

NARRATIVE

TO: Heather Brown
FROM: Wendy Troemel
DATE: December 22, 2022

Facility Name: **SK Battery America, Inc.**
AIRS No.: 015-00149
Location: Cartersville, GA (Bartow County)
Application #: 28655
Date of Application: December 12, 2022

Application/Background Information

SK Battery America, Inc. (SK) has submitted an application to construct and operate a new lithium-ion battery cell manufacturing facility. The new facility will be constructed at 5055 US Hwy 411, Cartersville, Georgia (Bartow County). Construction is anticipated to begin in April 2023.

Application No. 28655 (processed as an Expedited Permit) was received on December 14, 2022. A public advisory was issued on December 21, 2022 and expired on January 20, 2023. No comments were received. The greenfield facility was assigned AIRS No. 015-00149. The facility will be permitted to operate 8,760 hours/year. Bartow County is classified as attainment for all applicable pollutants.

Process Description

There are three steps of lithium-ion battery manufacturing: electrode manufacturing, battery cell assembly, and battery formation. The facility will operate twelve natural gas-fired hot oil heaters equipped with low NO_x burners. These hot oil heaters will provide process heat and indirect heating for the cathode and anode dryers and are rated at 35.3 or 30.5 MMBtu/hr (six units of each). Six natural gas-fired boiler will provide comfort heat and process heat. These boilers are equipped with ultra-low NO_x burners and are rated at 50.7 MMBtu/hr each. The facility intends to keep one unit out of each group of six as standby, but emissions profiles are based on all eighteen units operating. The facility also includes two 117 hp diesel fire pumps, various laboratories and quality evaluation centers, N-Methyl-2-Pyrrolidone (NMP) storage tanks, and cooling towers.

- Electrode manufacturing - Solid raw materials for the anodes and cathodes are measured and mixed with either NMP for cathodes or water for anodes. The electrode slurries are coated onto metal foil substrates, then the coated electrode foil is dried, processed further, and slit to size. PM emissions from various areas are controlled using dust collectors. VOC emissions from the electrode further processing are sent to activated carbon towers. Emissions from the dryers are collected by scrubbers for NMP recovery. The recovered NMP will be collected and shipped off-site for purification and brought back for re-use.

- Assembly process - Cathodes are dried further and both cathodes and anodes are notched (uncoated foil is trimmed to leave a tab for welding). After notching, the electrodes are stacked and the tabs are welded together. These packs are then pouched, filled with electrolyte, and sealed. PM emissions from assembly are controlled by dust collectors. Emissions from notching, stacking, and welding operations are routed to separate dust collectors for recycling the air back into the room for worker safety. VOC emissions from the drying process and electrolyte filling/sealing process are controlled by activated carbon towers.
- Formation area - Electrolyte cells are activated and accumulated gases are routed to carbon towers for control. Cells that do not meet quality standards are removed from the line and submerged in water to discharge the electronic potential. The emissions are controlled by activated carbon towers and a scrubber.

The facility will utilize nearly 300 dust collectors as both air pollution control equipment (APCE) and a method for cleaning process air to be recycled back into the building. Those dust collectors that clean air do not discharge to atmosphere and therefore will not be monitored as APCE. Those units are indicated below.

Equipment Table

<u>ID</u>	<u>Equipment</u>	<u>APCE ID No.</u>	<u>Stack #</u>	<u>Main Pollutant</u>
ELECTRODE MANUFACTURING				
AM	Anode Powder/Mixing	DC37-DC47	ST45	PM, Inorganic HAP
CM	Cathode Powder/Mixing	DC29-DC36	ST44	PM, Inorganic HAP
EO	Electrode Processing	AC01-AC06	ST23-28	VOC
CP	Cathode Further Processing	DC01-DC10	ST42	PM
CS	Cathode Slitter	DC11-DC14	ST42	PM
AP	Anode Further Processing	DC15-DC24	ST43	PM
AS	Anode Slitter	DC25-DC28	ST43	PM
CC	Cathode Coaters/dryer, NMP Recovery	SC01-SC10	ST13-22	VOC
ASSEMBLY PROCESSES				
CN	Cathode Notching	DC48-DC79	ST52	PM
CN-Int	Cathode Notching air recycled	DC80-DC119*	---	---
AN	Anode Notching	DC120-DC151	ST53	PM
AN-Int	Anode Notching air recycled	DC152-DC191*	---	---
AB-Int	Stacking, tab welding, assembly	DC192-DC263*	---	---
AO	Assembly – electrolyte fill and sealing adhesive	AC07-AC08	ST29-30	VOC/HCl
CELL FORMATION				
FO-Int	Cell handling air recycled	DC264-DC273*	---	---
FO	Cell formation/charging/degassing	AC09-AC14	ST31-36	VOC/HCl
DISCHARGE, LABS, QUALITY EVALUATION, UTILITIES, TANKS				
CD01	Cell Discharge (General)	AC16-AC18	ST38-40	VOC/HCl
CD02	Cell Discharge (Process tank hoods)	SC11	ST41	VOC/HCl
LB01-LB02	Laboratories	SC12-SC15	ST53-54	VOC/HCl
LB03	IQC Laboratory	SC16	ST55	VOC/HCl
QE01	Quality Evaluation Testing	AC15	ST37	VOC

<u>ID</u>	<u>Equipment</u>	<u>APCE ID No.</u>	<u>Stack #</u>	<u>Main Pollutant</u>
FP01-FP02	117 hp diesel Fire pumps	---	ST53-54	NO _x , CO
BL1– BL6	50.7 MMBtu/hr ultra low NO _x boilers, natural gas	---	ST46-51	NO _x , CO
OH1-OH6	35.3 MMBtu/hr natural gas hot oil heaters	---	ST01-06	NO _x , CO
OH7-OH12	30.5 MMBtu/hr natural gas hot oil heaters	---	ST07-12	NO _x , CO
CT01-CT07	Cooling Towers – low drift	---	---	PM
TK1-TK8	NMP Supply Tanks, 13,209 gal, fixed roof	---	---	VOC
TK9-TK18	NMP Recovery Tanks, 13,209 gal, fixed roof	SC01-10	ST13-22	VOC

*Dust collectors that clean process air to be recycled back into building; do not vent to atmosphere.

DC - Dust Collector

SC – Scrubber

AC – Activated Carbon Tower

Emissions Summary

The facility provided potential and estimated emissions. The facility requested limits to avoid classification as a major source of HAP (10/25 tpy), as well as 99 tpy limits for VOC, NO_x, CO, and PM. These limits are declared as their potential emissions for those pollutants.

Boilers/Hot Oil Heaters

Emission factors from AP-42, Section 1.4, Tables 1.4-1 and 1.4-2 were used to calculate emissions from the boilers and hot oil heaters, except for NO_x and CO. The total heat input capacity of all eighteen units is 699 MMBtu/hr. The facility anticipates that one boiler and two hot oil heaters will serve primarily as backup units. For the boilers, the manufacturer has guaranteed 9 ppm for NO_x and 25 ppm for CO. For the hot oil heaters, the manufacturer has guaranteed 24 ppm for NO_x and 50 ppm for CO. All units will only fire natural gas. Aside from the minimal emissions from the fire pumps, these units emit the NO_x and CO emissions from the facility, as well as nearly 23 tpy PM/PM₁₀/PM_{2.5}, 17 tpy of VOC, and 6 tpy HAPs from natural gas combustion.

Without the vendor guarantees on the burners, the facility's CO emissions based on the AP-42 factor of 84 lb/MMscf for Small Boilers would be 252 tpy CO. The facility's NO_x emissions, based on Small Boiler Low NO_x Burners at 50 lb/MMscf, would be 150 tpy NO_x.

Fire Pumps

Emission factors from Table 4 to 40 CFR 60 Subpart IIII for fire pumps newer than 2011 between 100 and 175 hp (converted from grams to pounds) were used to calculate emissions from the fire pumps. With both running 500 hours/year (117,000 hp-hr), NO_x was calculated at 0.39 tpy, VOC at 0.39 tpy (conservatively, VOC has the same emission factor as NO_x), and CO at 0.49 tpy. All other emissions are minimal.

Scrubbers/Baghouses/Carbon Tower Absorbers

The facility used an emission factor of 0.003 gr/SCF from all dust collectors for PM emissions based on data from a similar facility. The associated equipment cannot operate without the dust collectors in operation; additionally, nearly half of these dust collectors recycle air back indoors.

The SC01-SC10 scrubbers are classified as absorbers in the NMP recovery system and are used as material recovery devices for NMP; they are considered inherent process equipment and are not considered to be APCE. However, the bulk of the VOC emissions from the facility are from the NMP recovery process.

The facility estimated the following emissions from the scrubbers and activated carbon towers based on other facilities or past testing data.

<u>APCE</u>	<u>VOC emissions (lb/hr) (all as NMP)</u>	<u>VOC emissions (ppm)</u>	<u>HAP emissions (lb/hr)</u>	<u>HAP emissions (ppm)</u>
SC01 – SC10	0.49 (each)	0.3 (each)		
SC11	3.42	3.0	0.84 (HCl)	2.0 (HCl)
SC12-SC15			0.04 each (HCl)	2.0 (HCl)
SC16			0.04	2.0 (HCl)
AC01-AC06	1.75	2.0		
AC07-AC08	0.17	2.0	0.17 (acetonitrile)	
AC09-AC14	1.54	2.0		
AC15	1.73	6.0		
AC16-AC18	2.5	2.0		
TOTALS	16.01 lb/hr (70.13 tpy)		1.21 lb/hr (5.3 tpy)	

Storage tank working and breathing losses, as well as fugitives from loading/unloading are estimated at 0.1 tpy VOC. The facility will send the recovered NMP to a separate off-site facility for purification and reuse.

Water Cooling Towers

The facility will install cooling towers at a total circulating water rate of 310,100 gal/min. The facility has a target of 800 ppm total dissolved solids (TDS) due to 8 repeated pass-throughs in order to keep the water use in check (a typical value would be 500 ppm). The facility has calculated emissions at 5.5 tpy PM/4.6 tpy PM₁₀/0.05 tpy PM_{2.5}.

Facility-Wide Emissions (in tons per year)

Pollutant	Potential Emissions	Actual Emissions
PM/PM ₁₀ /PM _{2.5}	<99*	47.60/45.57/40.78
NO _x	<99*	63.38
SO ₂	1.92	1.92
CO	<99*	86.55
VOC	<99*	87.10
Max. Individual HAP	<10*	5.4 tpy hexane (combustion) 4.6 tpy HCl (process)
Total HAP	<25*	11.25
Total GHG (if applicable)	140,000	<140,000

* Potential emissions based on emission limits requested in permit

Regulatory Applicability*FEDERAL RULES***Prevention of Significant Deterioration (40 CFR 52.21)**

The facility's SIC code of 3691 – Storage Battery Manufacturing – is not included in the 28 source categories listed in 40 CFR 52.21(b)(1). However, the sum of the heat input from the six boilers exceeds the 250 MMBtu/hr threshold for fossil fuel-fired boilers (singularly or in combination) in the listed PSD 28 source categories in 40 CFR 52.21(b)(1)(iii)(u). Therefore, the boiler-fired source emissions are limited to a major source threshold of 100 tpy and fugitive emissions must be taken into account in these units' emissions calculations.

To maintain emissions below the 99 tpy threshold for NO_x and CO, the boilers and hot oil heaters are restricted to firing natural gas only and have accepted vendor guarantees that are lower than AP-42 emission factors. The facility is required to conduct yearly boiler/heater tune-ups for all units operate during the period of May 1 – September 30 for NO_x emissions under Georgia Rule 391-3-1-.02(2)(III) and will be required to test the units for CO emissions as well in order to verify compliance with the synthetic minor limits.

40 CFR 60 Subpart Dc – NSPS for Small Industrial-Commercial-Institutional Steam Generating Units

This rule applies to steam generating units with a heat input capacity between 10 and 100 MMBtu/hr, constructed after June 9, 1989. All six boilers and twelve hot oil heaters are classified as “steam-generating units” and are subject to this regulation. The hot oil heaters do not meet the definition of “process heaters” under this regulation. The units are restricted to firing natural gas only, so the PM, opacity, and SO₂ emission limitations and associated monitoring do not apply. The facility will be required to submit reports upon construction and startup of the units and maintain records of monthly natural gas usage. The facility has requested to keep plant-wide natural gas usage.

40 CFR 63 Subpart CCCCCC – Area Source NESHAP for Paints and Allied Products Manufacturing

This rule regulates area source manufacturers of paints and allied products that contain metal-containing HAP – defined as means a material containing benzene, methylene chloride, or compounds of cadmium, chromium, lead, and/or nickel, in amounts greater than or equal to 0.1% by weight for carcinogens, or 1% by weight for non-carcinogens. Paints and allied products manufacturing operations include the production of paints, inks, adhesives, stains, varnishes, shellacs, putties, sealers, caulks, and other coatings from raw materials, the intended use of which is to leave a dried film of solid material on a substrate.

The affected source is only those processes that process, use, or generate the target HAP, not the entire facility. The facility must comply with the requirements of this rule upon startup of the affected sources. Affected sources must operate a particulate control device during the addition of pigments or during grinding/milling of pigments that contained the listed compounds. PM control devices must be maintained such that visible emissions shall not exceed 10% opacity when averaged over three 1-minute periods if the device vents to atmosphere.

As previously described, the cathode preparation process includes the weighing and blending of the powdered components, which includes nickel (a listed metal HAP), with NMP to create the slurry that is applied to the foil substrate and dried. Affected sources must meet the following requirements:

- The facility must operate a capture system that minimizes fugitive particulate emissions when adding dry solids that contain compounds of nickel to a process vessel or to a grinding or milling operation, and route them to a particulate control device. This requirement does not apply to solids that are in paste, slurry, or liquid form. (Note that SK will not operate milling or grinding processes containing these metal HAP.)
- The facility must conduct an initial inspection of each particulate control device. The facility must visually inspect the ductwork and control equipment for leaks and inspect the interior of the control device for structural integrity. Conduct daily inspections to verify the presence of water flow. Conduct weekly visual inspections of any flexible ductwork for leaks. Conduct annual inspections of the rigid ductwork, and the interior of the control system.
- For each dry particulate control system, inspect the system ductwork and control device for leaks. Perform weekly visual inspections of any flexible ductwork for leaks. Inspect rigid ductwork for leaks and the interior of the dry particulate control device on an annual basis.
- Perform quarterly visual determination of emissions.

The affected equipment is the CM process - cathode powder feed and mixing vessels which are controlled by dust collectors DC29-DC36 – due to the cathode powder containing nickel compounds.

40 CFR 60 Subpart IIII – NSPS for Stationary Compression Ignition Internal Combustion Engines and 40 CFR 63 Subpart ZZZZ – NESHAP for Stationary Reciprocating Internal Combustion Engines

The facility has two 117 hp diesel fired emergency fire pumps that are classified as a reciprocating internal combustion engine (RICE) unit. The fire pumps operate on diesel at 500 hr/yr or less. Compliance with 40 CFF 60 Subpart IIII is demonstrated by purchasing engines certified to the emissions standards in 40 CFR 60.4205(c) and emission limitations of Table 4. Compliance with 40 CFR 63 Subpart ZZZZ is demonstrated by complying with all applicable requirements of 40 CFR 60 Subpart IIII per 40 CFR 63.6590(c).

GEORGIA RULES

Georgia Rule 391-3-1-.02(2)(b) – Visible Emissions

Georgia Rule (b) limits the opacity of emissions from any source to less than 40%, unless a more restrictive limit applies. The rule will apply to all process equipment at the facility. Violation of the rule is not likely due to the nature of the process and the use of control equipment.

Georgia Rule 391-3-1-.02(2)(d) – Fuel-Burning Equipment

Georgia Rule (d) contains provisions for PM, opacity, and NO_x emissions from fuel-burning equipment. The boilers and oil heaters will be constructed after January 1, 1972 and have a heat input capacity of greater than 10 MMBtu/hr but less than 250 MMBtu/hr. The filterable PM emissions from the boilers and oil heaters are limited to $0.5(10/R)^{0.5}$ lb/MMBtu heat input.

Georgia Rule (d) also limits the opacity from the boilers and oil heaters to less than 20% opacity (6-minute average), except for one 6-minute period per hour of not more than 27% opacity. These units will not be subject to the NO_x limit under 391-3-1-.02(2)(d)4 because the capacity for each unit is less than 250 MMBtu/hr.

Georgia Rule 391-3-1-.02(2)(e) – Particulate Emission from Manufacturing Processes

Georgia Rule (e) limits the emission of particulate matter on a pound per hour basis from a source based on the ton per hour of material input. The rule applies to all process equipment at the facility. Violation of the rule is not likely due to the use of control equipment.

Georgia Rule 391-3-1-.02(2)(g) – Sulfur Dioxide

Georgia Rule (g) limits the sulfur content of fuel burned in a unit below 100 MMBtu/hr to 2.5% or less. The facility will only fire natural gas in the boilers and hot oil heaters, which subsumes this limit and ensures compliance.

Georgia Rule 391-3-1-.02(2)(n) – Fugitive Emissions

Georgia Rule (n) limits the opacity of fugitive emissions to 20% and requires the facility to take precautions to prevent dust from becoming airborne. It is not likely this rule would be violated because all operations are in an enclosed building.

Georgia Rule 391-3-1-.02(2)(lll) – NO_x Emissions from Fuel-Burning Equipment

Georgia Rule (lll) limits NO_x emissions from all fuel-burning equipment with a heat input capacity between 10 and 250 MMBtu/hr installed after May 1, 1999 in specific counties, including Bartow County. The boilers and hot oil heaters are limited to 30 ppm NO_x at 3% O₂ on a dry basis during the months of May through September every year.

*RULES AND REGULATIONS THAT ARE NOT APPLICABLE*40 CFR 60 Subpart K, Ka, and Kb – NSPS for Volatile Organic Liquid Storage Vessels

While the facility will have volatile organic liquid (VOL) storage tanks on site for NMP, none of the tanks are larger than 75 m³ (19,813 gallons). Each of the ten NMP recovery systems have a 13,209-gallon storage tank associated with the process storing recovered NMP mixture. Additionally, there are eight NMP supply tanks at 13,209 gallons each storing fresh NMP. All tanks are equipped with fixed roofs. Therefore, none of the 40 CFR 60 Subparts K, Ka, or Kb apply. All tanks are exempt from permitting by Georgia Rule 391-3-1-.03(6)(c)7.

40 CFR 63 Subpart DDDDD and 63 Subpart JJJJJ – NESHAP for Industrial, Commercial, and Institutional Boilers (major sources and area sources)

The facility's boilers are not subject to 40 CFR 63 Subpart DDDDD since they are a minor source of HAP. 40 CFR 63 Subpart JJJJJ applies to each boiler at area sources of HAP. However, under §63.11195(e), gas-fired boilers, as defined in §63.11237, are not subject to 63 Subpart JJJJJ. Under §63.11237, a gas-fired boiler is defined as "any boiler that burns gaseous fuels," which includes natural gas. None of these units will be connected to a fuel oil source. Because the boilers meet this definition, they are not subject to 40 CFR 63 Subpart JJJJJ. The §63.11237 definition of "boiler," which also defines "process heaters," specifically excludes process heaters; therefore, the hot oil heaters are also not subject to 63 Subpart JJJJJ.

Georgia Rule 391-3-1-.02(2)(bb) – Petroleum Liquid Storage

This rule applies to tanks that have a capacity of greater than 40,000 gallons that store a petroleum liquid. All tanks at the facility are less than 40,000 gallons and NMP is not a petroleum liquid.

Georgia Rule 391-3-1-.02(2)(nn) – VOC Emissions from External Floating Roof Tanks

This rule applies to tanks that have a capacity of greater than 40,000 gallons. All tanks at the facility are less than 40,000 gallons and have fixed roofs.

Georgia Rule 391-3-1-.02(2)(vv) – Volatile Organic Liquid Handling and Storage

This rule applies to the transfer of VOLs in quantities greater than 4,000 gallons without tanks being equipped with submerged fill pipes and in specified counties. While NMP is classified as a VOL and Bartow County is a listed county, the facility is not subject to any other VOC requirements under State of Georgia regulations; therefore the facility is not subject to this rule.

Georgia Rule 391-3-1-.02(2)(mmm) – NOx Emissions from Stationary Gas Turbines and Stationary Engines used to Generate Electricity

This rule applies to stationary gas turbines or stationary engines used to generate electricity with a nameplate capacity greater than 100 kilowatts. At 117 hp, each fire pump is only 87.25 KWe. Additionally, emergency standby stationary gas turbines and stationary engines are exempt from limitations per 391-3-1-.02(mmm)4.(i).

*TESTING AND MONITORING REQUIREMENTS*Baghouses

The facility has indicated that dust collectors will control PM emissions from the cathode and anode measuring, feed, separation, and notching operations. Many dust collectors do not vent outside and instead clean and recycle air back into the facility. For the dust collectors that do vent to atmosphere through a stack, the facility will be required to establish pressure drop differential which will be monitored once per week of operation, perform weekly VE checks of the six stacks, and develop and implement a preventative maintain program (PMP) for the dust collectors that vent to atmosphere.

Scrubbers

There are sixteen scrubbers at the facility; however, SC01 through SC10 are classified as absorbers used in the NMP recovery system and are not considered to be APCE. The facility has proposed monitoring absorber water flow rate and outlet temperature for these scrubbers, while monitoring scrubbant flow rate and differential pressure across the other six process scrubbers. The facility will be required to test the VOC/HAP emissions from these units in order demonstrate compliance with the synthetic minor VOC and HAP emission limitations.

Activated Carbon Towers

There are eighteen activated carbon towers of varying sizes at the facility. The facility has proposed monitoring the carbon beds using a hand-held or similar monitoring device to measure total hydrocarbons (THC) on a propane basis. The facility has stated that a breakthrough of 10 ppm THC is equivalent to 6 ppm NMP (AC15 only), and 3 ppm THC is equivalent to 2 ppm NMP and will trigger a replacement of the activated carbon. The facility will monitor the carbon towers every week and make a note in the log when the carbon is replaced.

*SYNTHETIC MINOR LIMITS*HAP and VOC

The facility is required to create a protocol for calculating site-wide individual HAP, total HAP, and VOC emission based on fuel usage, materials usage, materials balances, emission factors, compliance testing, etc. Emissions must be calculated both monthly and on a twelve-month rolling average and reported to the Division.

CO and NO_x

Most of these emissions are generated by the boilers and hot oil heaters. By installing low NO_x burners and using natural gas only, emissions are minimized. Under Georgie Rule (III), the facility must test any fuel-burning unit that operates during ozone season. These results will verify compliance with the 99 tpy emission limitation. Additionally, the facility accepted vendor guarantees for minimizing CO emissions and will have to test as well. The facility has estimated 0.5 tpy each for both NO_x and CO emissions from the fire pumps for emissions calculation purposes.

PM

The facility is estimating 0.003 gr/SCF from all dust collectors for PM emissions. Emissions from Stacks ST44 and ST45 will be tested due to Georgia Air Toxics Guidelines to verify compliance with the 99 tpy limit. The facility has estimated 30 tpy for PM emissions from all fuel-burning equipment and the cooling towers for emissions calculation purposes.

Permit Conditions

Conditions 1.1 through 1.5 are general conditions that apply to all SIP sources.

Condition 2.1 limits the facility to less than 10 tpy of any individual HAP/25 tpy of all combined HAP. The facility requested this limit to remain classified as an area source for HAP.

Condition 2.2 limits the facility to less than 99 tpy each VOC, CO, NO_x, and PM emissions. The facility requested these limits to avoid applicability to 40 CFR Part 70.

Condition 2.3 requires the facility to operate the scrubbers and activated carbon towers at all times the associated process equipment is in operation.

Condition 2.4 requires the facility to operate the dust collectors DC01 through DC79 and DC120 through DC151 at all times the associated process equipment is in operation.

Condition 2.5 subjects the six boilers and twelve hot oil heaters at the facility to all applicable requirements of 40 CFR 60 Subparts A and Dc.

Condition 2.6 subjects the boilers and hot oil heaters to the PM and opacity requirements of Georgia Rule (d).

Condition 2.7 subjects the boilers and hot oil heaters to the NO_x limit of 30 ppm during the summer months under Georgia Rule (III).

Condition 2.8 restricts the boilers and heaters to firing natural gas only in order to remove the facility from applicability to 40 CFR 63 Subpart JJJJJJ.

Condition 2.9 requires the facility to comply with all requirements of 40 CFR Subpart CCCCCC and 40 CFR 63 Subpart A for the metal HAP emissions from the CM Cathode Powder/Mixing, controlled by Dust Collectors DC29 through DC36.

Condition 2.10 outlines the controls needed for the CM Cathode Powder/Mixing under 40 CFR 63 Subpart CCCCCC.

Condition 2.11 subjects the emergency fire pumps to the general requirements of 40 CFR 60 Subpart III. The condition is taken from the Title V permit template conditions in Section 8.0.

Condition 2.12 subjects all process equipment to an opacity of less than 40% (Georgia Rule (b)).

Condition 2.13 subjects to all applicable equipment to the requirements of Georgia Rule (e).

Condition 3.1 is the general fugitive emission requirement under Georgia Rule (n).

Condition 4.1 is a general condition that requires the facility to perform routine maintenance in order to keep air pollution control equipment in good working order.

Condition 4.2 requires the facility to keep an inventory of filter bags/cartridges on hand to replace any defective bags in any of the dust collectors.

Condition 4.3 outlines the parameters the facility must continue monitoring for the scrubbers after performance testing.

Condition 4.4 requires the facility to route the metal HAP emissions from CM Cathode Powder/Mixing to the associated dust collectors.

Condition 5.1 lists the monitoring parameters and frequency of data collection for the dust collectors, scrubbers, and activated carbon towers.

Condition 5.2 requires the facility to conduct tune up of the boilers and hot oil heaters for the purposes of complying with Georgia Rule (III). This condition includes recordkeeping requirements for the tune-ups.

Condition 5.3 requires the facility to monitor CO emissions from the fuel-burning units based on performance testing.

Condition 5.4 requires the facility to monitor the VOC concentration from the activated carbon towers weekly and to replace the carbon in the unit with the concentration exceeds 10 ppm THC as propane (AC15) or 3 ppm THC as propane (all others) within 7 days of such reading.

Condition 5.5 requires a weekly VE check from stacks ST42, ST43, ST44, ST45, ST52, and ST53.

Condition 5.6 requires the facility to develop a preventative maintenance program for the dust collectors.

Conditions 5.7 and 5.8 requires the facility to inspect and conduct visible emission tests of Dust Collectors DC29 through DC36 under 40 CFR 63 Subpart CCCCCC, and then make continuing inspections.

Condition 6.1 and 6.2 are general testing provisions that applies to all sources.

Condition 6.3 outlines the specific test methods for the facility.

Condition 6.4 requires the facility to conduct performance tests for VOC and HAP emissions from Scrubbers SC01 through SC16 and inorganic HAP from Dust Collectors DC29 through DC36 and establish lb/hr emission rates from these scrubbers and baghouses. The facility is uncertain about the timeline to install each production line (Scrubbers SC01 through SC10), so they will be allowed to test each line individually (or in groups) but the supporting equipment will need to be tested each time as production rates will change. On-going tests will occur every twelve months.

Condition 6.5 requires the facility to conduct initial performance testing for CO and NO_x emissions from the fuel-burning equipment, as well as outlines subsequent CO testing.

Condition 6.6 requires the facility to performance testing for PM emissions from stacks ST44 and ST45.

Conditions 7.1 and 7.2 are general provisions that apply to all sources.

Condition 7.3 requires the facility to notify the Division of construction and startup of the boilers and hot oil heaters under 40 CFR 60 Subpart Dc.

Condition 7.4 outlines the natural gas usage records for the boilers and hot oil heaters under 40 CFR 60 Subpart Dc.

Condition 7.5 requires the facility to maintain records of tune-ups and performance tests for the boilers and hot oil heaters.

Condition 7.6 requires the facility to maintain a log for carbon replacement in the activated carbon towers.

Condition 7.7 outlines the emission calculation protocol to be used to calculate monthly and 12 month rolling totals of VOC and HAP emissions.

Conditions 7.8 and 7.9 require the facility to calculate monthly and 12 month rolling total HAP emissions. Prior to site-specific performance testing, the facility will use the emission factors as described in Application No. 28655.

Conditions 7.10 and 7.11 require the facility to calculate monthly and 12 month rolling total VOC emissions. Prior to site-specific performance testing, the facility will use the emission factors as described in Application No. 28655.

Conditions 7.12 and 7.13 require the facility to calculate monthly and 12 month rolling total NO_x emissions. Prior to site-specific performance testing, the facility will use the emission factors as described in Application No. 28655. If all eighteen fuel-burning units are operating at full capacity, based on Georgia Rule (III) 30 ppm, this equates to 113 tpy NO_x. Based on the vendor guarantees of 9ppm for boilers and 24 ppm for the heaters, this equates to 66.6 tpy NO_x.

Conditions 7.14 and 7.15 require the facility to calculate monthly and 12 month rolling total CO emissions. Prior to site-specific performance testing, the facility will use the emission factors as described in Application No. 28655. If all eighteen fuel-burning units are operating at full capacity, based on vendor guarantees of 25ppm for boilers and 50 ppm for the heaters, this equates to 90 tpy CO.

Conditions 7.16 and 7.17 require the facility to calculate monthly and 12 month rolling total PM emissions. Prior to site-specific performance testing, the facility will use the emission factors as described in Application No. 28655, as well as account for 30 tpy from fuel-burning sources and cooling towers. Condition 7.18 requires the facility to notify the Division upon construction and initial startup of the facility. The facility must also submit a detailed list of all equipment (as a supplement to the Application) and a detailed sample of facility-wide VOC and HAP emissions calculations within 60 days after startup.

Condition 7.19 outlines the information required to be submitted in the semi-annual reports.

Condition 7.20 requires the facility to send in notification of startup.

Conditions 7.21-7.26 outline the various 40 CFR 63 Subpart CCCCCC recordkeeping and reporting requirements, including initial notifications, Notification of Compliance Status, and deviation reports.

Condition 8.1 is a general condition that applies to all Georgia air permits.

Condition 8.2 requires the facility to calculate and pay air permit fees.

Toxic Impact Assessment

Facility-wide emissions for formaldehyde, HCl, arsenic, cadmium, cobalt, manganese, nickel, and graphite exceeded the minimum emission rates (MER) as outlined in EPD's *Guidelines for Ambient Impact Assessment of Toxic Air Pollutants (TAP)*. The facility provided a facility wide toxic impact assessment for these TAP using SCREEN3. Cathode mixing will emit nickel, cobalt, and manganese out of a horizontal wall vent, modeled as a volume source. Graphite is emitted from the anode mixing out of a vertical stack ST45. Hydrogen chloride (HCl) is emitted from the five laboratory scrubbers and the cell discharge scrubber through stacks ST41, ST53, and ST54. The remaining TAP are combustion products from the boilers and hot oil heaters. The Division determined that the smaller hot oil heater stacks were the "worst case" stacks for products of combustion.

The Division reviewed the calculations, inputs, and results and agrees with the finding that all pollutants are less than the applicable acceptable ambient concentrations. Please see the application for a complete copy of the report. Note that the solvent NMP is not assessed in Georgia's current Toxics Guidelines.

TAP	Ave. Period	AAC (µg/m³)	MER (lb/yr)	Facility emissions (lb/yr)	Emission rate (lb/hr)	Total (µg/m³)	% of AAC	Pass
Arsenic	15-min	0.2	0.0567	1.20	0.000137	0.000528	0.264	YES
	Annual	0.000233				0.0000320	13.6	YES
Cadmium	15-min	30	1.35	6.60	0.000753	0.00324	0.01	YES
	Annual	0.00556				0.000196	3.5	YES
Cobalt	24-hour	0.24	11.7	27.95	0.0031875	0.0466	19.5	YES
Formaldehyde	15-min	245	267	450.77	0.0515	0.221	0.1	YES
	Annual	1.10				0.134	12.2	YES
Graphite	24-hour	5.95	290	6,959.07	0.794	1.04	17.5	YES
HCl	15-min	700	4,870	9,127.10	1.042	296	43.3	YES
	Annual	20				10.4	52	YES
Manganese	15-min	500	12.2	23.70	0.00271	0.131	0.03	YES
	Annual	0.05				0.00792	15.8	YES
Nickel	24-hour	0.794	38.6	46.06	0.00526	0.0769	10	YES

Summary & Recommendations

The public advisory for the SK Battery America, Inc. facility expired on January 20, 2023, and no comments were received. The facility has been classified as a synthetic minor source for HAP, VOC, PM, CO, and NO_x emissions and the appropriate operating and testing/recording/reporting requirements have been included in this “S” permit. The facility has indicated that it can comply with all applicable rules and regulations; therefore, I recommend that Air Quality Permit No. 3691-015-0149-S-01-0 be issued to SK Battery America, Inc.