

GENERATOR SAMPLING PLAN

It is the intent of GENERATOR to comply with all applicable environmental regulations pertaining to the characterization, management recycling and disposal of spent abrasives. This sampling plan and the regulatory conclusions arrived at from the waste determination process are instrumental in a compliant program. GENERATOR will seek the aid of a consultant to conduct the sampling events, conduct project review to determine the appropriate lab work and to implement the components of this plan. At this time, GENERATOR is electing to contract with Kleen Industrial Services to manage this program.

Objective (SW-846)

GENERATOR is a contractor, specializing in but not limited to, painting, recoating, fabricating structures, pipelines, tanks, maritime equipment and vessels including US Navy craft. Many owners such as the US Navy only allow specialized performance based coatings to be applied over specific portions of ships. Interior coatings are primarily epoxies that do not use heavy metal compounds as pigments. The exterior hull coatings of ships are copper or copper-zinc based pigments. In the process of recoating these ships, GENERATOR is required to prepare the ships steel surfaces by abrasive blasting prior to application of the new coating. GENERATOR will use the Mil Spec Approved abrasives Kleen Blast that has demonstrated its non-hazardous nature. GENERATOR is responsible for the proper recycling and disposal of the spent abrasive containing these coatings. This sampling plan is designed to confirm the presumed regulatory status of spent abrasives and to allow for acceptability at recycling or disposal facilities. Finally if comparison of results to the normal range of trace contaminants in Kleen Blast does not provide regulatory clarity, then the initial results will be used to target additional metals for subsequent analysis.

BACKGROUND CONSIDERATIONS

This plan has been developed to provide GENERATOR and its contractor with procedural guidance for sampling spent abrasives. A review of the Military Specifications for interior ballast and fuel tank coatings indicates that most coatings contain only trace concentration of heavy metals from impurities in the raw material processes. Exterior hull coatings are concentrated copper or copper zinc based coatings. Ship repair contractors use approximately 8 to 10 pounds of Kleen Blast Abrasives per square foot of coating removed and can only use this abrasive once. This uniform process creates a material that is consistent in composition and is comprised of 98-99% abrasive. The material is expected to be non-regulated spent abrasive from interior tank coatings

because no significant input of heavy metals will contribute to the spent abrasive. It is expected that a regulated waste material only from the exterior coatings and this material will be recycled under Health & Safety Code exclusion 25143.2 if non-RCRA. If material is clearly RCRA, Non-RCRA or non-Hazardous, subsequent samples are oftentimes not collected. According to Sw-846, "high accuracy and high precision is required if one or more chemical contaminants of a solid waste are present at a concentration that is close to the applicable regulatory threshold. Alternately, relatively low accuracy and low precision can be tolerated if the contaminants of concern occur at levels far below or far above their applicable thresholds." It is the borderline or heterogeneous materials that generally require more extensive sampling.

This sampling protocol for homogenous bulk spent abrasive material is more stringent than standard industry practice in that a multi-step process is employed. First, a thorough MSDS review for military architectural coatings has been conducted and a list of industry MSDS's for typical coatings has been compiled. This data is used to compare the compounds in spent grit with regulated metals and to make a predetermination about the potential metals that may get into spent abrasive. The result of this comparison will indicate when additional testing may be required prior to acceptance.

TYPES OF ANALYSIS

Initial testing can be performed by any desired state certified laboratory. The waste analysis performed prior to a shipment of spent grit depends upon the nature of the activity that generated the material. The project coating to be applied is governed by the same Mil Spec coating being removed in the sandblasting operation. This determines the potential for heavy metal concentrations that alter the spent abrasive's regulatory status and may cause the spent grit to exceed STLC or TTLC limits. In these cases the only analysis performed is the Toxicity Characteristic Leaching Procedure ("TCLP")(40CFR Part 261). Passing the TCLP establishes the spent grit as non-RCRA and allows it to be recycled as and Excluded Recyclable Material. If the material fails the analysis, it is not transported to the normal recycling service providers and must be managed as a RCRA Hazardous Waste including the identification, storage, labeling, manifesting, transportation and disposal of hazardous waste

If after project review, GENERATOR or its contractor cannot presume that the spent grit from this project exceeds TTLC or STLC thresholds, then the material is analyzed using the TTLC (Total Threshold Limit Concentration) and a 10x STLC (Soluble Threshold Limit Concentration) Waste Extraction Test ("WET") as specified in Title 22, 66261.24 (a) (1) California Code of Regulations. The total metal levels when compared to standard Kleen Blast concentrations will indicate if the coating has contributed any particular regulated metal that would require additional analysis. If the WET indicates a

constituent's concentrations exceed the STLC, then the TCLP analysis is also performed to determine RCRA status.

Finally, GENERATOR at the job site also implements a variety of measures to ensure that the spent grit does not become contaminated with substances not normally found in spent grit and, in the unlikely event that material is contaminated with foreign substances, that such contamination is detected prior to further handling of the spent grit. Most importantly is that a person knowledgeable in the generation and storage of that spent grit will certify that there has not been any paints, solvents or other foreign substances commingled with the grit. Those operational procedures are described in a separate document.

Sampling Devices and Equipment

The devices in the following list are utilized for sampling bags, bulk containers, and drums not equipped with valved sample ports:

Trier. The trier consists of a tube cut in half lengthwise with a sharpened tip allowing the trier to cut into sticky solids.

Scoops/Shovels. Scoops and shovels are utilized to sample granular or powdered materials.

Grabs. The actual bag or container can be used to grab a sample or a clean-gloved hand can dip into materials.

Description of Sampling Methods

Sampling methods for specific types of wastes/materials correspond to those referenced in 40CFR part 261 Appendix I, included by reference and summarized below:

Sampling Methods and Equipment

Material	Method	Equipment	Sample Container
Crushed or powdered material	ASTM D364-73	Tubing, Trier, Shovel, clean gloved hand	Plastic/Glass Jar Plastic zip-lock bag
Soil or Rock-like material	ASTM D420-69	Tubing, Trier, Shovel	Plastic/Glass Jar

Trier (slotted tubes) may be utilized to obtain a representative sample up to 40 inches deep. Solid materials may be sampled with the same tools as a compacted sludge or may be sampled using a measured trowel (small shovel) up to six inches deep. A trowel will not be utilized to sample a material that exhibits stratification properties

On-Site Container Sampling. Prior to acceptance into identified recycling programs, containers will be sampled for chemical analysis. Each container may be individually inspected and sampled depending on the type of container and the physical nature of the material. Roll-off bins or boxes containing solid granular material such as spent abrasives will be sampled using a trowel, dipper, trier or soil auger as required. Specific locations will be sampled by taking surface and subsurface grab samples. Individual grab samples can be composited, then cone and quartered, to obtain a representative sample.

Sampling Equipment Maintenance. Procedures for the required use and decontamination of the sampling tools will be maintained onsite at the staging facility. All sampling equipment will be cleaned after each use to prevent cross-contamination of future samples. Disposable sample devices may be utilized whenever appropriate. Cleaned sampling devices will be maintained in a clean environment prior to use.

Sampling equipment will be typically cleaned with a warm detergent solution, rinsed several times with tap water, a final rinse of deionized water and air-dried. Any of the sampling devices can be either disposable or reusable. Modifications can be made as long as equipment is non-contaminated and compatible with sampled materials.

Preservation of samples will be consistent with recommendations presented in the USEPA publications, "Methods for Chemical Analysis of Water and Wastes", USEPA (600/4-79-020), Revised March, 1983, and SW-846 (1). Telephone conversations with Envirochem Lab personnel have indicated that there is no chemical preservative needed for samples that will undergo heavy metal testing.

Analysis of all samples will be performed within the time periods consistent with the recommendations in "Methods for Chemical Analysis of Water and Wastes", USEPA (600/4-79-020, Revised March, 1983, (Appendix 1), SW-846 (1). Holding times for heavy metal samples is 6 months according to Envirochem.

ANALYTICAL METHODS

The following are the test methods to be used when required. The complete review process will determine the specific compounds.

TCLP w / metals (8 metals)	EPA 1311 / 6010 & 7000 series
CAM WET (17 metals)	WET / EPA 6010 & 7000 series
CAM 17, TTLC	EPA 3050A / 6010 & 7000 series

NUMBER OF SAMPLES ANALYZED

Material collected is not sampled solely based on volume of grit because the coating and the abrasive are consistent in chemical composition. Rather, random samples are collected from each “event” that generates spent grit. An event is the sand blasting of a single structure and similarly coated structures. While an event may generate a large or small volume of spent grit, the removal of a uniform vessel coating will generate spent grit with a uniform composition. Depending on the job, either separate grab samples can be taken or four individual simple random grab samples (Section 9.1.1.3.1) will be composited (Sections 9.1.1.4.1 and 9.2.4) into one sample at the project area. Either a total of four separate samples or composites (representing a total of 4 or 16 data points) can be taken and delivered under chain-of-custody to the selected lab. Each lab sample needs to be greater than 450 grams to provide sufficient material to replicate analysis (100 grams for each run of TCLP or STLC and <25grams for the TTLC). No sample preservative is needed for metals. To preserve the integrity of each individual sample, the lab will composite the four samples for analysis. If additional analysis is required, each sample can be run for the particular analyte.

Simultaneous blasting events on a large vessel by contractors are not very common; most projects are single events sequenced according to the contract schedule. In the rare case that spent grit from different events are commingled, additional testing may be required. Upon review of past analytical and with GENERATOR’s or the contractor’s knowledge of industry, there is clear indication that the majority of spent grit generated by an event is non-Hazardous. This waste determination process nonetheless, relies on sampling to confirm that determination.

As a result of these screening and testing procedures, it is assured that only spent sandblast grit that is classified as non-hazardous or excluded recyclable material transported to the appropriate facility.

HEALTH AND SAFETY

Considerations need to be made to ensure the health and safety of all workers asked to conduct sampling in conjunction with this plan. Basic safety training consistent with GENERATOR’s IIPP, contractor’s IIPP and/or shipyard safety programs specific to ship repair contracts will be conducted for all employees asked to participate in spent abrasive sampling events.

CHAIN-OF-CUSTODY

Samples will be taken, handled and transported under chain-of-custody to ensure the integrity of sample from collection to analytical report. The components of chain-of-custody include **sample label** (samples number, collector’s name, date & time, place) and **seals** (prevents tampering), **logbook** (records pertinent data on material sampled and

sampling event, can be note on the c-o-c record), **chain-of-custody record** and **analysis request** (traces sample movement from collection to lab and indicates analysis to be performed). Some of these can be combined to reduce the paperwork tracing. If samples are shipped via overnight the chain-of-custody record should indicate the carrier.

QUALITY CONTROL

Laboratories certified by the State of California, which must follow strict quality control guidelines to perform all analyses. Proper chain of custody (COC) documentation is required. Regardless of who arranges testing, GENERATOR, its contractor and its disposal /recycling service provider review all analytical results and compares them to applicable regulatory limits prior to any shipment of material. COC documents and any laboratory QA/QC measures are reviewed to identify any irregularities.

Should regulatory limits someday be adjusted downward or should knowledge of process change, then GENERATOR may need to revise this Plan in order to continue to minimize risk. Until then, GENERATOR will continue to operate in accordance with this plan.

Questions or comments regarding this plan should be directed to Fionn O'Neill @ Kleen Industrial Services at (925) 831-9802.