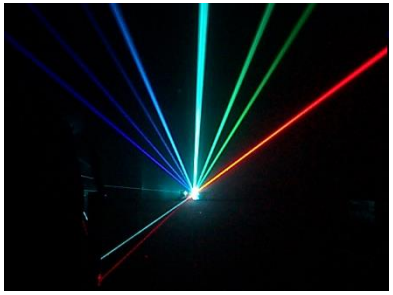
Flint Creek Resources, Inc.

Glass Polish Upcycling



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Why do we want to upcycle?

- Reduce polishing compound costs by 20 to 40%
- Improve polishing quality
- Create a stable supply of polishing compounds
- Preserve valuable rare earth resources
- Reduce waste materials in sewers and local landfills
- Create custom formulated compounds
- Become our own best raw material supplier
- Because it is the right thing to do for you, me and everyone

Why Does Glass Polish Upcycling Work?

- Cerium oxide particles do not wear out
- Cerium oxide does not chemically react with the glass, but promotes the hydration of the glass surface
- Slurry performance declines because it becomes contaminated with:
  - Glass particles
  - Pad material
  - Carrier material
- Contamination can be removed
- Fine ceria particles are also removed

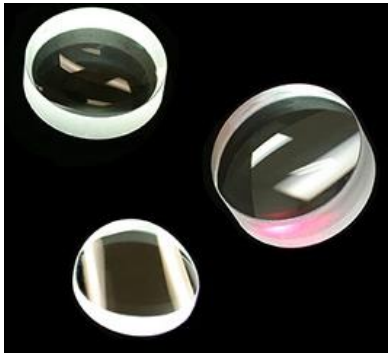
380,000 liters of slurry have been upcycled

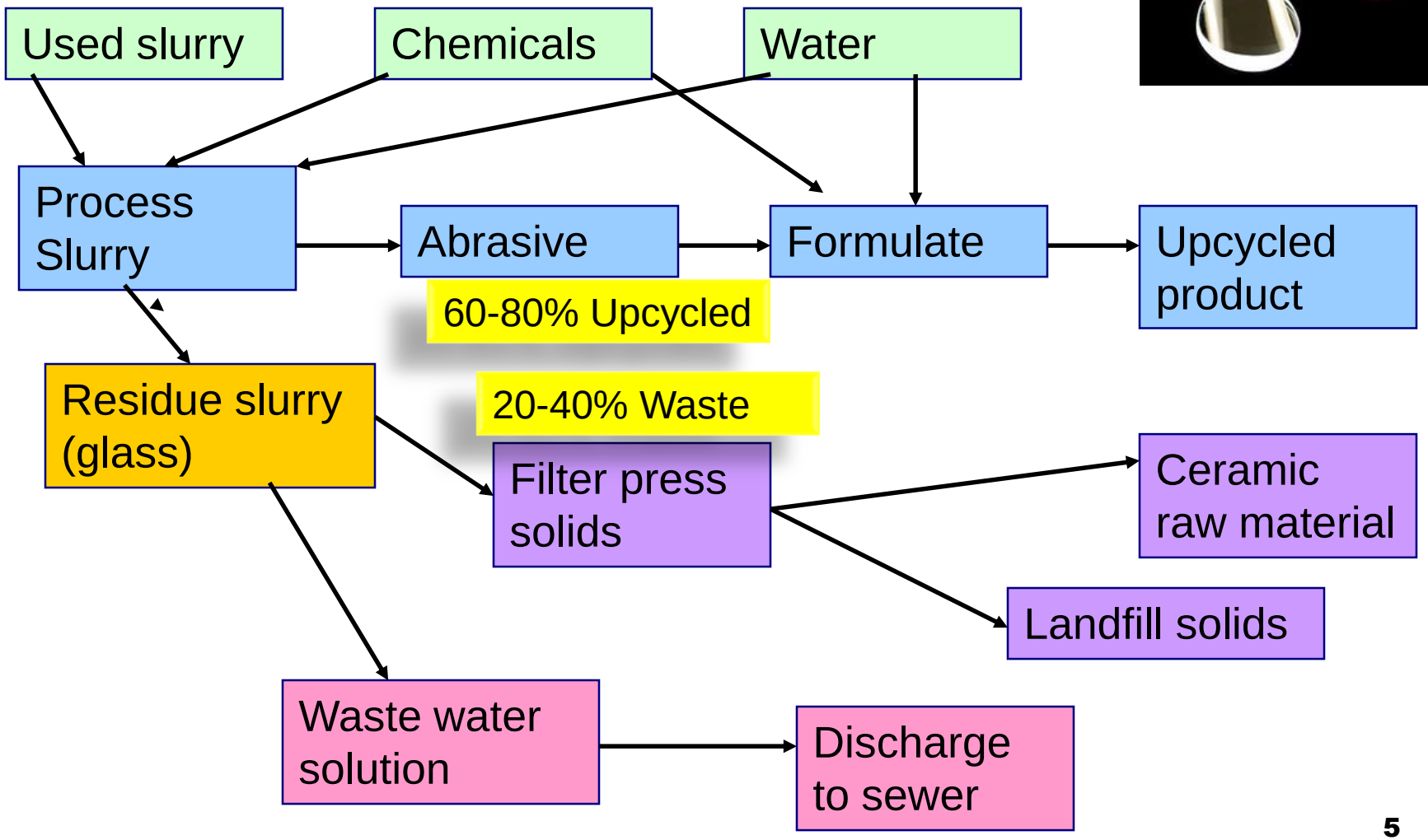
Process Overview

1) Recover spent slurry
2) Separate cerium oxide from slurry contamination
3) Mix in dispersion/suspension additives
4) Test
5) Use slurry
6) Recover spent slurry

Some particles have been upcycled for 5 years

Upcycling Process in the Facility





Customer Data

Surface quality in most cases has improved

Glass	Polish	Peak to Valley	RMS	Ra
Fused silica	Std.	79.2Å	9.2Å	7.3Å
	Upcycled	84.4	8.3	7.4
BK7	Std.	289.0	29.7	23.8
	Upcycled	182.0	21.7	17.3
Borofloat®	Std.	176.0	10.9	8.7
	Upcycled	118.0	10.6	8.4

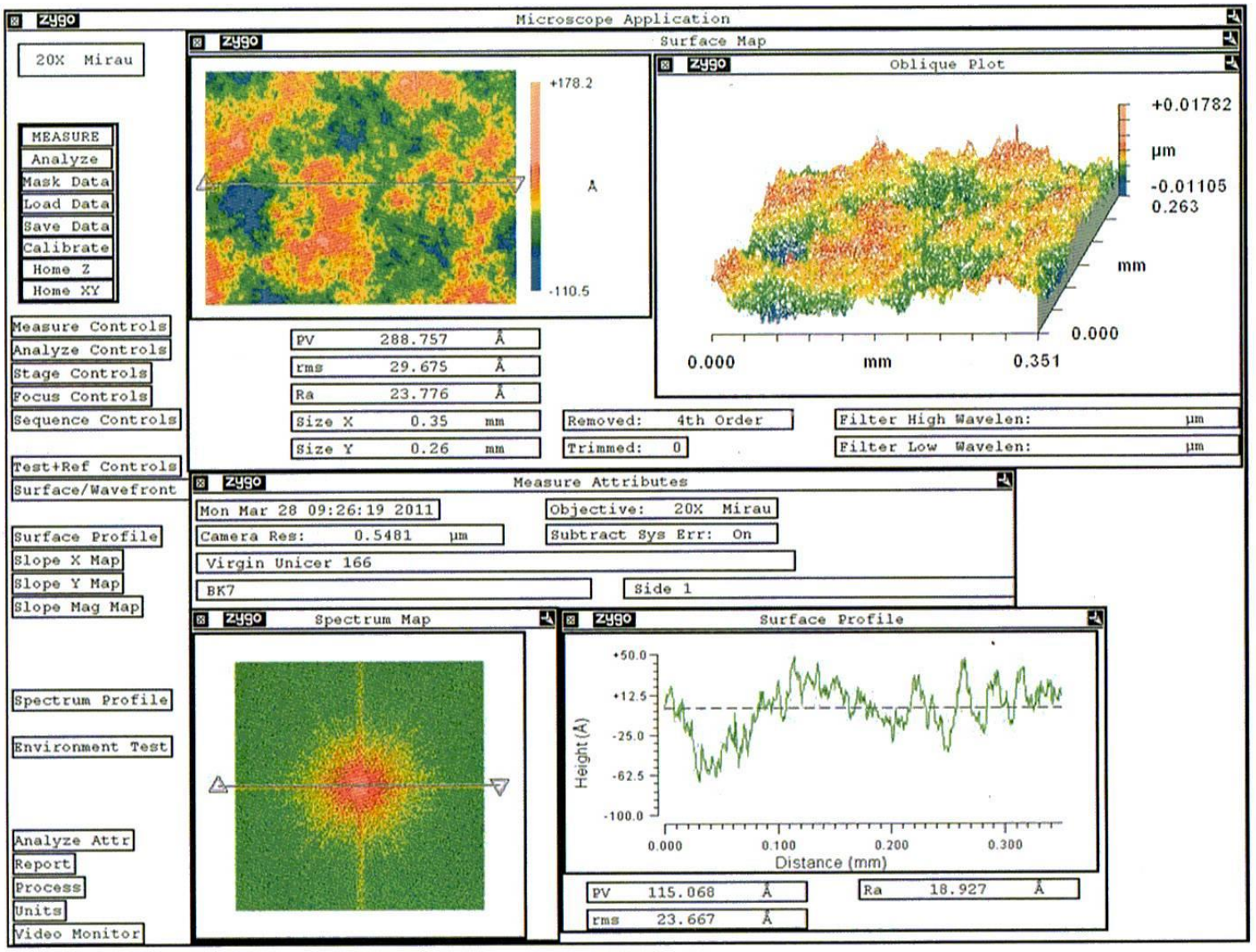
The glass removal rate says the same with all glass types

Virgin Slurry On BK7

PV 289 Å

RMS 29.7 Å

Ra 23.8 Å

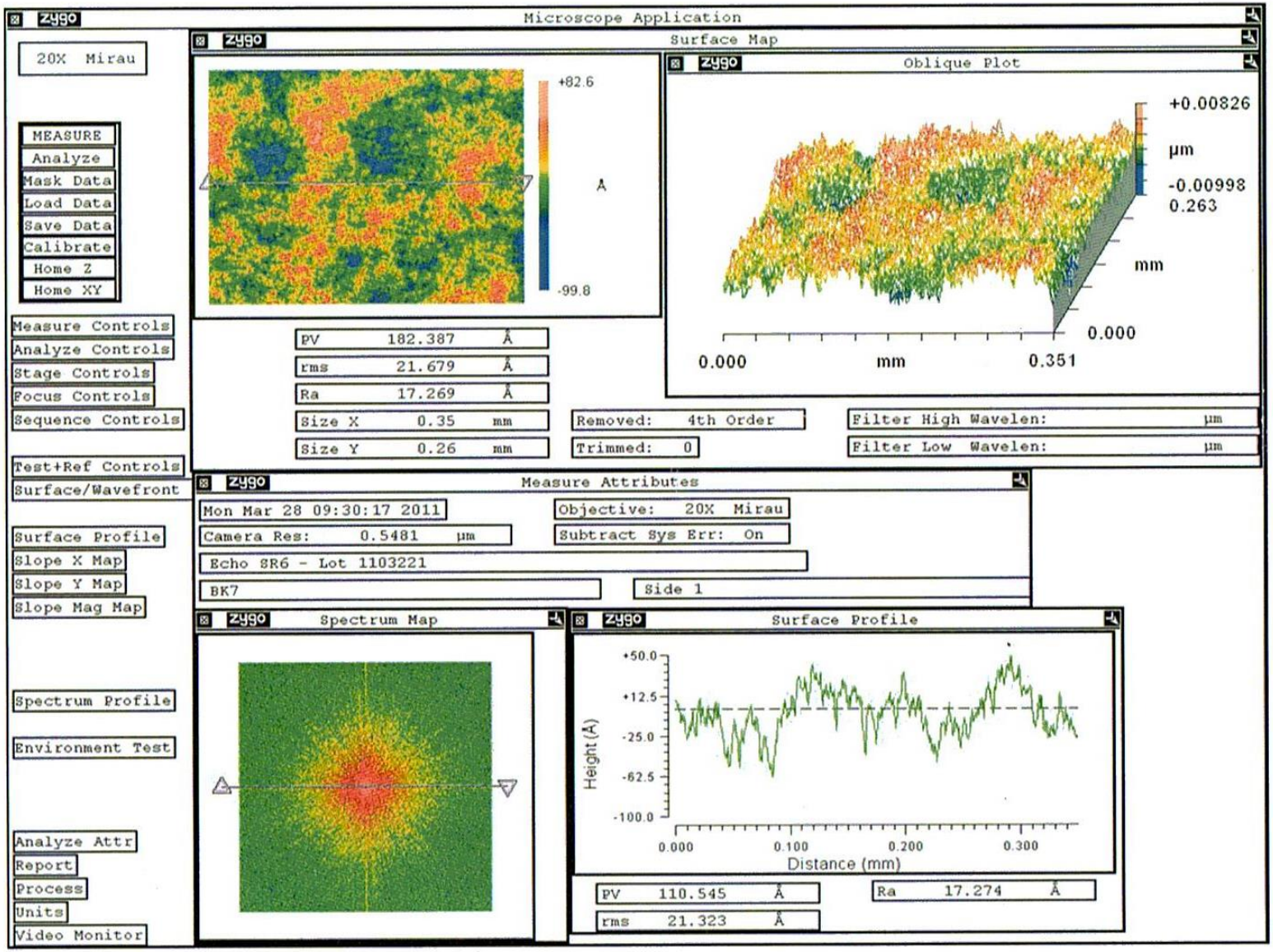


Upcycled Slurry on BK7

PV 182 Å

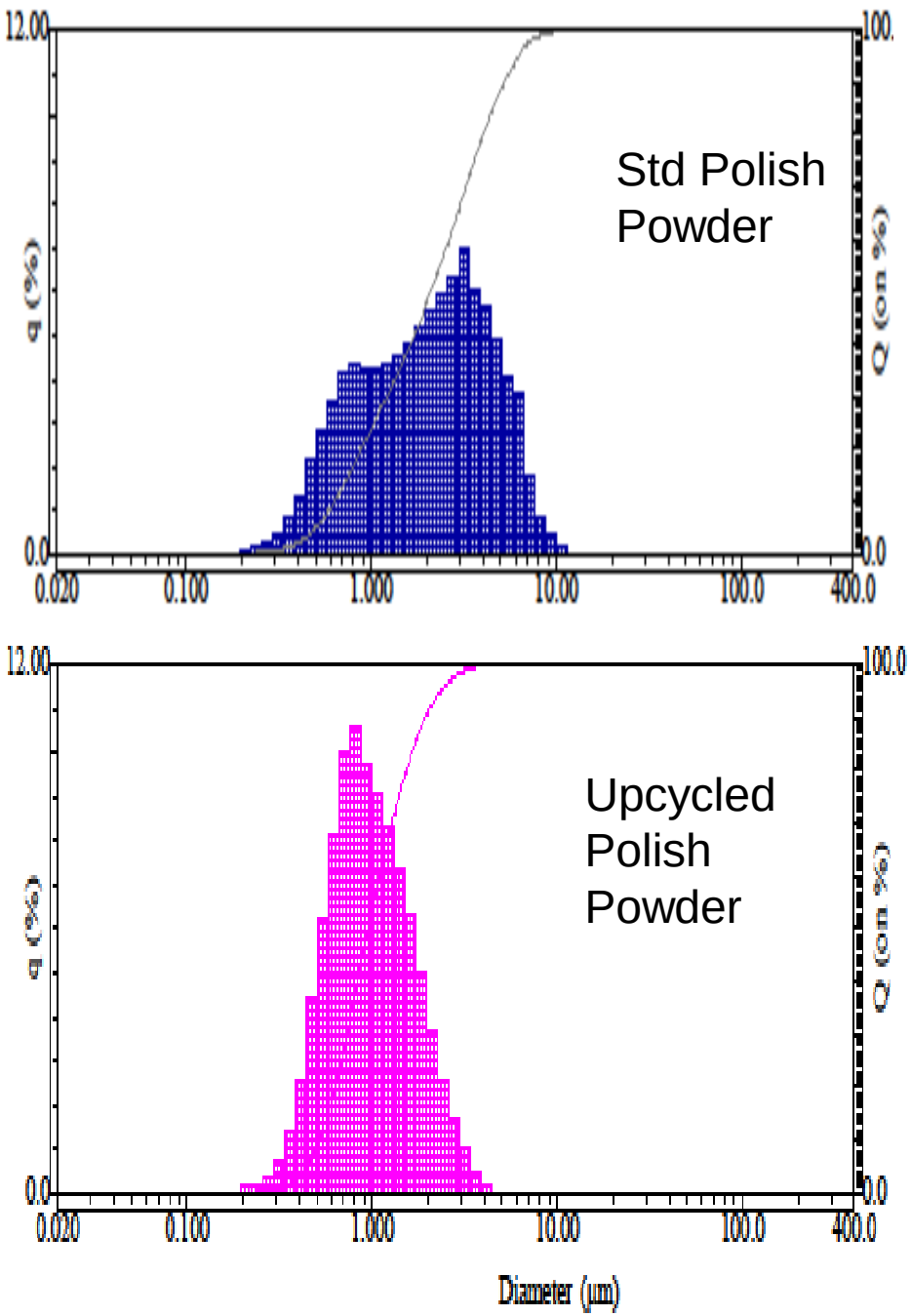
RMS 21.7 Å

Ra 17.3 Å



Particle Size

- Reduction of particle agglomerate size is likely the reason for better surface quality
- Std powder
  - D3 – 0.44µm
  - D50 – 2.1
  - D97 – 6.9
- Upcycled powder
  - D3 – 0.39µm
  - D50 – 0.9
  - D97 – 2.7



Process On a Pallet - POP

- In factory upcycling
- Upcycle 60 kgs per day
- Completely automatic
- Pilot test July 2016
- 1.3 x 1.3 meters
- Can be scaled to 1000 kgs/day

First Steps

1. Supply spent and virgin samples to FCR
   - FCR will upcycle the spent slurry
   - FCR will send polish test results for spent, virgin and upcycled slurry
2. Send larger spent slurry sample to FCR
   - FCR will upcycle spent slurry
   - Spent slurry is returned to customer for in-house testing
3. FCR will supply quote for POP unit