Division of Materials and Waste Management
March 2022

Foundry Sand Beneficially Used as an Ingredient in Structural Fill and as Pipe Bedding

The purpose of this document is to provide guidance on the Application for General Permit BUGPFS02, the beneficial use of foundry sand as a component in structural fill and as pipe bedding.

Who is the Applicant?

In general, the Applicant is the individual that applies for coverage under the general permit by submitting a Notice of Intent (NOI) form which can be found on Ohio EPA's Beneficial Use webpage. The Applicant can be the generator of the foundry sand, a third party such as a distributor, or the end user.

Who is the Permittee?

The Applicant becomes the Permittee when the Applicant receives written notification from the Director that coverage under the general permit is granted.

Applicable Statutes

- 3734
- 6111

Contact

If you have questions regarding this document or would like more information, please contact the Beneficial Use Unit in Central Office at (614) 644-2621.

Disclaimer

The procedures set out in this document are intended solely for guidance. The procedures are not intended and cannot be relied upon to create rights, substantive or procedural, enforceable by any party against Ohio EPA. While this guidance document is not legally binding, all statutes and rules referenced herein are binding and enforceable. Ohio EPA reserves the right to vary this guidance or to change it at any time without public notice and also reserves the right to deviate from this guidance on a case-by-case basis.

Eligibility Criteria

Only foundry sand that meets all the following criteria is considered a beneficial use byproduct and is eligible for beneficial use under this permit:

a. The foundry sand consists of silica sand and binders from sand molds and cores that have been through the production process from foundries that use iron (gray and ductile), steel, and aluminum metals; and that either can no longer be reused to cast products or are in excess of the existing sand system storage capacity;
b. The foundry sand does not exceed any of the constituent concentration limits specified in Table 1 of this guidance document.
c. The foundry sand is not a hazardous waste as defined by Ohio Revised Code (ORC) Section 3734.01, Ohio Administrative Code (OAC) Rule 3745-50-10(A), and OAC Rule 3745-51-03.

When should I apply for coverage under this general beneficial use permit?

You should apply for coverage at least two months before you want to beneficially use the foundry sand. After Ohio EPA has reviewed the complete application package, you will receive a letter granting coverage under the permit if you meet the criteria for coverage.

How long does it take to process a complete application package?

It takes the technical staff about a week to review all the information that is submitted with the application. If the application is complete, the letter granting coverage under the permit can be issued within a month.

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What if you want to beneficially use foundry sand from more than one generator?

There is no limit to the number of foundry sand generators that you can include in your coverage for this general permit. The fee is still $200, but you must fill out an NOI Form and submit sampling and analysis results for each facility (generator) producing foundry sand.

Can the generator of foundry sand apply for this general permit?

Yes. The generator can analyze its foundry sand and submit an NOI. The generator can distribute the foundry sand to a third party who is required to operate under the conditions of the foundry sand permit.

Complete Application Package and Explanation of Requirements

What are the requirements for a complete application package?

Each application package must include all of the following items.

- A completed NOI form including a demonstration that the foundry sand satisfies the eligibility criteria.
- Application fee of $200.
- Documentation which demonstrates that the foundry sand is not a hazardous waste.
- Sampling and analysis plan.
- Sampling results from the referenced sampling plan.
- A statistical evaluation of the sampling results.

How can I demonstrate that the foundry sand is not a hazardous waste?

According to OAC Rule 3745-599-05, prior to applying for a beneficial use permit, you must demonstrate that the beneficial use byproduct is not a hazardous waste as defined by ORC Chapter 3734.01, OAC Rule 3745-50-10(A), and OAC Rule 3745-51-03. In order to meet this demonstration, you may use either generator knowledge or a quantitative evaluation. For this general permit, Ohio EPA recommends that you use generator knowledge to demonstrate the foundry sand is not a hazardous waste. You may use some or all of the following information when using generator knowledge for determining that your waste is not a hazardous waste; 1) facility specific process flow diagram or narrative description of the process generating the waste, 2) a list of all ingredients or materials used in the process, 3) chemical makeup of all ingredients or materials used in the process that generates the waste (e.g. NSF/ANSI 60 listings), 4) data obtained from literature regarding waste produced from a similar process using the same ingredients and materials, and 5) Safety Data Sheet (SDS) of material used for treating raw water. Please refer to the Generator Knowledge guidance document for assistance in using this method of determination.

The Applicant may also submit Toxicity Characteristic Leaching Procedure (TCLP) Method 1311 data that has been used to quantitatively demonstrate the foundry sand is not a hazardous waste. TCLP Method 1311 is the only method that can be used to determine if a waste is below the regulatory level for a characteristically hazardous waste. If the total RCRA metal constituent level is less than 20 times the TCLP value found in OAC Rule 3745-51-24, you are not required to conduct the TCLP analysis.

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Sampling and Analysis for the NOI

How do I sample and analyze for total metals?

Ohio EPA requires representative sampling of any waste material proposed for beneficial use. The general permits are designed to allow flexibility in determining the number of samples necessary for representative sampling. Not every waste stream or situation is the same, therefore it is impossible to predict the number of samples required to demonstrate that the 95 percent Upper Confidence Limit (UCL) of the mean for each constituent analyzed for total metals and for leaching analysis from the foundry sand does not exceed the constituent limits in Table 1. U.S. EPA's Test Methods for Evaluating Solid Waste (SW-846 Chapter 9, Sampling Plan for evaluating piles of wastes) is a good reference tool. It explains different methods and strategies of representative sampling.

Need help?

Please contact DMWM's beneficial use unit at (614) 644-2621 if you need assistance developing your sampling and analysis plan or for any questions regarding sampling or analysis.

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Table 1

Constituent[1,2]	Totals Analysis (mg/kg)	Leaching Analysis (mg/L)
Aluminum (Al)	77000	4.0
Antimony (Sb)	31	0.12
Barium (Ba)	15000	40
Cadmium (Cd)	39	0.1
Copper (Cu)	1500	26
Iron (Fe)	55000	6.0
Lead (Pb)	300	0.3
Selenium (Se)	100	0.2
Zinc (Zn)	2800	100

The following are suggestions to assist you in devising your sampling plan to demonstrate that your foundry sand meets the constituent limits in Table 1.

1. The reported detection limit for each constituent analyzed from foundry sand should be less than the limit specified for each constituent in Table 1.

2. The storage method and pile size of the foundry sand can affect the number of foundry sand samples required to demonstrate the 95% UCL of the mean for each constituent (total metals and leaching analysis) does not exceed the constituent limit specified in Table 1.

3. It may be appropriate to screen the foundry sand prior to collecting grab samples. When setting up your sample collection, you should set up a 3-D sampling grid of the entire pile.

[1] Al, Sb, Ba, Fe: US EPA Regional Screening Levels, Residential Soil; Cd, Cu, Pb, Se, Zn: US EPA 40 Code of Federal Regulations Part 503 Pollutant Concentrations (Table 3 of 503.13).

[2] Al, Sb, Ba, Cd, Cu, Fe, Pb, Zn: TCLP Analysis limits for beneficial use of foundry sand are 20 times the drinking water standard (Maximum Contaminant Levels (MCLs) or Secondary MCLs); Se is 5 times the drinking water standard.

4. If the foundry sand pile is too large to obtain a sample from the top and bottom of the pile, then it may be more appropriate to remove a manageable amount of foundry sand from the pile and representatively sample the amount removed.

5. Foundry sand that has been stored as a product should be homogeneous enough that 3-5 samples should be adequate to demonstrate that the 95% UCL of the mean for each constituent (total metals and leaching analysis) does not exceed the constituent limit specified in Table 1.

6. For historical piles of foundry sand, the sampling and analysis strategy may require more extensive sampling analysis to demonstrate that the 95% UCL of the mean for each constituent does not exceed the total metals or leaching constituent limit specified in Table 1. It may be acceptable to take 12-15 grab samples from at least three equally divided depths of a pile of foundry sand (i.e. 3-dimensional sampling grid) to demonstrate that the 95% UCL of the mean for each constituent (total metals and leaching analysis) does not exceed the constituent limit specified in Table 1. Or, if you have foundry sand that has not been stored as a product, more extensive sampling and analysis may be required, or it may be more appropriate for you to apply for an individual permit.

7. You will need to analyze each sample for total metals and for leaching potential using the TCLP Method 1311 or the Synthetic Precipitation Leaching Procedure (SPLP) Method 1312 as described in SW 846, for the constituents specified in Table 1.

8. A statistical evaluation is necessary for decision makers to have a level of confidence that the beneficial use of the foundry sand will be protective of human health, safety, and the environment. A 95% UCL is one way to provide this level of confidence. Please refer to the guidance document for "*Calculating the 95% Upper confidence Limit".*

9. The current lab cost associated with each sample is approximately $200 for the list of constituents in Table 1 for total metals and TCLP. Ask the lab to give you the analytical results with a copy of the Tier I Data Report. A list of the Tier I Data Report requirements is provided in Appendix B.

10. Remember to submit your sampling plan, the sampling results, the Tier I data package, and the statistical evaluation with the NOI.

Tier I Data Report Requirements

1. Site name and Project Manager or Applicant sample control number;
2. Name of Project Manager or Applicant;
3. Field sample numbers cross-referenced to associated laboratory sample numbers (i.e., Contractor and subcontractor(s);
4. Project narrative (a.k.a. case narrative) describing tests used by the Contractor or subcontractor(s);
5. Sample results with units, method detection limits (MDL), reporting limits (RL) and dates (i.e. receipt, preparation, and analysis), as well as, surrogates and quality control (QC) limits for all organic tests,
6. Bench sheets (Note: for characteristic testing only, such as TCLP.)
7. QC narrative discussing QC outliers and corrective actions taken by the Contractor or subcontractor(s).
8. QC samples, including preparation and analysis dates, results, units, and QC limits (where applicable), [Note: Contractor or subcontractor(s) must include blanks, laboratory control spikes, duplicates, spikes, and surrogates for QC samples.]
9. Copy of a completed chain-of-custody form;
10. Copy of cooler receipt form, and;
11. Signed statement by either the Laboratory Manager, Quality Assurance Manager, or Project Manager attesting to the validity of the analytical results.

For an example of a Tier 1 Data Report please see the guidance document of Example Tier 1 Data Report.

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Permit Operating Conditions

Can I store foundry sand until I am ready to beneficially use it?

Yes. All foundry sand storage must comply with the following Best Management Practices (BMPs).

- Within 30 days of obtaining coverage under BUGPFS01, the Permittee must provide to Ohio EPA an aerial map that identifies the locations where the foundry sand is stored for beneficial use;
- Foundry sand storage must be at least 300 feet from public water system and private wells and surface waters used for drinking water or watering livestock and at least 100 feet from any other surface water.
- When storing foundry sand, the Permittee must create surface diversions to direct storm water run-on away from sites where foundry sand is stored or create a surface diversion to a sediment trap to remove solids in storm water runoff from a site where foundry sand is stored.
- Storage of foundry sand must not be over or within a sensitive ground water area.
- The Permittee must take measures to control fugitive dust and other air emissions that may result from when storing the foundry sand.
- By April 1 of each calendar year, the Permittee may store no more foundry sand than four times the amount of foundry sand that was beneficially used in the previous calendar year.
- The Permittee must ensure that any storage complies with the above storage BMPs and does not adversely affect public health or safety or the environment.

What best management practices (BMPs) do I need to follow when beneficially using foundry sand?

- When the Permittee land applies the foundry sand, it must be 300 feet from a public water system wells and surface waters used for drinking water or watering livestock.
- The Permittee must be at least 33 feet of surface waters of the state.
- Beneficial use of foundry sand must not be over or within a sensitive ground water area.
- The Permittee must take measures to control fugitive dust and other air emissions that may result when beneficially using the foundry sand.

What records am I required to keep?

All permittees must keep the following records for at least five years. You do not need to submit these records to Ohio EPA, but they need to be available for review by Ohio EPA.

- Records of the name, address and telephone number of each generator from which foundry sand was obtained.
- Records of the monthly log of operations that documents the tonnage of foundry sand received and managed and the tonnage of foundry sand beneficially used.
- Records of the annual volume of foundry sand accepted for beneficial use from each generator of foundry sand and the volume of foundry sand from each generator which was beneficially used.
- Documentation which demonstrates that the foundry sand from each generator is not a hazardous waste as defined by ORC section 3734.01, OAC Rule 3745-50-10(A), and OAC Rule 3745-51-03.
- Records of each date and location upon which the foundry sand is stored or placed on the land by the Permittee.
- Records of each location where foundry sand is stored and beneficially used by the Permittee, including aerial maps if required.
- The sampling plan detailing where and how samples of foundry sand from each generator were collected, dates that the samples were collected, and the list of constituents (total metals and leaching analysis) from Table 1 for which samples were analyzed.
- All laboratory data and analyses of the constituent concentrations listed in Table 1.

Do I need to submit an annual report?

Yes. The annual report can be submitted to the Division of Materials and Waste Management's virtual dropbox specified in the general permit. Annual reports are used to keep track of how much foundry sand is stored and beneficially used. The sampling and analysis information from the annual report helps Ohio EPA build a data

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base of the concentrations of the constituents in foundry sand. Even if you did not beneficially use any foundry sand in that calendar year, you are required to submit an annual report.

Contact

For more information about this general permit or any beneficial use question, you can contact the beneficial use unit of the Division of Materials and Waste Management at (614) 644-2621.

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