

Air Quality Advisory Committee

April 1, 2020

Agenda

1. Welcome/Introductions
2. Recap of previous meeting
3. Community Opens
4. AQAC Opens
5. Good Neighbor Agreement Items Update
6. Agenda for next meeting
7. Public comments/questions

GNA-Specified Agenda Items

- Intel to report to the AQAC at its quarterly meetings on:
 - Stack testing completed since the last AQAC meeting, any stack testing planned before next AQAC meeting,
 - Annual or semiannual reports submitted by Intel to DEQ pursuant to Intel's air permit.
 - Any requests to DEQ for authority to modify emission factors or emission sources that were submitted since the last AQAC meeting or that Intel anticipates will be submitted prior to the next AQAC meeting;
 - Update on the implementation of the measures identified on Attachment A and any measures raised in prior AQAC meetings that require further action or consideration;
 - Any excess emissions and upsets reported to the Department during the most recent calendar quarter

Stack Testing Overview

- Why does Intel perform stack testing?
 - Determination of compliance with Best Available Control Technology (BACT) emission limits
 - Determination of Rotary Concentrator Thermal Oxidizer (RCTO) control efficiencies
 - Development of emission calculations for fluorides and hydrogen fluoride
 - Good Neighbor Agreement Attachment B requirements
- Stack testing plans are reviewed and approved by Oregon DEQ and utilizes standard EPA and/or DEQ test methods
- DEQ and AQAC committee members can be onsite and witness testing events
- Stack testing performed by a 3rd party stack testing firm

2019 Stack Testing Update – RCTO Test Results

System	VOC DRE	NOx lb/hr	NOx BACT Limit	CO lb/hr	CO BACT Limit
D1B	99.8%	0.036	0.20	0.026	0.14
D1C	99.5%	0.095	0.20	0.120	1.51
D1D	97.0%	0.129	0.20	0.127	1.12
D1XM1-Munters	99.95%	0.317	0.34	0.021	0.24
D1XM2-Anguill	99.7%	0.595	0.78	0.080	0.54

2019 Stack Testing Update – Scrubber Test Results

System	HF lb/hr	TF lb/hr
D1B EXSC	0.112	0.144
RB1 C4 EXSC	0.013	ND
RB1 Planar EXSC	0.054	0.026
RB1 EXAM	0.007	ND
RP1 EXSC	<=0.012	ND
D1C EXSC	0.189	0.066
D1C EXAM	<=0.018	ND
D1XM2 EXAM	<=0.042	ND
D1XM2 EXSC (WESPs)	<=0.069	ND
D1XM1 EXSC (WESPs)	0.095	0.011
D1XM1 EXAM	<=0.042	0.001
D1D EXSC	0.297	0.226
D1D EXAM-1	<=0.008	ND
D1D EXAM-2	<=0.007	ND
F15 EXSC	<=0.078	0.024

2020 Stack Testing Plan

- 2020 Stack testing activities
 - Recurring RCTO stack testing at Aloha (F15)
 - Potential for recurring D1X MOD1 Anguil RCTOs

Continuous Emissions Monitoring System Overview

- Rotor Concentrator Thermal Oxidizer (RCTO)
 - Used to control emissions of VOCs
 - Method of control: Thermal oxidation (combustion)
 - Temperature = Key operating parameter
 - Measurement via thermocouple
 - Minimum temperature established during stack testing
 - Temperature measurements are reviewed on an ongoing basis
 - Alarms are also set to alert when measured value outside the acceptable range
 - Alarms are indication of off-spec operation, not an indication of excess emissions or bypass

Continuous Emissions Monitoring System Overview

- Wet Scrubbers
 - Used to control emissions of acid gases, primarily Fluorides, HF, and HCl
 - Method of control: pH adjusted water absorption
 - Water flow rate and pH = Key operating parameters
 - Measurements via pH probe and flow meter
 - Minimum pH and flow established during stack testing
 - Measurements are reviewed on an ongoing basis
 - Alarms are also set to alert when measured value outside the acceptable range
 - Alarms are indication of off-spec operation, not an indication of excess emissions or bypass

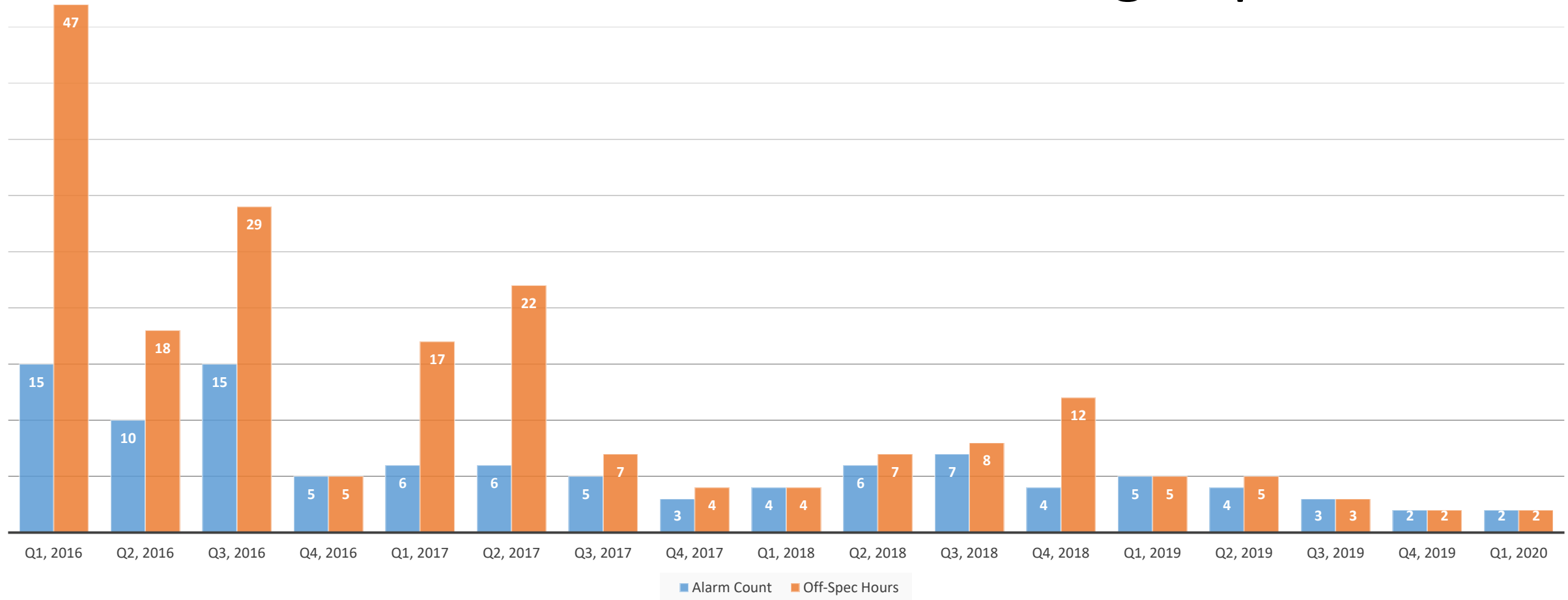
Continuous Emissions Monitoring Report

– Q4, 2019 & Q1, 2020

Attachment C

Source	Frequency	Parameter	Equipment	Q4, 2019 Report	Q1, 2020 Report
Rotary Concentrator Thermal Oxidizers (RCTO)	Continuous	Temperature	Thermocouple	2 low temp alarms	No issues
Acid Gas Scrubbers	Continuous	Flow pH	Flow Meter pH probe	No issues	1 low flow 1 low pH
Emergency Generators	When used	Hours of operation including time of engine start, time of engine stop and reason for operating		No issues	No issues

Continuous Emissions Monitoring Report



- Normal hourly operations for Q4, 2019 and Q1, 2020 is over 99.99%
 - Off-spec operation is not an indication of excess emissions and was limited to <math><0.01\%</math> of the hours for both Q4, 2019 and Q1, 2020
- Blue bars indicate the number of alarms per quarter
- Orange bars indicate the number of hours outside of normal operation per quarter

Annual Air Permit Compliance and Emissions Report Review

- Submitted to NCA and NEDC as required by GNA
- Annual Air Permit and GHG Annual Reports have been posted on Explore Intel website for both Ronler Acres and Aloha sites
- Annual report included one deviation for calendar year 2019
- In compliance with all other permit requirements

Annual Air Permit Compliance and Emissions Report Review

- 2019 Calendar Year Emission Inventory

Pollutant	Calendar Year 2019 tons/year	PSEL tons/year	Units
PM	26.3	41	tons per year
PM10	20.9	35	
PM2.5	16.6	31	
NOx	119.3	197	
CO	137.3	229	
SO2	3.9	39	
VOC	84.8	178	
Total Fluorides	4.5	6.4	
Total HAPs	10.4	24	
Individual HAP - HF	7.61	9	
Individual HAP - Cl2	2.03	9	
Individual HAP - HCl	0.43	9	
GHG	361,359	819,000	

Notes:

* All individual HAPs with annual emissions above 0.1 tons per year are reported above

DEQ Submittals

- Title V Application Update
 - Included:
 - Renewal of current air permit (ACDP)
 - Incorporation of all Type 1 and Type 2 applications submitted since January 2016
 - Minor administrative corrections
- Emission Factor Update Submitted on January 31, 2020
 - Updated process EFs based on recent tool level stack testing
 - Updated RCTO VOC DRE and NOx and CO EFs based on 2019 stack testing
 - DEQ approval received on February 19th
- Bypass event – D1B Scrubber #3
 - Event occurred on 2/22/2020 @ 5:16am and lasted for 1 hour and 22 mins
 - Caused by the make-up water air-actuated valve not been re-connected following a preventative maintenance completed on the previous day
 - Response to dry scrubbing was immediate after alarm received
 - After valve was actuated, scrubber sump was able to be filled with make-up water until filled to the level required for the recirculation pump to restart to end bypass
 - Based on recent stack testing, additional emissions:
 - HF emissions = 0.3 pounds
 - TF emissions = 0.15 pounds

Agenda for Next Meeting

September 16, 2020 (Q3, 2020)

- AQAC members to have input into the next agenda for each AQAC meeting
 - Standing agenda items
 - DEQ Submittals
 - Stack Testing Update
 - Project Update
 - Other
 - Stack testing 101
 - Others?

Public Comments/Questions

BACKUP

Attachment A

Emission Reduction Project	Target Date	Status / Method of Confirmation
Advocate to contractors working at the Facility to use newer onroad and nonroad diesel engines	2 nd quarter 2016	Ongoing collaboration with suppliers to encourage reductions
Evaluate ways to reduce (if possible) diesel particulate matter emissions either with onsite or offsite projects	3 rd quarter 2016	Reported out during Q3, 2016 AQAC quarterly meeting
Decommission four Fab 5 boilers	3 rd quarter 2016	Completed
Assess feasibility of reducing waste tank emissions	4 th quarter 2016	Completed
Retrofit RCTOs to optimize natural gas usage	2 nd quarter 2017	Completed
Boiler replacement with ultra low-NOx burner boilers at RA2 and RP1	3 rd quarter 2017	Project completed. Report out during Q3, 2017 AQAC meeting
Compare actual emissions inventory in 2020 to inventory used in HRA	2 nd quarter 2021	Report to AQAC at quarterly meeting