

BEE CANYON GREENER ODOR IMPACT MINIMIZATION PLAN

1.0 PURPOSE

In accordance with California Code of Regulations Title 14, Section 17863.4 (as of January 2016), compostable material handling operations and facilities shall prepare, implement, and maintain a site-specific odor impact minimization plan. This Odor Impact Minimization Plan (OIMP) is being submitted by OC Waste & Recycling to the County of Orange, Health Care Agency/ Local Enforcement Agency (LEA) as required and shall be implemented in minimizing impact of odors to potential receptors as the need arises. The plan is intended to provide guidance to on-site personnel in the handling, storage, and removal of compostable materials at the Bee Canyon Greenery (BCG) composting facility located within Frank R. Bowerman Landfill (FRB). This odor impact minimization plan shall be reviewed annually to determine if any revisions are necessary, a copy shall be provided to the LEA, within 30 days of those changes.

Facility Information

Site Name:	Bee Canyon Greenery
SWIS#:	30-AB-0469
Location:	11002 Bee Canyon Access Road, Irvine, CA 92602
Operation:	Compostable Material Handling Facility
Process:	Open windrow method
Capacity:	Phase 1 - Not to exceed 74,000 cubic yards; Phase 2 – Not to exceed 142,000 cubic yards
Project Area Size:	30 acres

2.0 ODOR MONITORING PROTOCOL

2.1 PROXIMITY OF ODOR RECEPTORS

The project area is located within the Frank R. Bowerman Landfill and odors coming from the composting operation may have an impact to both on-site and off-site receptors. Below is a list of potential receptors:

1. Potential On-Site Receptors
 - a. Landfill site personnel
 - b. On-site contractors
 - c. Transfer truck and material delivery drivers
 - d. Public utility personnel
2. Potential Off-Site Receptors (and corresponding distance away from composting project area, See Figure 1)
 - a. Agricultural produce storage yard and office- approximately 9,040 linear feet (1.71 miles) directly west of project area
 - b. Residential neighborhood – approximately 8,000 linear feet (1.5 miles) southwest of the project area.

2.2 METHOD FOR ASSESSING ODOR IMPACTS

Each operating day, designated on-site personnel shall assess and evaluate the perimeter of the facility area and landfill boundary for objectionable odors. Best Management Practices (BMPs) and good housekeeping measures are implemented to minimize the release of objectionable odors. BMPs include:

- Maintaining adequate heat in the piles through appropriate pile density, limiting turning frequency and/or pile dimensions.
- Providing adequate moisture throughout the active composting process.
- Frequent monitoring of temperature and moisture content assures composting conditions are within acceptable parameters.

Good housekeeping measures include:

- Clearing spilled materials between windrows.
- Eliminating areas with the potential for ponding water.
- Maintaining reasonably sized stockpiles of incoming feedstock by typically deploying it into windrows within 72 hours.

If objectionable odors are detected, the following assessment methods shall be implemented:

1. Designated site personnel shall investigate likely source of odors.
2. Designated site personnel shall determine wind patterns and direction at time odor was detected.

3. Based on the intensity of odor nuisance, designated site personnel shall determine if odor had travelled off-site by surveying the perimeter of the landfill and vicinity of potential off-site receptors.
4. If source of odors is found to be the composting project area, effectiveness of current on-site management practices shall be assessed and alternative or additional measures shall be implemented to reduce odors. (See Table 1 for Possible Causes of Odor and Odor Minimization Management Techniques)
5. The LEA shall be notified if it has been determined that possible odor impacts has occurred beyond the landfill property boundary.
6. If possible, odor impacts have been determined to occur beyond the property boundary, the incident shall be recorded in the compost daily operational log book which shall include all actions and activities taken to resolve or minimize odor nuisance for future reference and operational considerations.

3.0 METEOROLOGICAL CONDITIONS

Prevailing winds at FRB predominantly come from the south or southeast starting approximately from 8 PM through 8 AM with wind speeds ranging from 1 to 6 mph. During daylight hours, prevailing winds shift and come from the north to southwest approximately from 8 AM through 6:30 PM with wind speeds ranging from 1 to 13 mph (See Exhibit 1 containing wind roses obtained from the nearest weather station to the project area for various times of the year). Typical daytime wind directions will direct any potential odors south-southwest away from potential receptors. Santa Ana wind conditions do affect the site in the fall months approximately 20% of a three month period as can be seen in Exhibit 1 and are in the same direction as the typical daytime wind directions albeit at higher wind speeds.

The FRB Landfill maintains an onsite meteorology station that monitors wind direction, wind speed, temperature, and relative humidity. Data from this station may be used to help monitor conditions if an odor issue arises or prior to an issue occurring.

4.0 COMPLAINT RESPONSE PROTOCOL

As complaints are received from impacted receptors or regulators, the following response protocol shall be implemented:

1. All odor complaints received from potential receptors and/or regulators shall be recorded in the facility operational log book and

complaint log (See Exhibit 2 for Complaint Log).

2. Designated personnel shall contact complainant and/or regulator to obtain details of the complaint such as name, time, location, and nature or characteristics of odors.
3. Designated personnel shall notify appropriate regulators of the complaint.
4. Designated site personnel shall investigate and implement methods in assessing odor impacts as described in Section 2. Odor Monitoring Protocol, of this plan.
5. Designated site personnel shall immediately implement additional or appropriate measures to minimize odors.
6. Once the OIMP has been implemented and the odor has been minimized, designated personnel shall follow-up with complainant.

5.0 OPERATING PROCEDURES AND DESIGN CONSIDERATIONS TO MINIMIZE ODORS

Operational procedures and design considerations have been taken into account to minimize odor impacts as a result of the composting facility.

5.1 FEEDSTOCK CHARACTERISTICS AND MANAGEMENT

Feedstock material shall be supplied by regulated green waste processing facilities already permitted to supply FRB with Processed Green Material (PGM) for use as alternative daily cover (ADC). Feedstock is limited to PGM which has already undergone stages of sorting, screening, and grinding prior to its delivery to the BCG and is expected to emit very minimal odors as it undergoes deployment into windrows and the composting and curing process. Feedstock material received typically consists of green and agricultural material except food material and vegetative food material that contains no greater than 1.0 percent of physical contaminants by dry weight. Feedstock material shall have a moisture content not to exceed 50%. Extremely odorous loads shall not be accepted. Feedstock material shall be inspected visually for particle size, moisture content, and contamination level prior to its acceptance.

Incoming feedstock are typically deployed into windrows within 72 hours. If significant odors occur from the feedstock pile, a new compost pile will immediately be built. If it is determined that a significant odor problem will still occur, the material will be mixed with other materials on-site, including curing compost piles if necessary and reprocessed. A last-case option would be to landfill the material if no other options are available.

5.2 PROCESS WATER DISTRIBUTION

The feedstock processing areas and compost piles are frequently monitored to ensure adequate moisture content levels and dust control are addressed. Other than rainfall, water is generally not added to the feedstock or active compost piles during the winter months. During the warmer summer and fall months, water is used to spray on an as-needed basis for the composting materials handling operations (loading, unloading, stockpiling, mixing, turning, and screening) for dust and moisture content management of the feedstock processing areas and compost piles.

5.3 COMPOST PAD and SITE DRAINAGE

The BCG compost pad is constructed of compacted soil. The thickness of the pad is a minimum of four feet; because the facility sits atop landfill stockpile 5-D the thickness of the pad typically exceeds the minimum. The compost pad is partially located on top of historic waste fill. Settlement is expected to occur so remedial grading will be periodically conducted to eliminate any ponding on top of the pad which could contribute to odors. Stormwater runoff from the compost area is collected in a separate lined pond located adjacent to the windrows. The water collected in the pond will be recirculated into the compost piles for moisture control as needed to minimize the volume in the pond and reduce odors.

5.4 EQUIPMENT RELIABILITY

Processing equipment is maintained per the manufacturer's recommendations. Heavy equipment and water trucks are maintained per OC Waste & Recycling's comprehensive preventive maintenance program. OCWR has a fleet of heavy equipment and rental contracts and is able to immediately replace the dedicated pieces of heavy equipment at the composting facility as the need arises.

5.5 WEATHER EVENT IMPACTS

The Landfill's weather system is consulted to assure screening is not conducted during periods of high winds (measured at greater than 25 miles per hour). The facility uses both the weather monitoring system and an onsite windsock at the screening area to determine appropriate conditions for screening.

Heavy rainfall and/or wind are not uncommon weather events and could impede processing activities. There is adequate storage space available if operations have to temporarily cease due to adverse weather conditions.

5.6 METHOD AND DEGREE OF AERATION

Odors emanating from windrows typically indicate problems in the initial mixing, turning frequency, pile porosity and/or moisture content of the pile. The BCG strives to create windrows with appropriate carbon to nitrogen level (approximately 30:1 to start), adequate initial mixing and with adequate moisture

(45 percent to 60 percent) within the windrows.

Processed feedstock is placed into windrows and moisture is managed at the proper conditions. The windrows are turned using a specialized windrow turner or loader. The turner or loader mixes the feedstock, moisturizes the feedstock as needed, reestablishes the porosity and redistributes moisture and heat. The windrows are turned at least five (5) times during the 15-day process to further reduce pathogens (PFRP) between the operating hours of 7AM to 5PM. Following the PFRP, windrows are turned once per week.

5.7 MOISTURE CONTENT OF MATERIALS

Feedstock with greater than 50% moisture content will not be accepted. Water from the water tanks or the on-site storm water pond will be added to feedstock until an approximate moisture content of 50 percent is reached. This ensures optimal conditions for aerobic digestion to initiate in the windrows, minimizing the possibility of anaerobic conditions and attendant odor issues.

5.8 AIRBORNE EMISSION PRODUCTION

As described in Section 5.6, the windrows are to be turned regularly. Turning the windrows is important for maintaining even temperatures, redistributing moisture, and providing aeration. Proper aeration will allow for proper air flow and make oxygen available to the microorganisms. This will help control odors and emissions potentially associated with the windrows.

Fugitive dust is controlled through onsite visual monitoring and the use of a water truck that provides dust control as necessary. As discussed above, when needed due to lack of rainfall or during the hotter months, the compost piles will be sprayed with water to moisturize them and control dust.

5.9 PERSONNEL TRAINING

Project lead personnel have undergone and completed the 40-Hour United States Composting Council (USCC) Composting Operations training course which includes odor minimization management techniques. All BCG personnel will also be required to review and adhere to the OIMP. FRB site personnel working at the BCG have undergone the 40- Hour Hazardous Waste Operations and Emergency (Hazwoper) training certification program and are also required to attend the 8-hour refresher course annually. Records of employee training are maintained on-site. Orange County Fire Authority (OCFA) has issued the BCG general conditions which address operational, composting area, fire prevention, emergency response, safety protocols and requirements which will be adhered to in compliance with these requirements.

5.10 UTILITY SERVICE INTERRUPTIONS

Equipment utilized in the composting operation, including loaders, water truck, and screener, are powered by diesel fuel; potential power outages would not affect the equipment used at the BCG operation. Fuel for equipment is available through the existing diesel fuel storage tank at the FRB landfill.

5.11 SITE SPECIFIC CONCERNS

This facility has no site specific concerns.

TABLE 1

Possible Causes of Odors and Odor Minimization Management Techniques

Possible Causes of Odors	Odor Minimization Management Techniques
Odorous feedstock material upon arrival	1) Reject and turn back feedstock material loads to hauler/generator facility
	2) Initial moisture content of feedstock material loads shall not exceed 50% prior to its acceptance. If feedstock material exceeds 50% moisture content, load shall be rejected and turned back to hauler/generator facility
	3) Reject and turn back feedstock material loads with contamination level exceeding 10% and/or mixed with other organics
Excessive watering of compost pile in excess of 60% moisture content due to rain events causing ammonia-like odors	1) Once area is dry enough to work on, increase turning pile frequency to drain excess moisture and reduce moisture content between 40% - 60%
	2) Mix in additional feedstock material thoroughly while turning pile to absorb excessive moisture, provided that total volume of the pile does not exceed 92 cy.
Standing water or ponding underneath or adjacent compost pile causing saturated feedstock material to rapidly decompose and emit odors	1) Maintain composting pad grade to flow away from pile to a low point established to hold and contain contact water for collection and proper disposal
	2) Maintain and fill in low spots within project area to prevent ponding or standing water
	3) Practice good housekeeping by containing loose feedstock material within the pile

Compost pile emitting Sulfur-like odors due to high temperatures exceeding 160 °F (anaerobic condition) and/or moisture content is below 40%	1) Check pile temperatures in excess of 160 °F and moisture content below 40%. If any monitoring or sampling point is in excess of 160 °F and/or moisture content is below 40%, turn and water entire pile thoroughly to obtain temperatures between 131 °F - 160 °F and moisture content between 40% – 60%
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5.12 STORAGE PRACTICES

Feedstock receiving: Incoming materials will be stored no longer than 48 hours.

Composting: The average retention time for material in windrows will be 12 to 20 weeks. Windrow dimensions will be roughly 20 feet wide by 12 feet high.

Finished compost storage: Most compost may be cured in place prior to being moved to the screening area. If a larger curing pile is created, prior to or post screening, it will be limited to 20 feet in height. A larger curing pile will only be used if the material is biologically ready to be cured (i.e., generating insufficient heat to generate nuisance odors).

OCWR's goal is to have just in time storage and have all finished material sold before it is stored; however, given the fluctuations in compost markets, compost may be stored up to 180 days, as necessary. But this is not expected to generate off-site odors.

FIGURE 1



TETRA TECH BAS

21700 Copley Drive, Suite 200,
Diamond Bar, CA 91765
TEL 909.860.7777 FAX 909.860.8017

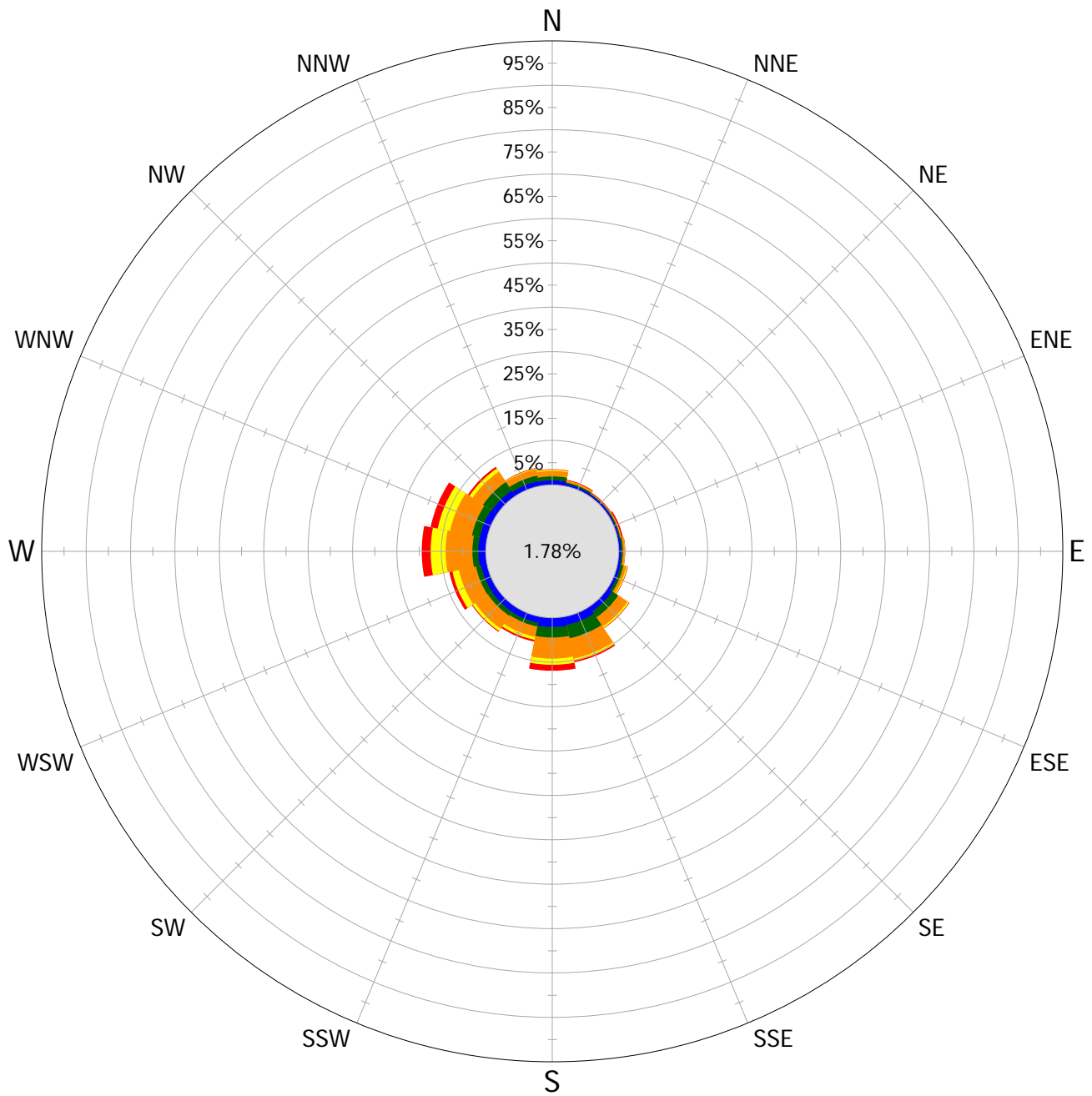
BEE CANYON GREENERY

POTENTIAL OFF-SITE ODOR
RECEPTORS MAP

FIGURE 1

EXHIBIT 1

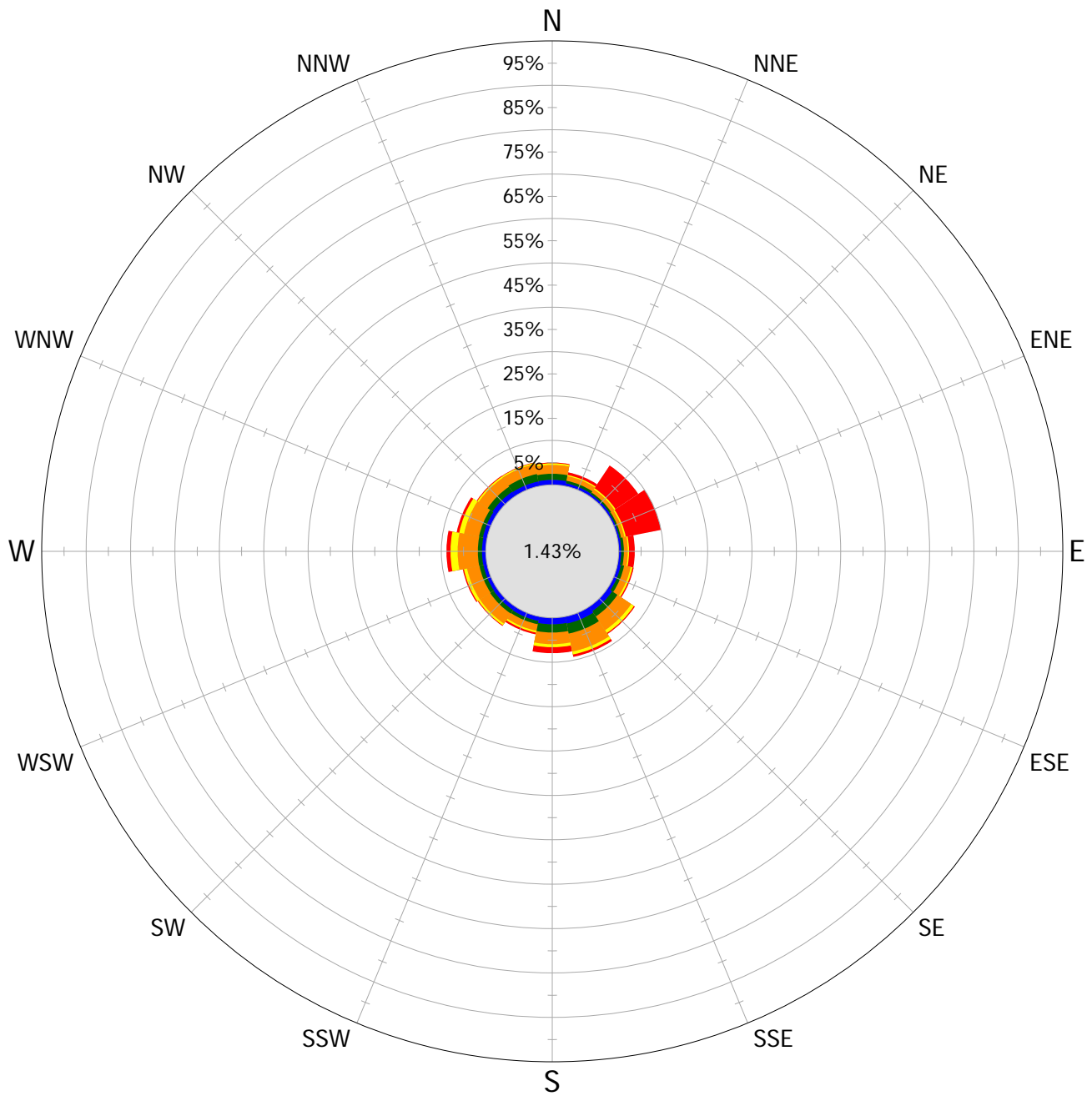
Wind Rose [FRB-1]



	>10.00	8.35%
	10.00	13.24%
	8.00	39.98%
	4.00	19.87%
	2.50	16.79%
	<=1.00	1.78%

Data Period :
From : 7/1/2017 00:00
To : 10/1/2017 00:00
Data Source : 1-Minute
W.Dir : WD(Degrees)
W.Speed: WS(MPH)
Total Records: 101414
Valid Records: 101414

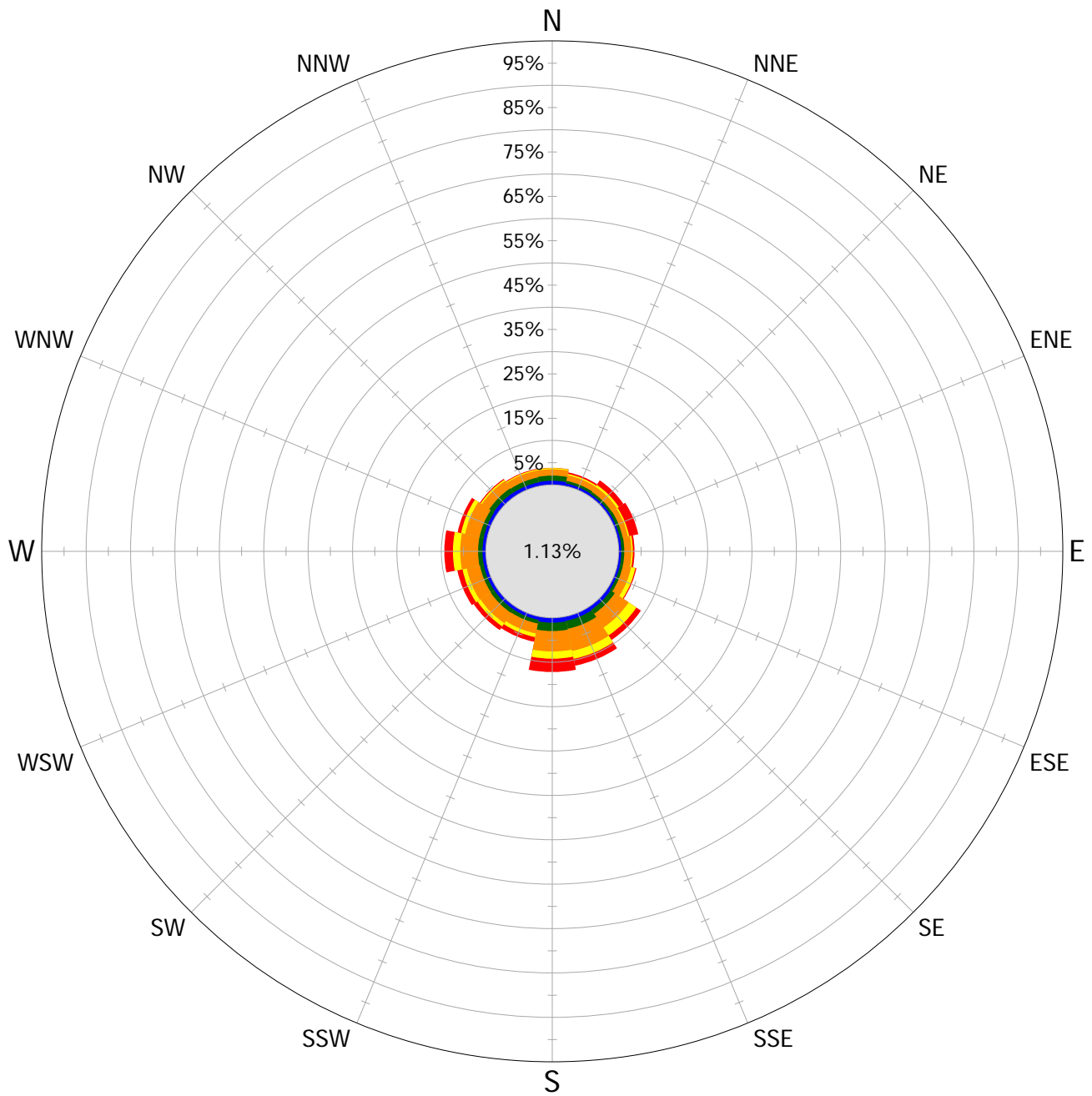
Wind Rose [FRB-1]



<div></div>	>10.00	21.34%
<div></div>	10.00	9.19%
<div></div>	8.00	37.23%
<div></div>	4.00	17.29%
<div></div>	2.50	13.52%
<div></div>	<=1.00	1.43%

Data Period :
From : 10/1/2017 00:00
To : 1/1/2018 00:00
Data Source : 1-Minute
W.Dir : WD(Degrees)
W.Speed: WS(MPH)
Total Records: 120749
Valid Records: 120749

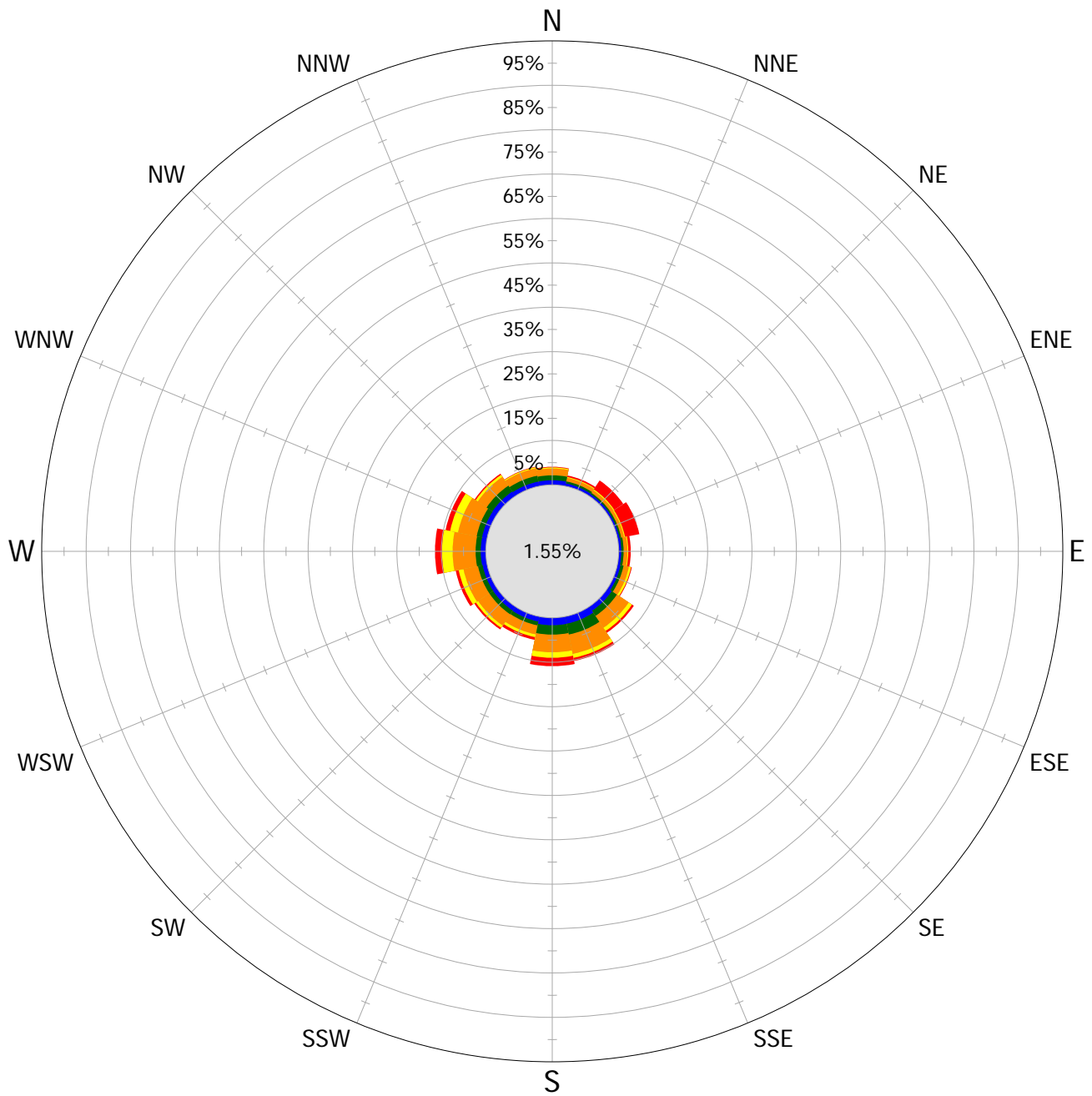
Wind Rose [FRB-1]



Red	>10.00	16.68%
Yellow	10.00	13.85%
Orange	8.00	41.40%
Green	4.00	16.11%
Blue	2.50	10.84%
Grey	<=1.00	1.13%

Data Period :
From : 1/1/2018 00:00
To : 4/1/2018 00:00
Data Source : 1-Minute
W.Dir : WD(Degrees)
W.Speed: WS(MPH)
Total Records: 98949
Valid Records: 98949

Wind Rose [FRB-1]



Red	>10.00	14.76%
Yellow	10.00	12.01%
Orange	8.00	39.40%
Green	4.00	17.96%
Blue	2.50	14.31%
Grey	<=1.00	1.55%

Data Period :
From : 6/1/2017 00:00
To : 4/1/2018 00:00
Data Source : 1-Minute
W.Dir : WD(Degrees)
W.Speed: WS(MPH)
Total Records: 369539
Valid Records: 369539

EXHIBIT 2

FRANK R. BOWERMAN LANDFILL COMPLAINT LOG

2019

Updated: XXXXXX by XXXXXXX

[ODOR INSPECTIONS LOG](#)

No.	Date and Time Complaint Received	Date and Time of Incident	Complaint Type (i.e., Odors, Noise, View)	Complainant Name and Contact Information	OC W&R Complaint Recipient	Description of Complaint Landfill Operational Conditions Weather Working Area	PIO Follow-Up and Closure
1	X/X/XX 1:15 PM Response	X/X/XX 1:15PM	Odor	John Doe XXX Sand Canyon, Irvine 949-211-0701 Jdoe@gmail.com	HQ Notice	Description of complaint - see email/response Site Daily Report - 1.2.18 Phase C3 480'	
2							
3							
4							
5							
6							
7							
8							
9							