

RISK ASSESSMENT: A risk assessment looks at the chemicals detected at a site, the frequency and concentration of detected chemicals, the toxicity of the chemicals and how people can be exposed, and for how long.

1. Data Collection and Evaluation

Find out:

- What happened at the site in the past.
- Where chemicals were left.
- Collect samples from soil, water and air.
- What chemicals are there and how much.

2. Toxicity Assessment

- Evaluates which illnesses or other health effects may be caused by chemical exposure.
- Looks at cancer-causing chemicals vs. those with non-cancer effects.
- Identifies how much of the chemical triggers health effects (dose/response relationships).

1. Data Collection & Evaluation



TOXICITY FACTORS – For Example Only

Chemical of Concern	Maximum Daily Dose (ug/day)	Chronic Health Effects
Arsenic	0.007	Cancer
Benzene	0.7	Cancer
Gas/Diesel	420	Multiple
TCE	1140	Cancer
Aspirin	100,000	G/I Tract

3. Exposure Assessment

2. Toxicity Assessment

CANCER RISK

The likelihood of some cancer resulting from a contaminated site is expressed as a probability: for example, a "1 in 10,000 chance" (sometimes expressed as 1×10^{-4}). This means that for every 10,000 people exposed to the reasonable maximum exposure, one extra cancer may occur

3. Exposure Assessment

- Use data from Step 1 to find out how much of each chemical people may be exposed to.
- People must come into contact with the chemical to be at risk.
- Exposure pathways at the Hookston site and vicinity are:
 - **Skin contact** from soil at the Hookston site only.
 - **Ingestion** of affected groundwater from the A or B zone
 - **Inhalation** from areas above shallow groundwater (A zone) from soil-gas vapors.

4. Risk Characterization

- The final step of the process sums it up.
- Reveals which chemicals are posing the risk and what the health risks are.
- It also says how sure we are about the results.

We can now use the Risk Assessment to develop a site cleanup plan that will make the site and surrounding areas safe for current and future uses.

NON-CANCER HEALTH EFFECTS

Can range from rashes, eye irritation, and breathing difficulties to organ damage, birth defects, and death.

CANCER RISKS IDENTIFIED IN THE BASELINE RISK ASSESSMENT

Receptor	Excess Cancer Risk (maximum theoretical lifetime risk estimate)
On-site worker	2.4 in a million
On-site construction worker	43 in a million
Off-site resident	96 in a million

EXPOSURE ROUTES: Routes of exposure to people are generally through ingestion (eating or drinking), contact with the skin, or inhalation.

REMEMBER:

- ➔ Risk assessment is not an exact science. Risk assessors use the best available data on what is occurring, or could occur, at the site.
- ➔ Risk assessors apply their scientific judgment to calculate the likelihood of exposure to hazardous substances and the health consequences.
- ➔ The results are probabilities, not certainties; however, the risk assessors are careful not to underestimate any threats.