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Sergei Boutenko will be answering your questions in the [wild harvesting forum](#) Monday through Friday!
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Gray water from ceramics

[gani et se](#)

Joined: Apr 24, 2011
Posts: 215
Location: Douglas County OR

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posted 3/7/2011 01:35:27 PM

I am going to be building a ceramic studio (for my sister, so I don't know jack about ceramics) and want to design an artificial wetland to handle the gray water from the studio. Can anyone suggest where I can find out what is likely to be in the glazes so I can start to work out what plants to use to remediate the (possible) toxins. Also, are there things to keep in mind if disposing of the plants? (i.e. Don't burn if the glazes contained ____, don't mulch food plants with if the glazes contained ____.)

The alternative is to let the gray water go into the septic -- I'm hoping to handle it more responsibly.

Thanks,
Gani

Intermountain (Cascades and Coast range) oak savannah, 550 - 600 ft elevation. USDA zone 7a. Arid summers, soggy winters

posted 3/7/2011 01:42:08 PM

Joined: Feb 03, 2011
Posts: 43
Location: 14519

I wouldn't let the grey water run into the house septic. That stuff will set up like concrete in the tank. You may have to put in a separate tank with leach lines & have it pumped out annually depending on the volume of waste water.

Wm. Brookover~ Opinion's given at no extra charge

[Tyler Ludens](#)
pollinator

Joined: Jun 25, 2010
Posts: 5326
Location: Central Texas USA
Latitude 30 Zone 8

20

posted 3/7/2011 02:17:02 PM

Here's a webpage I found about some of the toxic ingredients in ceramics clay and glaze: <http://www.pottery-magic.com/pottery/glazes/toxic.htm>

Remember in the case of metals and some other compounds, plant and bacterial action will not actually break them down, but they may become concentrated in the plants. This means the plants themselves may be toxic, and should not be fed to animals or people.

Idle dreamer

[gani et se](#)

Joined: Apr 24, 2011
Posts: 215
Location: Douglas County OR

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posted 3/7/2011 07:15:03 PM

Bill, just to be clear, there will be a (some kind of special for clay) trap on the sink used for clay cleanup. Thanks for that note, I will try to have the clay gray water go back to earth 😊 The main thing is treating the glazes appropriately.

Ludi, thanks for the link. I assumed that the "treatment" plants wouldn't be edible, I just wondered if they might need to be considered hazardous after they have been in use.

[Tyler Ludens](#)
pollinator

Joined: Jun 25, 2010
Posts: 5326


posted 3/7/2011 15:02:27 PM

Yes, I would consider them hazardous, so don't use as mulch.

20

[gani et se](#)

Joined: Apr 24, 2011
Posts: 215
Location: Douglas County OR

posted 3/7/2011 17:17:16 


Thanks again Ludi.

I'll need to go through all her glazes and find out just what (guessing) metals are in them, see which ones have been remediated with plants or fungi, and set up for those. Then I'll see if anybody can make guesses about what else to experiment with. Then the hard part -- figure out what to responsibly do with the spent bio-mass. I hope I don't have to convince her to stop using some favorite glaze! Unless I can come up with a "safer" alternative.

Hmm, just thought that I should back up and think about how to reduce the amount of glaze going into the waste stream instead of on the clay. It's cleaning the brushes. Maybe set up a tile which is used to wipe the brushes on. Use a spray bottle to spray the used brush to dilute the glaze, then wipe the dilute solution on the tile. Once the tile is overloaded with glaze, fire it and set up a new one. That removes more of the glaze from the waste stream and we'll see just how ugly the tiles turn out. I could use a lot of (even ugly) tiles in the yard before I run out of space for them. 😊
Gonna be fun!

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Joined: Dec 20, 2009
Posts: 148

posted 5/7/2011 01:49:26 

I suppose your sister could convert to non-toxic glazes. There are other processes like burnishing and salt-firing, and depending on whether she is making art stuff or commercial production stuff. Dishes for food are already supposed to be made in a facility with no poison glazes present.

[Dave Bennett](#)

Joined: Jun 25, 2011
Posts: 641


posted 5/7/2011 15:04:03 

Grow Mushrooms to detox the water. Mushrooms will detox anything. Figure which varieties will work. I haven't a clue if it will work but investigating Mushroom propagation might be worthwhile.

"When there is no life in the soil it is just dirt."
"MagicDave"

[William Roan](#)

Joined: May 24, 2011
Posts: 40

posted 7/7/2011 00:41:56 

Hi Gani et se

I just thought I would throw in my two cents, for what it's worth.

I was the ceramic tech for 14 years here at the University. After getting hired on to the position, the Fire Marshal came in and threatened to close down the studio, if we couldn't control our waste stream better. So I spent many years trying to come up with alternative ways of disposing of toxic waste.

In the Bay area nothing could go down the drain, so the glaze was collected and loaded into a 55 gallon drum at \$500 a barrel and shipped out to a hazardous waste landfill where it was stored until the landfill was filled up. Then a new bigger landfill site was build and your barrel was shipped out to the new site and you would be charged \$500 again for the new barrel resting site. That was known as cradle to grave waste disposal. You are responsible from the moment you produce the waste until you die.

Now a days the \$500 a barrel ceramic waste is sent out to an incinerator to be turned into fly ash to make cinder blocks or to fill another landfill.

If the students and instructors kept the glaze barrels clean of foreign materials, the waste disposal company could sell the glaze to commercial fertilizer companies. It could be added to the fertilizer sold to farmers, to replace the metals and minerals that industrial farming and erosion has removed from the soil.

I tended to go with a low tech method of handling the glaze cycle. Get your sister three of those large blue 55 gallon drums, (steel drums rust and then you have an even bigger waste disposal problem). Get the ones that the top comes off.

The first barrel is filled with clean water and is used for cleaning the ceramic pieces before she does any glazing. She will dip the piece, removing any dust left from the greenware and bisque firing stage. This will prevent the glaze from crawling during the glaze firing. This water will be contaminated with dust and can be dumped in the yard.

Second barrel is for gross cleaning of glaze. The bottoms of her work will be sponge cleaned over this barrel, as well as cleaning work table tops, paint brushes, spray guns, spray hood filters and sponges etc. When it gets filled with a watery glaze, the barrel is left to settle out. The heavy materials sink to the bottom and the top is left cloudy water. Decant the upper water and place in the third barrel, to be used the same way as the second barrel. Final cleaning of paint brushes will be done in small containers and deposited in the second barrel; this is where most of the waste water will come from.

The remaining glaze at the bottom of the second barrel is stirred up with an electric drill and a paddle paint mixer. If the second glaze barrel wasn't kept clean of foreign materials, it will need to be screened. She will then need to do a test firing of her new glaze. If she only uses one glaze for production runs, then her new glaze will probably fire out close to what she is already using. If she uses a variety of glazes she will probably get a dark green or black. If they turn out to be a color she doesn't like, they can be used for glazing the inside of pots. Most of the time I got pretty respectable colored glazes. The toolroom tech would add a lot of cobalt to these glazes, and she got some pretty dreamy multi-dipped glazes. But the receipts are her secret, so your sister will have to do her own experiments. "Keep that notebook".


No self respecting ceramicist would ever do the following, but it worked for me. The cloudy water that was

floating on top of the second barrel is mostly clay and a little bit of heavy metals. Decant that water off and mix in a 5 gallon bucket, with the scrap clay that she will be generating every day. Mix it in a pug mill and she will not be able to tell the difference between normal clay and glaze water clay.


I was mixing about ¼ glaze from the bottom of the second barrel to ¾ recycled clay and made a clay body for roof tiles for a shed, pavers for my yard and sculpture. Every once in a while during a bisque firing, I would get a little glaze spotting. But it was nothing that a coat of glaze wouldn't cover up. She should do some test firings to see how high a firing the clay will go before it turns into a puddle.

Good luck, "Ceramics the World most fascinating hobby."


Bill

posted 7/7/2011 12:48:21 

Joined: Dec 20, 2009
Posts: 148


BB: Those are the best ideas I've seen presented here. 

Dave Bennett

posted 7/7/2011 15:47:08 


Joined: Jun 25, 2011
Posts: 641

rockguy wrote:

BB: Those are the best ideas I've seen presented here. 

What rockguy said.....

Jonathan Byron

posted 7/7/2011 21:42:05 

Joined: Apr 16, 2011
Posts: 225

Dave Bennett wrote:

Grow Mushrooms to detox the water. Mushrooms will detox anything.

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Mushrooms do not detoxify heavy metals. Heavy metals are not compounds that can be broken down. Mushrooms can be very good at breaking down hydrocarbons from petroleum, carbon-based pesticides, polybrominated and polychlorinated compounds - if the conditions are just right.

Some plants and fungi can concentrate heavy metals - which means that they are even more toxic than the background contamination in the soil. When a site is contaminated, these accumulators need to be systematically gathered and treated like hazardous waste.

The only real solution is to avoid using dyes and glazes that contain cadmium, lead, and other highly toxic heavy metals. Some heavy metals (iron, manganese, copper, zinc, selenium, molybdenum, etc) can be beneficial in small amounts but toxic at higher levels.

gani et se

posted 8/7/2011 19:17:23 

Joined: Apr 24, 2011
Posts: 215
Location: Douglas County OR

Thanks to all who have replied, especially Biology Bill for that thorough intro to "Coping With Ceramic Glaze Waste." That is such useful information!

BB, when you say clean of foreign materials, is that mostly blobs of clay, or?? Do you have any further notes about screen size if I do have to clear foreign materials? Any problem with having her use 5 gallon buckets and then dump them in barrel 2? (she's somewhat disabled for standing at the 55 gallon drum, and doing mostly small pieces) I'm assuming it would just mean a time to let things settle before dealing with the decanting and bottom sludge.

Jonathan, thanks for clarifying about mushrooms not being effective for metals, I knew that and had intended to post it myself.

Time to start collecting plastic 55 gallon drums. 

1

William Roan

posted 8/7/2011 20:22:52 

Joined: May 24, 2011
Posts: 40

Hi Gani et se

Students and Professors would contaminate the second and third barrels with broken bisqueware, paint brushes, broken glass, sticks, food, you name it. Also as Blackpowder Bill stated, some glazes will setup like concrete when it settled out. So even if she keeps the barrels clean, you will probably need to sieve the recycled glaze. You can make your own sieve using metal window screen or order a large sieve from your local ceramic store.

If your sister can't stand at a barrel, then yes a couple of 5 gallon plastic buckets or those plastic oil pans sold at auto supply stores will work great. When you sieve the glazes, stir it up with a drill, lay two sticks across the top of your container, with the sieve on top. Pour the glaze into the sieve and then push it through with your hands or Bondo paddles.

For stirring small batches of glaze, those handheld choppers-mixes work surprisingly well. Clean up is dipping the thing in the recycle barrel and turning it on. No fuss no muss. Don't waste your time trying a flour sifter; you will generate more waste water cleaning the thing then it's worth.

Another trick I liked to do is stir up the second barrel with a drill, (no sieving necessary), dip my bisqueware in

the watery glaze solution, transfer the piece to a plastic oil pan, sponge the thin glaze from the highlights using the cloudy water from the third barrel . This left the thin glaze in the low areas. When fired the glaze gave the piece a more dramatic effect, similar to painting on an oxide wash.
This same technique can be used as a base for other glazes placed on top. When fired the deeper trace glaze will react with the top glaze, to create a more dramatic effect.
I'm glad my information was of some help. Don't be afraid to experiment and keep that notebook handy.
Bill

gani et se

posted 9/7/2011 15:32:48 

Joined: Apr 24, 2011
Posts: 215
Location: Douglas County OR

Thank you to everybody for your replies, esp. Biology Bill for "Ceramic Glaze Waste for Dummies (the Compressed Version)." That is very valuable information to me, and I doubt there is any book that would outline it! I expect I will eventually have to post again with more questions once I make the studio a reality -- could be a year away -- and I begin to further appreciate the depth of my ignorance.

1

Jonathan, I did know mushrooms won't concentrate metals, and am planning to grow some that wouldn't be of questionable edibility!
Gani



subject: Gray water from ceramics

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