# Building 873 Closure Plan


## Puget Sound Naval Shipyard & Intermediate Maintenance Facility
## Bremerton, Washington
## February 2011

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# Table of Contents

## List of Figures and Tables

# List of Acronyms

ARAR ..... *applicable or relevant and appropriate requirement*
BNC ..... *Bremerton Naval Complex*
CERCLA ..... *Comprehensive Environmental Response, Compensation, and Liability Act*
CO ..... *Consent Order*
DoN ..... *Department of the Navy*
EPA ..... *Environmental Protection Agency*
MTCA ..... *Model Toxics Control Act*
NAVBASE ..... *Naval Base*
OU ..... *Operable Unit*
PPE ..... *personal protective equipment*
PSNS & IMF ..... *Puget Sound Naval Shipyard & Intermediate Maintenance Facility*
PVC ..... *polyvinyl chloride*
RCRA ..... *Resource Conservation and Recovery Act*
ROD ..... *Record of Decision*
SAA ..... *Satellite Accumulation Area*
SARA ..... *Superfund Amendments and Reauthorization Act*
SOP ..... *Standard Operating Procedure*
US ..... *United States*
WAC ..... *Washington Administrative Code*
WDOE ..... *Washington Department of Ecology*

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# 1 Closure Plan Overview

This closure plan is prepared in response to the Consent Order (CO) (EPA Docket No. RCRA-10-2010-0251, September 2010) issued by the United States (US) Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act (RCRA) and the Washington State Dangerous Waste Regulations as specified in Washington Administrative Code (WAC), Chapter 173-303 and related to dangerous waste found in the secondary containment areas below the plating process tanks of Building 873, Metal Preparation Facility at the Bremerton Naval Complex (BNC) (Figure 1-1). Prior to signing the consent order, the Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS & IMF) conducted the cleanup operations described in this plan. As a result of the consent order, PSNS & IMF agreed to prepare this plan and to describe actions taken. Once the plan for procedural closure is approved, PSNS & IMF will obtain a certification from a professional engineer that the actions taken complied with this plan. Thus the closure plan contains the process for the removal of wastes identified within the secondary containment structure in Building 873, the decontamination of the secondary containment, the confirmation of decontamination, and the disposal of all wastes generated during the closure process.

This process incorporates the requirements of WAC 173-303-400(3) and by reference 40 CFR 265 Subpart G and follows Washington Department of Ecology (WDOE) Guidance for Clean Closure of Dangerous Waste Units and Facilities, Publication #94-111, Revised May 2005 to the extent practicable. Those requirements include:

- A description of how the area identified as containing dangerous waste will be closed
- A description of the performance standard for closing the area
- An estimate of the maximum amount of dangerous waste on site at any one time
- A description of the methods to be used during closure
- A description of methods for confirming removal of waste and decontamination of the area and equipment under concern
- A proposed method to schedule completing closure activities

This process is a procedural closure and does not include any processes for closing and ultimate disposition of Building 873, which remains in operation as a plating shop.

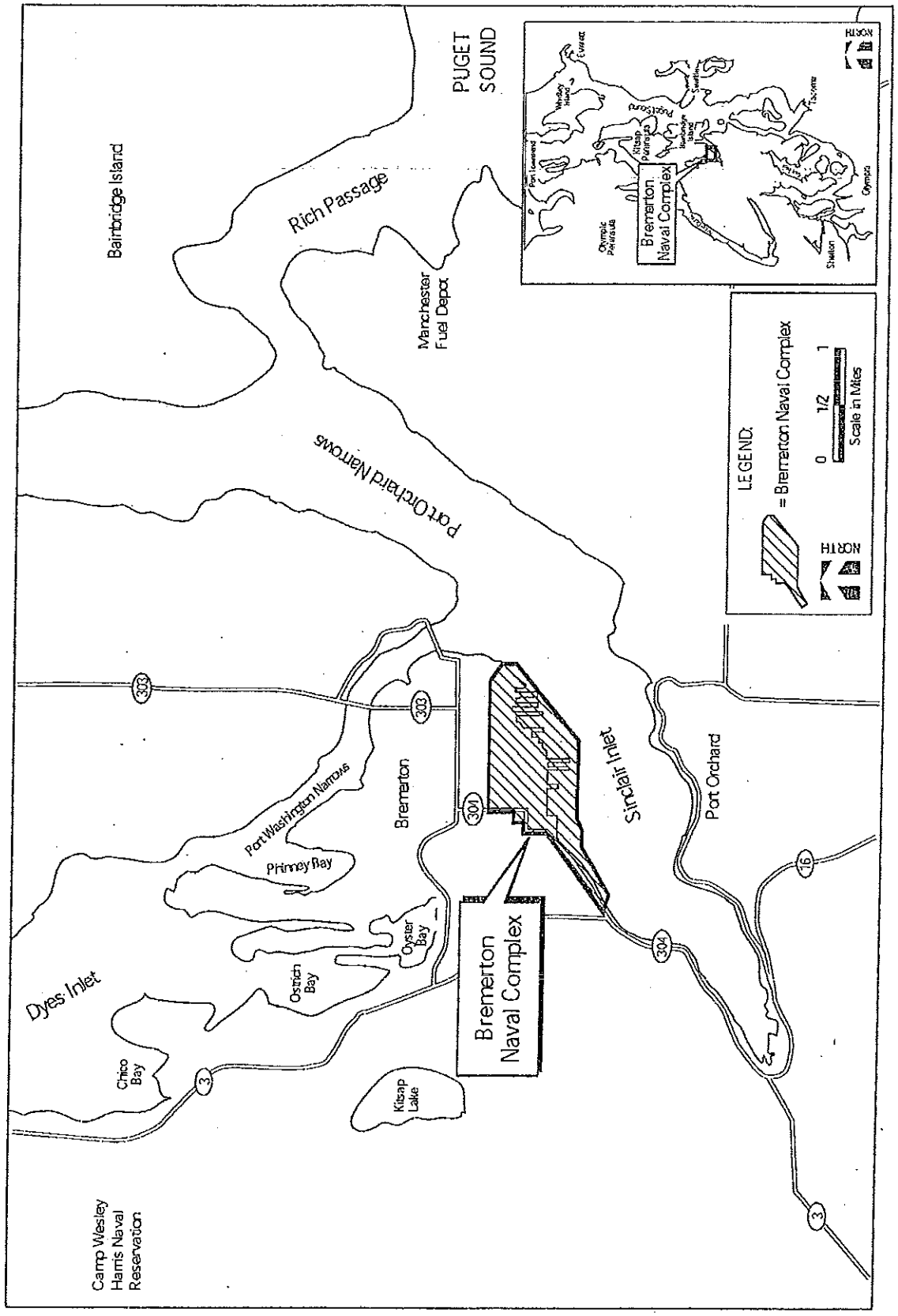


**Figure 1-1: Bremerton Naval Complex Vicinity Map**

# 2 Introduction

The BNC is located on a 327-acre parcel in Bremerton, Washington and consists of two commands of the US Department of the Navy (DoN): PSNS & IMF and Naval Base (NAVBASE) Kitsap Bremerton. Both areas are located on Sinclair Inlet. PSNS & IMF employs approximately 8,000 civilian workers. The primary mission of PSNS & IMF is to perform ship maintenance services, including planning, engineering, equipment production, overhaul, alteration, dry-docking, repair, and logistic support.

Building 873 is located in the Operable Unit (OU) B Terrestrial, north of Site 10 Central (Figure 2-1). The underlying soil and groundwater contained in OU B Terrestrial site is covered under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. There is no indication that contamination of soil or groundwater occurred from operations that resulted in the clean-up actions of the CO.

The DoN will address historical soil and groundwater contamination present under the building as part of the CERCLA remedy, as specified in the Record of Decision (ROD) agreed upon by the EPA, WDOE, and the DoN.

Building 873 was constructed in 1978 and is used by Shop 31 for electroplating. Metal plating activities include metal preparation, aluminum plating, and nickel/chrome plating. Waste types generated from plating operations include solutions of acid and alkaline, cyanide, and chromium waste. Demolition of Building 873 is not called for in this plan. After completion of procedural closure activities, Building 873 will continue to operate as an electroplating facility.

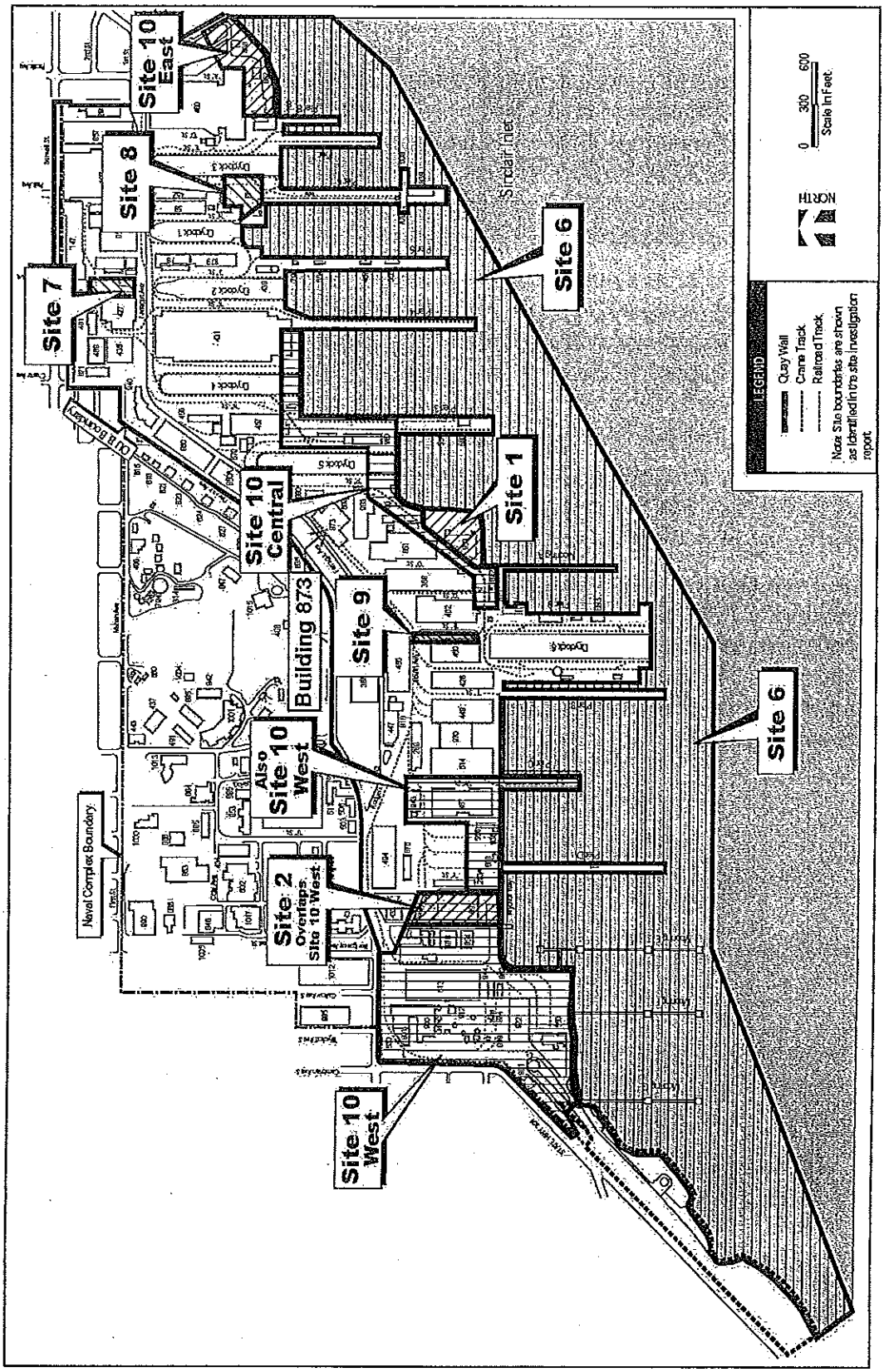


**Figure 2-1: Building 873 Location**

# 3 Facility Description

The metal plating preparation area (Shop 31) is located on the main floor and consists of chrome, cyanide, acid, and alkaline process tanks situated on a grated metal deck. Appendix A contains a list of the process tanks and their contents as well as a layout of Building 873's main floor. A diagram of the plating process flow is also contained in Appendix A. Wastewater generated from plating operations includes solutions of acid and alkaline, cyanide, and chromium wastes.

Waste generated from metal plating operations collects in the secondary containments below the process tanks in the sub-floor of the building (Figure 3-1). Generation of waste from plating activities is normally caused by drag-out, wash down operations, and/or spillage from the plating units, which falls through the grating and subsequently into the various secondary containments. There are three separate wastewater collection systems in the building: chromium, acid/alkaline, and cyanide. Each collection system consists of a segregated concrete secondary containment berm, sump, and waste retention tank. Wastewater collected in the sloped concrete secondary containment berms from periodic wash downs is directed to the sumps and consequently pumped to the appropriate retention tank. Tank 873-15 is a sump used as primary containment for dirty water from cleaning the lower level floor and secondary containment for tanks 873-3 and 873-4 (chromium retention tank and acid/alkaline retention tank, respectively).

The condensate collection systems are segregated in the same manner as the wastewater collection systems (chromium, acid/alkaline, and cyanide). The system includes air scrubber towers, recirculation tanks, containment sumps (873-6, 7, and 8), and retention tanks (873-3, 4, and 5). Steam collected from the main floor process tanks is directed to a scrubber system and recirculation tanks via ventilation ducting. Wastewater from the scrubber system is cleaned and directed to sumps and ultimately to the appropriate retention tank. The waste retention tanks have the following capacities:

- Chromium Retention Tank - 1,780 gallons
- Cyanide Retention Tank - 1,585 gallons
- Acid/Alkaline Retention Tank - 1,780 gallons

The contents of the retention tanks are pumped to the Industrial Wastewater Pretreatment Facility, Building 1109, which is adjacent to Building 873. Each retention tank is connected to Building 1109 by a dedicated run of double-walled polyvinyl chloride (PVC) pipe that transfers the wastewater for treatment. Wastewater generated from the plating shop accounts for more than 90% of the waste treated at Building 1109.

## 3.1 Maximum Waste Inventory

The maximum amount of waste present at Building 873 is estimated to be the total volume of the three waste retention tanks. The individual volumetric capacities of the retention tanks are listed above and provide a total waste capacity of 5,145 gallons. The sub-floor's secondary containments are designed to handle and contain 100% of the hazardous materials in the associated process tanks located on the main floor.

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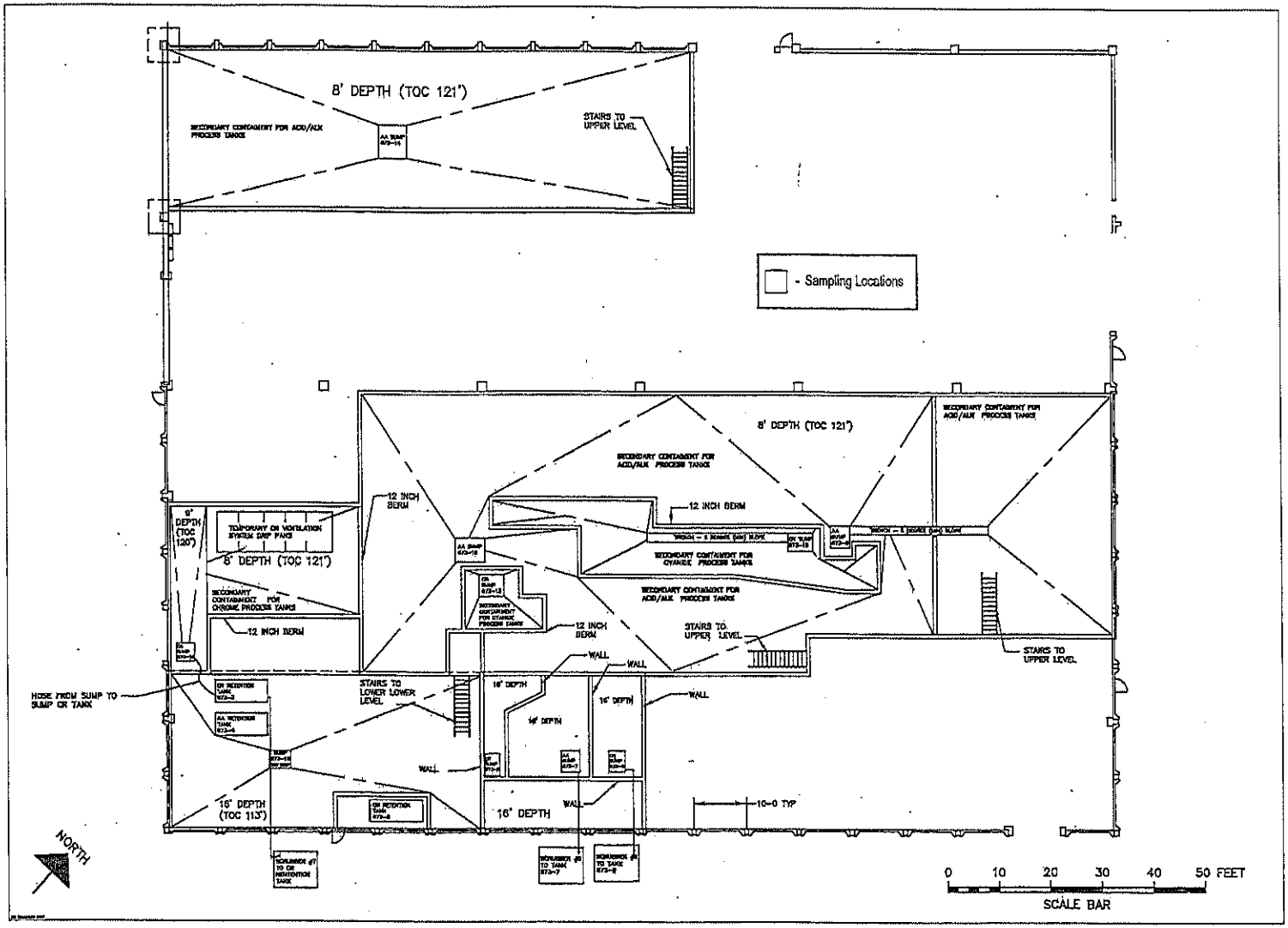


**Figure 3-1: Building 873 Sub-floor Overview**

# 4 Closure Plan Performance Standard

Closure performance standards are found in WAC 173-303-610(2). Dangerous waste facilities are to be closed in a manner that:

- Minimizes the need for further maintenance;
- Controls, minimizes, or eliminates to the extent necessary to protect human health and the environment from the post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated run-off, and dangerous waste decomposition products to the ground, surface water, groundwater, and air;
- Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.

Consideration of closure standards must take into account the continued use of the facility for its intended purpose. The secondary containments located in the sub-floor shall be expected to receive drippage from wash down during future operations, and the potential for large spills due to unusual circumstances is possible.

The selected standard for the secondary containment area is based on 40 CFR 268.45, Table 1, and "Alternative Treatment Standards for Hazardous Debris." The selected standard is found in Section A, Physical Extraction - High Pressure Steam and Water Sprays. This method is defined as: "Application of water or steam sprays of sufficient temperature, pressure, resident time, agitation, surfactants, and detergents to remove hazardous contaminants from debris surfaces or to remove contaminated debris surface layers." The Performance Standard is: "Treatment to a clean debris surface." "Clean debris surface" is defined as a surface that, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area.

Future operations to eliminate the collection of waste within the secondary containments shall be per daily visual inspections performed per Standard Operating Procedures (SOPs) regarding Metal Preparation Facility Work Process Cleanliness. Implementation of these requirements is further discussed in Section 8 of this plan.

# 5 Closure Activities

This section outlines all actions taken to achieve the closure performance standard as listed in Section 4.

## 5.1 Contaminated Debris and Equipment Disposal

During cleanup operations, shop personnel removed debris from the sub-floor secondary containment berms and sumps. All debris, discarded personal protective equipment (PPE), and cleaning supplies (sponges, rags, etc.) used during closure activities were consigned to appropriate waste containers and placed in a Satellite Accumulation Area (SAA).

## 5.2 Surface Cleaning and Decontamination

Shop personnel performed surface cleanup and decontamination during cleanup activities. This included scrubbing of all surfaces in the sub-floor to remove stains, drips, and any evidence of hazardous waste accumulation, followed by a thorough wash down. Simple Green cleaner and potable water were used in the scrubbing and wash down activities. Surfaces cleaned included overhead piping and valves, light fixtures, ventilation ducts, structural supports; sumps, and walls. Wash downs were conducted until the liquid contained in the sump was clear and colorless and until stains present on surfaces were of a permanent nature with no visible color released into wash water.

## 5.3 Surface Coating

Several layers of different colored chemical-resistant epoxy coatings were applied to the sub-floor during building construction to ensure no migration of waste and process liquid through the concrete sub-floor. Shop 71 (Painting Shop) repaired any cracks found in the protective epoxy coating after surface cleaning and decontamination. All repairs that were made visually indicated that damage to the epoxy coating was confined to the surface or upper coating layer only. After the repairs were completed and the proper cure time had passed, a new layer of surface coating was applied to the entire sub-floor. This was done to provide a contrasting color scheme to aid in the detection of liquid on the sub-floor. The surface coatings were applied per the manufacturer's instructions. A copy of the coating's MSDS is contained in Appendix B.

## 5.4 Health and Safety

Worker safety is the top priority during cleanup operations. During the cleanup operations, shop personnel donned proper PPE (hard hat, steel toed shoes, boot covers, safety glasses with side shields, and gloves) to reduce exposure to hazardous waste. Plating operations were suspended during clean-up and access to the sub-floor area was strictly controlled.

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# 6 Confirmation Testing and Inspection

It is appropriate to use a performance standard that includes two elements: (1) removal of identifiable quantities of material, and (2) testing of wastewater located in sumps originating from rinse water after wash downs.

Confirmation testing included visual inspection of the entire area below the process tanks to confirm all loose debris was removed from the overhead fixtures and secondary containment surface and to confirm the surface of the secondary containment area met the requirement of "clean debris surface" under 40 CFR 268.45, Table 1, "Alternative Treatment Standards for Hazardous Debris." A "clean debris surface" means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations. Soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area.

Confirmation sampling and analysis included grab sampling from each sump after completion of wash downs. Sample locations are indicated by yellow highlighted areas in Figure 3-1. **Clean closure shall be achieved when visual inspection and analytical results from samples indicate that clean closure performance standards have been met.** Samples were recorded and records are maintained by PSNS & IMF to document clean closure.

## 6.1 Visual Standards

Visual inspections were conducted to determine the cleanliness of the sub-floor area and were based on the following observations:

- Floors free of large objects, papers, rags, and other loose debris
- Scale and built up chemical deposits removed
- Floor and other stains minimized and removed to maximum extent possible without grinding or scraping the protective surface
- Floors free of large cracks, crevices, and pits

## 6.2 Location of Visual Inspection

Visual inspections were conducted in the secondary containment area under the chromium process tanks (Tanks A1-A4 and B1-B5). No cracks penetrating the epoxy layers were found.

Visual inspections for cracks were conducted in the secondary containment area under the cyanide process tanks (Tanks F3, F4, F5, F7, F8, G5, G6, G7, G7A, G8, and G9). No cracks penetrating the epoxy layers were found.

Visual inspections were conducted in the secondary containment area under the cyanide process tanks (Tanks E3, E4, and E5). No cracks penetrating the epoxy layers were found.

Visual inspections were conducted in the area under the chemical cleaning tanks (tanks V1, V2, V3, W1, W2, W3, X1, X2, X3, Y1, Y2, Y3, Z1, Z2, Z3, and the large vapor degreaser). No cracks penetrating the epoxy layers were found.

## 6.3 Facilities and Equipment Cleanup Levels

Facilities and equipment will remain in use after procedural closure since Building 873 is to remain in operation. Disposal of facilities and equipment are not addressed in this closure plan.

## 6.4 Analytical Performance Standards

Criteria for evaluation of closure are based on the materials used in the plating shop. Appendix A shows the list of operational tanks in the plating shop. Constituents of concern include Chromium, Silver, and Cyanide. The dangerous waste characteristic of corrosivity is also of concern. Since other metals may be found in the alloys treated in the plating shop, the following additional RCRA metals will be included in the test: Arsenic, Barium, Cadmium, Lead, and Selenium. Copper, Nickel, and Zinc have been excluded from the test, as they are not hazardous waste characteristics, and the wastewater pretreatment plant processes all such waste to levels meeting Washington State Waste Discharge Permit ST-7374.

Cleanup levels are based on WAC 173-303-090, Dangerous Waste Characteristics. Cyanide cleanup levels are based on 40 CFR 268.48, Universal Treatment Standards.

Analytical testing methods and their representative constituents are listed below in Table 6-1.

**Table 6-1: Hazardous Constituent Cleanup Levels**

| Hazardous Constituent or Property | Source of Cleanup Level | Cleanup Level | Analytical Method |
|---|---|---|---|
| Silver | WAC 173-303-090 | 5 mg/L | SW-846-6010, prep-method 1311 |
| Arsenic | WAC 173-303-090 | 5 mg/L | SW-846-6010, prep-method 1311 |
| Barium | WAC 173-303-090 | 100 mg/L | SW-846-6010, prep-method 1311 |
| Cadmium | WAC 173-303-090 | 1 mg/L | SW-846-6010, prep-method 1311 |
| Chromium | WAC 173-303-090 | 5 mg/L | SW-846-6010, prep-method 1311 |
| Lead | WAC 173-303-090 | 5 mg/L | SW-846-6010, prep-method 1311 |
| Selenium | WAC 173-303-090 | 1 mg/L | SW-846-6010, prep-method 1311 |
| Cyanide | 40 CFR 268.48 | 1.2 mg/L | EPA 335.4 |
| Corrosivity | WAC 173-303-090 | Minimum pH > 2<br>Maximum pH < 12.5 | SM 4500-H |

# 7 Sampling and Analysis Plan

Sampling and analysis was conducted to confirm achievement of the clean closure performance standards identified in Table 6.1. Wash downs of the areas included in the closure plan were completed prior to sampling. All sample analysis was performed by a laboratory accredited in accordance with WAC 173-50.

## 7.1 Sampling Locations

Samples were taken for the analytes listed in Table 6.1 and based on exposure of sampling location in relation to process tanks. Sumps 873-6, 7, and 8 are enclosed within their respective rooms apart from the main sub-floor area and cannot accumulate waste from process spills, drips, stains, or drag-out. Sampling locations are listed below in Table 7-1 and indicated by highlighted areas in Figure 3-1.

**Table 7-1: Building 873 Sampling Locations**

| Sample Location | Description | Parameter & Analytical Method |
|---|---|---|
| Sump 873-9 | Acid/Alkaline Sump | Note 2 |
| Sump 873-10 | Cyanide Sump | Note 1 |
| Sump 873-12 | Acid/Alkaline Sump | Note 2 |
| Sump 873-13 | Cyanide Sump | Note 1 |
| Sump 873-14 | Acid/Alkaline Sump | Note 2 |
| Sump 873-15 | Acid/Alkaline Sump | Note 2 |
| Sump 873-16 | Chromic Acid Sump | Note 2 |

*Note 1- Indicates testing for all hazardous constituents/properties with their respective analytical method listed in Table 6-1.*
*Note 2- Indicates testing for all hazardous constituents/properties with their respective analytical method listed in Table 6-1, except omit sampling for cyanide.*

## 7.2 Sampling Procedure

Standard EPA sampling methods and protocols were used. All samples were collected using the sampling procedures in Bremerton Shipyard Job Guide 90HM 2-30 - Sample And Analysis Procedures.

Sample results are located in Appendix D.

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# 8 Closure Schedule and Post-Closure Operations

Final closure schedule shall be set after agreement on the closure procedure has been reached.

Following procedural closure activities, Building 873 shall continue to perform plating operations. Future cleanliness and compliance of the building will be ensured by the implementation of Standard Operating Procedures (See Appendix D) to minimize to the maximum extent practicable the routine drippage and spillage through the main floor grating and continuation of cleanliness through daily wash downs, inspections, and management oversight. Spills and drips shall be immediately cleaned upon discovery. As mentioned earlier, there is no evidence that plating operations resulted in a release outside of the building. The DoN shall address any underlying soil and groundwater contamination prior to building demolition or as part of the CERCLA remedy, whichever occurs first, which includes the Washington State Model Toxics Control Act (MTCA) as an applicable or relevant and appropriate requirement (ARAR).

After procedural closure is achieved, no special precautions shall be necessary for the operation of the building as residual contamination should not be present. Instead, post-closure operations shall be in keeping with normal plating practices and compliance with the Standard Operating Procedures described in Appendix C.

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# APPENDIX A: PLATING PROCESS INFORMATION

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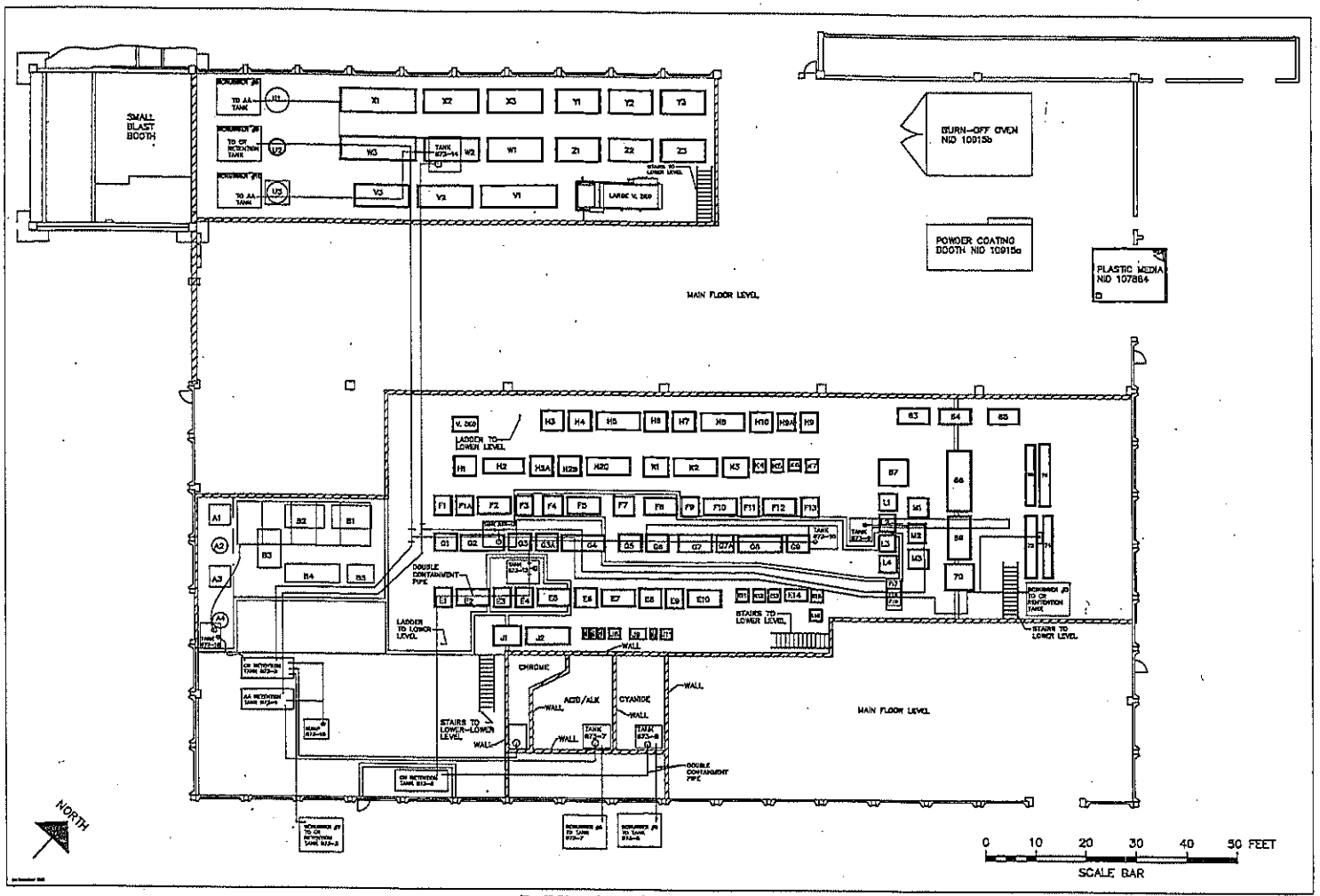



**Building 873 Main Floor Overview**

# Building 873 Plating Process Tank Descriptions

| Tank # | Process | Component | Concentration (oz/gal) | Volume (gal) |
|---|---|---|---|---|
| E-1 | Caustic Cleaner | Sodium Hydroxide | 14 | 145 |
| E-2 | Acid/Alk Rinse | Process Water | - | 337 |
| E-3 | Cyanide Copper Strike | Copper Cyanide | 3.5 | 168 |
| | | Sodium Cyanide | 1.4 | |
| E-4 | Cyanide Copper | Copper Cyanide | 11 | 168 |
| | | Sodium Cyanide | 14 | |
| | | Sodium Hydroxide | 4 | |
| E-5 | Cyanide Rinse | Deionized Water | - | 337 |
| E-6 | Acid Copper | Copper Sulfate | 30 | 168 |
| | | Sulfuric Acid | 4.8 | |
| E-7 | Acid/Alk Rinse | Deionized Water | - | 337 |
| E-8 | Tin | Sodium Stannate | 7.5 | 224 |
| | | Sodium Hydroxide | 1.5 | |
| E-9 | Acid/Alk Rinse | Deionized Water | - | 337 |
| E-10 | Hot Acid/Alk Rinse | Deionized Water | - | 224 |
| E-11 | Presto Black | Presto Black PC-10 | 12.8 | 75 |
| E-12 | Acid/Alk Rinse | Deionized Water | - | 75 |
| E-13 | Zinc Phosphate | Oakite Cryscoat XH | 3.5 % by volume | 75 |
| E-14 | Acid/Alk Rinse | Deionized Water | - | 150 |
| E-15 | Chromic Phosphoric Dip | Phosphoric Acid | 2 (ml/gal) | 75 |
| | | Chromic Acid | 1.13 (gm/gal) | |
| E-16 | Acid/Alk Rinse | Deionized Water | - | 75 |
| F-1 | Hydrochloric Acid Pickle | Hydrochloric Acid | 85.3 | 168 |
| | | Diethylthiorea | 0.57 | |
| | | Rhodine | 0.14 | |
| | | Detergent | 0.12 | |
| F-1A | Nickel Chloride Strike | Nickel Chloride | 32 | 168 |
| | | Hydrochloric Acid | 7.7 | |
| F-2 | Acid/Alk Rinse | Deionized Water | - | 337 |
| F-3 | Zinc | Zinc Cyanide | 8.1 | 168 |
| | | Sodium Cyanide | 5.6 | |
| | | Sodium Hydroxide | 10.5 | |
| | | Sodium Polysulfide | 0.3 | |
| | | Roglow 900 | 0.3 | |

| Tank # | Process | Component | Concentration (oz/gal) | Volume (gal) |
|---|---|---|---|---|
| F-4 | Zinc | Zinc Cyanide | 8.1 | 196 |
| | | Sodium Cyanide | 5.6 | |
| | | Sodium Hydroxide | 10.5 | |
| | | Sodium Polysulfide | 0.3 | |
| | | Roglow 900 | 0.3 | |
| F-5 | Cyanide Rinse | Deionized Water | - | 337 |
| F-5A | Cyanide Dip | Sodium Cyanide | 5 | 12 |
| F-7 | Cadmium | Cadmium Oxide | 4 | 196 |
| | | Sodium Cyanide | 15 | |
| | | Sodium Hydroxide | 4 | |
| | | Super XL | 0.9 | |
| F-8 | Cyanide Rinse | Deionized Water | - | 337 |
| F-9 | 1/2% Nitric Dip | Nitric Acid | 9 | 168 |
| F-10 | Acid/Alk Rinse | Deionized Water | - | 337 |
| F-11 | Cadmium/Zinc Conversion | Iridite 80 | 206 | 168 |
| F-12 | Chrome Rinse | Deionized Water | - | 337 |
| F-13 | Hot Chrome Rinse | Deionized Water | - | 168 |
| G-1 | Electroclean | Oakite Multi-Temp Cleaner | 6 | 212 |
| G-2 | Acid/Alk Rinse | Process Water | - | 424 |
| G-3 | Hydrochloric Acid Pickle | Hydrochloric Acid | 85.3 | 212 |
| | | Diethylthiorea | 0.57 | |
| | | Rhodine | 0.14 | |
| | | Detergent | 0.12 | |
| G-3A | Nickel Chloride Strike | Nickel Chloride | 32 | 212 |
| | | Hydrochloric Acid | 7.7 | |
| G-4 | Acid/Alk Rinse | Deionized Water | - | 424 |
| G-5 | Cyanide Dip | Sodium Cyanide | 5 | 212 |
| G-6 | Silver Strike | Silver Cyanide | 0.45 | 212 |
| | | Sodium Cyanide | 10.5 | |
| G-7 | Silver | Silver Cyanide | 4 | 212 |
| | | Sodium Cyanide | 4.5 | |
| G-7A | Silver Strip | Sodium Cyanide | 5 | 159 |
| G-8 | Cyanide Rinse | Deionized Water | - | 424 |
| G-9 | Hot Cyanide Rinse | Deionized Water | - | 212 |
| H-1 | Caustic Cleaner | Sodium Hydroxide | 14 | 404 |
| H-2 | Acid/Alk Rinse | Process Water | - | 808 |

| Tank # | Process | Component | Concentration (oz/gal) | Volume (gal) |
|---|---|---|---|---|
| H-2A | Hydrochloric Acid Dip | Hydrochloric Acid | 8.2 | 404 |
| H-2B | Nickel Strike | Nickel Chloride | 32 | 404 |
| H-2C | Acid/Alk Rinse | Deionized Water | - | 808 |
| H-3 | Sulfuric Etch-Forward | Sulfuric Acid | 20 | 404 |
| H-4 | Sulfuric Etch-Reverse | Sulfuric Acid | 20 | 404 |
| H-5 | Acid/Alk Rinse | Deionized Water | - | 808 |
| H-6 | Nickel Sulfamate pH 3.75 | Nickel Sulfamate | 64 | 404 |
| | | Boric Acid | 4.7 | |
| | | Nickel Chloride | 1.5 | |
| | | Stress Control | 1 | |
| | | Anti Pit | 0.7 | |
| H-7 | Nickel Sulfamate pH 3.75 | Nickel Sulfamate | 64 | 404 |
| | | Boric Acid | 4.7 | |
| | | Nickel Chloride | 1.5 | |
| | | Stress Control | 1 | |
| | | Anti Pit | 0.7 | |
| H-8 | Acid/Alk Rinse | Deionized Water | - | 808 |
| H-9 | Nickel Strip, Acid | Sulfuric Acid | 43.5 | 196 |
| | | Copper Sulfate | 4 | |
| H-9A | Acid/Alk Rinse | Deionized Water | - | 168 |
| H-10 | Hot Acid/Alk Rinse | Deionized Water | - | 404 |
| J-1 | Nickel Strip, Alk | Nickel Stripper | 40 | 224 |
| J-2 | Acid/Alk Rinse | Deionized Water | - | 100 |
| J-5 | Sulfuric Etch-Forward | Sulfuric Acid | 20 | 12 |
| J-6 | Sulfuric Etch-Reverse | Sulfuric Acid | 20 | 12 |
| J-7 | Acid/Alk Rinse | Deionized Water | - | 22 |
| J-8 | Nickel Strike | Nickel Chloride | 32 | 45 |
| | | Hydrochloric Acid | 7.7 | |
| J-9A | Watts Nickel | Nickel Sulfate | 42 | 6 |
| | | Boric Acid | 4.7 | |
| | | Nickel Chloride | 4.7 | |
| | | Triton X-10 | 10 (ml/gal) | |

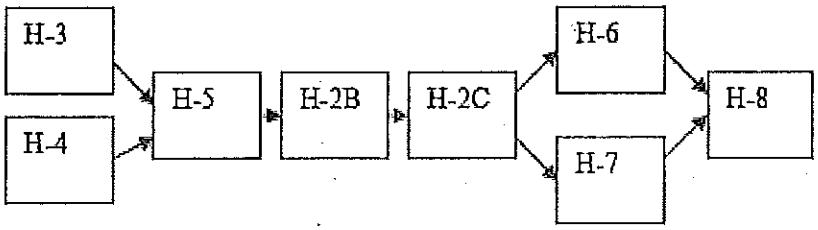
| Tank # | Process | Component | Concentration (oz/gal) | Volume (gal) |
|---|---|---|---|---|
| J-9B | Watts Nickel | Nickel Sulfate | 42 | 6 |
| | | Boric Acid | 4.7 | |
| | | Nickel Chloride | 4.7 | |
| | | Triton X-10 | 10 (ml/gal) | |
| J-10 | Acid/Alk Rinse | Deionized Water | - | 22 |
| J-11 | Nickel Sulfamate pH 3.75 | Nickel Sulfamate | 64 | 252 |
| | | Boric Acid | 4.7 | |
| | | Nickel Chloride | 1.5 | |
| | | Stress Control | 1 | |
| | | Anti Pit | 0.7 | |
| K-1 | Iron Phosphate (not used) | Aerocote #1 | 10% by Volume | 449 |
| K-2 | Acid/Alk Rinse | Deionized Water | - | 252 |
| K-3 | Chromic Phosphoric Dip (not used) | Phosphoric Acid | 2 (ml/gal) | 75 |
| | | Chromic Acid | 1.13 | |
| K-4 | Grain Refiner (not used) | Aerocote Conditioning Rinse-M | 4% by Volume | 75 |
| K-5 | Manganese Phosphate (not used) | Surcoat 323M | 10% by Volume | 75 |
| K-6 | Acid/Alk Rinse (not used) | Deionized Water | - | 75 |
| K-7 | Chromic Phosphoric Dip (not used) | Phosphoric Acid | 2 (ml/gal) | 75 |
| | | Chromic Acid | 1.13 (g/gal) | |
| L-1 | Copper Strip | Sodium Cyanide | 12 | 159 |
| | | Sodium Hydroxide | 2 | |
| L-2 | Cyanide Rinse | Deionized Water | - | 159 |
| L-3 | Acid/Alk Rinse | Deionized Water | - | 159 |
| L-4 | Zinc Strip | Hydrochloric Acid | 85.3 | 159 |
| M-1 | Hot Acid/Alk Rinse | Deionized Water | - | 196 |
| M-2 | Acid/Alk Rinse | Deionized Water | - | 196 |
| M-3 | Sulfamic Cleaner | Sulfamic Cleaner | 8 | 196 |
| DEG-1 | Vapor Degreaser | N-Propyl Bromide | - | 220 |
| DEG-2 | Vapor Degreaser | Trichloroethylene | - | 110 |
| U-1 | Caustic Clean | Sodium Hydroxide | 8 | 1362 |
| U-2 | Cold Water Rinse | Process Water | - | 748.7 |

| Tank # | Process | Component | Concentration (oz/gal) | Volume (gal) |
|---|---|---|---|---|
| U-3 | Hydrochloric Acid Pickle | Hydrochloric Acid | 85.3 | 1362 |
| | | Diethylthiorea | 0.53 | |
| | | Rhodine | 50.14 | |
| | | Detergent | 0.12 | |
| V-1 | Caustic Clean-Lye Tank | Sodium Hydroxide | 8 | 2304 |
| V-2 | Cold Water Rinse | Process Water | - | 1645.7 |
| V-3 | Cold Water Rinse | Water spray area/blow down | - | NA |
| W-1 | Neutralizer | Sodium Metasilicate | 6 | 1645.7 |
| W-2 | Cold Water Rinse | Potable Water | - | 1645.7 |
| W-3 | Ferrous Pickle | Hydrochloric Acid | 85.3 | 2074.6 |
| | | Diethylthiorea | 0.53 | |
| | | Rhodine | 50.14 | |
| | | Detergent | 0.12 | |
| X-1 | Hot Water Rinse | Process Water | - | 1645.7 |
| X-2 | Cold Water Rinse | Process Water | - | 1645.7 |
| X-3 | Nonferrous Pickle | Hydrochloric Acid | 85.3 | 2094.6 |
| | | Diethylthiorea | 0.53 | |
| | | Rhodine | 50.14 | |
| | | Detergent | 0.12 | |
| Y-1 | Bright Dip | Sulfuric Acid | 57 | 1316.6 |
| | | Nitric Acid | 28.5 | |
| Y-2 | Bright Dip | Process Water | - | 1316.6 |
| Y-3 | Cold Water Rinse | Process Water | - | 1316.6 |
| Z-1 | Chrome Dip | Chromic Acid | 16 | 1316.6 |
| | | Sulfuric Acid | 2 | |
| Z-2 | Cold Water Rinse | Process Water | - | 1316.6 |
| Z-3 | Cold Water Rinse | Process Water | - | 1316.6 |
| A-1 | Sulfuric Etch | Sulfuric Acid | 25% by Volume | 1915 |
| A-2 | Cold Water Rinse | Deionized Water | - | 645 |
| A-3 | Chrome Plate | Sulfuric Acid | 33 | 1915 |
| | | Chromic Acid | 33 | |
| A-4 | Cold Water Rinse | Process Water | - | 845 |
| B-1 | Chrome Plate | Sulfuric Acid | 33 | 1338.6 |
| | | Chromic Acid | 33 | |
| B-2 | Chrome Plate | Sulfuric Acid | 33 | 1338.6 |
| | | Chromic Acid | 33 | |

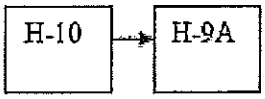
| Tank # | Process | Component | Concentration (oz/gal) | Volume (gal) |
|---|---|---|---|---|
| B-3 | Recovery Rinse | Process Water | - | 1080 |
| B-4 | Counter Current Rinse | Process Water | - | 1512 |
| B-5 | Hot Water Rinse | Process Water | - | 720 |
| 63 | Caustic Clean | Sodium Hydroxide | 14 | 280 |
| 64 | Acid/Alk Rinse | Process Water | - | 280 |
| 65 | Aluminum Etch | Isoprep | 35 | 280 |
| 66 | Sulfuric Anodize | Sulfuric Acid | 22-28 | 696 |
| | | Aluminum | 2.7 | |
| 67 | Not Used | | | |
| 69 | Chrome Rinse Water | Process Water | - | 598 |
| 70 | Cold Water Rinse | Process Water | - | 598 |
| 71 | Dye Tank | Dye | 0.25% - 1% by Volume | 299 |
| 73 | Deoxidizer | DE-Oxidizer | 24% by Volume | 87 |
| 77 | Copper Iridite | Copper Iridite | 0.8 - 1.3 | 420 |
| 78 | Aluminum Iridite | Aluminum Iridite | 2 | 419 |
| 80 | Not Used | | | 464 |

# Building 873 Plating Process Flow Diagram

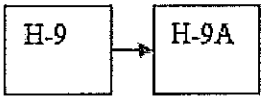
Sulfamate Nickel Line



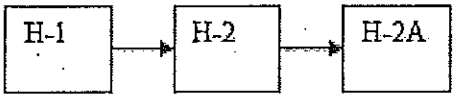

Teflon ball cleaning



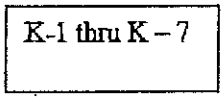

Nickel Strike Removal



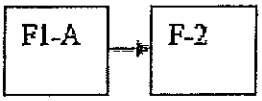

Caustic Clean



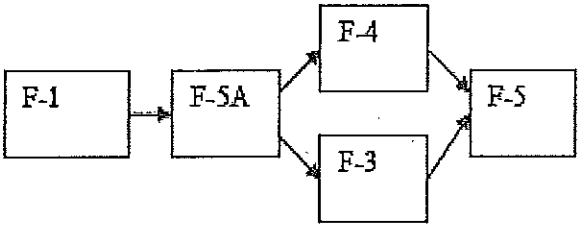

Chrome phosphoric dip (not used)



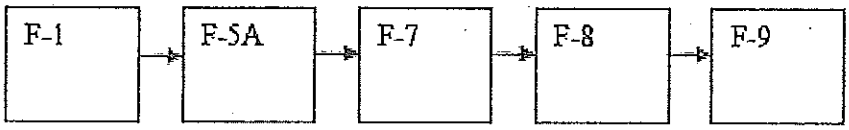

Zinc Strip



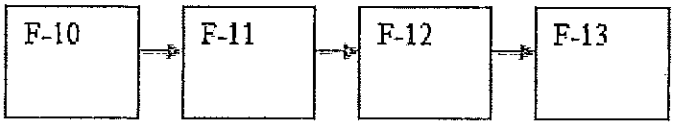

Zinc Line



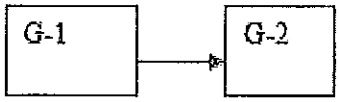
Cadmium Line



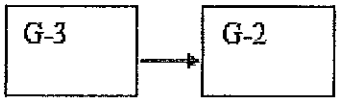

Dichromate Line Zinc and Cadmium



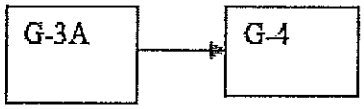

Cleaning process




Special cleaning process (hydrochloric acid pickle)

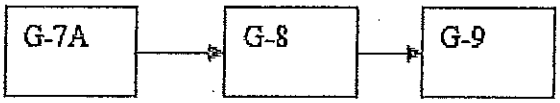



Nickel Chloride Strike

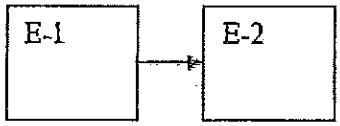



Silver Line

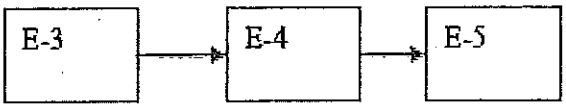

Silver Strip



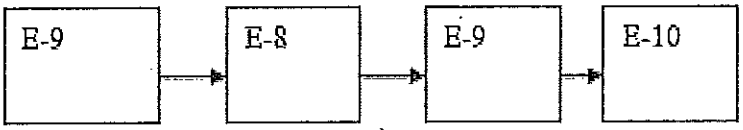

Special Clean Process



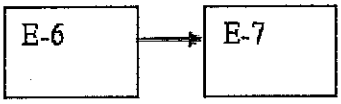
Copper Cyanide



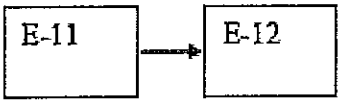

Tin



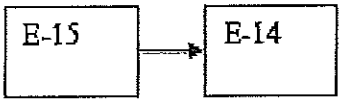

Acid Copper



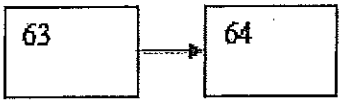

Presto Black



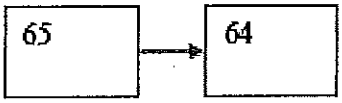

Stainless Steel Passivate



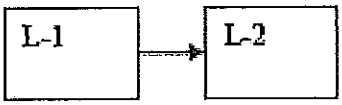

Caustic Cleaner



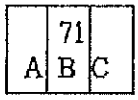

Aluminum Etch



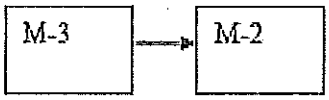

Cyanide strip



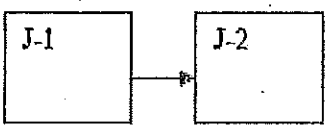
Dye Tank



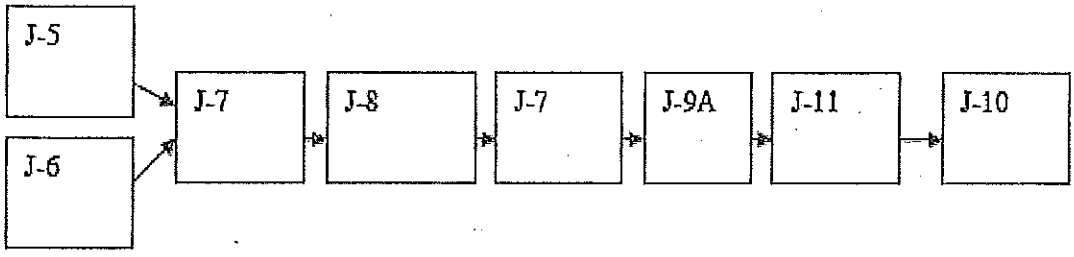

Sulfamic Cleaning



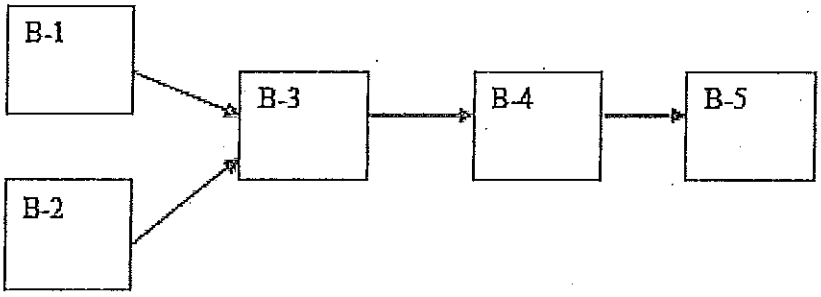

Nickel Strip



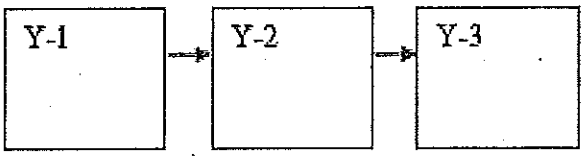

Nickel Diamond Line



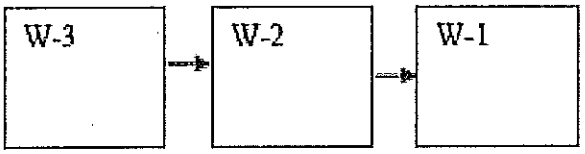

Chrome plate



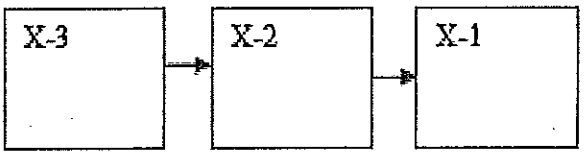
Bright Dip



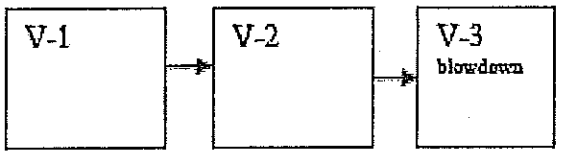

Ferrous Pickle



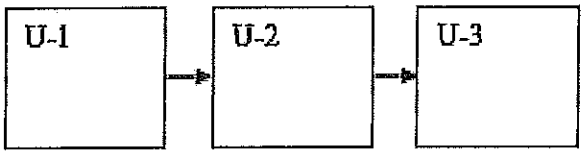

Non ferrous pickle




Caustic clean




Caustic Strip



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# APPENDIX B: SURFACE COATING MSDS

SHERWIN WILLIAMS

Protective & Marine Coatings

# MACROPOXY® 646-100 FAST CURE EPOXY

PART A B58-620
PART B B58V620
SERIES HARDENER

Revised 12/10

## PRODUCT INFORMATION

4.52

### PRODUCT DESCRIPTION

MACROPOXY 646-100 FAST CURE EPOXY is a high solids, less than 100 g/L VOC, high build, fast drying, polyamide epoxy designed to protect steel and concrete in industrial exposures. Ideal for maintenance painting and fabrication shop applications. The high solids content ensures adequate protection of sharp edges, corners, and welds. This product can be applied directly to marginally prepared steel surfaces.

- Low VOC,<100 g/L
- Low odor
- Outstanding application properties
- Chemical resistant
- Abrasion resistant

### PRODUCT CHARACTERISTICS

| | |
|---|---|
| Finish: | Semi-Gloss |
| Color: | Mill White and a wide range of colors available through tinting |
| Volume Solids: Mill White | 73% ± 2%, mixed |
| Weight Solids: Mill White | 83% ± 2%, mixed |
| VOC (EPA Method 24): mixed | Unreduced: <100 g/L; .83 lb/gal<br>Reduced 10%: <100 g/L; .83 lb/gal |
| Mix Ratio: | 1:1 by volume |

**Recommended Spreading Rate per coat:**

| | Minimum | Maximum |
|---|---|---|
| Wet mils (microns) | 7.0 (175) | 13.5 (338) |
| Dry mils (microns) | 5.0* (125) | 10.0* (250)* |
| ~Coverage sq ft/gal (m²/L) | 116 (2.8) | 232 (5.7) |
| Theoretical coverage sq ft/gal (m²/L) @ 1 mil / 25 microns dft | 1168 (28.6) | |

*NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.*

*See Recommended Systems on reverse side. See Performance Tips section also.

**Drying Schedule @ 7.0 mils wet (175 microns):**

| | @ 40°F/4.5°C | @ 77°F/25°C 50% RH | @ 100°F/38°C |
|---|---|---|---|
| To touch: | 4-5 hours | 2 hours | 1.5 hours |
| To handle: | 48 hours | 8 hours | 4.5 hours |
| To recoat: | | | |
| minimum: | 48 hours | 8 hours | 4.5 hours |
| maximum: | 1 year | 1 year | 1 year |
| Cure for | | | |
| service: | 10 days | 7 days | 4 days |
| immersion: | 14 days | 7 days | 4 days |
| Pot Life: | 10 hours | 4 hours | 2 hours |
| Sweat-In-time: | 30 minutes | 30 minutes | 15 minutes |

*If maximum recoat time is exceeded, abrade surface before recoating.*
*Drying time is temperature, humidity, and film thickness dependent.*

| | |
|---|---|
| Shelf Life: | 36 months, unopened<br>Store indoors at 40°F (4.5°C) to 100°F (38°C). |
| Flash Point: | 61°F (16°C), PMCC, mixed |
| Reducer/Clean Up: | Reducer R7K111 or Oxsol 100 |

### RECOMMENDED USES

- Marine applications
- Fabrication shops
- Pulp and paper mills
- Power plants
- Offshore platforms
- Refineries
- Chemical plants
- Tank exteriors
- Water treatment plants
- Mill White is acceptable for immersion use for salt water and fresh water
- Not acceptable for potable water
- Suitable for use in USDA inspected facilities
- Conforms to AWWA D102-03 OCS #5

### PERFORMANCE CHARACTERISTICS

Substrate*: Steel
Surface Preparation*: SSPC-SP10/NACE 2
System Tested*:
1 ct. Macropoxy 646-100 Fast Cure @ 6.0 mils (150 microns) dft
*unless otherwise noted below

| Test Name | Test Method | Results |
|---|---|---|
| Abrasion Resistance | ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load | 84 mg loss |
| Accelerated Weathering - QUV[1] | ASTM D4587, QUV-A, 12,000 hours | Passes |
| Adhesion | ASTM D4541 | 1,037 psi |
| Corrosion Weathering[1] | ASTM D5894, 36 cycles, 12,000 hours | Rating 10 per ASTM D714 for blistering; Rating 9 per ASTM D610 for rusting |
| Direct Impact Resistance | ASTM D2794 | 30 in. lb. |
| Dry Heat Resistance | ASTM D2485 | 250°F (121°C) |
| Exterior Durability | 1 year at 45° South | Excellent, chalks |
| Flexibility | ASTM D522, 180° bend, 3/4" mandrel | Passes |
| Immersion | 1 year fresh and salt water | Passes, no rusting, blistering, or loss of adhesion |
| Pencil Hardness | ASTM D3363 | 3H |
| Salt Fog Resistance[1] | ASTM B117, 6,500 hours | Rating 10 per ASTM D610 for rusting; Rating 9 per ASTM D1654 for corrosion |
| Water Vapor Permeance | ASTM D1653, Method B | 1.16 grains/day |

Epoxy coatings may darken or discolor following application and curing.

*Footnotes:*
[1] *Zinc Clad II Plus Primer*


continued on back

Protective & Marine Coatings

# MACROPOXY® 646-100 FAST CURE EPOXY

PART A B58-620
PART B B58V620
SERIES HARDENER

## PRODUCT INFORMATION

4.52

### RECOMMENDED SYSTEMS

| | | Dry Film Thickness / ct. Mils | (Microns) |
|---|---|---|---|
| **Immersion and atmospheric:** | | | |
| **Steel:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Concrete/Masonry, smooth:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Concrete Block:** | | | |
| 1 ct. | Kem Cati-Coat HS Epoxy Filler/Sealer as needed to fill voids and provide a continuous substrate. | 10.0-20.0 | (250-500) |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Atmospheric:** | | | |
| *Steel: | | | |
| (Shop applied system, new construction, AWWA D102-03, can also be used at 3 mils (75 microns) dft when used as an intermediate coat as part of a multi-coat system) | | | |
| 1 ct. | Macropoxy 646-100 Fast Cure Epoxy | 3.0-6.0 | (75-150) |
| 1-2 cts. | of recommended topcoat | | |
| **Steel:** | | | |
| 1 ct. | Recoatable Epoxy Primer | 4.0-6.0 | (100-150) |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Steel:** | | | |
| 1 ct. | Macropoxy 646-100 | 4.0-6.0 | |
| 1-2 cts. | Acrolon 218 Polyurethane | 3.0-6.0 | (75-150) |
| or | Hi-Solids Polyurethane | 3.0-5.0 | (75-125) |
| or | SherThane 2K Urethane | 2.0-4.0 | (50-100) |
| **Steel:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| 1-2 cts. | Tile-Clad HS Epoxy | 2.5-4.0 | (63-100) |
| **Steel:** | | | |
| 1 ct. | Zinc Clad II Plus | 3.0-6.0 | (75-150) |
| 1 ct. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| 1-2 cts. | Acrolon 218 Polyurethane | 3.0-6.0 | (75-150) |
| **Steel:** | | | |
| 1 ct. | Zinc Clad III HS | 3.0-5.0 | (75-125) |
| or | Zinc Clad IV | 3.0-5.0 | (75-125) |
| 1 ct. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| 1-2 cts. | Hi-Solids Polyurethane-100 | 3.0-6.0 | (75-150) |
| **Aluminum:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |
| **Galvanizing:** | | | |
| 2 cts. | Macropoxy 646-100 | 5.0-10.0 | (125-250) |

The systems listed above are representative of the product's use, other systems may be appropriate.

### DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

### SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

| | |
|---|---|
| Iron & Steel | |
| Atmospheric: | SSPC-SP2/3 |
| Immersion: | SSPC-SP10/NACE 2, 2-3 mil (50-75 micron) profile |
| Aluminum: | SSPC-SP1 |
| Galvanizing: | SSPC-SP1 |
| Concrete & Masonry | |
| Atmospheric: | SSPC-SP13/NACE 6, or ICRI No. 310.2, CSP 1-3 |
| Immersion: | SSPC-SP13/NACE 6-4.3.1 or 4.3.2, or ICRI No. 310.2, CSP 1-3 |

Surface Preparation Standards

| | Condition of Surface | ISO 8501-1 BS7079:A1 | Swedish Std. SIS055900 | SSPC | NACE |
|---|---|---|---|---|---|
| White Metal | | Sa 3 | Sa 3 | SP 5 | 1 |
| Near White Metal | | Sa 2.5 | Sa 2.5 | SP 10 | 2 |
| Commercial Blast | | Sa 2 | Sa 2 | SP 6 | 3 |
| Brush-Off Blast | | Sa 1 | Sa 1 | SP 7 | 4 |
| Hand Tool Cleaning | Rusted | C St 2 | C St 2 | SP 2 | - |
| | Pitted & Rusted | D St 2 | D St 2 | SP 2 | - |
| Power Tool Cleaning | Rusted | C St 3 | C St 3 | SP 3 | - |
| | Pitted & Rusted | D St 3 | D St 3 | SP 3 | - |

### TINTING

Tint Part A with Maxitoners at 150% strength. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

Tinting is not recommended for immersion service.

### APPLICATION CONDITIONS

| | |
|---|---|
| Temperature: | 40°F (4.5°C) minimum, 140°F (60°C) maximum (air, surface, and material) |
| | At least 5°F (2.8°C) above dew point |
| Relative humidity: | 85% maximum |

Refer to product Application Bulletin for detailed application information.

### ORDERING INFORMATION

| | |
|---|---|
| Packaging: | |
| Part A: | 1 gallon (3.78L) and 5 gallon (18.9L) containers |
| Part B: | 1 gallon (3.78L) and 5 gallon (18.9L) containers |
| Weight: | 13.24 ± 0.2 lb/gal ; 1.6 Kg/L. mixed, may vary by color |

### SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

### WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

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Protective & Marine Coatings

# MACROPOXY® 646-100 FAST CURE EPOXY

PART A B58-620
PART B B58V620

SERIES HARDENER

Revised 12/10

## APPLICATION BULLETIN

4.52

### SURFACE PREPARATIONS

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

**Iron & Steel, Atmospheric Service:**
Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. For better performance, use Commercial Blast Cleaning per SSPC-SP6/NACE 3, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils / 50 microns). Prime any bare steel within 8 hours or before flash rusting occurs.

**Iron & Steel, Immersion Service:**
Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2-3 mils / 50-75 microns). Remove all weld spatter and round all sharp edges by grinding. Prime any bare steel the same day as it is cleaned.

**Aluminum**
Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1.

**Galvanized Steel**
Allow to weather a minimum of six months prior to coating. Solvent Clean per SSPC-SP1 (recommended solvent is VM&P Naphtha). When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.

**Concrete and Masonry**
For surface preparation, refer to SSPC-SP13/NACE 6, or ICRI No. 310.2, CSP 1-3. Surfaces should be thoroughly clean and dry. Concrete and mortar must be cured at least 28 days @ 75°F (24°C). Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Fill bug holes, air pockets and other voids with Steel-Seam FT910.

**Concrete, Immersion Service:**
For surface preparation, refer to SSPC-SP13/NACE 6, Section 4.3.1 or 1.3.2 or ICRI No. 310.2, CSP 1-3.

**Follow the standard methods listed below when applicable:**
ASTM D4258 Standard Practice for Cleaning Concrete.
ASTM D4259 Standard Practice for Abrading Concrete.
ASTM D4260 Standard Practice for Etching Concrete.
ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete.
SSPC-SP 13/Nace 6 Surface Preparation of Concrete.
ICRI No. 310.2 Concrete Surface Preparation.

**Previously Painted Surfaces**
If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, or if this product attacks the previous finish, removal of the previous coating may be necessary. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above.

**Surface Preparation Standards**

| | Condition of Surface | ISO 8501-1 BS7079:A1 | Swedish Std. SIS055900 | SSPC | NACE |
|---|---|---|---|---|---|
| White Metal | | Sa 3 | Sa 3 | SP 5 | 1 |
| Near White Metal | | Sa 2.5 | Sa 2.5 | SP 10 | 2 |
| Commercial Blast | | Sa 2 | Sa 2 | SP 6 | 3 |
| Brush-Off Blast | | Sa 1 | Sa 1 | SP 7 | 4 |
| Hand Tool Cleaning | Rusted | C St 2 | C St 2 | SP 2 | - |
| | Pitted & Rusted | D St 2 | D St 2 | SP 2 | - |
| Power Tool Cleaning | Rusted | C St 3 | C St 3 | SP 3 | - |
| | Pitted & Rusted | D St 3 | D St 3 | SP 3 | - |

### APPLICATION CONDITIONS

| | |
|---|---|
| Temperature: | 40°F (4.5°C) minimum, 140°F (60°C) maximum<br>(air, surface, and material)<br>At least 5°F (2.8°C) above dew point |
| Relative humidity: | 85% maximum |

### APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reducer/Clean Up .....Reducer R7K111 or Oxsol 100

Airless Spray
- Pump.....30:1
- Pressure.....2800 - 3000 psi
- Hose.....1/4" ID
- Tip.....017" - .023"
- Filter.....60 mesh
- Reduction.....As needed up to 10% by volume

Conventional Spray
- Gun .....DeVilbiss MBC-510
- Fluid Tip .....E
- Air Nozzle.....704
- Atomization Pressure.....60-65 psi
- Fluid Pressure.....10-20 psi
- Reduction.....As needed up to 10% by volume
- Requires oil and moisture separators

Brush
- Brush.....Nylon/Polyester or Natural Bristle
- Reduction.....Not recommended

Roller
- Cover .....3/8" woven with solvent resistant core
- Reduction.....Not recommended

If specific application equipment is not listed above, equivalent equipment may be substituted.

SHERWIN WILLIAMS

Protective & Marine Coatings

# MACROPOXY® 646-100 FAST CURE EPOXY

PART A B58-620 SERIES
PART B B58V620 HARDENER

## APPLICATION BULLETIN

4.52

### APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly with low speed power agitation. Make certain no pigment remains on the bottom of the can. Then combine one part by volume of Part A with one part by volume of Part B. Thoroughly agitate the mixture with power agitation. Allow the material to sweat-in as indicated prior to application. Re-stir before using.

If reducer solvent is used, add only after both components have been thoroughly mixed, after sweat-in.

Apply paint at the recommended film thickness and spreading rate as indicated below:

**Recommended Spreading Rate per coat:**

| | Minimum | Maximum |
|---|---|---|
| Wet mils (microns) | 7.0 (175) | 13.5 (338) |
| Dry mils (microns) | 5.0* (125) | 10.0* (250)* |
| ~Coverage sq ft/gal ($m^2$/L) | 116 (2.8) | 232 (5.7) |
| Theoretical coverage sq ft/gal ($m^2$/L) @ 1 mil / 25 microns dft | 1168 (28.6) | |

*NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.*

*See Recommended Systems on reverse side. See Performance Tips section also.

**Drying Schedule @ 7.0 mils wet (175 microns):**

| | @ 40°F/4.5°C | @ 77°F/25°C 50% RH | @ 100°F/38°C |
|---|---|---|---|
| To touch: | 4-5 hours | 2 hours | 1.5 hours |
| To handle: | 48 hours | 8 hours | 4.5 hours |
| To recoat: | | | |
| minimum: | 48 hours | 8 hours | 4.5 hours |
| maximum: | 1 year | 1 year | 1 year |
| Cure for | | | |
| service: | 10 days | 7 days | 4 days |
| immersion: | 14 days | 7 days | 4 days |
| Pot Life: | 10 hours | 4 hours | 2 hours |
| Sweat-in-time: | 30 minutes | 30 minutes | 15 minutes |

*If maximum recoat time is exceeded, abrade surface before recoating.*
*Drying time is temperature, humidity, and film thickness dependent.*

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

### CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with Reducer R7K111 or Oxsol 100. Clean tools immediately after use with Reducer R7K111 or Oxsol 100. Follow manufacturer's safety recommendations when using any solvent.

### DISCLAIMER

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### PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Do not mix previously catalyzed material with new.

Do not apply the material beyond recommended pot life.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with Reducer R7K111 or Oxsol 100.

Insufficient ventilation, incomplete mixing, miscatalyzation, and external heaters may cause premature yellowing.

Excessive film build, poor ventilation, and cool temperatures may cause solvent entrapment and premature coating failure.

Tinting is not recommended for immersion service.

Use only Mil White for immersion service.

Quik-Kick Epoxy Accelerator is acceptable for use. See data page 4.99 for details.

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

**For Immersion Service:** (if required) Holiday test in accordance with ASTM D5162 for steel, or ASTM D4787 for concrete.

When coating over aluminum and galvanizing, recommended dft is 2-4 mils (50-100 microns).

Refer to Product Information sheet for additional performance characteristics and properties.

### SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

### WARRANTY

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# APPENDIX C: METAL PREPARATION FACILITY WORK PROCESS CLEANLINESS STANDARD OPERATING PROCEDURES

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# STANDARD OPERATING PROCEDURES

Title: Metal Preparation Facility Work Process Cleanliness
Number: B873
Prepared by: Adam Richards
Rev: 4
Date: September 17, 2010

Reference: PSNS&IMFINST P5090.5, Waste Management Plan

Enclosure(1): Building 873 Daily Inspection Log: Permit-By-Rule Tanks/Sumps (Rev. 4-09)

1. PURPOSE AND SCOPE:

This Shop 31 Standard Operating Procedure (SOP) is in effect to maintain cleanliness of the Metal Preparation Facility, Building 873 at PSNS & IMF; and to minimize the routine drippage and spillage of process solutions through the main floor grating to the sub-floor (or lower level). It specifically outlines how platers will minimize drips and spills, conduct the wash down process, inspect critical facility systems, and housekeeping issues. These procedures will reduce the number of hazardous drips and spills, clean the ones that happen, and ensure wash downs of unknown drips are conducted when identified.

2. PERSONNEL:

(a) Facility Manager: The on-site Facility Manager for the Metal Preparation Facility (Building 873) is a required position. The primary duties and assignments are ensuring facility maintenance, maintaining cleanliness standards, and overseeing operations for environmental compliance.

(b) Supervisor: Supervisors conduct process, safety, and environmental briefs; supervise production work practices; and conduct oversight inspections.

(c) Operations Personnel: Electroplaters perform daily production, inspections and cleaning. Follow applicable environmental, safety and health requirements.

3. DEFINITIONS:

NOTE: Drips, Process Drips, and Spills can be classified as non-hazardous or hazardous. You must know the hazards associated with the liquids you are working with and take the appropriate actions to eliminate unnecessary risks to yourself, fellow workers, and to the environment.

(a) Drips are drops of liquids that lands on a surface after escaping its primary containment system.

Examples of non-hazardous drips are drops of liquid from a soda/water bottle or coffee cup; drops of liquid coming from a leaking valve on the eye wash station; or drops of liquids coming off of clothing after coming in from the rain.

Examples of hazardous drips are drops of liquid coming from a process tank ventilation system; drops of liquid coming from a sample bottle after taking a sample from a process tank that contains a hazardous liquid; or drips from a hazardous material (HM) container after pouring some of it into a transfer container.

(b) Permit By Rule Tanks are sumps and retention tanks that are managed under the Permit By Rule (PBR) regulations instead of hazardous waste (HW) tank regulations. Like HW tanks, PBR tanks can have or accumulate a hazardous liquid in them.

(c) Process Drips are drops of liquid coming from process tanks; or equipment or parts being worked as part of the plating or metal preparation process that land on a surface or surfaces outside the process tank or its containment equipment.

Examples of non-hazardous process drips are drops of liquid coming off of a plated part as it is removed from the final rinse tank (tank contents are designated as non-hazardous); drops of liquid that fall from a processed piece of equipment during final inspection after final rinse as it is being examined.

Examples of hazardous process drips would be drops of liquid that land on the floor grating and/or equipment beneath the grating, coming from a HM process tank; or drips coming from the drain boards (also known as drip trays) between hazardous process tanks; or drops of liquid coming from a part that is being moved from a HM process tank to the next that lands on surfaces outside the drain boards between the process tanks.

(d) Secondary Containment. The bermed areas in the lower level are considered secondary containment for the process tanks on the main floor above them. As secondary containment for process tanks, they are not allowed to accumulate any HW. Any drips or spills of HM or HW in the secondary containments should be cleaned up immediately.

(e) Spills are running, flowing, or standing liquid accumulating as a result of unrecognized and/or repeated drips from a source.

Examples of a non-hazardous spill would be rupture of the potable water line to the eye wash shower or knocking over a jug of ionic water.

Examples of a hazardous spill would be a hole in a HW transfer pipe discovered through observance of staining on

the floor; dropping a HW sample container that releases some or all of its contents.

(f) Sump. Any pit or reservoir which meets the definition of a "tank," to collect dangerous or hazardous waste for transport to dangerous waste storage, treatment, or disposal facilities.

(g) Tank. Any stationary device designed to contain an accumulation of dangerous waste or used oil, and constructed primarily of non-earthen materials to provide structural support.

4. CLEANLINESS AND INSPECTION CRITERIA:

(a) Hazardous process solutions must not be present in the form of spills, drips, splashes, crystals or debris on any surface(s) on the main process floor, sub-floor, piping, valves, light fixtures, ventilation ducts, structural supports, sumps, or walls.

(b) The bermed secondary containments should be dry and free of debris, but can contain identified non-hazardous substances.

(c) Any standing liquid in the sumps, below the portable sump pump siphon suction, must be clear and colorless to perform the sump's secondary containment leak detection equipment inspection.

(d) Visible staining must not leach color during wash downs.

(e) Attributes are described in the Building 873 Daily Inspection Log: Permit-By-Rule Tanks/Sumps (Latest Rev.).

(f) Sumps have an attribute that says "No visible fluids or liquids" or are "dry" for a satisfactory condition. Sump pumps usually leave some residual liquid below the siphon when the pump loses suction. This condition is satisfactory as long as the visual inspection can be conducted through clear and colorless water (with no solids or debris).

(g) Drip stains seen down the walls or on piping running through the sub-floor area are stains which persist from previously washed drips and spills.

(h) Non-hazardous effluents from eye wash station operational checks or non-hazardous rinse waters that are designed to drain to the bermed areas of the sub-floor do not require process controls or spill clean-up actions.

(i) After wash down, a final clean-up inspection will include the sub-floor's overhead piping, valves, hangers, and ventilation ducts; structural supports; lighting fixtures; and walls.

5. CRITICAL FACILITY SYSTEMS, EQUIPMENT, AND INSPECTION CRITERIA:

(a) Lower Level Floor Coating and Process Tank Secondary Containment Coating Integrity: no chips, cracks, or damage to coating which exposes the underlying concrete.

(b) All sump linings: no chips, cracks, damage or deterioration of sump lining (i.e., leak proof).

(c) All sump pumps: pumps operational according to manufacturer's specification. Intakes are not damaged or clogged. Ancillary equipment in good condition and not leaking.

(d) Sump pump in sump #14 is firmly anchored: pump bracing and anchoring system is not severely corroded or rusted.

(e) All Leak Detection Equipment and Alarms for Tanks and Sumps: must be functional.

(f) All Process Tank Ventilation Systems: must be operational during plating operations.

(g) All Building Emergency Detection and Response Equipment: must be operational, functioning, and current in required inspections and certifications.

6. PROCESSES:

All personnel performing metal preparation and/or electroplating operations in the tank areas of Bldg. 873 will follow these requirements.

(a) Access Control:

(1) Building: The building shall be locked when authorized personnel are not present. Signs shall be posted at all entrances to the sub-floor area stating "Danger - Unauthorized Personnel Keep Out".

(2) Process area: Accesses to this area shall be clearly marked and only operational personnel and supervision assigned to the area are to be allowed access. For personnel who are not assigned, access is prohibited until a safety briefing on the hazards of the area has been provided by the Facility Manager (or designated representative).

(3) Subfloor area: Access to the subfloor area shall be strictly controlled. Access requires a briefing of the hazards of the subfloor area by the Facility

Manager (or designated representative). Prior to granting access to the subfloor area, plating/cleaning operations above the subfloor area(s) being accessed shall be suspended. Personnel shall not be allowed access to the bermed tank areas without appropriate PPE (e.g., hard hat, steel-toed shoes/boots, or safety glasses w/side shields). If known hazardous drips or spills are present employee shall don rubber shoe covers, flimsies, or rubber boots to prevent potential of work shoes/boots becoming contaminated.

(b) Process Control:

(1) Drain Boards (drip trays) will be installed between plating and rinse tanks along the plating line so that drips from parts moving from tank to tank will be cycled back into the appropriate process tank to avoid drips to subfloor areas.

(2) Keep work pieces over the process tanks and drain boards (drip trays). This will prevent any process solution drag out from dripping on the subfloor. At the end of the plating/cleaning process line, parts shall be suspended above the final tank to allow any drips to go into the final tank.

(3) Never leave the water hose unattended while filling or topping off tanks to ensure tanks are not overfilled.

(4) Prevent drips and spills when adding or removing solution from the tanks.

(5) Prevent drips and spills by placing parts in tanks carefully to avoid splashing.

(6) When removing parts: withdraw parts slowly from tanks; maximize the draining of bath solution back into the process tank, by extending drip time and turning parts in all directions to allow liquid to fall from crevices and pores. Finally, use care when removing masking to allow liquid to drain into the tank and not splash outside of the tank.

(7) If hazardous drips occur, personnel will finish the process then clean up the drips using wash down procedures described below.

(c) Wash downs:

(1) When Not Required:

Wash downs of the main floor or sub-floor area(s) are not required during periods when plating operations are not being performed; building operations DO NOT involve the release (drips or spills) of any known hazardous substances; daily inspections do not indicate a cleanliness problem; and liquids/debris that are observed are known to be non-hazardous. Facility Manager (or designated representative) must be able to justify (by knowledge through daily log entries in the wash down log) that wash down of the main floor and/or the sub-floor area(s) were not required.

Bermed areas in support of other plating lines unaffected by hazardous drips or spills are not required to be washed down.

(2) When Required:

(a) Facility Manager (or designated representative) may direct wash downs at their discretion. Factors that could require a wash down are cleanliness; equipment failures involving releases; or spills that effect the process floor area(s) and/or sub-floor area(s). Releases or spills suspected of being hazardous will be washed down. Safety and protection of worker's health and the environment are primary concerns.

(b) The main floor process area and sub-floor under the process tanks, where operations were performed, will be washed down at the completion of the process or at the end of the shift, whichever comes first. Safety of employees is paramount and the Facility Manager (or designated representative) will make final determination as to wash down at job completion or at the end of the shift if a question arises regarding wash down timing.

(c) Facility Manager (or designated representative) will inform Code 106.33, so notification can be made to Washington Department of Ecology, anytime a wash down resulting from the release of hazardous substances cannot be performed within 24 hours. Factors regarding this type of situation will be recorded by documentation on the daily log sheet for the building. A wash down will be initiated when it is first safe for employees to access the sub-floor area, and documented on the daily wash down log.

(d) Known Hazardous Drips or Spills: In the event that it is unsafe to access the sub-floor area due to other ongoing plating operations, the employee shall rinse the main floor, grated process area where the hazardous drips or spills occurred. Attention will be paid to piping, valves, hangers, vent ducts, structural supports or walls directly below the process area being rinsed to ensure they are also rinsed off through the grating.

**NOTE**: Contact Shop 99 at Building 1109, Industrial Wastewater Pretreatment Facility (IWPF) if a wash down is performed due to a hazardous spill. Wash down water may have highly concentrated metals that require additional attention at the IWPF when treated.

(e) Unknown Drips: In addition to daily inspections to the sub-floor area to look for unknown drips, plating shop managers conduct daily oversight walk-throughs of the sub-floor area and shall require wash-downs of the affected area as deemed necessary.

(3) How to Wash Down:

(a) Prior to washing, remove any debris from the subfloor area (i.e., pick up debris that will not, or should not, be allowed to go through the sump pump). This debris shall be properly designated for disposal. Coordinate weekly inspection and flushing of eyewash stations and showers with the wash down.

(b) Wash process equipment surfaces, and floors above the grating to remove any accidental drips and return drips in drain boards to process tanks. When washing down main floor grating, attention will be paid to piping, valves, hangers, vent ducts, structural supports or walls that are directly below the grating to ensure they are also washed to remove any waste that may accumulate on them.

(c) Proceed to the sub-floor area under the grating to finish the wash down. Rinse overhead piping, valves, hangers, vent ducts, and lighting fixtures; structural supports; walls; and floor area while working towards the sump(s).

(d) Ensure stains are washed and cleaned to verify that staining is of a permanent nature with no visible color released into wash water.

(e) Squeegee (or similar device/method) remaining wash water in each applicable sub-floor area(s) towards the sump(s).

(f) Complete final inspection of affected wash down area(s) looking for signs of previously unidentified staining, wastes, or debris that was missed during the wash down. Repeat wash down if

necessary. Remove any debris that is observed in the overhead, floor or sump area(s).

(g) Ensure remaining liquid in the sump(s) is clear and colorless.

(h) Above grating washes: When conducting a process (for example de-carbonization) which creates a drip (on tank, grating and/or subfloor) that cannot be completed and fully cleaned within 24 hours contact Code 106.33, wash the grating, sides of tanks and rinse the subfloor down through the grating to prevent buildup during the process.

7. INSPECTIONS:

Daily management oversight (walk-through inspections) specifically look for housekeeping issues; fluids and other signs of leaks; signs of deterioration; and evaluate that leak detection alarms are operational. These inspections and oversight will ensure wash downs of unknown drips are conducted when identified.

(a) Oversight: The on-site Facility Manager or Electroplater Supervisor inspects the process tanks and sub-floor areas for cleanliness and to ensure critical systems are operating. In the event of non-routine drips, they ensure that affected surfaces are washed and sumps are pumped to low suction.

(b) Daily: Documented inspections of the Permit By Rule tanks and sumps are to be performed, with oversight by the Facility Manager to ensure standards are maintained.

(1) Visually check the following: corrosion or other signs of leakage, tank level/inventory, other leak-detection data (e.g., electronic leak detection alarms), integrity of secondary containment and signs of leakage, surrounding area checked for erosion or other signs of leakage, proper labeling, ancillary equipment (e.g., valves, unions, etc.) checked for signs of leakage.

(2) Document inspections on the Building 873 Daily Inspection Log: Permit-By-Rule Tanks/Sumps (Latest Rev.) form.

(3) Deficiencies. All unsatisfactory conditions noted on daily inspections will be recorded in the comment section of the Building 873 Daily Inspection Log: Permit-By-Rule Tanks/Sumps (Latest Rev.) form. Comments are to include, at a minimum, a description of the unsatisfactory condition, the time and date of the discovery of the unsatisfactory condition, corrective actions taken, work request numbers, and estimated completion date.

**NOTE:** Facility Manager will shut down affected process and/or the building operations and notify Code 106.33 of unsatisfactory conditions that cannot be immediately remedied, and poses an environmental, safety or health risk.

(c) Annually: Annual inspections shall be performed and documented as required by PSNS&IMFINST P5090.5, Appendix I, section 4..

(1) Operational Inspections. Operational inspections of overfill control systems; visual inspections of "Permit By Rule" tanks and sump systems, and review of emergency response procedures are required annually. The term "annually" will mean any time during the month in which the inspection was conducted the previous year, or earlier. If it appears that an annual inspection will not occur on time, the responsible shop will contact Code 106.3 as soon as possible to make alternate inspection arrangements. See exhibit I-2, Annual Inspection Log Permit By Rule, PSNS&IMF 5090/142 (Rev. 3-05), for items to be checked.

(2) Tank Systems. Permit-By-Rule tanks will be cleaned for annual inspections and will include a gas-free certification for enclosed tank systems when entry is required. The tank systems must be emptied, cleaned, and gas-free-certified prior to personnel entry. Cleaning for inspections will consist of removing all waste and sludge such that all surfaces, including cracks, can be visually inspected. The responsible shops will provide all necessary assistance to the inspector during annual inspections.

8. RECORDKEEPING:

(a) Building 873 Daily Inspection Log: Permit-By-Rule Tanks/Sumps (Latest Rev.) are required to be signed daily by the inspector, reviewed and signed monthly by the responsible shop supervisor. Signatures verify that the tank system indicated on the log has been inspected properly and the information recorded on the log is true and accurate.

(b) Original Building 873 Daily Inspection Log: Permit-By-Rule Tanks/Sumps (Latest Rev.) will be forwarded to Code 106.33 on a monthly basis, submitted no later than the 10th of the following month.

(c) Annual Inspection Log Permit By Rule form will be forwarded to Code 106.33 within 2 weeks of completion.

(d) Facility Manager will keep records of all inspections, note any problems, and corrective actions taken for a minimum of five years.

(e) Code 106.33 will retain the Building 873 Daily Inspection Log: Permit-By-Rule Tanks/Sumps (Latest Rev.) and the Annual Inspection Log Permit By Rule, PSNS&IMF 5090/142 (Latest Rev.) indefinitely.

TIM BRUHN
Shop Superintendent

Code 106.33 Concurrence: _____

# BUILDING 873 DAILY INSPECTION LOG : PERMIT-BY-RULE TANKS/SUMPS

MONTH: YEAR: TANK #: 873-3,4,5,6,7,8,9,10,12,13,14, and 16

| NOTE: UNSAT FINDING MUST BE EXPLAINED ON BACK PAGE | | SAT / UNSAT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Exterior Of Tanks #3, 4, 5 and 6** | No evidence of leakage or overflow. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | No signs of cracks, corrosion, or other signs of deterioration. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Containment areas for sumps #7, 8, 9, 10, 12, 13, 14, and 16** | Minimal amount of liquid in sumps (minimal wash down water). | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | No signs of cracks, corrosion, other signs of deterioration. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Good housekeeping- Sumps free of unnecessary debris and equipment. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Secondary Containment For Sumps #7, 8, 9, 10, 12, 13, 14, and 16** | No signs of fluid or leakage. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | No signs of corrosion, cracks, or deterioration. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Leak detection alarms not alarming | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Ancillary Equipment** | No signs of leaks below unions, valves, piping, etc. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Hangers and supports in good condition and properly secured. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Miscellaneous** | Surrounding areas free from erosion or other signs of leakage. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Proper labeling of piping, sumps, and tanks | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Good housekeeping - Overhead area clean and free of debris. | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Sump #873-15 is dry (or loss of sump pump suction) and free of debris | S | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | U | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

GENERAL REMARKS

(Rev. 4-09)

Page 1 of ___

## BUILDING 873 DAILY INSPECTION LOG : PERMIT-BY-RULE TANKS/SUMPS

| REMARKS AND RECORD OF UNSAT FINDINGS | | |
|---|---|---|
| DATE/TIME | FINDING (indicate tank # and describe discrepency or comment) | ACTION TAKEN (Include corrective actions, workrequest #, estimated completion date, assigned codes, etc.) |
| | | |
| | | |
| | | |
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| | | |
| | | |
| GENERAL REMARKS | | |

(Rev. 4-09)

Page 2 of ___

| BUILDING 873 DAILY INSPECTION LOG : PERMIT-BY-RULE TANKS/SUMPS | | | |
|---|---|---|---|
| MONTH: | | YEAR: | TANK: 873-3,4,5,6,7,8,9,10,12,13,14,16 |
| DATE | TIME | PRINTED NAME OF INSPECTOR | SIGNATURE OF INSPECTOR |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
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| 13 | | | |
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| 18 | | | |
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| 20 | | | |
| 21 | | | |
| 22 | | | |
| 23 | | | |
| 24 | | | |
| 25 | | | |
| 26 | | | |
| 27 | | | |
| 28 | | | |
| 29 | | | |
| 30 | | | |
| 31 | | | |
| RESPONSIBLE SHOP SUPERVISOR'S SIGNATURE | | | DATE |

(Rev. 4-09)

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# APPENDIX D: ANALYTICAL RESULTS FOR BUILDING 873 POST CLEANUP SAMPLING

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## CYANIDE SUMP 10

| TEST | METHOD | RESULT | UNITS | CLOSURE PERFORMANCE STANDARD |
|---|---|---|---|---|
| Silver | SW-846 6010 | 2.18 | mg/l | 5 mg/l |
| Arsenic | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Barium | SW-846 6010 | 0.3 | mg/l | 100 mg/l |
| Cadmium | SW-846 6010 | 0.7 | mg/l | 1 mg/l |
| Chromium | SW-846 6010 | 0.2 | mg/l | 5 mg/l |
| Copper | SW-846 6010 | 2.9 | mg/l | NA |
| Nickel | SW-846 6010 | 0.7 | mg/l | NA |
| Lead | SW-846 6010 | 0.2 | mg/l | 5 mg/l |
| Selenium | SW-846 6010 | <0.1 | mg/l | 1 mg/l |
| Zinc | SW-846 6010 | 15 | mg/l | NA |
| Cyanide | EPA 335.4 | 1.51 | mg/l | 1.2 mg/l |
| pH | SM 4500-H | 8.9 | | >2.5; <12.5 |

## CYANIDE SUMP 13

| TEST | METHOD | RESULT | UNITS | CLOSURE PERFORMANCE STANDARD |
|---|---|---|---|---|
| Silver | SW-846 6010 | <0.05 | mg/l | 5 mg/l |
| Arsenic | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Barium | SW-846 6010 | <0.1 | mg/l | 100 mg/l |
| Cadmium | SW-846 6010 | <0.06 | mg/l | 1 mg/l |
| Chromium | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Copper | SW-846 6010 | 0.2 | mg/l | NA |
| Nickel | SW-846 6010 | <0.1 | mg/l | NA |
| Lead | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Selenium | SW-846 6010 | <0.1 | mg/l | 1 mg/l |
| Zinc | SW-846 6010 | 0.4 | mg/l | NA |
| Cyanide | EPA 335.4 | <0.04 | mg/l | 1.2 mg/l |
| pH | SM 4500-H | 8.2 | | >2.5; <12.5 |

## ACID ALKALINE SUMP 9

| TEST | METHOD | RESULT | UNITS | CLOSURE PERFORMANCE STANDARD |
|---|---|---|---|---|
| Silver | SW-846 6010 | 0.23 | mg/l | 5 mg/l |
| Arsenic | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Barium | SW-846 6010 | 0.5 | mg/l | 100 mg/l |
| Cadmium | SW-846 6010 | 0.1 | mg/l | 1 mg/l |
| Chromium | SW-846 6010 | 0.3 | mg/l | 5 mg/l |
| Copper | SW-846 6010 | 3.4 | mg/l | NA |
| Nickel | SW-846 6010 | 1.3 | mg/l | NA |
| Lead | SW-846 6010 | 0.2 | mg/l | 5 mg/l |
| Selenium | SW-846 6010 | <0.1 | mg/l | 1 mg/l |
| Zinc | SW-846 6010 | 2.0 | mg/l | NA |
| Cyanide | EPA 335.4 | | mg/l | 1.2 mg/l |
| pH | SM 4500-H | 7.5 | | >2.5; <12.5 |

## ACID ALKALINE SUMP 12

| TEST | METHOD | RESULT | UNITS | CLOSURE PERFORMANCE STANDARD |
|---|---|---|---|---|
| Silver | SW-846 6010 | 0.2 | mg/l | 5 mg/l |
| Arsenic | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Barium | SW-846 6010 | 0.3 | mg/l | 100 mg/l |
| Cadmium | SW-846 6010 | 1.4 | mg/l | 1 mg/l |
| Chromium | SW-846 6010 | 0.4 | mg/l | 5 mg/l |
| Copper | SW-846 6010 | 9.0 | mg/l | NA |
| Nickel | SW-846 6010 | 2.7 | mg/l | NA |
| Lead | SW-846 6010 | 0.5 | mg/l | 5 mg/l |
| Selenium | SW-846 6010 | <0.1 | mg/l | 1 mg/l |
| Zinc | SW-846 6010 | 8.0 | mg/l | NA |
| Cyanide | EPA 335.4 | | mg/l | 1.2 mg/l |
| pH | SM 4500-H | >12 | | >2.5; <12.5 |

## ACID ALKALINE SUMP 14

| TEST | METHOD | RESULT | UNITS | CLOSURE PERFORMANCE STANDARD |
|---|---|---|---|---|
| Silver | SW-846 6010 | <0.05 | mg/l | 5 mg/l |
| Arsenic | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Barium | SW-846 6010 | 0.6 | mg/l | 100 mg/l |
| Cadmium | SW-846 6010 | <0.06 | mg/l | 1 mg/l |
| Chromium | SW-846 6010 | 0.7 | mg/l | 5 mg/l |
| Copper | SW-846 6010 | 2.2 | mg/l | NA |
| Nickel | SW-846 6010 | 0.8 | mg/l | NA |
| Lead | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Selenium | SW-846 6010 | <0.1 | mg/l | 1 mg/l |
| Zinc | SW-846 6010 | 0.7 | mg/l | NA |
| Cyanide | EPA 335.4 | | mg/l | 1.2 mg/l |
| pH | SM 4500-H | 7.7 | | >2.5; <12.5 |

## ACID ALKALINE SUMP 15

| TEST | METHOD | RESULT | UNITS | CLOSURE PERFORMANCE STANDARD |
|---|---|---|---|---|
| Silver | SW-846 6010 | <0.05 | mg/l | 5 mg/l |
| Arsenic | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Barium | SW-846 6010 | <0.1 | mg/l | 100 mg/l |
| Cadmium | SW-846 6010 | <0.06 | mg/l | 1 mg/l |
| Chromium | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Copper | SW-846 6010 | 0.1 | mg/l | NA |
| Nickel | SW-846 6010 | <0.1 | mg/l | NA |
| Lead | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Selenium | SW-846 6010 | <0.1 | mg/l | 1 mg/l |
| Zinc | SW-846 6010 | 0.6 | mg/l | NA |
| Cyanide | EPA 335.4 | | mg/l | 1.2 mg/l |
| pH | SM 4500-H | 7.5 | | >2.5; <12.5 |

## ACID ALKALINE SUMP 16

| TEST | METHOD | RESULT | UNITS | CLOSURE PERFORMANCE STANDARD |
|---|---|---|---|---|
| Silver | SW-846 6010 | <0.05 | mg/l | 5 mg/l |
| Arsenic | SW-846 6010 | <0.1 | mg/l | 5 mg/l |
| Barium | SW-846 6010 | <0.1 | mg/l | 100 mg/l |
| Cadmium | SW-846 6010 | <0.06 | mg/l | 1 mg/l |
| Chromium | SW-846 6010 | 2.8 | mg/l | 5 mg/l |
| Copper | SW-846 6010 | 0.4 | mg/l | NA |
| Nickel | SW-846 6010 | 0.1 | mg/l | NA |
| Lead | SW-846 6010 | 2.4 | mg/l | 5 mg/l |
| Selenium | SW-846 6010 | <0.1 | mg/l | 1 mg/l |
| Zinc | SW-846 6010 | 0.5 | mg/l | NA |
| Cyanide | EPA 335.4 | | mg/l | 1.2 mg/l |
| pH | SM 4500-H | 6.9 | | >2.5; <12.5 |

BUILDING 873 CYANIDE SUMP #10 SAMPLE RESULTS

Enclosure (2)

Report Number: 2011PS03523

# Laboratory Analysis Report

Laboratory Division

Puget Sound Naval Shipyard and IMF, Code 134, Bremerton, WA 98314-5001

Customer: Code 106.33
Job Order: 91617-4HW7-500
Customer Ref Number: 280503
Lab Code : 134.1
Project/Program: OVERHEAD
Specification for Tests: 40CFR261, Rev 00
Analysis/Service Requested: Hazardous Waste
RequestType: SAR
Metals Group: TOTAL
Sampling Procedure: 90HM 2-30

Date Submitted: 06-06-2011
Submitted by: PASLAY
Submitter's Phone: 6-7092 Fax: 6-8810
Lab Phone: 476-8090

Prep: Liquid

## Test Results

**Sample Number: E001**

Sample Description: Clear Liquid B873 cyanide sump Traceability Number: 280503 10

Sampled Date/Time: 06-06-2011 09:37

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| Silver | 007440-22-4 | SW-846 6010 | 1.02 | mg/L | 06-10-2011 10:51 |
| Arsenic | 007440-38-2 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 10:51 |
| Barium | 007440-39-3 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 10:51 |
| Cadmium | 007440-43-9 | SW-846 6010 | < 0.06 | mg/L | 06-10-2011 10:51 |
| Chromium | 007440-47-3 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 10:51 |
| Copper | 007440-50-8 | SW-846 6010 | 0.7 | mg/L | 06-10-2011 10:51 |
| Nickel | 007440-02-0 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 10:51 |
| Lead | 007439-92-1 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 10:51 |
| Selenium | 007782-29-2 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 10:51 |
| Zinc | 007440-66-6 | SW-846 6010 | 1.1 | mg/L | 06-10-2011 10:51 |
| Total CN | 000057-12-5 | EPA 335.4 | 1.4 | mg/L | 06-07-2011 13:40 |

**Sample Number: W001**

Sample Description: Clear Liquid B873 cyanide sump Traceability Number: 280503 10

Sampled Date/Time: 06-06-2011 09:30

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| pH Temperature | | SM 4500-H | 24 | deg C | 06-06-2011 15:46 |
| pH | | SM 4500-H | 9.3 | | 06-06-2011 15:46 |

Samples analyzed as received. Results relate only to item(s) tested.

Report Number: 2011PS03635

# Laboratory Analysis Report

Laboratory Division

Puget Sound Naval Shipyard and IMF, Code 134, Bremerton, WA 98314-5001

Customer: Code 106.33
Job Order: 91617-4HW75-000
Customer Ref Number: 280505
Lab Code : 134.1
Project/Program: OVERHEAD
Specification for Tests: 40CFR261, Rev 00
Analysis/Service Requested: Hazardous Waste
RequestType: SAR
Metals Group: TOTAL
Sampling Procedure: 90HM 2-30

Date Submitted: 06-08-2011
Submitted by: PASLAY
Submitter's Phone: 5-7092
Lab Phone: 476-8090

Prep: Liquid

## Test Results

**Sample Number: E001**
Sample Description: Clear Liquid B873 Cyanide Sump #10
Traceability Number: 280505
Sampled Date/Time: 06-08-2011 09:16

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| Silver | 007440-22-4 | SW-846 6010 | 0.75 | mg/L | 06-10-2011 11:02 |
| Arsenic | 007440-38-2 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 11:02 |
| Barium | 007440-39-3 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 11:02 |
| Cadmium | 007440-43-9 | SW-846 6010 | < 0.06 | mg/L | 06-10-2011 11:02 |
| Chromium | 007440-47-3 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 11:02 |
| Copper | 007440-50-8 | SW-846 6010 | 0.6 | mg/L | 06-10-2011 11:02 |
| Nickel | 007440-02-0 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 11:02 |
| Lead | 007439-92-1 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 11:02 |
| Selenium | 007782-29-2 | SW-846 6010 | < 0.1 | mg/L | 06-10-2011 11:02 |
| Zinc | 007440-66-6 | SW-846 6010 | 1.3 | mg/L | 06-10-2011 11:02 |
| Total CN | 000057-12-5 | EPA 9014 | 1.4 | mg/L | 06-15-2011 13:21 |

**Sample Number: W001**
Sample Description: Clear Liquid B873 Cyanide Sump #10
Traceability Number: 280505
Sampled Date/Time: 06-08-2011 09:16

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| pH Temperature | | SM 4500-H | 25 | deg C | 06-08-2011 14:35 |
| pH | | SM 4500-H | 8.9 | | 06-08-2011 14:35 |

Samples analyzed as received. Results relate only to item(s) tested.

Report Number: 2011PS03686

# Laboratory Analysis Report

*Laboratory Division*

Puget Sound Naval Shipyard and IMF, Code 134, Bremerton, WA 98314-5001

Customer: Code 106.33
Job Order: 91617-4HW75-000
Customer Ref Number: 280507
Lab Code : 134.1
Project/Program: OVERHEAD
Specification for Tests: 40CFR261, Rev 00
Analysis/Service Requested: Hazardous Waste
RequestType: SAR
Metals Group: TOTAL
Sampling Procedure: 90HM 2-30

Date Submitted: 06-10-2011
Submitted by: PASLAY
Submitter's Phone: 6-7092 Fax: 6-8810
Lab Phone: 476-8090

Prep: Liquid

## Test Results

**Sample Number: E001**

Sample Description: Clear Liquid B873 Cyanide sump 10 Traceability Number: 280507
Sampled Date/Time: 06-10-2011 08:45

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| Silver | 007440-22-4 | SW-846 6010 | 1.17 | mg/L | 06-17-2011 08:49 |
| Arsenic | 007440-38-2 | SW-846 6010 | < 0.1 | mg/L | 06-17-2011 08:49 |
| Barium | 007440-39-3 | SW-846 6010 | < 0.1 | mg/L | 06-17-2011 08:49 |
| Cadmium | 007440-43-9 | SW-846 6010 | < 0.06 | mg/L | 06-17-2011 08:49 |
| Chromium | 007440-47-3 | SW-846 6010 | < 0.1 | mg/L | 06-17-2011 08:49 |
| Copper | 007440-50-8 | SW-846 6010 | 1.3 | mg/L | 06-17-2011 08:49 |
| Nickel | 007440-02-0 | SW-846 6010 | < 0.1 | mg/L | 06-17-2011 08:49 |
| Lead | 007439-92-1 | SW-846 6010 | < 0.1 | mg/L | 06-17-2011 08:49 |
| Selenium | 007782-49-2 | SW-846 6010 | < 0.1 | mg/L | 06-17-2011 08:49 |
| Zinc | 007440-66-6 | SW-846 6010 | 2.9 | mg/L | 06-17-2011 08:49 |
| Total CN | 000057-12-5 | EPA 9014 | 5.2 | mg/L | 06-15-2011 13:23 |

**Sample Number: W001**

Sample Description: Clear liquid B873 sump 10 Traceability Number: 280507
Sampled Date/Time: 06-10-2011 08:45

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| pH Temperature | | SM 4500-H | 25 | deg C | 06-10-2011 16:21 |
| pH | | SM 4500-H | 9.1 | | 06-10-2011 16:21 |

Samples analyzed as received. Results relate only to item(s) tested.

Report Number: 2011PS03899

# Laboratory Analysis Report

Laboratory Division

Puget Sound Naval Shipyard and IMF, Code 134, Bremerton, WA 98314-5001

Customer: Code 106.33
Job Order: 91617-4HW75-000
Customer Ref Number: 280570
Lab Code : 134.1
Project/Program: OVERHEAD
Specification for Tests: 40CFR261, Rev 00
Analysis/Service Requested: Hazardous Waste
RequestType: SAR
Metals Group: NONE
Sampling Procedure: 90HM 2-30

Date Submitted: 06-21-2011
Submitted by: PASLAY
Submitter's Phone: 6-7092
Lab Phone: 476-8090
Prep: Liquid

## Test Results

**Sample Number: E001**
Sample ID: B873 CYANIDE SUMP 10
Traceability Number: 280570
Sampled Date/Time: 06-20-2011 14:25
Sample Description: CLEAR LIQUID

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| Total CN | 000057-12-5 | EPA 9014 | < 0.04 | mg/L | 06-27-2011 10:46 |

Samples analyzed as received. Results relate only to item(s) tested.

| (1) Prepared By: | Date: | Authorized Representative: | Date: |
|---|---|---|---|
| A Vincent 155054 | 6-27-11 | 476058 | 06-27-11 |

(1) The person designated to sign for an action verifies based on personal observation or certified records, and certifies by signature that the action has been performed in accordance with the specified requirements.

Distribution: Code 106.33, PASLAY,MORAN FAX 6-8810, Division Files



PS020_441

Report Number: 2011PS03964

# Laboratory Analysis Report

Laboratory Division
Puget Sound Naval Shipyard and IMF, Code 134, Bremerton, WA 98314-5001

Customer: Code 106.33
Job Order: 91647-4HW75-000
Customer Ref Number: 280571
Lab Code : 134.1
Project/Program: OVERHEAD
Specification for Tests: 40CFR261, Rev 00
Analysis/Service Requested: Hazardous Waste
RequestType: SAR
Metals Group: NONE
Sampling Procedure: 90HM 2-30

Date Submitted: 06-23-2011
Submitted by: MINER
Submitter's Phone: 6-7092
Lab Phone: 476-8090

Prep: Liquid

## Test Results

**Sample Number: E001**
Sample ID: B873 CYANIDE SUMP 10
Traceability Number: 280571
Sampled Date/Time: 06-22-2011 14:58

Sample Description: CLEAR LIQUID

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| Total CN | 000057-12-5 | EPA 9014 | < 0.04 | mg/L | 06-27-2011 10:49 |

Samples analyzed as received. Results relate only to item(s) tested.

| (1) Prepared By: | Date: | Authorized Representative: | Date: |
|---|---|---|---|
| R Vincent 155054 | 6-27-11 | 176055 | 6-27-11 |

(1) The person designated to sign for an action verifies based on personal observation or certified records, and certifies by signature that the action has been performed in accordance with the specified requirements.

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PS020_441

Report Number: 2011PS04014

# Laboratory Analysis Report

Laboratory Division

Puget Sound Naval Shipyard and IMF, Code 134, Bremerton, WA 98314-5001

Customer: Code 106.33
Job Order: 91617-4HW75-000
Customer Ref Number: 280573
Lab Code : 134.1
Project/Program: OVERHEAD
Specification for Tests: 40CFR261, Rev 00
Analysis/Service Requested: Hazardous Waste
RequestType: SAR
Metals Group: NONE
Sampling Procedure: 90HM 2-30

Date Submitted: 06-27-2011
Submitted by: PASLAY
Submitter's Phone: 6-7092
Lab Phone: 476-8090
Prep: Liquid

## Test Results

**Sample Number: E001**
Sample Description: CLEAR LIQUID B873 CYANIDE SUMP 10
Sampled Date/Time: 06-24-2011 15:00

Traceability Number: 280573

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| Total CN | 000057-12-5 | EPA 9014 | < 0.04 | mg/L | 06-28-2011 11:46 |

Samples analyzed as received. Results relate only to item(s) tested.

| (1) Prepared By: | Date: | Authorized Representative: | Date: |
|---|---|---|---|
| D Vincent 155054 | 6-28-11 | 171002 | 6-28-11 |

(1) The person designated to sign for an action verifies based on personal observation or certified records, and certifies by signature that the action has been performed in accordance with the specified requirements.

Distribution: Code 106.33, PASLAY, MORAN FAX 6-8810, Division Files

BUILDING 873 ACID/ALKALINE SUMP #12 SAMPLE RESULTS

Report Number: 2011PS03524

# Laboratory Analysis Report

Laboratory Division

Puget Sound Naval Shipyard and IMF, Code 134, Bremerton, WA 98314-5001

Customer: Code 106.33
Job Order: Mission Funding
Customer Ref Number: 280504
Lab Code : 134.1
Project/Program: OVERHEAD
Specification for Tests: 40CFR261, Rev 00
Analysis/Service Requested: Hazardous Waste
RequestType: SAR
Metals Group: NONE
Sampling Procedure: 90HM 2-30

Date Submitted: 06-06-2011
Submitted by: PASLAY
Submitter's Phone: 6-7092 Fax: 6-8810
Lab Phone: 476-8090

Prep: Liquid

## Test Results

**Sample Number: W001**
Sample Description: Clear Liquid B873 acid/alkaline sump12
Traceability Number: 280504
Sampled Date/Time: 06-06-2011 09:50

| Test | CAS number | Method | Result | Units | Test Date/Time |
|---|---|---|---|---|---|
| pH Temperature | | SM 4500-H | 24 | deg C | 06-06-2011 15:48 |
| pH | | SM 4500-H | 8.3 | | 06-06-2011 15:48 |

Samples analyzed as received. Results relate only to item(s) tested.

| (1) Prepared By: 185776 | Date: 6-8-11 | Authorized Representative: 16566 | Date: 6-8-11 |
|---|---|---|---|

(1) The person designated to sign for an action verifies based on personal observation or certified records, and certifies by signature that the action has been performed in accordance with the specified requirements.

Distribution: Code 106.33, Paslay (fax6-8810), Division Files





PS020_441

Report Number: 2011PS03636

# Laboratory Analysis Report

Laboratory Division

Puget Sound Naval Shipyard and IMF, Code 134, Bremerton, WA 98314-5001

Customer: Code 106.33
Job Order: Mission Funding
Customer Ref Number: 280506
Lab Code : 134.1
Project/Program: OVERHEAD
Specification for Tests: ENVIRONMENTAL
Analysis/Service Requested: Customer Support Sample
RequestType: SAR

Date Submitted: 06-08-2011
Submitted by: Moran
Submitter's Phone:
Lab Phone: 476-8090

## Test Results

**Sample Number: W001**
Traceability Number: 280506

Sample ID: Clear Liquid B873 Acid/alkaline sump #12

Sampled Date/Time: 06-08-2011 09:30

| Test | Method | Result | Units | Limits | Pass/Fail |
|---|---|---|---|---|---|
| pH Temperature | SM 4500-H | 24 | deg C | | |
| pH | SM 4500-H | 8.89 | | | |

Results relate only to item(s) tested.

| (1) Prepared By: 183336 | Date: | Authorized Representative: 160561 | Date: |
|---|---|---|---|
| Timothy W Cornelius | 6-8-11 | | 6/8/11 |

(1) The person designated to sign for an action verifies based on personal observation of certified records, and certifies by signature that the action has been performed in accordance with the specified requirements.

Distribution: Code 106.33, Moran/Paslay Fax 6-8810, Division Files



111009

Report Number: 2011PS03685

# Laboratory Analysis Report

Laboratory Division

Puget Sound Naval Shipyard and IMF, Code 134, Bremerton, WA 98314-5001

Customer: Code 106.33
Job Order: 91617-4HW75-000
Customer Ref Number: 280508
Lab Code : 134.5
Project/Program: OVERHEAD
Specification for Tests: 40CFR261, Rev 00
Analysis/Service Requested: Hazardous Waste
RequestType: SAR
Metals Group: NONE

Date Submitted: 06-10-2011
Submitted by: PASLAY
Submitter's Phone: 6-7092 Fax: 6-8810
Lab Phone: 476-3406

Prep: Liquid

## Test Results

**Sample Number: W001**
Sample Description: Clear liquid B873 Acid/alkaline sump 12
Traceability Number: 280508
Sampled Date/Time: 06-10-2011 09:15

| Test | Method | Result | Units | Limits | Pass/Fail |
|---|---|---|---|---|---|
| pH Temperature | SM 4500-H | 25 | deg C | | |
| pH | SM 4500-H | 9.0 | | | |

Results relate only to item(s) tested.

| (1) Prepared By: | Date: | Authorized Representative: | Date: |
|---|---|---|---|
| [signature] | 6/10/11 | [signature] 1755hr | 6/10/11 |

(1) The person designated to sign for an action verifies based on personal observation or certified records, and certifies by signature that the action has been performed in accordance with the specified requirements.

Distribution: Code 106.33, FAX 6-8810, Division Files





111009