

Deer Creek - Robbed (not Alcoa!)

NE of Pittsburgh, PA.

Watershed 27 square miles.

Coal Mining 1900-1980

Deep room and pillar

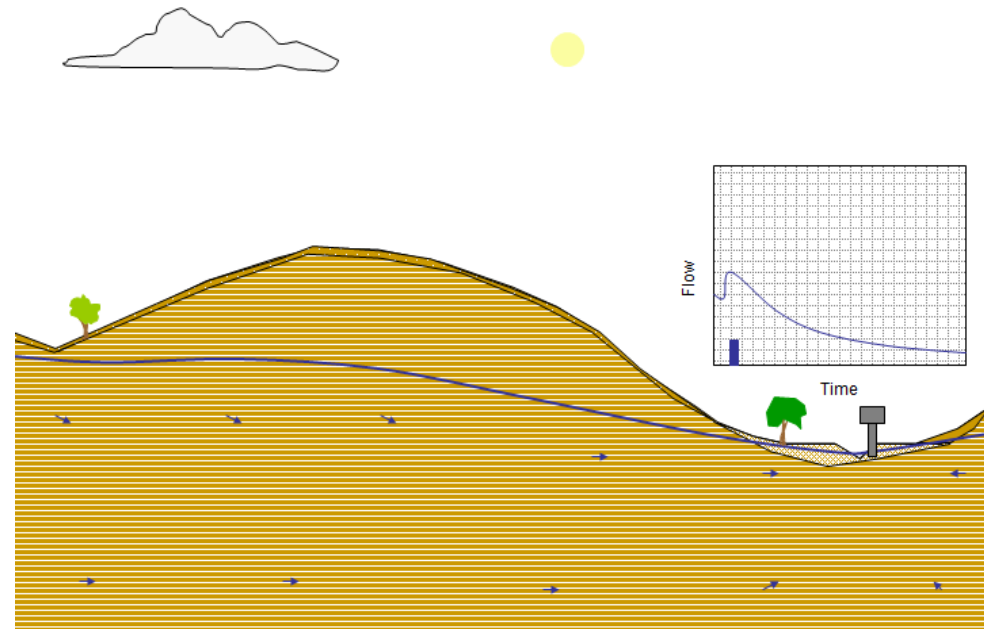
Nearly entire watershed.

Robs base flow. Drought:

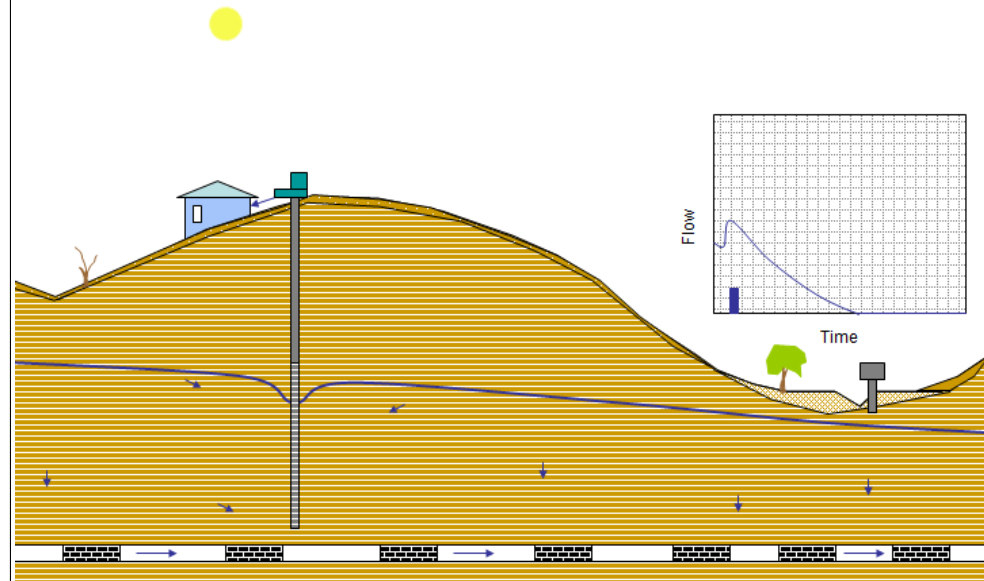
- Up = Temp, TDS, & nutrients
- Down = DO, fish diversity.

Its forever.

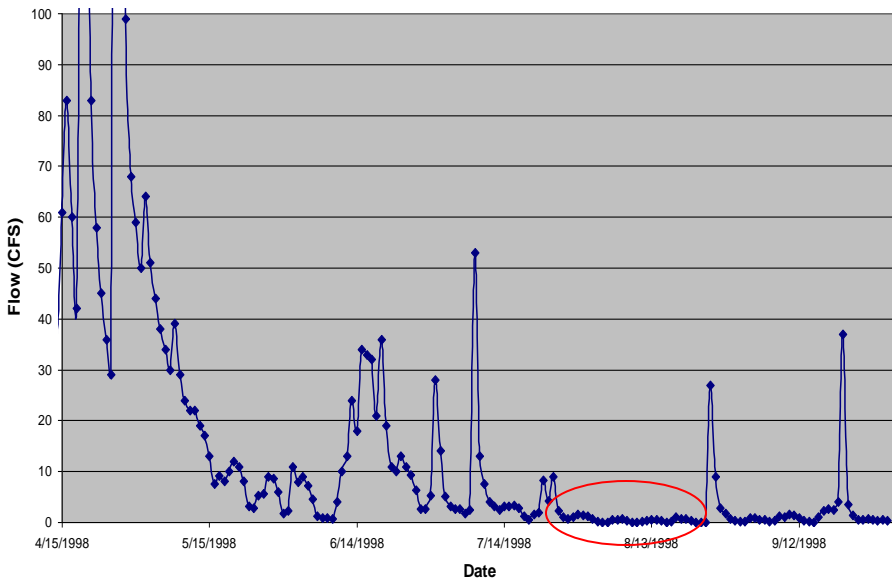
Normal Late Summer



Late Summer w/ Deep Mine & Wells



Deer Creek Daily Flow at Emmerling Park



Lancaster Works – Wetland Augmentation

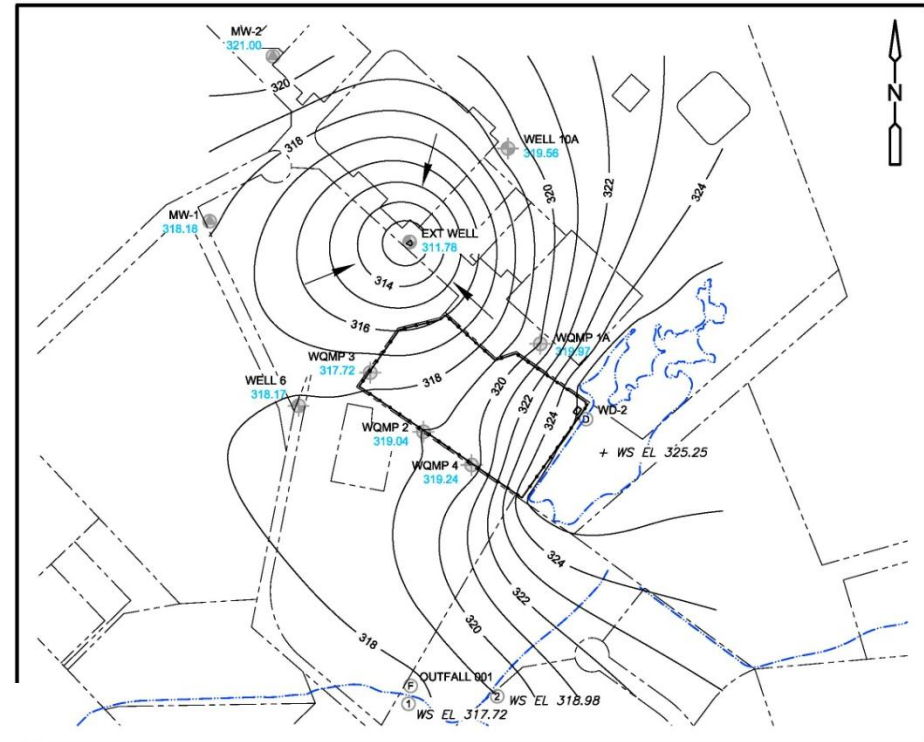
Mid - 1950s to 1985 : Metal fabrication

1988 GW P&T contain CIVOC plume.

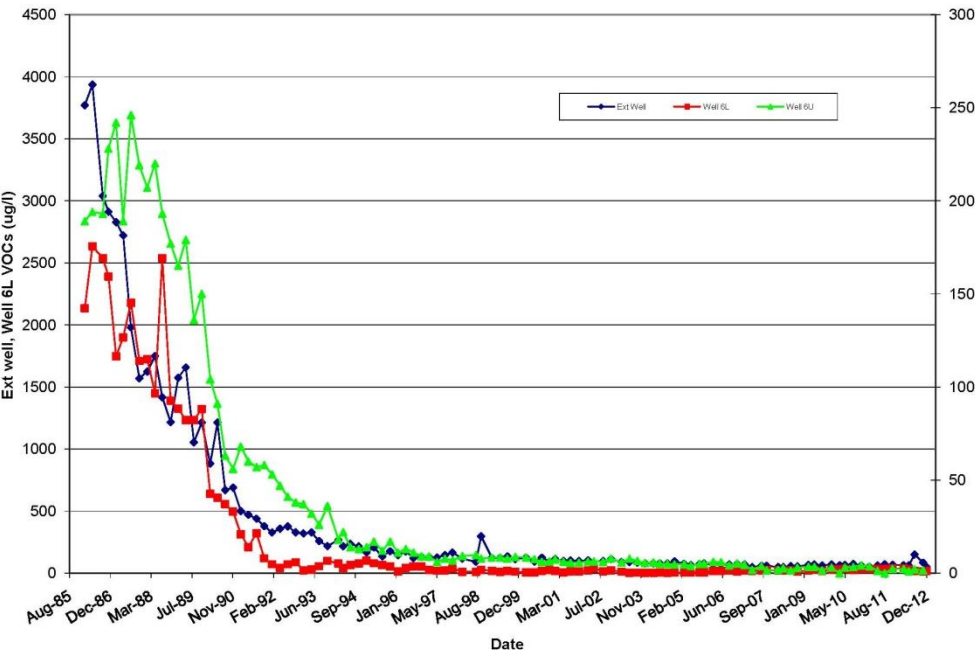
2003 Community concern wetland drying up. Alcoa augments flow to wetland.

2007 Aquifer classification change.

2012 Pilot shutdown - will we be allowed to shutdown?



Total VOC Comparison

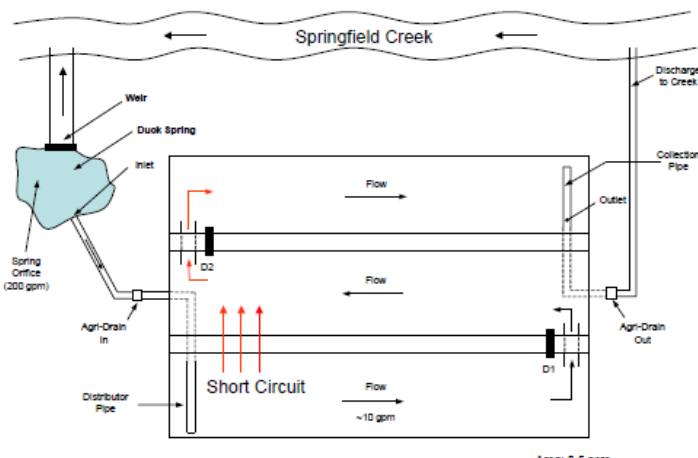


Duck Spring Wetland - An Ecosystem Service

Natural Degradation of cyanide in a manmade wetland.

Spent potliner leachate impacting a karst spring w/ flows 300-500 gpm.

2003 - 2007 Alcoa pilot testing lead to full scale in 2010 (6 acres).



TCN vs. FeCN vs. Free CN

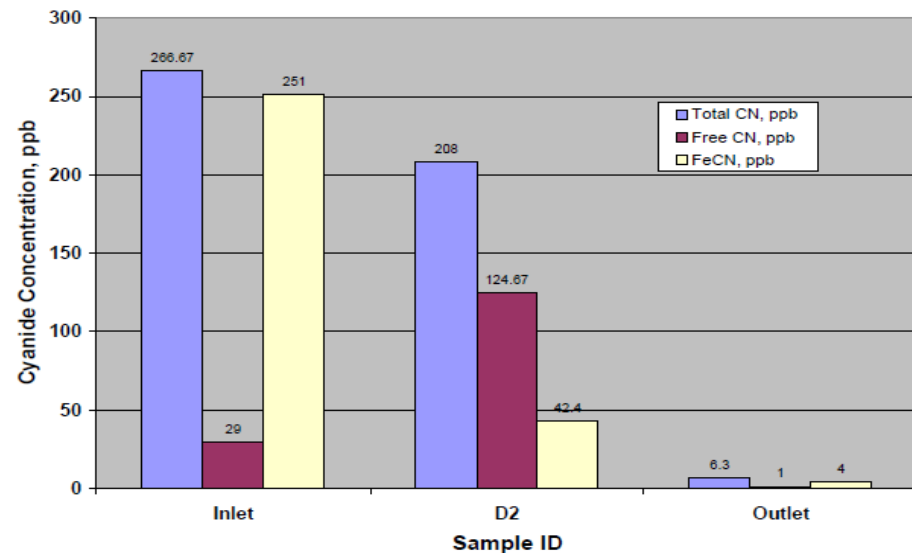


Figure 7. Actual flow pattern in the wetland during the first 21-day monitoring event.

Figure 10a. Average Cyanide Speciation in the Wetland during June-July 2004.

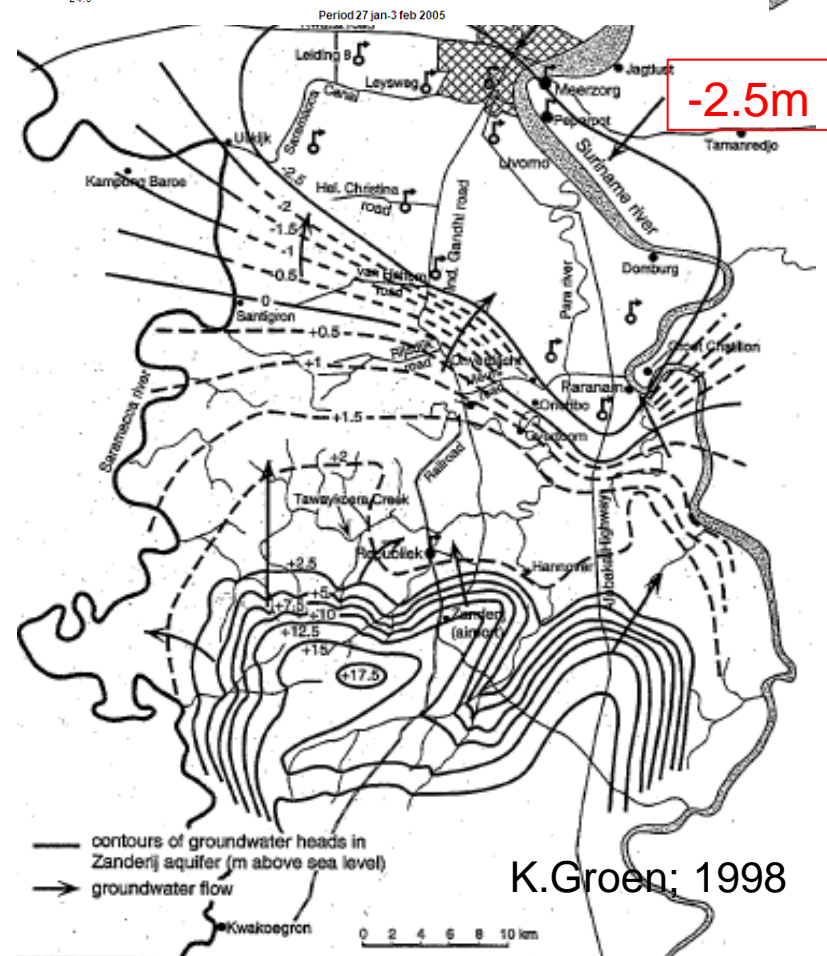
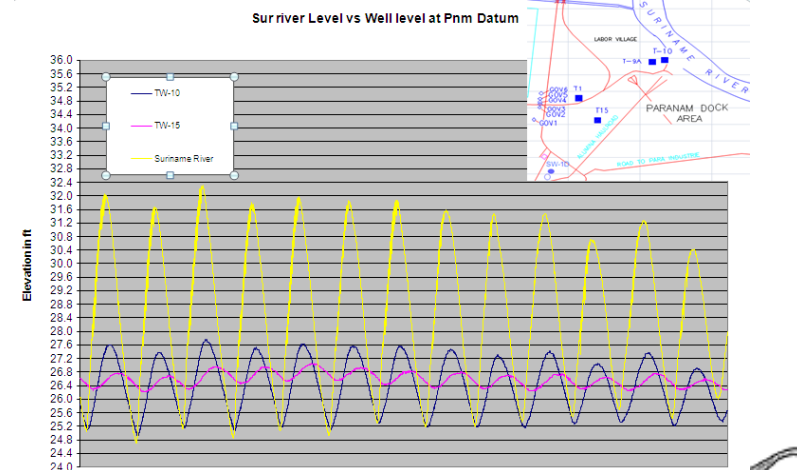
Paranam Suriname – Mining the GW resource

The Problem:

- Poor public well placement:
 - Saline intrusion
 - River and ship channel in drought.
 - Up coning.
 - Loss of wetlands.
 - Acid soil dewatering and oxidation of metal sulfides.
- Lack of sanitary sewerage.
- High system losses.
- Lack of funds.

Alcoa:

- Reducing water use:
 - 16ML/d to <3ML/d.
- Relocating a public well field.
- Turning over wells at mine sites w/ good location but w/restrictions.

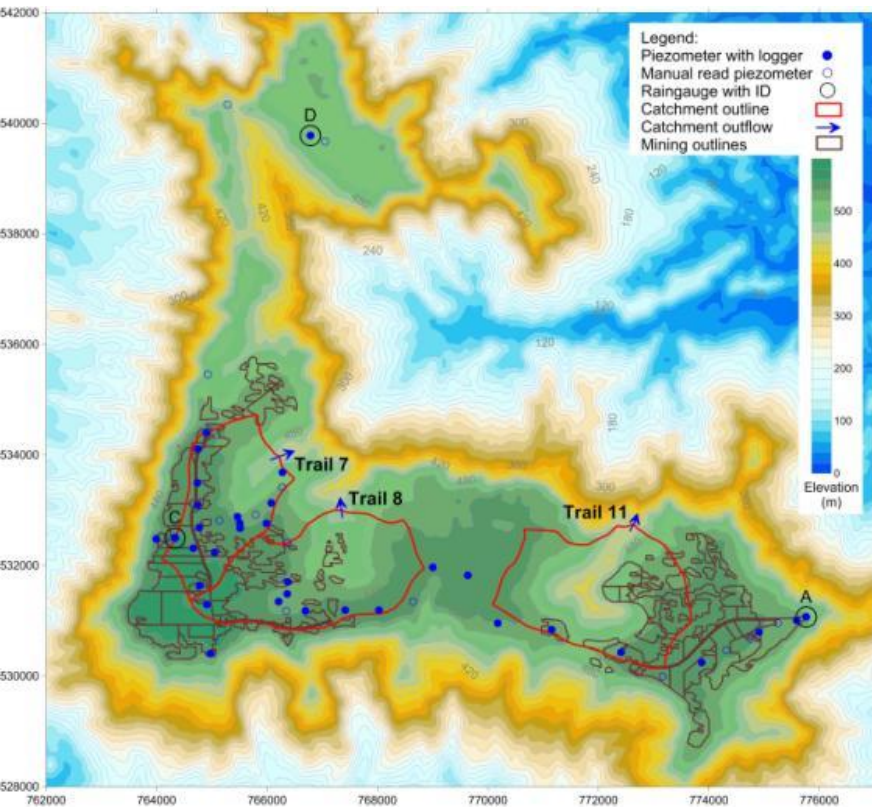


K.Groen; 1998

Nassau – Planning a mine in a pristine environment.

Bauxite capped plateau w/3m rain a year.
ESIA: Shoulder creeks excellent WQ
Genetically unique fish. Turbidity critical.
Huge impact on mine development plans:

- 2 of 4 ore areas to be left undisturbed.
- Mine drainage to less sensitive creeks.
- Progressive rearmor rehab.



Hartiella crassicauda