SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT
RULE 1210 RISK REDUCTION AUDIT AND PLAN
EMISSION INVENTORY YEAR 2015

for

Pacific Ship
Repair & Fabrication Inc.
1625 Rigel Street
San Diego, CA 92113

San Diego Air Pollution Control District
Facility ID# 7067

Submitted to:

San Diego Air Pollution Control District
Air Toxics Engineering Division
10124 Old Grove Rd.
San Diego, CA 92131

Prepared by:

BlueScape Environmental
16870 W. Bernardo Drive, Suite 400
San Diego, California 92127

Submitted: May 12, 2022

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1.0 INTRODUCTION

On November 16, 2021, Pacific Ship Repair & Fabrication Inc. (PacShip) (SDAPCD Facility #7067) received a letter from the San Diego County Air Pollution Control District (SDAPCD or District) that notified PacShip of the need for a risk reduction audit and plan (RRAP) based on the health risk assessment (HRA) approved by the District. The approved HRA was based on the emission inventory year 2015 Toxic Emissions Inventory Report (TEIR). The HRA results indicated that maximum worker chronic non-cancer Health Hazard Index (HHI), the maximum worker 8-hour chronic non-cancer HHI, and the maximum worker acute non-cancer HHI exceed the risk reduction levels specified in District Rule 1210, section (e)(1). Although the Maximum Individual Worker (MEIW) cancer risk exceeded the public notification level of 10 in one million specified in District Rule 1210(d)(1), it did not exceed the risk reduction level of 100 in one million specified in District Rule 1210(e)(1)(ii) for emissions inventory years prior to 2018. Therefore, this risk reduction audit and plan for reporting year 2015 will address proposed risk reduction measures for chronic, 8-hour chronic, and acute non-cancer worker impacts from the HRA.

The chronic, 8-hour chronic, and acute non-cancer results from the HRA based on the emission inventory year 2015 are listed below:

Maximum Worker Chronic Non-Cancer HHI: 2.01
Maximum Worker 8-hour Chronic Non-Cancer HHI: 1.84
Maximum Worker Acute Non-Cancer HHI: 2.75

This report presents the requested RRAP for the chronic, 8-hour chronic, and acute non-cancer health risk impacts on off-site workers. The required SDAPCD General Permit Application form for this permit modification application is included with this RRAP in Appendix A.

2.0 FACILITY INFORMATION

2.1 Address and Contacts

Pacific Ship Repair & Fabrication, Inc.
SDAPCD Facility #7067
1625 Rigel Street
San Diego, CA 92113

Facility Contact:
Mr. David Bain
1625 Rigel Street
San Diego, CA 92113
Work Phone: (619) 232-3200 ext. 111

RRP Preparer Contact:
Mr. James Westbrook
BlueScape Environmental

16870 W. Bernardo Drive, Ste. 400
San Diego, CA 92127
Cell Phone: (858) 774-2009

2.2 Description of Operations

The PacShip facility in San Diego conducts sheet metal product fabrication, coating, and master ship repair for the US Navy and a variety of other military and commercial maritime clients. These services may require welding, precision water-jet cutting, powder coating, sheet metal repair and fabrication, fabrication of water-tight closures such as doors, hatches and manholes for the shipbuilding and repair industry, and ship preservation (blasting and painting). Equipment at the facility includes welding equipment, an abrasive blasting room, and coating booths. The facility is located in a mostly industrial setting approximately a half mile from the ship docks in San Diego Bay.

3.0 RISK REDUCTION EVALUATION

The PacShip facility's abrasive blasting operations, followed by the welding operations, are the biggest contributors to the worker chronic, 8-hour chronic, and acute non-cancer impacts. The chronic HHI is mainly due to nickel (94%) and cadmium (6%); the 8-hour chronic HHI is due entirely to nickel (100%); and the acute HHI is entirely due to nickel (100%). Nickel is emitted from both abrasive blasting and welding operations; cadmium is emitted from abrasive blasting operations only. Therefore, the focus of this RRAP will be to reduce health risk impacts from abrasive blasting and welding operations at the PacShip facility.

3.1 Abrasive Blasting Operations

PacShip's abrasive blasting operations are performed in only one location at the facility: Building 12 (Blast Booth). This building is directly adjacent the off-site worker location to the southwest of the Blast Booth that has the most risk impacts. Blasting operations are entirely enclosed in the Blast Booth and emissions from blasting are collected with 100% capture efficiency. Blasting emissions are then directed to a filter system with 95% control efficiency. The filtered emissions are vented through a stack with a height of approximately 4 ft off the ground and located between the Blast Booth building and the Paint/Spray Booth. Because 100% of the blasting emissions are captured in the enclosed booth, there are no fugitive emissions. In the TEIR reporting year 2015, the only blasting material used was steel shot, which emitted 0.00475 lbs cadmium and 0.048 lbs nickel per ton of steel shot blasted based upon APCD default emission factors.[1]

Emissions of nickel (and to a lesser degree, cadmium) from blasting as reported for 2015 were the primary cause of acute, 8-hr chronic, and chronic non-cancer health

[1] SDAPCD Abrasive Blasting, Steel Shot, Uncontrolled Emission Factors, Method A08. https://www.sdapcd.org/content/dam/sdapcd/documents/permits/emissions-calculation/abrasive-blasting/APCD%20Steel%20Shot%20blast%20Medium%20Site%20Specific%20Controls.pdf

risk. The APCD default emission factors are not expected to be representative of blasting emissions at the PacShip facility. A source test of a grab sample from the blasting booth filter will be needed to determine the most representative emission factors for the components of emissions from abrasive blasting.

Installation of a 99% control efficiency filter on the exhaust stack for the blasting booth will reduce acute, worker chronic, and worker 8-hr chronic risks to below the 1.0 HHI threshold.

3.2 Welding Operations

PacShip's welding operations are performed in multiple locations throughout the facility, but the majority of the welding operations take place in the northwest and southeast ends of Building 24 (Welding Shop). Facility staff estimated for 2015 that 60% of welding operations were in the northwest portion of Building 24, 20% of welding operations were in the southeast portion of Building 24, 15% of welding operations were in Building 16 (Pipe Fitting Shop), and 5% of welding operations were in Building 15 (Sheet Metal Shop).

In 2015, both controlled and uncontrolled welding operations were reported for the TEIR. Controls assumed for controlled welding were based on their use of portable control devices equipped with non-HEPA filters. Capture and control efficiencies of 80% capture/80% control were assumed for the portable devices in the calculation of controlled welding emissions, with 20% of emissions as fugitive emissions. No capture and control efficiencies were assumed for uncontrolled welding emissions, with 100% of the emissions as fugitive emissions.

In March 2022, the District released updated emission factor calculation procedures for welding operations.[2] For some of the welding rods that PacShip was using in 2015, the hexavalent chromium (CrVI) and nickel emission factors were updated to demonstrate a reduction in health risks for this RRAP. These emission factors are considered representative for facility operations.

Health risk impacts due to nickel emissions from welding operations can be reduced by performing welding operations only in a permitted enclosed welding booth with 80% capture, with a blower to direct welding fumes to a filter system fitted with HEPA filters with 99.97% control efficiency. If a welding operation will emit nickel or CrVI, it will not be performed outside of an enclosed welding booth with 80% capture and 99.97% control efficiency (no uncontrolled welding of these materials).

4.0 RISK REDUCTION PLAN

To reduce risks below the Rule 1210 thresholds, the following Plan is proposed:

[2] SDAPCD Welding Operations Emission Factors updated in March 2022 can be found here: https://www.sdapcd.org/content/sdapcd/permits/toxics-emissions/calculation-procedures.html

Abrasive Blasting

1. Utilize site-specific sampling of abrasive blasting media to document site-specific emission factors.

2. Install a 99% control efficiency filter on the blasting booth exhaust stack.

3. Improve documentation of blasting operations, including recording the estimated amount of blast media used per hour/day/year, the duration that blasting occurs, and a description of the materials blasted.

Welding

1. Utilize the updated toxic air contaminant (TAC) emission factors from February 2022 for future health risk impacts.

2. Indoor Welding Booth in Building 17 (Pipe Fitting Shop) – Enclose toxic emission welding areas with flexible curtains during welding operations. Utilize fume extractors during welding. Vent welding booth emissions to the roof through particulate filters. The goal of this plan is to achieve at least 80% capture and 99.97% control of fine (less than 1 μm) particulate matter and TAC emissions.

3. Welding Areas in Building 24 (north and south areas) - Enclose toxic emission welding areas with flexible curtains during welding operations. Utilize fume extractors during welding. Vent welding areas through particulate filters. The goal of this plan is to achieve at least 80% capture and 99.97% control of fine (less than 1 μm) particulate and TAC emissions.

4. Documentation – Record the following at each welding location: welding rod usage in lbs per hour/day/year, by type of welding rod (E316, 309, etc.), and by welding operation type (FCAW, GMAW, etc.). Retain the current Safety Data Sheet (SDS) or other specifications of the welding rods. Confirm for each hour of operation that the welding area is completely enclosed with flexible curtain, fume extractors used, and emissions vented to operated filters.

Toxic emission welding areas are defined for this Plan as any areas utilizing welding rods with non-trace, or 0.1% by weight or more of chromium, nickel, cadmium, or lead as shown by the material SDS or other specifications. Based upon the Risk Reduction demonstration provided in Section 5.0. This plan will be sufficient to reduce acute risk impacts below the Rule 1210 thresholds.

5.0 RISK REDUCTION DEMONSTRATION

To demonstrate that the risk reduction measures proposed in Section 4.0 will decrease acute, 8-hr chronic, and chronic health risk impacts on nearby off-site workers, the emissions reported were recalculated using the proposed capture and control efficiencies for each type of operation, and updated District welding emission

factors. Table 1 shows the reported emissions and the recalculated emissions for each of the welding sources and for the abrasive blasting source.

TABLE 1
PACIFIC SHIP 2015 EMISSIONS PREVIOUSLY REPORTED AND RECALCULATED WELDING AND ABRASIVE BLAST EMISSIONS

AERMOD Source ID	Pollutant	Previously Reported Annual Emissions (lb/yr)	Recalculated Annual Emissions (lb/yr)	Previously Reported Hourly Emissions (lb/hr)	Recalculated Hourly Emissions (lb/hr)
WELD_1	Aluminum	5.20E-02	0	4.47E-03	0
	Chromium (hexavalent)	6.05E-03	2.02E-03	4.31E-05	1.69E-05
	Cobalt	0	4.39E-05	0	3.00E-07
	Copper	6.88E-03	2.36E-05	4.66E-05	1.31E-06
	Manganese	7.40E-02	5.88E-02	3.18E-04	3.32E-04
	Nickel	5.79E-02	3.10E-02	4.26E-04	1.37E-04
	Phosphorus	1.93E-04	0	1.18E-06	0
	Zinc	1.06E-04	0	5.90E-06	0
WELD_2	Aluminum	1.73E-02	0	1.49E-03	0
	Chromium (hexavalent)	2.02E-03	6.75E-04	1.44E-05	5.64E-06
	Cobalt	0	1.46E-05	0	1.00E-07
	Copper	2.29E-03	7.88E-06	1.55E-05	4.38E-07
	Manganese	2.47E-02	1.96E-02	1.06E-04	1.11E-04
	Nickel	1.93E-02	1.03E-02	1.42E-04	4.56E-05
	Phosphorus	6.43E-05	0	3.93E-07	0
	Zinc	3.54E-05	0	1.97E-06	0
WELD_3	Aluminum	1.30E-02	0	1.12E-03	0
	Chromium (hexavalent)	1.51E-03	5.06E-04	1.08E-05	4.23E-06
	Cobalt	0	1.10E-05	0	7.51E-08
	Copper	1.72E-03	5.91E-06	1.17E-05	3.28E-07
	Manganese	1.85E-02	1.47E-02	7.95E-05	8.29E-05
	Nickel	1.45E-02	7.76E-03	1.07E-04	3.42E-05
	Phosphorus	4.82E-05	0	2.95E-07	0
	Zinc	2.66E-05	0	1.48E-06	0
WELD_STK	Aluminum	4.34E-03	0	3.73E-04	0
	Chromium (hexavalent)	5.04E-04	1.69E-04	3.59E-06	1.41E-06
	Cobalt	0	3.65E-06	0	2.50E-08
	Copper	5.73E-04	1.97E-06	3.88E-06	1.09E-07
	Manganese	6.17E-03	4.90E-03	2.65E-05	2.76E-05
	Nickel	4.83E-03	2.59E-03	3.55E-05	1.14E-05
	Phosphorus	1.61E-05	0	9.84E-08	0
	Zinc	8.85E-06	0	4.92E-07	0

TABLE 1
PACIFIC SHIP 2015 EMISSIONS PREVIOUSLY REPORTED AND RECALCULATED WELDING AND ABRASIVE BLAST EMISSIONS

AERMOD Source ID	Pollutant	Previously Reported Annual Emissions (lb/yr)	Recalculated Annual Emissions (lb/yr)	Previously Reported Hourly Emissions (lb/hr)	Recalculated Hourly Emissions (lb/hr)
WELD_1U	Aluminum	2.44E-01	0	3.05E-03	0
	Chromium (hexavalent)	3.21E-03	4.95E-04	1.52E-05	3.42E-06
	Cobalt	0	3.86E-05	0	3.60E-07
	Copper	1.67E-01	3.35E-02	5.62E-03	1.12E-03
	Manganese	4.36E-01	8.72E-02	2.69E-03	5.38E-04
	Nickel	8.59E-02	1.77E-02	2.35E-03	4.73E-04
	Phosphorus	0	0	0	0
	Zinc	6.26E-03	1.20E-03	6.03E-04	1.20E-04
WELD_2U	Aluminum	8.13E-02	0	1.02E-03	0
	Chromium (hexavalent)	1.07E-03	1.65E-04	5.06E-06	1.14E-06
	Cobalt	0	1.29E-05	0	1.20E-07
	Copper	5.58E-02	1.12E-02	1.87E-03	3.75E-04
	Manganese	1.45E-01	2.91E-02	8.96E-04	1.79E-04
	Nickel	2.86E-02	5.91E-03	7.85E-04	1.58E-04
	Phosphorus	0	0	0	0
	Zinc	2.09E-03	4.00E-04	2.01E-04	4.00E-05
WELD_3U	Aluminum	6.10E-02	0	7.62E-04	0
	Chromium (hexavalent)	8.01E-04	1.24E-04	3.80E-06	8.55E-07
	Cobalt	0	9.64E-06	0	9.01E-08
	Copper	4.18E-02	8.36E-03	1.40E-03	2.81E-04
	Manganese	1.09E-01	2.18E-02	6.72E-04	1.35E-04
	Nickel	2.15E-02	4.43E-03	5.89E-04	1.18E-04
	Phosphorus	0	0	0	0
	Zinc	1.57E-03	3.00E-04	1.51E-04	3.00E-05
WELD_4U	Aluminum	2.03E-02	0	2.54E-04	0
	Chromium (hexavalent)	2.67E-04	4.13E-05	1.27E-06	2.85E-07
	Cobalt	0	3.21E-06	0	3.00E-08
	Copper	1.39E-02	2.79E-03	4.68E-04	9.37E-05
	Manganese	3.63E-02	7.27E-03	2.24E-04	4.49E-05
	Nickel	7.16E-03	1.48E-03	1.96E-04	3.94E-05
	Phosphorus	0	0	0	0
	Zinc	5.22E-04	1.00E-04	5.03E-05	1.00E-05
BLST_STK	Cadmium	1.54E-01	3.09E-02	5.94E-05	1.19E-05
	Copper	1.40E-01	2.80E-02	5.38E-05	1.08E-05
	Lead	1.40E-01	2.80E-02	5.38E-05	1.08E-05
	Manganese	1.56E+00	3.12E-01	6.00E-04	1.20E-04
	Nickel	1.56E+00	3.12E-01	6.00E-04	1.20E-04

Table 2 shows the previously modeled health risk results and the recalculated results using the more controlled emissions.

TABLE 2
PACIFIC SHIP 2015 RISK RESULTS
BEFORE AND AFTER RISK REDUCTION MEASURES (RRM)

Risk Type	Risk at PMI		Risk at MEIW	
	Before RRM (HHI)	After RRM (HHI)	Before RRM (HHI)	After RRM (HHI)
Acute Risk	3.64	0.75	2.75	0.57
Worker Chronic Risk	2.68	0.54	2.01	0.40
Worker 8-hr Chronic Risk	2.46	0.49	1.84	0.37

After the proposed risk reduction measures are put into place, acute risk, worker chronic risk, and worker 8-hr chronic risk are all reduced to below the Rule 1210 1.0 HHI threshold.

6.0 RISK REDUCTION SCHEDULE

Rule 1210(e)(2)(iv) and (vi) state that the proposed airborne toxic risk reduction measures must be completed within five years, with interim progress reports provided to the District no less frequently than 12 months from when the plan is approved, and annually thereafter. PacShip plans to comply with these rules, with the goal to complete these proposed risk reduction measures by 2023.

7.0 CONCLUSIONS

PacShip has included all of the required information from Rule 1210(e) regarding the RRAP. The risk reduction activities detailed in this permit modification application serve to update the current permit and show that PacShip is taking all necessary steps to reduce health risk from the facility.

APPENDIX A

GENERAL PERMIT APPLICATION FORM AND FEE ESTIMATE

Internal Use Only	
APP ID: APCD	-APP/CER-
SITE ID: APCD	-SITE-

GENERAL PERMIT OR REGISTRATION APPLICATION FORM

San Diego County Air Pollution Control District

Submittal of this application does not grant permission to construct or to operate equipment except as specified in Rule 24(c).

REASON FOR SUBMITTAL OF APPLICATION:

- ☐ New Installation
- ☐ Amendment to Existing Authority to Construct or Application
- ☐ Change of Permit Conditions
- ☐ Registration of Portable Equipment
- ☐ Existing Unpermitted Equipment or Rule 11 Change
- ☐ Change of Equipment Location
- ☐ Change Permit to Operate Status to Inactive
- ■ Other (Specify) Rule 1210 2015 Risk Reduction Audit and Plan
- ☐ Modification of Existing Permitted Equipment
- ☐ Change of Equipment Ownership *(please provide proof of ownership)*
- ☐ Banking Emissions

List affected APP/PTO Record ID(s): Not applicable

APPLICANT INFORMATION

Name of Business (DBA) Pacific Ship Repair & Fabrication, Inc.

Does this organization own or operate any other APCD permitted equipment at this or any other adjacent locations? ■ Yes ☐ No

If yes, list assigned Site Record IDs listed on your Permits APCD1988-SITE-07300

Name of Legal Owner (if different from DBA)

Equipment Owner	Authority to Construct Mailing Address
Name: Pacific Ship Repair & Fabrication	Name: Same
Mailing Address: 1625 Rigel Street, San Diego, CA 92113	Mailing Address:
City: State: Zip:	City: State: Zip:
Phone: ( )(619) 232-3200 ext.111	Phone: ( )
E-Mail Address: dbain@pacship.com	E-Mail Address:

Permit To Operate Mailing Address	Invoice Mailing Address
Name: Same	Name: Same
Mailing Address:	Mailing Address:
City: State: Zip:	City: State: Zip:
Phone: ( )	Phone: ( )
E-Mail Address:	E-Mail Address:

EQUIPMENT/PROCESS INFORMATION: Type of Equipment: ■ Stationary ☐ Portable, *if portable please enter below the equipment storage address*. If portable, will operation exceed 12 consecutive months at the same location ☐ Yes ☐ No

Equipment Location Address 1625 Rigel Street City San Diego State: CA

Parcel No. Zip 92113 Phone ( ) E-mail: dbain@pacship.com

Site Contact David Bain Phone ( )

General Description of Equipment/Process General Application for Rule 1210 2015 Risk Reduction Audit & Plan

Application Submitted by ■ Owner ☐ Operator ☐ Contractor ☐ Consultant Affiliation

EXPEDITED APPLICATION PROCESSING: ☐ I hereby request Expedited Application Processing and understand that:

a) Expedited processing will incur additional fees and permits will not be issued until the additional fees are paid in full (see Rule 40(d)(8)(iv) for details) b) Expedited processing is contingent on the availability of qualified staff c) Once engineering review has begun this request cannot be cancelled d) Expedited processing does not guarantee action by any specific date nor does it guarantee permit approval.

☐ **This application contains trade secret or confidential information** *(see reverse for instructions)*

I hereby certify that all information provided on this application is true and correct.

[redacted] Date 5-11-22

Print Name David Bain Company Pacific Ship Repair & Fabrication

Phone ( )(619) 232-2300 ext. 111 E-mail Address dbain@pacship.com

Internal Use Only

Date Staff Initials: Amt Rec'd $ Fee Schedule

RNP: EMF: NBF: TA:

10124 Old Grove Rd. – San Diego - California 92131-1649 – (858) 586-2600
www.sdapcd.org

SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT

APPLICATION FEE ESTIMATE

Applicant Site ID/EIF ID:	*APCD1988-SITE-07300*	*NA*	
Applicant DBA:	*Pacific Ship Repair*	Fee Schedule:	JOB
		Reason for Submittal:	Risk Reduction
		Existing Site?	Yes
APCD Engineer:	*Allison Weller*	Estimate Date:	5/12/2022
Equipment Description:	*Hot Spots risk reduction plan (APCD2020-HRA-0045)*		

ACTIVITY	EMPLOYEE CLASSIFICATION	LABOR HOURS	COST	SUBTOTAL	
Initial Evaluation Fee - T&M (Rule 40(d)(3)(i))					
Authority to Construct	Project Engineer		$0.00		
	Senior Engineer		$0.00	$0.00	ETM
Permit to Operate	Project Engineer	40.0	$7,880.00		
	Senior Engineer	10.0	$2,380.00	$10,260.00	ETM
T&M Application - No Fixed Fee, see above					
Authority to Construct/Permit to Operate		N/A	T+M	$0.00	ETM
Additional Evaluation and Processing Fees (Rule 40(d)(5))					
New Source Review	Project Engineer		$0.00		NSR
	Meteorologist		$0.00	$0.00	AQI
Prev. Significant Deterioration	Project Engineer		$0.00	$0.00	PSD
Toxics New Source Review	Project Engineer		$0.00		
(Health Risk Assessment)	Meteorologist		$0.00		
	Air Resources Specialist		$0.00		
	HRA Base Estimate	Standard	$2,124.00	$2,124.00	TNS
Title V	Project Engineer		$0.00		
	Senior Engineer		$0.00	$0.00	TIV
NESHAPS/ATCM/NSPS	Project Engineer		$0.00	$0.00	HAP
CEQA	Project Engineer		$0.00	$0.00	CEQ
AB 3205 Notice	Project Engineer		$0.00		
	Public Notice Costs		$0.00	$0.00	AB3
Equipment subject to	Project Engineer		$0.00		
Rule 11(a)(3)	Senior Engineer		$0.00	$0.00	R51
H&SC 42301(e)	Project Engineer		$0.00		
	Senior Engineer		$0.00	$0.00	HSC
Testing or Test Witness	Project Engineer		$0.00		STF
	Senior Chemist		$0.00		ad-hoc
	Associate Chemist		$0.00		ad-hoc
	Source Test Technician		$0.00		ad-hoc
Fixed Test Fee Sched. NA	Fixed Testing Fees		$0.00	$0.00	ad-hoc
Miscellaneous Fees					
Processing Fee (Rule 40(d)(1)(ii))		1.0	$85	$85.00	EFX
Renewal Fee (Rule 40(e)(2)(ii))		N/A	N/A	$0.00	REN
Emissions Fee (Rule 40(e)(2)(iv))			N/A	$0.00	EMF

ESTIMATE TOTAL: $12,469.00

NOTES:

(1) To avoid possible processing delays, this document should be submitted with your application forms.

(2) The fees contained in this estimate are are based on APCD Rule 40. Final fee may be more or less than this estimate (see Rule 40(d)(1)(iii)).

(3) Emissions determined to be greater than 5 tons per year will be charged a emission fee on a ton per year basis. (see Rule 40 (e)(2)(iv)(A))

(4) Fees paid by credit card will be assessed a 2.19% processing fee (see Rule 40(c)(5))

(5) Federal government payments made through DFAS: Please reference the above liste Site ID Record number in your DFAS submittal.

(6) This estimate is valid only for applications received by the District by June 30, 2020