUSION

NA19 was included in the DTR proposed remedial footprint because of a “likely” impacted score in the DTR Triad analysis and relatively high TBT and PCB levels. However, none of the four benthic community indicators evaluated is significantly different from reference conditions, and only one of the three toxicity tests (bivalve larval development, the least reliable of the three tests) was different from reference. In other words, the “likely” disturbance score was due solely to high chemistry, and one of seven biological indicators being different from reference conditions. TBT can potentially impact gastropods and pose a food web risk. However, a realistic analysis of food web risks to wildlife and human receptors shows that there are no significant risks, and there is no evidence of an impacted gastropod population at the shipyard. PCBs are a potential food web risk driver, and again, there is no evidence of food web risk from PCBs, based on a realistic analysis of risk to wildlife and human receptors. Therefore, no risk-based justification for remediating NA19 exists.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA20

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 50 of 66 polygons
- Copper ranking = 61 of 66 polygons
- Mercury ranking = 65 of 66 polygons
- HPAH ranking = 43 of 66 polygons
- PCB ranking = 60 of 66 polygons
- TBT ranking = 14 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.34 (less than 0.90 benchmark)

3. No impacts to benthic community:

- **Triad Station: “Unlikely” benthic impacts**
- **DTR chemistry score = low**
SQGQ1 is less than 1.0. No chemicals exceed both DTR SQG and UPL.
- **DTR toxicity score = low**
Amphipod, urchin, and bivalve tests all scored above reference LPL.
- **DTR benthic disturbance score = moderate**
The number of taxa present is below that found in the reference condition. However, the other three indicators show no sign of disturbance. BRI is below the reference UPL. Abundance and diversity index are above reference LPL. The relatively low number of taxa present is likely the result of physical disturbance in this area.
- **SPI data indicate Stage I and III successional stages present.**

CONCLUSION

Based on relatively low chemistry, and the absence of clear evidence of benthic impacts, NA20 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA21

SUMMARY OF STATION CONDITIONS

- 1. Only TBT is relatively high:**
 - Composite SWAC ranking = 41 of 66 polygons
 - Copper ranking = 50 of 66 polygons
 - Mercury ranking = 58 of 66 polygons
 - HPAH ranking = 50 of 66 polygons
 - PCB ranking = 51 of 66 polygons
 - TBT ranking = 12 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.50 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA21 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA22

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 51 of 66 polygons
- Copper ranking = 50 of 66 polygons
- Mercury ranking = 63 of 66 polygons
- HPAH ranking = 33 of 66 polygons
- PCB ranking = 47 of 66 polygons
- TBT ranking = 36 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.35 (less than 0.90 benchmark)

3. No direct evidence of impacts to benthic community:

- **Triad Station: “Likely” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. No chemicals exceed both DTR SQG and UPL.
- **DTR toxicity score = moderate**
Bivalve test scored below reference LPL.
- **DTR benthic disturbance score = moderate**
No evidence of disturbance. BRI is below reference UPL. Abundance and number of taxa are above reference LPL. Diversity index is above reference LPL.
- **SPI data indicate Stage I and III successional stages present.**

CONCLUSION

Station NA22 has relatively low COPC levels. This station received a “likely” impacted score in the DTR Triad analysis. However, none of the four benthic community indicators evaluated is significantly different from reference conditions, and only one of the three toxicity tests (bivalve larval development, the least reliable of the three tests) was different from reference. In other words, the “likely” disturbance score was due solely to high chemistry, and one of seven biological indicators being different from reference conditions. Furthermore, this area is under the influence of deposition from Chollas Creek, and will be assessed as part of the Chollas Creek Mouth TMDL process. For this reason, NA22 was not included and the DTR proposed remedial footprint, and no risk-based justification for remediation exists.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA23

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 31 of 66 polygons
- Copper ranking = 11 of 66 polygons
- Mercury ranking = 13 of 66 polygons
- HPAH ranking = 36 of 66 polygons
- PCB ranking = 20 of 66 polygons
- TBT ranking = 36 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.72 (less than 0.90 benchmark)

3. No direct evidence of impacts to benthic community:

- **Non-Triad Station in Phase 2**
- **Triad Station in 2009: “Possible” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. Only one chemical exceeds both DTR SQG and UPL.
- **DTR toxicity score = low**
Amphipod, and urchin tests both scored above reference LPL.
- **DTR benthic disturbance score = moderate**
The total abundance is below that found in the reference condition. However, the other three indicators show no sign of disturbance. BRI is below the reference UPL. Number of taxa and diversity index are above reference LPL. The relatively low abundance is likely the result of physical disturbance in this area, due to dry dock operations.
- **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of toxicity, benthic impacts from sediment contamination are not considered likely. This area is known to be periodically disturbed by raising and lowering of the large floating dry dock, and it is likely that the single benthic community indicator that was outside reference conditions (total abundance) is due to physical disturbance. NA23 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA24

SUMMARY OF STATION CONDITIONS

1. Primary COCs are relatively low:

- Composite SWAC ranking = 45 of 66 polygons
- Copper ranking = 40 of 66 polygons
- Mercury ranking = 29 of 66 polygons
- HPAH ranking = 50 of 66 polygons
- PCB ranking = 37 of 66 polygons
- TBT ranking = 49 of 66 polygons

2. Chemistry is below conservative biological benchmarks:

- No exceedances of 60% LAETs
- SS-MEQ = 0.47 (less than 0.90 benchmark)

3. No direct evidence of impacts to benthic community:

- **Non-Triad Station in Phase 2**
- **Triad Station in 2009: “Possible” benthic impacts**
- **DTR chemistry score = moderate**
SQGQ1 is less than 1.0. No chemicals exceed both DTR SQG and UPL.
- **DTR toxicity score = low**
Amphipod, and urchin tests both scored above reference LPL.
- **DTR benthic disturbance score = moderate**
The total abundance is below that found in the reference condition. However, the other three indicators show no sign of disturbance. BRI is below the reference UPL. Number of taxa and diversity index are above reference LPL. The relatively low abundance is likely the result of physical disturbance in this area.
- **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of toxicity, benthic impacts from sediment contamination are not considered likely. This area is known to be periodically disturbed by ship movements and proximity to the floating dry dock, and it is likely that the single benthic community indicator that was outside reference conditions (total abundance) is due to physical disturbance. NA24 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA25

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 64 of 66 polygons
 - Copper ranking = 63 of 66 polygons
 - Mercury ranking = 62 of 66 polygons
 - HPAH ranking = 59 of 66 polygons
 - PCB ranking = 64 of 66 polygons
 - TBT ranking = 63 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.20 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA25 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA26

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 61 of 66 polygons
 - Copper ranking = 64 of 66 polygons
 - Mercury ranking = 60 of 66 polygons
 - HPAH ranking = 64 of 66 polygons
 - PCB ranking = 47 of 66 polygons
 - TBT ranking = 58 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.23 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA26 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA27

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 36 of 66 polygons
 - Copper ranking = 10 of 66 polygons
 - Mercury ranking = 10 of 66 polygons
 - HPAH ranking = 44 of 66 polygons
 - PCB ranking = 40 of 66 polygons
 - TBT ranking = 42 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.69 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA27 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA28

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 42 of 66 polygons
 - Copper ranking = 14 of 66 polygons
 - Mercury ranking = 31 of 66 polygons
 - HPAH ranking = 36 of 66 polygons
 - PCB ranking = 47 of 66 polygons
 - TBT ranking = 45 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.55 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA28 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA29

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 58 of 66 polygons
 - Copper ranking = 58 of 66 polygons
 - Mercury ranking = 53 of 66 polygons
 - HPAH ranking = 53 of 66 polygons
 - PCB ranking = 45 of 66 polygons
 - TBT ranking = 50 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.30 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA29 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA30

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 59 of 66 polygons
 - Copper ranking = 54 of 66 polygons
 - Mercury ranking = 45 of 66 polygons
 - HPAH ranking = 62 of 66 polygons
 - PCB ranking = 61 of 66 polygons
 - TBT ranking = 64 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.30 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI Data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA30 was properly excluded from the proposed remedial footprint in the DTR.

**TENTATIVE CLEANUP AND ABATEMENT ORDER
NO. R9-2011-0001**

STATION NA31

SUMMARY OF STATION CONDITIONS

- 1. Primary COCs are relatively low:**
 - Composite SWAC ranking = 66 of 66 polygons
 - Copper ranking = 65 of 66 polygons
 - Mercury ranking = 64 of 66 polygons
 - HPAH ranking = 66 of 66 polygons
 - PCB ranking = 65 of 66 polygons
 - TBT ranking = 65 of 66 polygons

- 2. Chemistry is below conservative biological benchmarks:**
 - No exceedances of 60% LAETs
 - SS-MEQ = 0.16 (less than 0.90 benchmark)

- 3. No direct evidence of impacts to benthic community:**
 - **Non-Triad Station**
 - **No SPI data**

CONCLUSION

Based on relatively low chemistry, and the lack of evidence of benthic impacts, NA31 was properly excluded from the proposed remedial footprint in the DTR.