

Summary of Concerns re Proposed Expansion of Miller Braeside Quarry

1) General Hydrogeology Concerns about Quarries

- impacts on quantity of available groundwater (due to dewatering pumping)
- impacts on groundwater quality (due to contaminants associated with the operation)
- impacts on surface water quantity, quality, and ecosystem

2) Miller Quarry

- approved base elevation is about 125 masl, but so far only 1 lift (base now at 135 masl)
- quarry footprint is 17 hectares (ha), expansion would add about 51 ha (to total 68 ha)
- **likely that 2nd lift will cause additional groundwater impacts**

3) Regional Hydrogeology

- the quarry is situated on a 30-40 meter (m) high bedrock ridge or plateau, top is 145 masl
- only groundwater source for the plateau comes from recharge of rainfall
- Miller's domestic well inventory is incomplete, but clearly 100+ homes in area
- excellent, abundant groundwater in the area, with quarry and 100+ homes the main users
- **Miller has not done water balance for the plateau, so it is not known how much of the natural recharge is being used by the quarry and by domestic wells**
- I estimate plateau in area of the quarry might have total of about 600 million L/yr available

4) Local (Quarry) Hydrogeology

- quarry is 10 m deep, proposed depth is 20 m (deeper the quarry, the more water it draws)
- monitoring wells drilled for the quarry were almost all dry wells, thus useless

5) Groundwater Quantity Impacts

- **I estimate that quarry is currently taking over 100 million L/yr of groundwater, domestic wells 30-50 million L/yr**
- **off-site impacts on wells have occurred, and residents have had to deepen wells**
- **monitoring of off-site residential wells is not being done**
- **proposed expansion drainage area (90 ha) will be removing over 300 million liters per year of water from the plateau's groundwater flow system**
- **proposed impact contingency plan inadequate**

6) Water Quality Impacts

- typically from leaks/spills of fuel or oils
- small amounts can impact a huge area (eg. one liter of gasoline can contaminate 1 million liters of groundwater)
- at this site proposed asphalt plant would be a major concern (see below)
- **no groundwater or surface water quality monitoring is proposed**

7) Surface Water Discharges

- **"boom or bust" (either no flow or huge flow) is useless to ecosystem**

8) Asphalt Plant

- asphalt plants are known sources of PAHs (polycyclic aromatic hydrocarbons)
- PAHs are a group of over 100 chemicals, including benzo(a)pyrene (a known carcinogen)
- air emissions are most likely exposure route to people near the site
- PAHs can have high acute and chronic toxicity to aquatic life, bioaccumulate - low PWQO
- **proposed monitoring program omits PAHs in air quality or surface discharges**