



Naval Facilities Engineering Systems Command Southwest
BRAC PMO West
San Diego, CA

**Air Monitoring Summary Report
December 1 to December 31, 2021**

Phase IV Non-Time Critical Removal Action, Solid Waste
Disposal Area Westside, Installation Restoration Site 12
Former Naval Station Treasure Island
San Francisco, CA
February 2022



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Disposal Area Westside, Installation Restoration Site 12
Former Naval Station Treasure Island
San Francisco, CA
February 2022

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Acronyms and Abbreviations

AMP	Air Monitoring Plan
BAAQMD	Bay Area Air Quality Management District
BAP(Eq)	benzo(a)pyrene equivalency
cfm	cubic feet per minute
CFR	Code of Federal Regulations
DAC	derived air concentration
DCP	Dust Control Plan
DTSC	Department of Toxic Substances Control
Gilbane	Gilbane Federal
HERO	Human and Ecological Risk Office
IR	Installation Restoration
mg/m ³	milligram per cubic meter
Navy	U.S. Department of the Navy
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PDR	personal data-logging real-time aerosol monitor
PM10	particulate matter less than 10 microns in diameter
PUF	polyurethane foam
Ra-226	radium-226
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TLV	threshold limit value
TSP	total suspended particulates
µg/m ³	microgram per cubic meter
USEPA	United States Environmental Protection Agency
Work Plan	<i>Final Work Plan, Phase IV Non-Time Critical Removal Action, Solid Waste Disposal Area Westside, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California</i>

1.0 Introduction

This Air Monitoring Report was prepared by Gilbane Federal (Gilbane) as requested by the United States Department of the Navy (Navy) under the Radiological Multiple Award Contract (RADMAC II) N62473-12-D-D005, Contract Task Order N6247317F5271. Gilbane is performing dust and air monitoring at Former Naval Station Treasure Island in accordance with the Final Dust Control Plan (DCP) and Air Monitoring Plan (AMP), included as appendices to *Phase IV Non-Time Critical Removal Action Work Plan, Solid Waste Disposal Area Westside, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California* (Work Plan; Gilbane, 2021).

The DCP describes best management practices and procedures to be implemented to minimize dust generation during work activities. Dust monitoring is conducted to ensure that these procedures are effective. Dust monitoring is also conducted to verify that the working environment meets occupational health and safety standards and that workers are safe. The AMP outlines the requirements for prevention of exposure for construction workers to dust and potential airborne chemicals of concern from the work area. The AMP also establishes the conservative project action levels for dust at the work area boundary to protect residents.

This summary report describes the following:

- Dust and air monitoring sampling locations – **Section 2.0**,
- Dust and air monitoring sample collection and analytical methods – **Section 3.0**,
- Dust and air monitoring data – **Section 4.0**, and,
- Dust and air monitoring results – **Section 5.0**.

This summary report presents the dust and air monitoring test results at Installation Restoration (IR) Site 12 from December 1st through December 31st, 2021 and compares the results with the established action levels included in the Work Plan (Gilbane, 2021). During this reporting period, the Site 12 air monitoring stations (AMSW1 and AMSW2) operated on December, 1st, 2nd, 3rd, 6th, 7th, 8th, 9th, and 10th for earth-moving tasks involving potentially contaminated soil. The air monitoring stations were shut down for the remainder of the month as operationally the crew was receiving clean import backfill soil and not performing earth-moving tasks involving potentially contaminated soil. Dust monitoring using the PDR stations continued through the duration of the month while the field team acquired clean import soil and began grading.

During the reporting period, personal data-logging real-time aerosol monitoring (PDR) dust data was collected. Air samples were collected and analyzed for lead, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), dioxin [2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)], total suspended particulates (TSP), and particulate matter less than 10 microns in diameter (PM10). In addition, air samples were analyzed for radiological gross alpha and beta levels.

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2.0 Monitoring Site Locations

2.1 Dust Monitoring

During earthmoving activities, several PDR stations are set up to monitor real-time airborne dust concentrations. The purpose of the PDR stations is to act as a first line of defense in protecting workers' health, and ultimately the public's health, during field activities. PDR stations are situated immediately adjacent to the current work area locations most likely to generate the greatest volume of airborne dust and are adjusted as necessary due to changes in wind direction and/or work location. Real-time dust monitoring ensures dust levels remain below action levels during fieldwork operations.

The general locations for dust monitors in IR Site 12 are shown on **Figure 1**. Specific locations of each PDR are described in the individual PDR daily data files. Field forms from each location are presented in **Attachment 1** of this report. During earth moving activities at IR Site 12 (i.e., transportation of excavated soil to the radiological screening yard, excavation, and backfilling), one PDR serves as the upwind (background) location (DMW7, DMW13, DMW16, DMW19) and two PDRs are placed in downwind perimeter locations (DMW8, DMW9, DMW14, DMW15, DMW17, DMW18, DMW20, DMW21).

2.2 Air Monitoring

Air monitoring samples collected using high volume samplers are collected to identify and quantify airborne contaminants and to confirm the results recorded during dust (PDR) monitoring. Air monitoring stations are mobilized to collect air monitoring samples upwind and downwind of work areas. General locations of the IR Site 12 air monitoring stations are shown on **Figure 1**. The locations of the air monitoring stations are determined based on the prevailing wind direction (typically from the southwest) and are modified as needed.

Weather forecasts including wind direction are checked daily with a weather station located at Building 572. The weather station records temperature, pressure, wind speed and direction, etc., every 30 minutes, 24 hours per day. Wind speed is also monitored near the work site during soil excavation and handling to ensure that work is stopped if sustained winds over 25 miles per hour are encountered. No work stoppages due to sustained wind speed exceedances were required during this reporting period. Wind speed and direction data gathered during work hours for this reporting period, presented on a wind rose diagram in **Figure 2**, generally depict the wind blowing between the South and West directions at 3-6 miles/hour with gusts up to 10 miles/hour. Detailed weather data is not reported in this document but can be provided upon request.

High volume air monitoring stations remain stationary while sampling is being conducted; however, locations may be adjusted when the wind direction changes and

when overall excavation work areas change from one site to another. Each upwind and downwind high-volume monitoring station includes separate monitoring systems for the following:

- TSP - collected daily
- PM10 - collected daily
- Lead - collected daily
- PAHs, PCBs, and dioxin - collected on alternating days

2.3 Radiological Air Monitoring

Radiological air samplers are positioned adjacent to excavation work activities for radiologically impacted soil at one upwind and one downwind location during earthmoving activities associated with radiologically impacted soil. The radiological air samplers may be co-located with PDRs or the high-volume samplers.

3.0 Sampling and Analytical Methods

Dust and air samples are collected during earthmoving activities. However, during precipitation events, the dust and air monitoring units may not be operable. An attempt will be made to collect samples and readings regardless of the weather. If dust or air monitors are found to be malfunctioning or nonfunctional, earthmoving activities will stop until monitors can be repaired or replaced. The Site Health and Safety Officer is responsible for monitoring the air and dust monitoring sampling equipment. In rare cases, due to ancillary equipment malfunction such as generator failure during the night, a sample may be collected that represents a period of less than 24 hours. If this situation occurs, a note is added to the sample result data tables indicating why the full sampling period was not achieved. All AMS samplers run approximately 24 hours before the sample is collected however per FCR04 the final set of samples for the week will be collected on the last workday of the week once intrusive activities have finished for the day. These samples will have a runtime of 8-10 hours to cover the full work shift which meets the minimum 4-hour runtime required for lab analysis. Two sets of samples will be sent to the lab for examination on that final workday of the week. The results will be adjusted for the reduced runtime and fully comparable against project screening criteria.

3.1 Dust Samples

The PDR is a high sensitivity photometric monitor with a light-scattering sensing configuration that has been optimized for the measurement of the respirable fraction of airborne dust, smoke, fumes, and mists. PDRs are used to evaluate real-time monitoring of airborne dust concentrations, to determine if there is a need for additional dust control or personal protection.

3.2 Air Samples

Air samples were sampled in accordance with the United States Environmental Protection Agency (USEPA) reference sampling method for PM₁₀, described in 40 Code of Federal Regulations (CFR) 50, Subpart J. Each sample was collected on a filter over an approximately 24-hour period; the filter was then weighed to determine the amount of PM₁₀ collected.

TSP samples were collected with a high-volume (39 to 60 cubic feet per minute [cfm]) air sampler in accordance with USEPA's reference sampling method for TSP, described in Title 40 CFR, Part 50, Subpart B. Each sample was collected on a filter over an approximately 24-hour period; the filter was then weighed to determine the amount of TSP collected. Once the filter weight was determined, the sample was analyzed for lead in accordance with USEPA Method 6020 using inductively coupled mass spectrometry.

Air samples for PCBs, PAHs, and dioxin are collected and analyzed in accordance

with USEPA Methods TO-4A, TO-13, TO-9A, respectively, using TISCH polyurethane (PUF) samplers. The filter media collected from the air samplers is submitted to the analytical laboratory for appropriate analysis.

PCB, PAH, and dioxin samples are collected on alternating days at the downwind and upwind stations during earthmoving activities.

3.3 Radiological Air Samples

Radiological air monitoring is also conducted upwind and downwind on days of earthmoving activities. Radiological samples are collected with a LV-1 low volume air sampler. Air filters are counted on site following a decay period and are compared with public air concentration limits published in 10 CFR Part 20. Radiological air sampling methods and procedures are detailed in Gilbane Radiological Procedure PR-RP-150 *Radiological Survey and Sampling* (Gilbane, 2016).

The radiological air sample is counted on a Low Background Protean WPC-9950 and analyzed for gross alpha and beta activity. The calculated airborne concentration in microcuries is then compared to the effluent concentration (often but incorrectly refer to as a derived air concentration [DAC] which applies only to occupational exposures) limit specified in Table 2 of Appendix B to 10 CFR 20. The effluent concentration is the concentration of a given radionuclide in air which, if inhaled continuously over the course of a year, results in an exposure equal to the annual regulatory limit specified in 10 CFR 20.1302. The threshold for radiological effluent air monitoring samples is 10 percent of the effluent concentration, which ensures work practices are evaluated and modified as necessary to ensure the limit is not reached.

4.0 Dust Monitoring Results

If dust (PDR) monitoring equipment alarms, the source of exceedance will be determined by evaluating both upwind and downwind dust (PDR) sample locations. If the difference between upwind and downwind concentrations is greater than the action level for a sustained period of 15 minutes, then earthmoving activities will be halted until dust control measures are implemented. These may include, but are not limited to, adding water to the work area during earth moving tasks, evaluation of alternate work procedures or equipment, and/or cessation of the activity that is creating the dust until the PDR readings are below the screening criteria.

Dust monitoring action levels that are implemented on a real-time basis are listed in **Table 1**. PDR data are collected and reviewed each day by the Site Health and Safety Manager. PDR data are included in **Attachment 1**.

On December 1st, 2nd, 6th, and 21st PDR readings were observed above project screening criteria, however, the delta between the upwind and downwind monitors remained below action levels. On these days the field team documented foggy, hazy, and or thick low hanging marine layer conditions presented in **Attachment 1**. On the days mentioned above elevated or high readings were noted during setup before any intrusive activities had begun. In conclusion, field work continued as field activities were not generating visible dust and onsite atmospheric conditions generated elevated PDR data. On December 3rd dust levels were detected above action limits however no atmospheric conditions were noted on filed documentation. Field work continued as no visible dust generation was documented and the delta between the upwind and downwind PDR stations was well below project dust action limits.

Table 1: Dust Monitoring Project Action Levels

Method	Monitoring Location	Monitoring Frequency ^a	Action Level ^b	Action
PDR	Near Workers' Breathing Zones (typically on equipment)	Periodically ^c	<2.0 mg/m ³ >2.0 mg/m ³	<2.0 mg/m ³ continue work in Level D. Increase dust control (i.e., apply water or other suppression method) and/or upgrade to Level C if concentrations >2.0 mg/m ³ .
	Job Site Perimeter	Continuously	<1.0 mg/m ³ >1.0 mg/m ³	Continue work. STOP work, apply water or other dust suppression methods until levels decrease below 1.0 mg/m ³

Notes:

Only the Health and Safety Manager is authorized to downgrade levels of personal protective equipment.

- ^a Frequency of air monitoring may be adjusted by the project Certified Industrial Hygienist after sufficient characterization of site contaminants has been completed, tasks have been modified, or site controls have proven effective.
- ^b Five readings exceeding the action level in any 15-minute period or a sustained reading exceeding the action level for five minutes will trigger a response. Action levels represent airborne particulate concentrations in excess of background particulate concentrations.
- ^c PDR will be monitored a minimum of three times a day.
- < less than
- > greater than
- mg/m³ milligrams per cubic meter
- PDR personal data-logging real-time aerosol monitor

Table 2: Air Monitoring Project Screening Criteria

Chemicals of Concern	Project Screening Criteria (Threshold Limit Value) $\mu\text{g}/\text{m}^3$	Basis
Lead	1,575	TI Site 12 Subchronic Dust Action Level
TSP	50	TI Site 12 Dust Action Level
PM10	50	BAAQMD Ambient Air Quality Standard
BAP(Eq)	55,330	TI Site 12 Chronic Dust Action Level
PCBs ^a	NA	TI Site 12 Dust Action Level
Dioxin ^a	1E+07	TI Site 12 Chronic Dust Action Level
Radiological (Ra-226)	10% of DAC ^c	Occupational and public air concentration limits for Ra-226 published in 10 Code of Federal Regulations Part 20.

Notes:

- ^a The dust action level was increased by a factor of 10 to account for the short-term duration of the project relative to the lifetime assumptions incorporated into the toxicity criteria and exposure assumption.
- ^b BAP(Eq) action level will be ~55 mg/m^3 for all excavations
- ^c Public air concentration limits are commonly referred to as DAC, but are actually Effluent Concentrations from Table 2 for 10 CFR Part 20.

BAAQMD	Bay Area Air Quality Management District
BAP(Eq)	benzo(a)pyrene equivalency
DAC	derived air concentration
mg/m^3	milligrams per cubic meter
PCBs	polychlorinated biphenyls
PM10	particulate matter smaller than 10 microns in diameter
Ra-226	radium-226
TSP	total suspended particulates
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter

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5.0 Air Monitoring Results

The Human and Ecological Risk Office (HERO) at the request of the California Department of Toxic Substances Control (DTSC) developed dust action levels for community air monitoring for IR Site 12. Sub-chronic and chronic dust action levels as PM10 were calculated for lead, dioxin, benzo(a)pyrene (BAP) equivalency (Eq) by PAHs analysis, and PCBs. As presented in the document *Dust Action Levels for Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California* (HERO, 2018), the action levels were calculated using the maximum chemicals of concern soil concentrations at IR Site 12.

Based on HERO's recommendations, a PM10 dust action level of 50 microgram per cubic meter ($\mu\text{g}/\text{m}^3$) will be implemented for all excavation areas at IR Site 12. TSP is expected to be further controlled based on the limit employed for PM10, in accordance with guidance provided by the San Francisco Bay Area Air Quality Management District (BAAQMD), which estimates that PM10 makes up approximately 55 percent of TSP. If it is apparent that project activities are the cause of exceedances, additional control measures will be considered and implemented.

Analytical results from air monitoring samples are compared with the project screening criteria (threshold limit values [TLV]) listed in **Table 2**. Air monitoring results are included in **Attachment 2**. Weather information (including ambient pressure and temperature data) and high-volume air monitoring sample results are presented in **Attachment 2**. Weather information was collected from the weather station at Building 572, Avenue M, Treasure Island, San Francisco, California. Radiological air monitoring results are presented in **Attachment 3**.

PM10 analytical results from December 2021 did not exceed the project-specific screening criteria presented in **Table 2-2**.

TSP analytical results from December 2021 did not exceed project-specific screening criteria presented in **Table 2-3**.

Metals (lead), PAHs, total PCBs, and dioxin analytical results from December 2021, did not exceed the project-specific screening criteria presented in **Table 2**.

On December 7th, 2021 the field team documented a generator malfunction at the upwind AMSW1 air sampler. It was determined that the GFCI had tripped overnight due to a rain event ultimately shutting off the AMS stations overnight. The breaker was reset when field personnel arrived onsite the next morning and the stations operated according to design. The sample media runtime ran greater than the four hour minimum so the samples were sent for analysis. The results were adjusted for the smaller runtime which makes the data accurate and valid.

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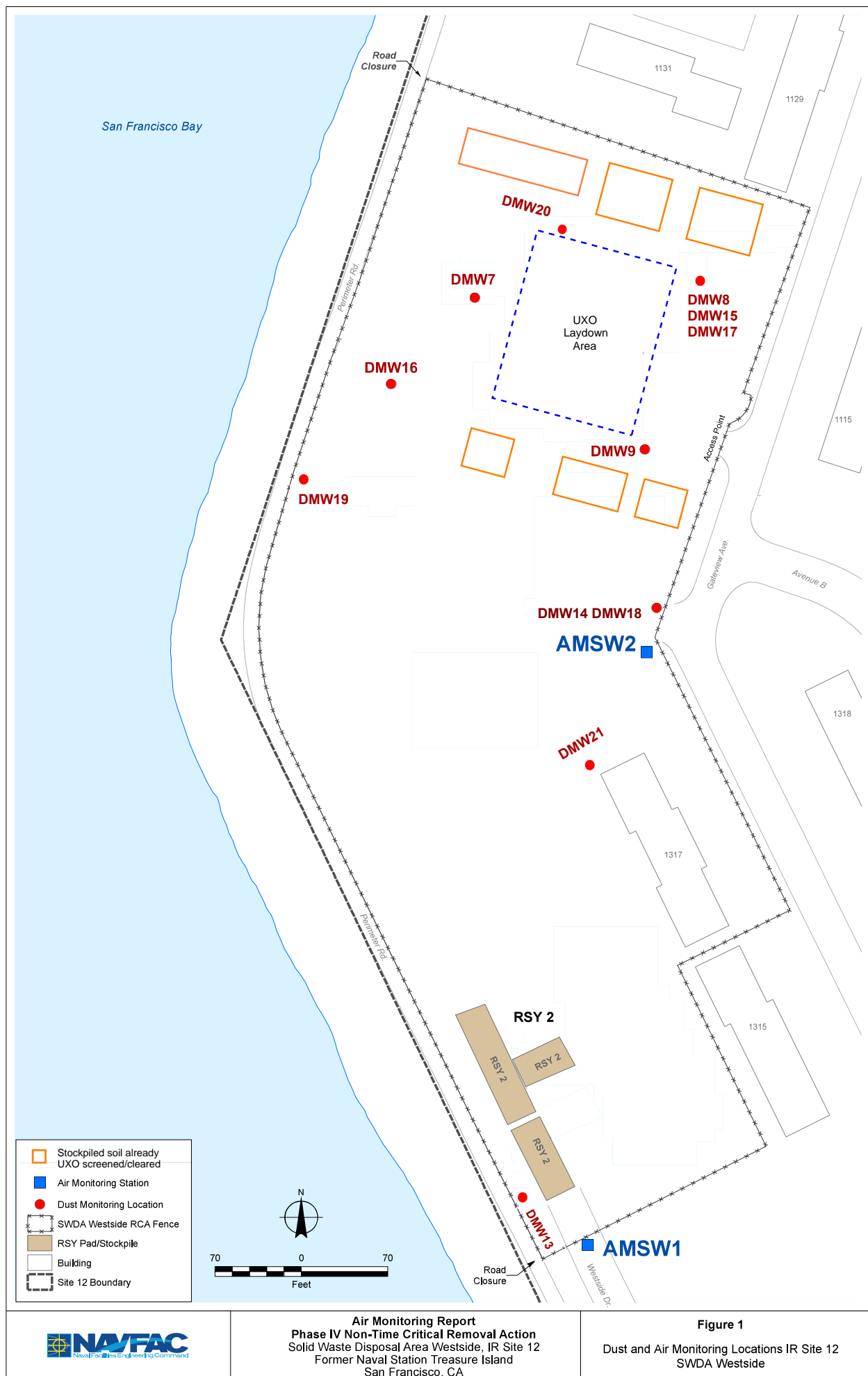
6.0 References

- Gilbane, 2016. *Radiological Procedure PR-RP-150 Radiological Survey and Sampling*. January.
- Gilbane, 2021. *Phase IV Non-Time Critical Removal Action Work Plan, Solid Waste Disposal Area Westside, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. March.
- Gilbane, 2021. *Phase IV Non-Time Critical Removal Action Work Plan, Air Monitoring Plan, Solid Waste Disposal Area Westside, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. March.
- Gilbane, 2021. *Phase IV Non-Time Critical Removal Action Work Plan, Dust Control Plan, Solid Waste Disposal Area Westside, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. March.
- HERO, 2018. *Dust Action Levels for Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. September.

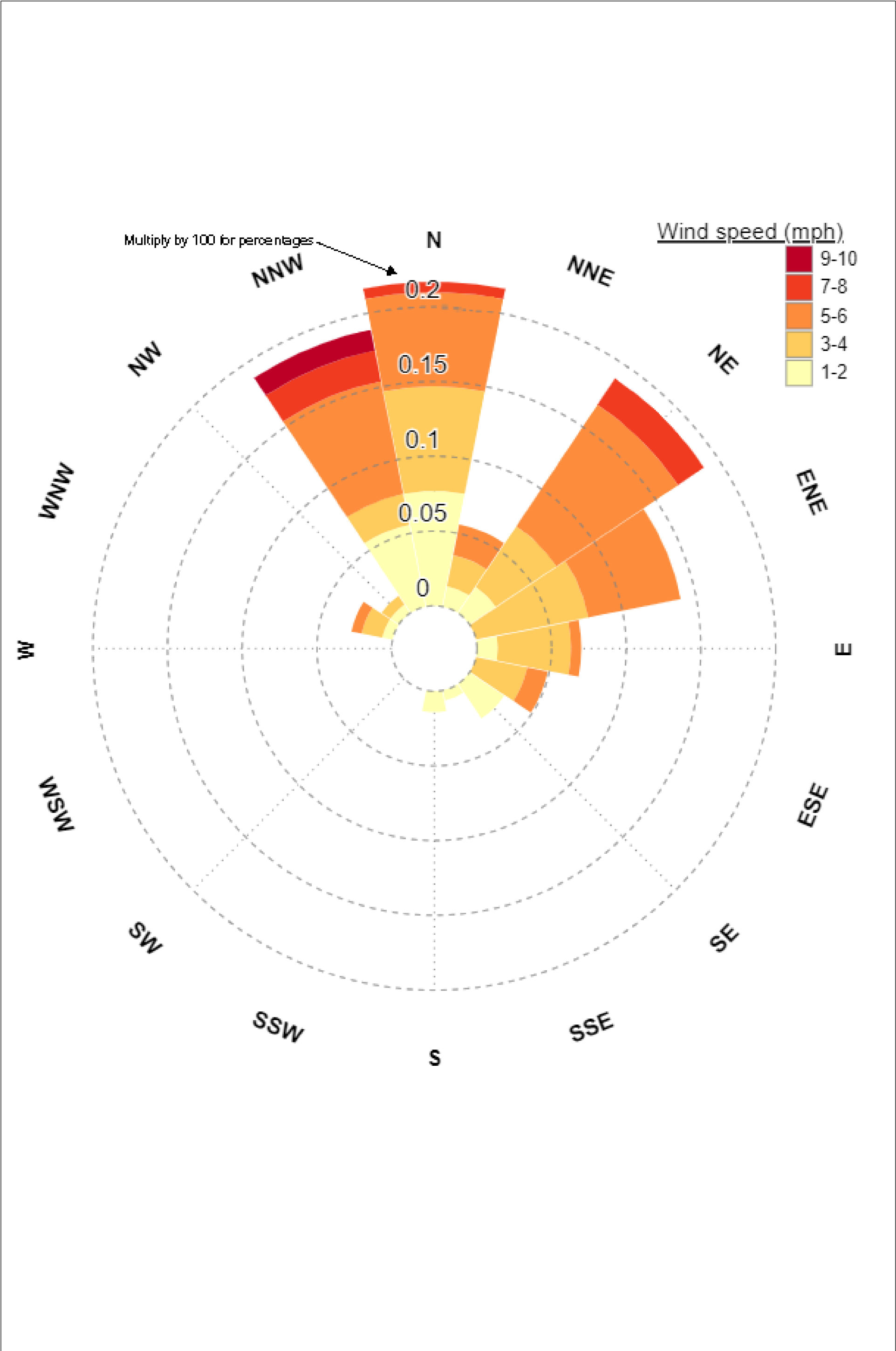
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FIGURES

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Air Monitoring Report
Phase IV Non-Time Critical Removal Action
Solid Waste Disposal Area Westside, IR Site 12
Former Naval Station Treasure Island
San Francisco, CA

Figure 2
Wind Rose
IR Site 12 SWDA Westside

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ATTACHMENT 1
PDR SUMMARY TABLE AND FIELD FORMS
(Provided on CD)

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Table 1-1: Personal Data-Logging Real-Time (PDR) Aerosol Monitoring Results

DustTrak Unit	IR Site	Date	Maximum ¹ (mg/m ³)	Average ¹ (mg/m ³)	Delta Between Upwind and Downwind Stations (mg/m ³)	Below action level? (0.050 mg/m ³) (Yes/No)
DMW7	Site 12	12/1/2021	0.112	0.075	NA	Yes
DMW8	Site 12		0.108	0.077	0.002	Yes
DMW9	Site 12		0.117	0.077	0.002	Yes
DMW16	Site 12	12/2/2021	0.157	0.076	NA	Yes
DMW17	Site 12		0.161	0.088	0.012	Yes
DMW18	Site 12		0.149	0.079	0.003	Yes
DMW16	Site 12	12/3/2021	0.064	0.039	NA	Yes
DMW17	Site 12		0.066	0.039	0.000	Yes
DMW18	Site 12		0.074	0.044	0.005	Yes
DMW16	Site 12	12/6/2021	0.120	0.098	NA	Yes
DMW17	Site 12		0.128	0.101	0.003	Yes
DMW18	Site 12		0.125	0.097	-0.001	Yes
DMW7	Site 12	12/7/2021	0.035	0.024	NA	Yes
DMW8	Site 12		0.036	0.025	0.001	Yes
DMW9	Site 12		0.040	0.026	0.002	Yes
DMW7	Site 12	12/8/2021	0.034	0.012	NA	Yes
DMW8	Site 12		0.038	0.013	0.001	Yes
DMW9	Site 12		0.040	0.011	-0.001	Yes
DMW13	Site 12		0.006	0.005	NA	Yes
DMW14	Site 12		0.002	0.001	-0.004	Yes
DMW15	Site 12		0.004	0.003	-0.002	Yes
DMW16	Site 12	12/9/2021	0.009	0.005	NA	Yes
DMW17	Site 12		0.009	0.006	0.001	Yes
DMW18	Site 12		0.015	0.007	0.002	Yes
DMW16	Site 12	12/10/2021	0.008	0.005	NA	Yes
DMW17	Site 12		0.009	0.006	0.001	Yes
DMW18	Site 12		0.008	0.006	0.001	Yes
DMW19	Site 12	12/13/2021	0.013	0.009	NA	Yes
DMW20	Site 12		0.021	0.012	0.003	Yes
DMW21	Site 12		0.015	0.014	0.005	Yes
DMW19	Site 12	12/14/2021	0.004	0.002	NA	Yes
DMW20	Site 12		0.004	0.003	0.001	Yes
DMW21	Site 12		0.012	0.003	0.001	Yes
DMW19	Site 12	12/15/2021	0.008	0.005	NA	Yes
DMW20	Site 12		0.007	0.005	0.000	Yes
DMW21	Site 12		0.009	0.006	0.001	Yes
DMW19	Site 12	12/16/2021	0.011	0.003	NA	Yes
DMW20	Site 12		0.019	0.006	0.003	Yes
DMW21	Site 12		0.011	0.005	0.002	Yes
DMW19	Site 12	12/17/2021	0.023	0.015	NA	Yes
DMW20	Site 12		0.029	0.020	0.005	Yes
DMW21	Site 12		0.030	0.019	0.004	Yes
DMW19	Site 12	12/20/2021	0.032	0.027	NA	Yes
DMW20	Site 12		0.034	0.028	0.001	Yes
DMW21	Site 12		0.039	0.027	0.000	Yes
DMW19	Site 12	12/21/2021	0.047	0.035	NA	Yes
DMW20	Site 12		0.055	0.045	0.010	Yes
DMW21	Site 12		0.049	0.043	0.008	Yes

Notes:

bold = results above screening criteria

mg/m³ = milligrams per cubic meter

NA = not applicable

¹ Maximum and average dust readings from daily PDR data downloads. Data are available upon request.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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Date _____

1216121

Project No. J310000800 SWDA Westside, Site 12, Treasure Island

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Logged by

Logan Schwing

Weather

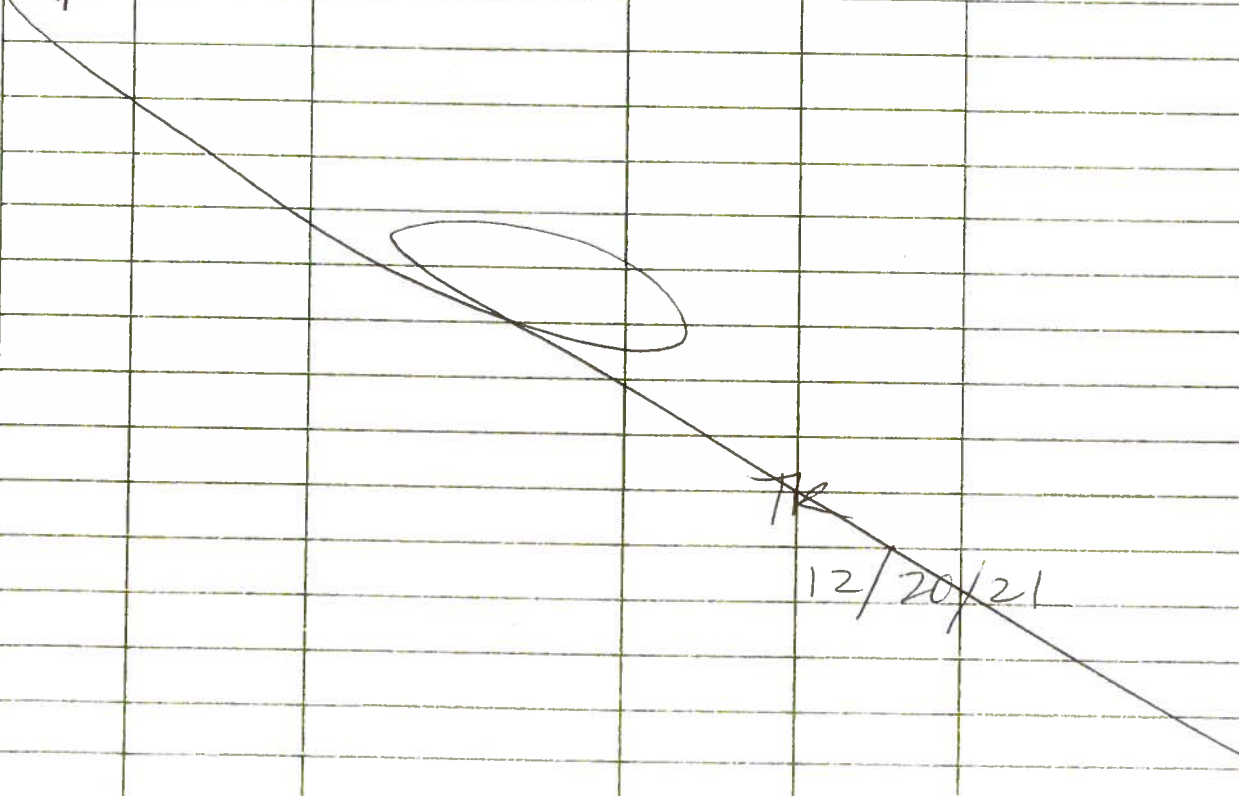
45°F - 57°F. Some clouds & Sun.

Instrument Type: Dust Trak II

Calibration Standards Used Factory Calibrated

[illegible]

[illegible]

Time	Dust Monitoring Station Number	Location	Instrument Reading (mg/m ³)	Unit Number	Activities Remarks
0800	DMW 19	upwind of import fill	0.025	2845	mobilization
↓	DMW 20	downwind import fill	0.032	2341	
↓	DMW 21	downwind import fill	0.033	2726	
1245	DMW 19		0.030		Moving import fill
↓	DMW 20		0.031		
↓	DMW 21		0.031		
1415	DMW 19		0.029		Moving import fill
↓	DMW 20		0.032		
↓	DMW 21		0.032		
					
12/20/21					

AIR MONITORING LOG

Client Name NAVFAC

Date _____

12 | 21 | 2

Project No. J31000800 SWDA Westside, Site 12, Treasure Island Page 1 of 1

Logged by Logan Schwing

Weather 39°F-51°F. PM rain, AM haze/fog

Instrument Type: Dust Trak II

Calibration Standards Used Factory Calibrated

[illegible]

ATTACHMENT 2
SUMMARY OF AIR MONITORING AND
AIR SAMPLING RESULTS
(Provided on CD)

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Table 2-1: Ambient Pressure and Temperature Monitoring Results

Sample Date	Ambient Pressure (inches of Hg)	Ambient Temperature (°F)	Ambient Temperature (°K)
12/1/2021	30.10	58.26	287.74
12/2/2021	30.09	59.17	288.24
12/3/2021	30.10	54.33	285.56
12/3/2021	30.12	53.44	285.06
12/7/2021	30.05	51.29	283.87
12/8/2021	30.03	54.40	285.59
12/9/2021	29.98	52.90	284.76
12/10/2021	30.08	51.27	283.86
12/10/2021	30.22	52.60	284.59

Notes:

Weather data collected from weather station at Building 572, Avenue M, Treasure Island, San Francisco, CA

°F = Degrees Fahrenheit

Hg = mercury

°K = Degrees Kelvin

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Table 2-2: Particulate Matter Smaller than Ten Microns (PM10)

Location ID	Sampling Period (Hours)	Sample Date	Particulate Matter Less Than 10 Microns in Diameter (ug/m ³)	Delta between Downwind and Upwind Stations (ug/m ³)	PM10 Exceedance? (Yes/No)
Screening Criteria					50
AMSW1	23.34	12/01/2021	30	NA	NA
	23.47	12/02/2021	40	NA	NA
	21.47	12/03/2021	24	NA	NA
	7.31	12/03/2021	19	NA	NA
	9.74*	12/07/2021	33	NA	NA
	24.08	12/08/2021	14	NA	NA
	23.44	12/09/2021	8.7	NA	NA
	21.1	12/10/2021	9.8	NA	NA
	6.85	12/10/2021	4.9	NA	NA
AMSW2	23.63	12/01/2021	31	1	No
	23.76	12/02/2021	43	3	No
	21.98	12/03/2021	26	2	No
	7.35	12/03/2021	23	4	No
	23.53	12/07/2021	40	7	No
	24.4	12/08/2021	16	2	No
	23.82	12/09/2021	8	-0.7	No
	21.56	12/10/2021	13	3.2	No
	7.0	12/10/2021	30	25.1	No

Notes:

ug/m³ = micrograms per cubic meter

NA = Not applicable

PM10 = particulate matter less than 10 microns in diameter

* = generator/sampler malfunction

bold = result above screening criteria

Table 2-3: Total Suspended Particulates Monitoring Results

Location ID	Sampling Period (Hours)	Sample Date	Total Suspended Particulate (ug/m ³)	Delta Between Downwind and Upwind Stations (ug/m ³)	TSP Exceedance? (Yes/No)
Screening Criteria					50
AMSW1	20.01	12/01/2021	45.2137	NA	NA
	22.66	12/02/2021	55.2229	NA	NA
	20.8	12/03/2021	35.2547	NA	NA
	7.29	12/03/2021	31.221	NA	NA
	9.75*	12/07/2021	46.4543	NA	NA
	24.07	12/08/2021	20.9864	NA	NA
	23.46	12/09/2021	12.6545	NA	NA
	21.11	12/10/2021	15.0202	NA	NA
AMSW2	6.83	12/10/2021	12.6875	NA	NA
	23.63	12/01/2021	42.3224	-2.8913	No
	23.77	12/02/2021	52.2834	-2.9395	No
	21.97	12/03/2021	39.7679	4.5132	No
	7.37	12/03/2021	37.2325	6.0115	No
	23.54	12/07/2021	57.5265	11.0722	No
	24.42	12/08/2021	24.4737	3.4873	No
	23.82	12/09/2021	15.224	2.5695	No
	21.56	12/10/2021	22.3354	7.3152	No
	7.01	12/10/2021	41.9641	29.2766	No

Notes:

J = estimated value

ug/m³ = micrograms per cubic meter

NA = Not applicable

TSP = total suspended particulate

bold = results above screening criteria

* = generator/sampler malfunction

Table 2-4: Lead by EPA 6020 Monitoring Results

Location ID	Sampling Period (Hours)	Sample Date	Lead (ug/m ³)	Lead Exceedance? (Yes/No)
Screening Criteria				1,575
AMSW1	23.34	12/01/2021	0.0039	No
	23.47	12/02/2021	0.0047	No
	21.47	12/03/2021	0.002	No
	7.31	12/03/2021	0.0033	No
	9.74*	12/07/2021	0.0024	No
	24.08	12/08/2021	0.0013	No
	23.44	12/09/2021	0.00082	No
	21.1	12/10/2021	0.0012	No
	6.85	12/10/2021	0.0017 J	No
AMSW2	23.63	12/01/2021	0.0045	No
	23.76	12/02/2021	0.0062	No
	21.98	12/03/2021	0.0022	No
	7.35	12/03/2021	0.0024	No
	23.53	12/07/2021	0.0034	No
	24.4	12/08/2021	0.0021	No
	23.82	12/09/2021	0.00074	No
	21.56	12/10/2021	0.0019	No
	7.0	12/10/2021	0.005	No

Notes:

J = indicates an estimated value

ug/m³ = micrograms per cubic meter

* = generator/sampler malfunction

bold = results above screening criteria

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Location ID	Sampling Period (Hours)	Sample Date	BAP(Eq) Exceed-ance? (Yes/No)	BAP(Eq)	2-Methyl-naph-thalene (ug/m³)	Acenaph-thene (ug/m³)	Acenaph-thylene (ug/m³)	Anthracene (ug/m³)	Benzo(a) anthracene (ug/m³)	Benzo(a) pyrene (ug/m³)	Benzo(b) fluoran-thene (ug/m³)	Benzo(g,h,i) perylene (ug/m³)	Benzo(k) fluoran-thene (ug/m³)	Chrysene (ug/m³)	Dibenz(a,h)anth-racene (ug/m³)	Fluoran-thene (ug/m3)	Fluorene (ug/m3)	Indeno (1,2,3-c,d) pyrene (ug/m3)	Naph-thalene (ug/m3)	Phenan-threne (ug/m3)	Pyrene (ug/m3)
Screening Criteria ¹				55,330	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
AMSW1	23.5	12/02/2021	No	0	0.0052	0.00065	< 0.00055	< 0.00055	< 0.00055	< 0.00055	< 0.00055	< 0.00055	< 0.00055	< 0.00055	< 0.00055	0.00044 J	0.0008	< 0.00055	0.012	0.0012	0.0003 J
	9.76*	12/07/2021	No	0	0.0096	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	< 0.0012	0.00069 J	< 0.0012	0.013	0.00095 J	< 0.0012
	21.12	12/10/2021	No	0	0.0017	0.00025 J	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.00026 J	< 0.0006	0.0056	0.00046 J	< 0.0006
AMSW2	23.77	12/02/2021	No	0	0.0054	0.00061	< 0.00052	0.00036 J	< 0.00052	< 0.00052	< 0.00052	< 0.00052	< 0.00052	< 0.00052	< 0.00052	0.0012	0.0011	< 0.00052	0.012	0.0045	0.00074
	23.54	12/07/2021	No	0	0.009	0.0005	< 0.00047	0.00049	< 0.00047	< 0.00047	< 0.0017	< 0.00047	< 0.00047	< 0.00047	< 0.00047	0.00097	0.001	< 0.00047	0.011	0.0039	0.00066
	21.57	12/10/2021	No	0	0.0022	0.00026 J	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	0.0003 J	0.00037 J	< 0.00056	0.0063	0.0011	< 0.00056

Notes:

¹ The dust action level was adjusted by a factor of 10 to account for the short-term duration of the project.

NA = Not applicable

NE = None established

BAP(Eq) = Benzo(a)pyrene equivalency

J = estimated value

ug/m³ = micrograms per cubic meter

bold = results above screening criteria

* = PUF sampler/generator malfunction

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Table 2-6: Polychlorinated Biphenyls by TO-4A Monitoring Results

Location ID	Sampling Period (Hours)	Sample Date	Total PCB Exceedance? (Yes/No)	Total PCB	PCB-1016 (Aroclor 1016) (ug/m ³)	PCB-1221 (Aroclor 1221) (ug/m ³)	PCB-1232 (Aroclor 1232) (ug/m ³)	PCB-1242 (Aroclor 1242) (ug/m ³)	PCB-1248 (Aroclor 1248) (ug/m ³)	PCB-1254 (Aroclor 1254) (ug/m ³)	PCB-1260 (Aroclor 1260) (ug/m ³)
Screening Criteria				NE							
AMSW1	21.49	12/03/2021	NA	0	< 0.00082	< 0.00082	< 0.00082	< 0.00082	< 0.00082	< 0.00082	< 0.00082
	24.04	12/08/2021	NA	0	< 0.00077	< 0.00077	< 0.00077	< 0.00077	< 0.00077	< 0.00077	< 0.00077
	6.79	12/10/2021	NA	0	< 0.0026	< 0.0026	< 0.0026	< 0.0026	< 0.0026	< 0.0026	< 0.0026
AMSW2	21.99	12/03/2021	NA	0	< 0.00078	< 0.00078	< 0.00078	< 0.00078	< 0.00078	< 0.00078	< 0.00078
	24.39	12/08/2021	NA	0	< 0.00065	< 0.00065	< 0.00065	< 0.00065	< 0.00065	< 0.00065	< 0.00065
	7.00	12/10/2021	NA	0	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022	< 0.0022

Notes:

NA = Not applicable

NE = None established

PCB = polychlorinated biphenyl

ug/m³ = micrograms per cubic meter

< = nondetected less than associated reporting limit

J = estimated value

* = sampler/generator malfunction

Table 2-7: Dioxin as 2,3,7,8-TCDD by TO-9A Monitoring Results

Location ID	Sampling Period (Hours)	Sample Date	2,3,7,8-Tetrachlorodibenzo-p-dioxin (ug/m ³)	Dioxin Exceedance? (Yes/No)
Screening Criteria				10,000,000 ug/m³
AMSW1	23.35	12/01/2021	< 0.00000002	No
	7.23	12/03/2021	< 0.00000006	No
	23.42	12/09/2021	< 0.00000002	No
AMSW2	23.62	12/01/2021	< 0.00000002	No
	7.34	12/03/2021	< 0.00000006	No
	23.81	12/09/2021	< 0.00000002	No

Notes:

J = estimated value

ug/m³ = micrograms per cubic meter

< = nondetected less than associated reporting limit

bold = results above screening criteria

ATTACHMENT 3
RADIOLOGICAL AIR MONITORING RESULTS
(Provided on CD)

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AIR SAMPLING EQUIPMENT

Project Information								Effective as of: 31 Jan 2022			
Contract / Task Order Number: N62473-17-D-0005		Project Title / Location: IR Site 12 RD/RA, Treasure Island, SF, CA				Gilbane Project Number: J310000800					
Perimeter/Effluent Air Sampling Equipment				Breathing Zone Air Sampling Equipment							
Equip Number	Air Sampler Make/Model	Serial Number	Cal Due Date	Equip Number	Air Sampler Make/Model	Serial Number	Cal Due Date				
PE01	LV-1	4532	5/20/21	BZ01							
PE02	LV-1	4360	5/20/21	BZ02							
PE03	LV-1	4352	4/20/22	BZ03							
PE04	LV-1	4300	4/20/22	BZ04							
PE05				BZ05							
PE06				BZ06							
PE07				BZ07							
PE08				BZ08							
PE09				BZ09							
PE10				BZ10							
PE11				BZ11							
PE12				BZ12							
PE13				BZ13							
PE14				BZ14							
PE15				BZ15							
PE16				BZ16							
PE17				BZ17							
PE18				BZ18							
PE19				BZ19							
PE20				BZ20							
Sample Counting Instruments											
Inst Number	Model Number	Serial Number	Cal Due Date	Count Time (min)		Background (cpm) ^a		Abs Ct Eff (cnts/dis) ^b		MDC (dpm/sample) ^c	
				Bkgrd	Source	Alpha	Beta	Alpha	Beta	Alpha	Beta
A	Protean	615068	9/15/21	1	1	0.0	1.1	0.352	0.355	15.4	29.0
B	Protean	9085100	10/5/21	1	1	0.0	1.2	0.356	0.352	15.2	29.9
C	Protean	9085100	10/1/22	1	1	0.0	1.2	0.359	0.355	15.1	29.6
D											
E											
Notes											
^a background values obtained from instrument set-up worksheet											
^b absolute counting efficiency = 4π efficiency calculated as ratio of measured count rate and contained activity [total dpm] of source (see IN-RP-141, <i>Alpha/Beta Scaler Instrument Set-Up and Operation</i>)											
^c MDC calculated using the Stapleton approximation (see IN-RP-141, <i>Alpha/Beta Scaler Instrument Set-Up and Operation</i>)											

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AIR SAMPLE RESULTS - PUBLIC EXPOSURE MONITORING

Project Information									Effluent Air Concentration					Sampling Period			Color Codes						
Contract / Task Order Number: N62473-17-D-0005		Project Title / Location: IR Site 12 RD/RA, Treasure Island, SF, CA			Gilbane Project Number: J310000800				Effluent Conc (µCi/ml)			Alpha		Beta	Air samples collected between 22 Mar 2021 and 10 Dec 2021		Value < MDC			Value < 0.1 x Effluent Conc			
												Radionuclide		Ra-226			Sr-90	< 72 hr decay time			Value > 0.1 x Effluent Conc		
												Data reviewed					Value > Effluent Conc						
Information effective as of: 31 Jan 2022																							
Sample Collection									Count Information							Sample Results					Initials		
Sample Number	Sample Type	Sample Location	Equip No	Ave Flow Rate (lpm)	Start Day Time	End Date Time	Elapsed Time (min)	Volume (ml)	Inst No	Count Date	Time (min)	Counting Units	Gross Activity		Net dpm		Activity (µCi/ml)		*Effluent Conc (%)		Count Tech	Data Reviewer	
													Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta			
AS-0327	Perimeter	Upwind	PE03	60	12/1/21 7:25	12/1/21 17:05	580	3.5E+07	C	12/10/21	1	cpm	0.05	6.35	0.1	14.5	1.8E-15	1.9E-13	0.2%	3.1%	DB	CB	
AS-0328	Perimeter	Downwind	PE04	60	12/1/21 7:30	12/1/21 17:02	572	3.4E+07	C	12/10/21	1	cpm	0.25	7.15	0.7	16.8	9.1E-15	2.2E-13	1.0%	3.7%	DB	CB	
AS-0329	Perimeter	Upwind	PE03	60	12/2/21 7:20	12/2/21 17:05	585	3.5E+07	C	12/10/21	1	cpm	0.00	5.90	0.0	13.2	0.0E+00	1.7E-13	0.0%	2.8%	DB	CB	
AS-0330	Perimeter	Downwind	PE04	60	12/2/21 7:25	12/2/21 17:10	585	3.5E+07	C	12/10/21	1	cpm	0.20	6.55	0.6	15.1	7.1E-15	1.9E-13	0.8%	3.2%	DB	CB	
AS-0331	Perimeter	Upwind	PE03	60	12/3/21 7:25	12/3/21 17:15	590	3.5E+07	C	12/10/21	1	cpm	0.25	4.65	0.7	9.7	8.9E-15	1.2E-13	1.0%	2.1%	DB	CB	
AS-0332	Perimeter	Downwind	PE04	60	12/3/21 7:30	12/3/21 17:10	580	3.5E+07	C	12/10/21	1	cpm	0.25	5.55	0.7	12.3	9.0E-15	1.6E-13	1.0%	2.6%	DB	CB	
AS-0333	Perimeter	Upwind	PE03	60	12/6/21 8:08	12/6/21 17:10	542	3.3E+07	C	12/17/21	1	cpm	0.30	3.70	0.8	7.0	1.2E-14	9.8E-14	1.3%	1.6%	DB	CB	
AS-0334	Perimeter	Downwind	PE04	60	12/6/21 8:14	12/6/21 17:15	541	3.2E+07	C	12/17/21	1	cpm	0.25	4.55	0.7	9.4	9.7E-15	1.3E-13	1.1%	2.2%	DB	CB	
AS-0335	Perimeter	Upwind	PE03	60	12/7/21 7:20	12/7/21 17:20	600	3.6E+07	C	12/17/21	1	cpm	0.10	5.70	0.3	12.7	3.5E-15	1.6E-13	0.4%	2.6%	DB	CB	
AS-0336	Perimeter	Downwind	PE04	60	12/7/21 7:25	12/7/21 17:22	597	3.6E+07	C	12/17/21	1	cpm	0.00	4.65	0.0	9.7	0.0E+00	1.2E-13	0.0%	2.0%	DB	CB	
AS-0337	Perimeter	Upwind	PE03	60	12/8/21 6:55	12/8/21 16:05	550	3.3E+07	C	12/17/21	1	cpm	0.10	4.10	0.3	8.2	3.8E-15	1.1E-13	0.4%	1.9%	DB	CB	
AS-0338	Perimeter	Downwind	PE04	60	12/8/21 7:00	12/8/21 16:08	548	3.3E+07	C	12/17/21	1	cpm	0.10	2.95	0.3	4.9	3.8E-15	6.8E-14	0.4%	1.1%	DB	CB	
AS-0339	Perimeter	Upwind	PE03	60	12/9/21 6:40	12/9/21 17:10	630	3.8E+07	C	12/17/21	1	cpm	0.15	3.55	0.4	6.6	5.0E-15	7.9E-14	0.6%	1.3%	DB	CB	
AS-0340	Perimeter	Downwind	PE04	60	12/9/21 6:45	12/9/21 17:15	630	3.8E+07	C	12/17/21	1	cpm	0.20	4.15	0.6	8.3	6.6E-15	9.9E-14	0.7%	1.7%	DB	CB	
AS-0341	Perimeter	Upwind	PE03	60	12/10/21 6:17	12/10/21 17:05	648	3.9E+07	C	12/17/21	1	cpm	0.25	3.95	0.7	7.7	8.1E-15	9.0E-14	0.9%	1.5%	DB	CB	
AS-0342	Perimeter	Downwind	PE04	60	12/10/21 6:20	12/10/21 17:08	648	3.9E+07	C	12/17/21	1	cpm	0.15	3.65	0.4	6.9	4.8E-15	8.0E-14	0.5%	1.3%	DB	CB	
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					
												cpm			#N/A	#N/A	#N/A	#N/A					

CFM to LPM Converter

1 cfm = 28.316846592 lpm

Enter cfm: 2.1

lpm: 60.0

Sample Types

Perimeter

Effluent

Counting Units

cnts

cpm

10 CFR 20 Appendix B Table 2 Effluent Concentrations
(listed in order of most to least restrictive radionuclide)

Column 1		
Alpha-Emit Radionuclid	Retention Class	Air (µCi/ml)
Th-232	W	4.E-15
Pu-239/24C	W	2.E-14
Am-241	W	2.E-14
U-233/234	Y	5.E-14
U-235	Y	6.E-14
U-238	Y	6.E-14
Ra-226	W	9.E-13
(TBD)	(TBD)	(TBD)

Column 1		
Beta-Emitti Radionuclid	Retention Class	Air (µCi/ml)
Sr-90	Y	6.E-12
Eu-152	W	3.E-11
Eu-154	W	3.E-11
Co-60	Y	5.E-11
Cs-137	D	2.E-10
(TBD)	(TBD)	(TBD)

Color Legend	
No exceedance above regulatory criteria	
Elevated however no exceedance above regulatory criteria	
Exceedance above regulatory criteria	

* Effluent concentration is a regulatory number from the NRC considered protective of the public

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