

Inspection Report: New Frontier Materials, Clean Air Act Stationary Source

Inspection Date(s): September 29, 2023

Facility Name: New Frontier Materials Operations Alpha LLC – O’Fallon Asphalt

Facility Address: 1440 Terra Lange West, O’Fallon, MO 63139

FRS ID #: 110009413642

Federal Facility: No

NCI: Creating Cleaner Air for Communities

Facility size: Synthetic Minor

Activity: Partial Compliance Evaluation

State Referral: No

NAICS code: 324121 – Asphalt Paving Mixture and Block Manufacturing

Lead Inspector: Bryan Lange, ERG Inspector, (919) 622-2374

Asst. Inspector: Elizabeth Hubbard, ERG Inspector Trainee, (919) 468-7894

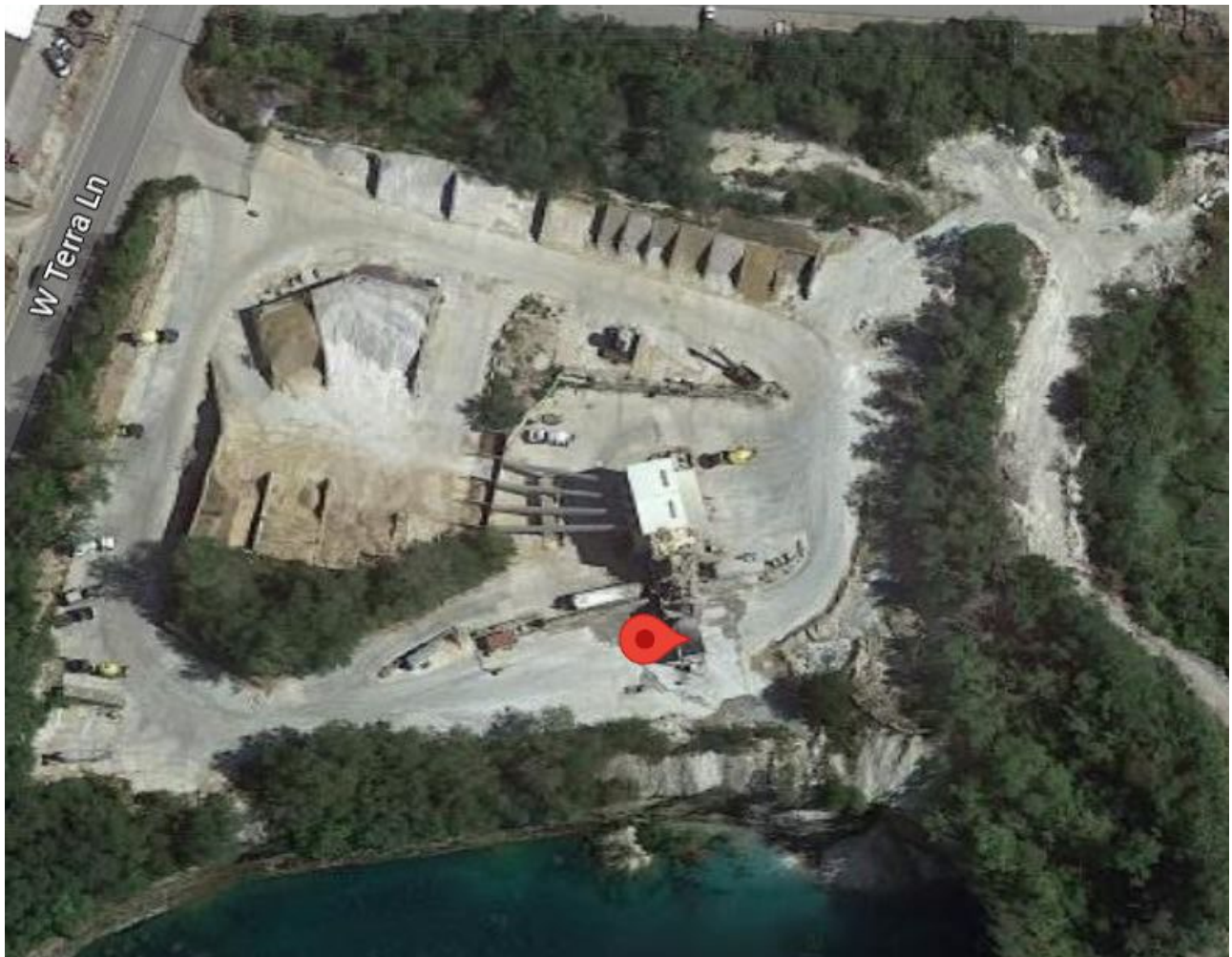
State Inspector: Patrick Glass, Missouri Department of Natural Resources (MoDNR),
314-416-2960

Facility Contacts: Lina Klein, Environmental Manager, (314) 910-7822,
ljklein@newfrontiermaterials.com

1. Plant Description:

The facility's 2018 operating permit states, "O'Fallon Asphalt is a hot mix asphalt plant located in the St. Louis metropolitan area. When operating in batch mode, cold aggregate is transferred and dried, mixed with heated asphalt oil and loaded out to trucks. When operating as a drum mix plant, asphalt oil, and sometimes Reclaimed Asphalt Pavement (RAP), is added to the rotary mixer; hot asphalt is then conveyed to silos, then loaded out to trucks...The installation has the potential to exceed the Part 70 permitting threshold for Carbon Monoxide (CO), but has accepted a 100 ton/year voluntary limit to remain below that threshold. The installation is a Named Source and is located in a nonattainment area for ozone. 40 CFR Part 60, Subpart I - Standards of Performance for Hot Mix Asphalt Facilities applies to this installation."

Figure 1: Satellite image of the New Frontier Materials facility in O'Fallon, MO.



2. Facility Entry:

The representatives of the United States Environmental Protection Agency (“EPA”), Elizabeth Hubbard and Bryan Lange from Eastern Research Group, Inc. (“ERG”), and a representative from the Missouri Department of Natural Resources (“MoDNR”), Patrick Glass, arrived at the New Frontier Materials facility at 1440 Terra Lange West, O’Fallon, MO (“New Frontier” or “the facility”) at approximately 9:30 am. The MoDNR and ERG representatives (“the inspectors”) were met at the gate by Lina Klein, Environmental Manager. Ms. Klein led the inspectors to the office building, where they were joined by Justin Worthington, Superintendent. The inspectors presented their identification credentials and provided an overview and scope of the inspection. The inspectors explained that ERG worked as contractors to conduct facility inspections for EPA. They provided a copy of EPA’s “Small Business Resources Information Sheet.”

3. Opening Conference/Technical Discussion:

The inspectors explained that they were at the facility to conduct a routine Clean Air Act (“CAA”) inspection, including a focus on volatile organic compounds (“VOCs”) and hazardous air pollutants (“HAPs”). The inspectors explained that during the facility walkthrough, they would capture digital images of the facility’s processes and emission points using a digital point and shoot camera, as well as an optical gas imaging, forward looking infrared (“FLIR”) video camera, model GF320, that were not intrinsically safe. Therefore, they requested that the facility representatives inform them of any areas where there could be a potentially explosive atmosphere. Ms. Klein explained that particulate emissions, not VOCs or HAPs, were the pollutants of concern. The inspectors were free to take the cameras to any areas. The list of digital images and FLIR videos taken during the inspection are included in Appendix A.

The inspectors asked for background information about New Frontier and the facility. Ms. Klein and Mr. Worthington (“the facility representatives”) provided an overview of the facility’s history and general operations that take place at the facility. The facility representatives could not provide the original construction date of the asphalt manufacturing equipment, but a baghouse was installed in 2000 to capture emissions from the dryer, hot elevator, screens, bins, and mixer. On September 13, 2000, performance tests were conducted to demonstrate that particulate matter (“PM”) emissions were compliant with 40 CFR Part 60 Subpart I, *Standards of Performance for Hot Mix Asphalt Facilities*. Ms. Klein described the performance test conditions as a high level of production. No additional testing has been performed on the equipment. In 2002, conveyors were added, giving the facility the ability to mix Reclaimed Asphalt Pavement (“RAP”).¹

In 2008, the equipment was relocated to its current location.² At that time, improvements were made including: the addition of a rotary mixer, the addition of a cyclone as a prefilter to the baghouse, and the

¹ Applicability Determination Index (ADI) No. NR114 - Adding a RAP dryer to an existing batch plant does not constitute a modification.

² ADI No. I004 - Relocation of a portable plant; change of aggregate; and transfer of ownership are not considered modifications which would require an existing plant to comply with the standard. 40 CFR 60.2 “Modification” means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

replacement of three vertical liquid asphalt storage tanks with four horizontal tanks. In July of 2021, New Frontier purchased the facility from Fred Weber, Inc., along with several other asphalt and aggregate assets located in the St. Louis, MO area.

The inspectors noted that the facility's active operating permit was issued in 2018 and would be expiring before the end of the calendar year. They asked if the facility had submitted an updated permit application. Ms. Klein said the permit renewal application was submitted May 11, 2023. She said that New Frontier had also submitted an amendment application in 2020 to allow production of "dry trap." Dry trap uses include High Friction Surface Treatments ("HFST") and railroad ballast.

The facility representatives explained that the facility operates Monday through Friday and had 3 employees at the time of the inspection, while New Frontier Materials had 150 employees company-wide. At the time of the inspection, the expected production target for the day was 650 tons of BP1 (or 180 tons per hour). Mr. Worthington explained that BP1 is a highway mix that is commonly produced and contains RAP. Ms. Klein showed the inspectors a spreadsheet used to track daily production and energy usage. See photo DSCN7587.JPG.

The following is a summary of the New Frontier operations based on the facility representatives' general overview. Aggregate materials are metered from the 10 hoppers onto a conveyor belt and are transported into a rotary dryer. The dryer is counterflow, meaning the virgin aggregate flow is opposite or counterflow to the direction of exhaust gases. The dry material enters a bucket elevator where it is processed as a batch or continuously.

- In the batch process, the dry material is screened into a weigh hopper, mixed with liquid asphalt, then dropped down directly into a truck for delivery.
- The continuous process mixes materials (i.e., dry virgin aggregate and RAP) and liquid asphalt without additional heat. The mixer exhaust is ducted into the dryer. Ms. Klein explained this configuration treats "blue smoke."³ The dryer exhaust is ducted first to the cyclone, then to the baghouse. Dust is recovered from these PM control devices and sent to the elevator. The mixture is conveyed to storage silos, where it is eventually dropped into transport trucks. Mr. Worthington explained that an average truck loadout was 15 tons.

Mr. Worthington said that generally, the facility operates as a continuous process rather than batch.

The inspectors asked the facility representatives to describe the baghouse. The facility representatives said that the baghouse contains 720 bags in 12 zones, and each bag is approximately 15 feet long and 6 inches in diameter. The facility has procedures in place to maintain baghouse performance. Specific maintenance activities include frequent pulses (which will breakup filter cake), measuring baghouse pressure drop, and periodic inspections. The normal pressure drop range is 1 to 2 inches of water. Mr. Worthington explained that a pressure drop of 4 or 5 inches of water could indicate muddy bags caused by wet particulate. Ms. Klein estimated the baghouse removal efficiency at 99%, citing engineering judgment. Ms. Klein showed the inspectors the spreadsheet used to track baghouse pressure drop

³ ADI No. I008 – "Blue smoke" has been observed at the opening of the pugmill dump during loading of hot asphalt concrete into trucks.

measurements, malfunctions, and maintenance activities. See photo DSCN7591.JPG. Mr. Worthington showed the inspectors the control box where pressure drop measurements are taken. The inspectors noted the pressure drop at that time was approximately 1.2 inches of water. See photo DSCN7592.JPG.

The inspectors asked how often the facility performed visible emissions observations. The facility representatives responded that they conducted visible emissions observations using EPA Method 9 once per month from the dryer, hot elevator, screens, hot bins, and mixers. The facility representatives presented a Method 9 Opacity Observations log from September 1, 2023, and a Method 9 certification for Mr. Worthington. See photos DSCN7593.JPG and DSCN7594.JPG.

Mr. Worthington explained that RAP is typically collected by the Department of Transportation ("DOT") and delivered to New Frontier where it is stockpiled. New Frontier has a portable crusher that is brought on site as needed. It can produce RAP in 1/2 and 3/8-inch sizes. The facility representatives explained that New Frontier does not have mobile hot mix asphalt production equipment.

The facility representatives described the on-site storage tanks:

- Two Stone Matrix Asphalt ("SMA") vertical storage tanks. Mr. Worthington described these materials as "fine-fine dust."
- Three 150-ton hot mix asphalt storage silos.
- Three vertical liquid asphalt storage tanks, with a collective storage capacity of 30,000 gallons.

Liquid asphalt is delivered by tanker truck; a full truck holds 26 tons. Liquid asphalt deliveries are demand driven. Mr. Worthington stated that on September 28, 2023 (the previous day), there were two truck deliveries, while on the day of the inspection, there was only one. Liquid asphalt is maintained at 350 degrees Fahrenheit ("F") such that the liquid asphalt is pumpable. The high temperature is maintained with a 150 million British thermal units ("MMBtu") per hour natural gas-fired oil heater. The heated oil circulates through a coil inside each tank. The facility representatives provided a liquid asphalt storage tank schematic which showed the exhaust vent (also functions as an overflow pipe) and the heating coils. See Appendix E.

All plant liquid asphalt lines are accompanied by a heated oil "tracer line" which manages viscosity with heat. The hot mix asphalt silos are also heated with circulated oil. The oil heater and the dryer burner are tuned annually by an external contractor. Natural gas is supplied to the facility by pipeline.

The inspectors asked how the facility calculated emissions for the Emission Inventory Questionnaire ("EIQ") and Annual Emissions Reports. Ms. Klein showed the inspectors an electronic copy of the emission calculation spreadsheet which incorporated: production-based emission factors developed from the 2000 performance test (e.g., carbon monoxide) and AP-42 fuel based emission factors for natural gas. Ms. Klein also showed the rolling 12-month annual average of 42 tons of CO per year. The permit conditions limit annual CO emissions on a monthly and consecutive 12-month basis to 100 tons per year. See photo DSCN7588.JPG.

The inspectors asked what type of solvent was used in the facility's parts washer. The facility representatives responded that the parts washer uses "safety clean premium solvent." Ms. Klein presented the safety data sheet to the inspectors. See photos DSCN7589.JPG and DSCN7590.JPG. Mr. Worthington indicated that heat was more effective at removing dried liquid asphalt from metal.

4. Facility Tour/Walkthrough:

At approximately 10:30 am, the facility representatives led the inspectors on a walkthrough of the facility. They started at the aggregate hoppers, proceeded to the dryer, the batch tower, baghouse, the liquid asphalt storage tank area, the oil heater, the parts washer, and final product testing area. See photos DSCN7581.JPG, DSCN7583.JPG through DSCN7586.JPG, and DSCN7596.JPG through DSCN7607.JPG.

At the liquid asphalt storage tank area, the inspectors searched for emissions with the FLIR camera coming from the tank overflow vents but saw none. See video MOV_2771.mp4. The parts washer was also inspected without discovery of emissions using the FLIR. See video MOV_2772.mp4.

At approximately 12:15 pm, the inspectors returned to the conference room and provided the facility representatives with a closing conference.

5. Closing Conference:

The inspectors thanked the facility representatives for their time and cooperation during the inspection. The inspectors explained to the facility representatives that EPA would provide New Frontier with an inspection report in approximately 60 days. They explained that the report would be available to the public through the Freedom of Information Act, and therefore, if the company wanted to claim any notes or digital images as confidential business information (“CBI”), they could do so today or within 10 days following the inspection. They provided Ms. Klein with EPA’s confidentiality notice form. Ms. Klein filled out and signed the form. See Appendix B.

The inspectors summarized questions and concerns raised during the inspection. They noted that during the facility walkthrough, they observed no VOC emissions while using the FLIR camera. The inspectors had no questions about the accuracy of the CO emissions calculations the facility used to remain a synthetic minor source. The inspectors provided the facility representatives with a Notice of Preliminary Findings form and explained that EPA may follow up with additional questions. See Appendix C.

The inspectors took one copy of a liquid asphalt storage tank schematic. See Appendix E. They provided the facility representatives with a receipt for the document. See Appendix D.

At approximately 12:45 pm, the inspectors departed from the facility.

6. Appendices

- A. Digital Image Log
- B. Confidentiality Notice Form
- C. Notice of Preliminary Findings Form
- D. Document Receipt Form
- E. Asphalt Storage Tank Schematic

Inspection Report Sign-Off

Lead Inspector's Name: Bryan Lange, ERG

Signed by Jason Sese for Bryan Lange

X

Lead Inspector

Assisting Inspector's Name: Elizabeth Hubbard, ERG

X

Assisting Inspector

Supervisor's Name: Tracey Casburn, Air Branch Chief, ECAD

X

Supervisor