Brian Yang  
10/19/13  
Per 4 – APES

FR Questions

2.

a. Calculate the volume, in m^3, of each of the following

i.

200 mm rain water \* 1m/1000mm (conversion) = .2m rain water

ii.

10k m^3 \* .2 m \* 50% (.5) infiltrated water / 100% (1) water = 1 x 10^3 m^3

b. Given that the cadmium

100m^3 drain water/yr \* 2g Cd/1m^3 \* 1kg/1000g (conversion) = .2kg cd yr^-1

C.

900 m^3 treatable leachate \* $10/1m^3leachate = $9k year

D. Educate the public. Give them information about how to reduce\recycle any cadmium containing product\battery. Tell them about why it’s a good idea to be concerned about this and propose new and easier ways of working with this (Technology).

Give an incentive to help reduce Cd. Give the general public an incentive for buying any product that doesn’t use Cd.

E. Recycling would cost energy and might possibly be a benefactor for hazardous handling.

2006

b.

If the US continues to use coal as a method of energy production, CO2 concentrations will become insanely hazardous to human life. If there is no innovation in alternative energy sources, aside from coal, natural gas, etc., then we will be in trouble. We need to, by the time it is 2050, be able to successfully use thorium as an energy source as well as possibly nuclear fusion.

c.

Methane (especially from cows), leakage from pipelines, refineries, mines.

CFC (chloroflouorocarbon) produced in refrigerator, air conditioner production, to clean electronics, etc.

3.

a.

The cost would be a problem as well as risking contaminated soil from contaminating other areas while transporting them to a container.

b.

When using phytoremediation, it would be cheap, help reduce soil erosion, is less disruptive of the habitat, and reduces the amount of material that is being taken to the landfill. A disadvantage is that it’ll be a lot slower than cleaning it by hand\machine. It would also possibly introduce other species that find the habitat suitable, which might disrupt the food chain. Also, when the vegetation is removed, it will still be hazardous.

c.

Environmental – Reduces groundwater contamination  
Social – Aesthetically pleasing to the community

d.

i.

Alternative energy sources (wind, solar, hydroelectric, geothermal)

ii.

Bioremediation (organisms to decompose contaminated material)

2009

4

A

10 million to 20 million = 100% increase

B

1999 – 30 mil  
1997 – 10 mil  
2 years = 20 million/2yr   
10mha/yr

C

30m hec

5 yr -> 10mha/yr = 50 mil hec  
2004 = 80m hec

D

Governmental regulation\control\laws

2012

3.

A

If direct exposure of product X shows a higher mortality rate for minnows than an indirect exposure, then the product has an impact on their survivability.

Have the control be a set number of minnows and have the first set be just for the direct exposure and the other for indirect. For the indirect have a container sprayed with a set amount of product X and drop the minnow onto the container. Find out the mortality rate via. that way. The dependent variable would be the death rate out of 10, although a more precise experiment would use a lot more.

B

If both containers showed similar death rates, then my hypothesis would be wrong because a direct exposure, should in theory, be more lethal than an indirect.

C.

IPM stands for integrated pest management; it is to suppress pests without hurting their environmental beneficial level. They are used (biological\chemical\physical)ly to control pests.

D

Using irrigation systems and using modern farm equipment, not outdated.