National Zinc Overlay District
Soil Sampling Procedure

Properties within the National Zinc Overlay District Boundary that have not been sampled and analyzed for metal contamination (lead, cadmium, arsenic), will require sampling to be conducted using the procedures included in this packet. Before beginning, you will first need to read this entire packet to ensure a full understanding of all procedures and requirements. Next, you will need to create a sampling location map using the grid paper included in this packet and submit the map to the City's Environmental Representative for approval prior to proceeding with sampling.

You will also need to contact a certified analytical laboratory to gather information about their sample collection requirements and sample delivery requirements for soil testing. Some laboratories may offer collection services for an additional fee. If you prefer to collect the samples yourself, ask the lab if they provide a soil sampling kit for heavy metals testing (lead, cadmium, and arsenic) or if it's ok to use a 1-gallon size Ziploc bag for each sample collected, double bagged in a second 1-gallon size Ziploc bag for shipping. If you do not following laboratory requirements, they will not perform the testing of your samples.

In addition to the Ziploc bags or other approved sampling containers, you will also need a 2-gallon bucket, a trowel or small shovel, latex gloves, a permanent marker, dishwashing liquid, and clean running water.

The City of Bartlesville uses Green Country Testing laboratory in Tulsa (see contact information below) for its testing needs. However, the Oklahoma Department of Environmental Quality also provides laboratory services (see contact information below).

Green Country Testing
6825 E 38th Street
Tulsa, OK 74145
918.828.9977
Website: www.greencountrytesting.com

State Environmental Laboratory Services
Oklahoma Department of Environment Quality
707 N Robinson
Oklahoma City, OK 73102
405.702.1000
Website:
https://www.deq.ok.gov/state-environmental-laboratory-services/laboratory-services-fees/

Soil Sampling Procedure:

I. **CREATING A SAMPLING LOCATION MAP:**

A. First, measure the lot(s) to be tested.

B. Using the grid paper provided in the back of this packet, draw a map of the property. Include structures, fences, garden areas, driveways, playgrounds, & sidewalks.

C. Using the following information, determine an appropriate layout of composite sample areas* (maximum 3500 sf). **Composite sample areas* *are areas in which multiple individual samples are dug and then combined following a specific mixing process to create a composite sample for testing.*

1. Each composite sampling area should be divided into a 20-foot by 20-foot sampling grid containing no more than 5 or 6 samples per composite area.
2. For a typical lot, approximately 50 feet wide by 100 feet long and empty, divide the property into 2 composite sampling areas (front half and back half).
3. If the lot is larger than 5000 sf, the number of composite samples will increase.
4. Driveways, sidewalks, and fences can help decide the shapes of your composite areas.
5. If there is a home on the property with a side yard at least 15 feet wide, measured from the drip line of the structure to the closest property boundary, then that area should be tested as its own composite area.
6. Gravel piles, gravel drives, small gardens, & bare-ground play areas should be tested separately as individual discreet samples.
7. Additional Sample Location Guidelines:
    a) Sample locations should be no closer than 5-ft from existing structures (and at least three feet from roof drip zone).
    b) Sample locations should be no closer than 10-ft from existing roads, driveways, and paved parking lots.
    c) Soil samples should not be collected in areas visually observed to be impacted by oil or other petroleum products.
    d) Soil sampling locations should not be closer than 3-ft from in-yard garbage/compost piles, abandoned or stored vehicles, or other "junked" items.
    e) Soil samples should not be collected from within drainage ditches or creeks.

D. Once the sampling areas are determined, draw and label each area on the map.

E. Then determine and mark all individual sampling locations within each area (max 20-ft spacing).

F. Next, note the abbreviation for each composite area in the map. (ex. "F" for front yard, "B" for Back Yard, "NS" for North Sideyard, etc). These abbreviations will be used for labeling the each sampling locations on the map and for labeling the samples going to the lab for analysis.

G. Now number each sampling location. The label should begin with the area's abbreviation code followed by sequential numbering or for discreet samples use the abbreviation "DS".

H. Make sure to label any adjacent streets and special structures on the map.

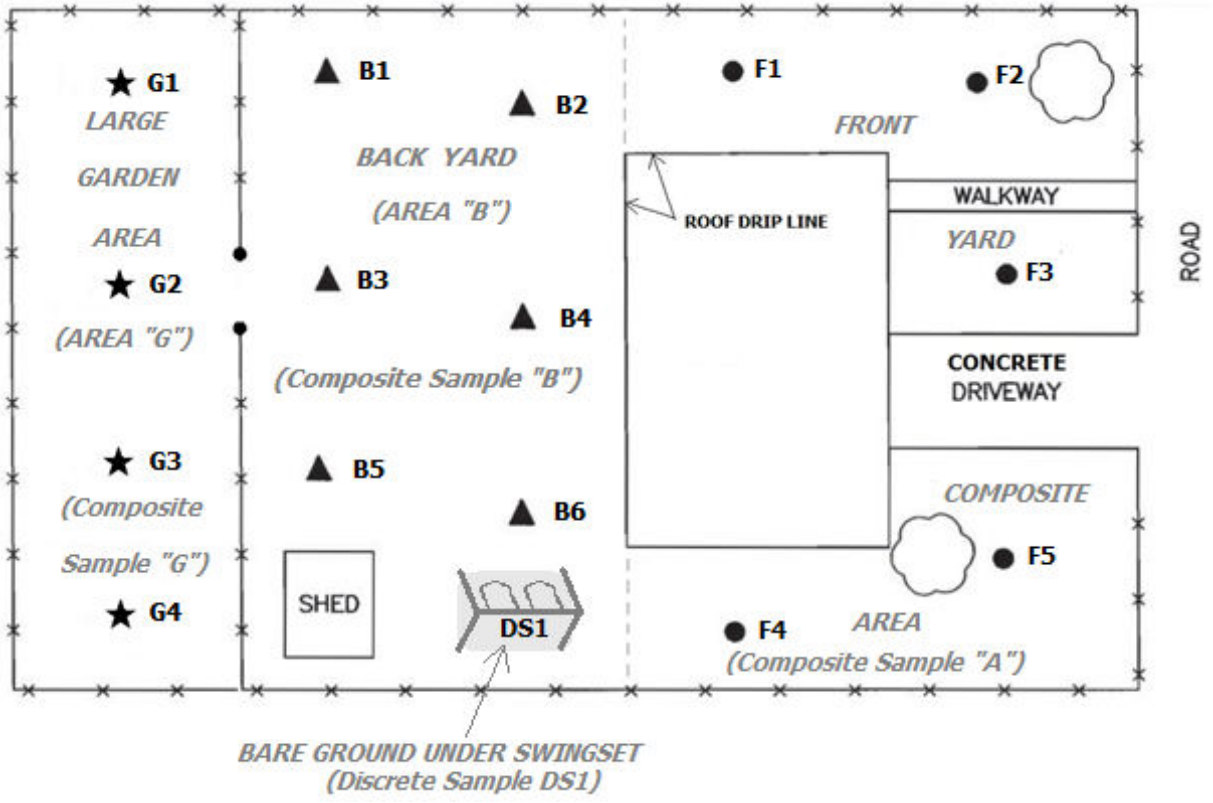
I. Add a north arrow for orientation reference.

J. Now you are ready to turn your map into the City's Environmental Representative for review and approval prior to beginning sampling. At the time of review, the City will determine if a City Representative will need to be present when the sampling is done.

K. When the review is complete, the City will sign off on the map, which will then give you the go ahead to proceed with sampling and testing.

L. If you need help determining an acceptable testing layout please contact the City Environmental Representative for assistance.

M. Below is an example of a lot with three composite areas and one discreet sample. Each composite area is labeled (garden, back yard, & front yard) with individual sampling locations in each area marked and numbered.



II. SAMPLING PROCEDURES

A. After your map is approved, decide which composite area you are going to sample first.

B. Before beginning work and before working on a new sampling area, you MUST:

1. Wash and rinse your bucket and shovel.
2. Put on clean gloves before starting each composite area. If reusing the same gloves, wash thoroughly between each composite area to avoid carryover of potential contaminants from one area to the next, which can influence test results.
3. For your health and safety be sure to wash your hands, if you stop for a break to eat or do other activities (like smoking). Also, a mask or other face covering is recommended to prevent dust inhalation.

C. Prepare your first composite sampling container so it will be ready to fill.
1. Use appropriate sampling container that has either been provided by the lab, specified by the lab, or approved by the lab.
2. Write very clearly.
3. Use a permanent marker. Sharpie pens work well for this.
4. Print your name, your address, the composite area name (i.e. “front yard” or “back yard”), the date, the time, and the sampler’s name on the sampling container.
5. Now you are ready to begin sampling. At the first sampling location, clear an approximate 8” circle of all surface materials that have been placed on top of the soil (such as mulch, weeds, sod).
6. Now use your trowel or small shovel to dig a sample from the entire cross section O to 6 inches, placing it in the).
7. Now prepare a circle about 8 inches across so it is clear of grass, weeds, and roots.
8. Using a steel trowel or small shovel to dig out the soil, place the soil into a clean steel bucket, until you have a hole that is about 6 inches deep at the deepest. (The top of the hole should be about as wide as the hole is deep).
9. Dig the other holes the same way you did the first one, placing the dirt from the other holes into the same bucket, with the dirt from the first hole.
10. Mix the soil from all the holes in the first composite area thoroughly for a couple of minutes, using the trowel or your hands (with gloves on).
11. Now take a handful of soil from the middle of the bucket, and put it into the sampling container. Then take a handful from somewhere around the edge of the bucket and put it in the container. Take three more handfuls from around the outer edges of the bucket, until you have five handfuls of soil in the container from five different locations in the bucket. Now seal the container.
12. Use the soil that is left in the bucket to fill the holes you dug.
13. Now wash the inside of the bucket and the trowel or shovel with dishwashing liquid and water. Wash your latex or nitrile gloves if you intend to re-use them, or else put them in your trash can and get a new pair.
14. Everything that is washed should be thoroughly rinsed with clean water.

15. Repeat the above 15 steps for each of the remaining composite areas.
16. When you are done, you should have one sampling container of dirt for each composite sampling area of your property.

III. **SHIPPING**

A. Follow the laboratory's directions for submitting samples including timing restrictions, delivery protocols, and any additional requirements.

B. Containers must be protected during transportation.

C. If shipping via mail or delivery service rather than hand delivering samples to lab, additional packing material should be added to the shipping container to prevent shifting of samples and possible damage during transportation.

D. Each sample sent to the laboratory must be identified on a Chain of Custody (COC) form which must be included with the samples when submitted to the lab. An example of a completed COC is attached along with a generic blank form. The COC not only details the soil transaction but also states the analysis to be performed by the lab.

IV. **TESTING COSTS**

A. Laboratory analyses will be out-of-pocket expenses to property owners.

B. Costs charged by laboratories vary, so ask the lab for a cost per sample to analyze for total lead, cadmium and arsenic concentrations using ICP methods in accordance with the EPA SW-846 methods, and report the results as mg/Kg ppm units.

V. **TEST RESULTS**

When the lab results are received, a copy must of the results and Chain of Custody record must be submitted to the City's Environmental Representative.

The results will be evaluated and you will be notified of any additional requirements determined by the results.

The results will be added to the permanent NZOD testing database.

Once all required testing has been completed, a signed NZOD Permit will be issued allowing you to proceed with the construction work referenced on the Permit.

For your information, here are the remediation action levels for most properties within the district:

925 mg/Kg for lead
100 mg/Kg of cadmium
60 mg/Kg of arsenic

Commercial Property Testing:

Most commercial properties will still have to meet residential remediation levels unless no portion of the property abuts a residentially zoned area. When a commercially zoned property is

completely surrounded only by other commercial/industrial zoned properties then the following remediation levels may be used for determining remedial action requirements:

Commercial/Industrial Remediation Levels for NZOD

2000 mg/Kg for lead
200 mg/Kg of cadmium
600 mg/Kg of arsenic

Contact City Environmental Representative for help with commercial site sampling location map requirements.

www.PrintablePaper.net

LAB SAMPLE COVER LETTER

RE: Soil sample from National Zinc Overlay District in Bartlesville, Oklahoma

To Whom It May Concern,

Enclosed please find the soil sample(s) that was taken from the National Zinc Overlay District (NZOD) in Bartlesville, Oklahoma. Please analyze this sample for total levels in mg/Kg parts per million for the following metals: Arsenic, cadmium, and lead.

If the testing results exceed any of the following (Check Residential or Commercial Box below), please conduct a Toxicity Characteristic Leaching Procedure (TCLP) on the sample provided:

	Limits for Residential ☐	**Limits for Commercial** ☐ ONLY USE IF NO RESIDENTIAL ZONING ABUTS PROPERTY
Metal	mg/Kg	mg/Kg
Arsenic	60 ppm	600 ppm
Cadmium	100 ppm	200 ppm
Lead	925 ppm	2000 ppm

Enclosed is a check to cover the cost of analysis for total metal concentrations. Should you have to conduct a TCLP analysis, please call to inform me of the additional cost and I will send payment as soon as possible.

I have also enclosed a copy of the instruction sheet I followed when taking the sample, should you have any questions about the manner in which the sample was obtained. Thank you for your assistance in this matter. Please mail these soil sample results directly to the following address:

Sincerely,

CHAIN OF CUSTODY

REPORT TO:			INVOICE TO:			
CLIENT:			CLIENT: Same			LAB PROJECT ID
ADDRESS:			ADDRESS:			
CITY:	STATE:	ZIP	CITY:	STATE:	ZIP:	Quotation #:
PHONE:			PHONE:			Email:
ATTN:			ATTN:			

PROJECT REFERENCE

Matrix Codes:

AQ - Aqueous Liquid	**WA** - Water	**DW** - Drinking Water	**SO** - Soil	**SD** - Solid	**WP** - Wipe	**OL** - Oil
NQ - Non-Aqueous Liquid	**WG** - Groundwater	**WW** - Wastewater	**SL** - Sludge	**PT** - Paint	**CK** - Caulk	**AR** - Air

REQUESTED ANALYSIS

DATE COLLECTED	TIME COLLECTED	COMPOSITE	GRAB	SAMPLE IDENTIFIER	MATRIX CODES	NUMBER OF CONTAINERS											REMARKS	LAB SAMPLE NUMBER

Turnaround Time		Report Supplements			
Availability contingent upon lab approval; additional fees may apply.					
Standard 5 day	☐	None Required	☐	None Required	☐
10 day	☐	Batch QC	☐	Basic EDD	☐
Rush 3 day	☐	Category A	☐	NYSDEC EDD	☐
Rush 2 day	☐	Category B	☐		
Rush 1 day	☐				
Other	☐	Other	☐	Other EDD	☐
please indicate date needed:		please indicate package needed:		please indicate EDD needed :	
_____		_____		_____	

Sampled By **Date/Time**

Relinquished By **Date/Time**

Received By **Date/Time**

Received @ Lab By **Date/Time**

Total Cost:

P.I.F.