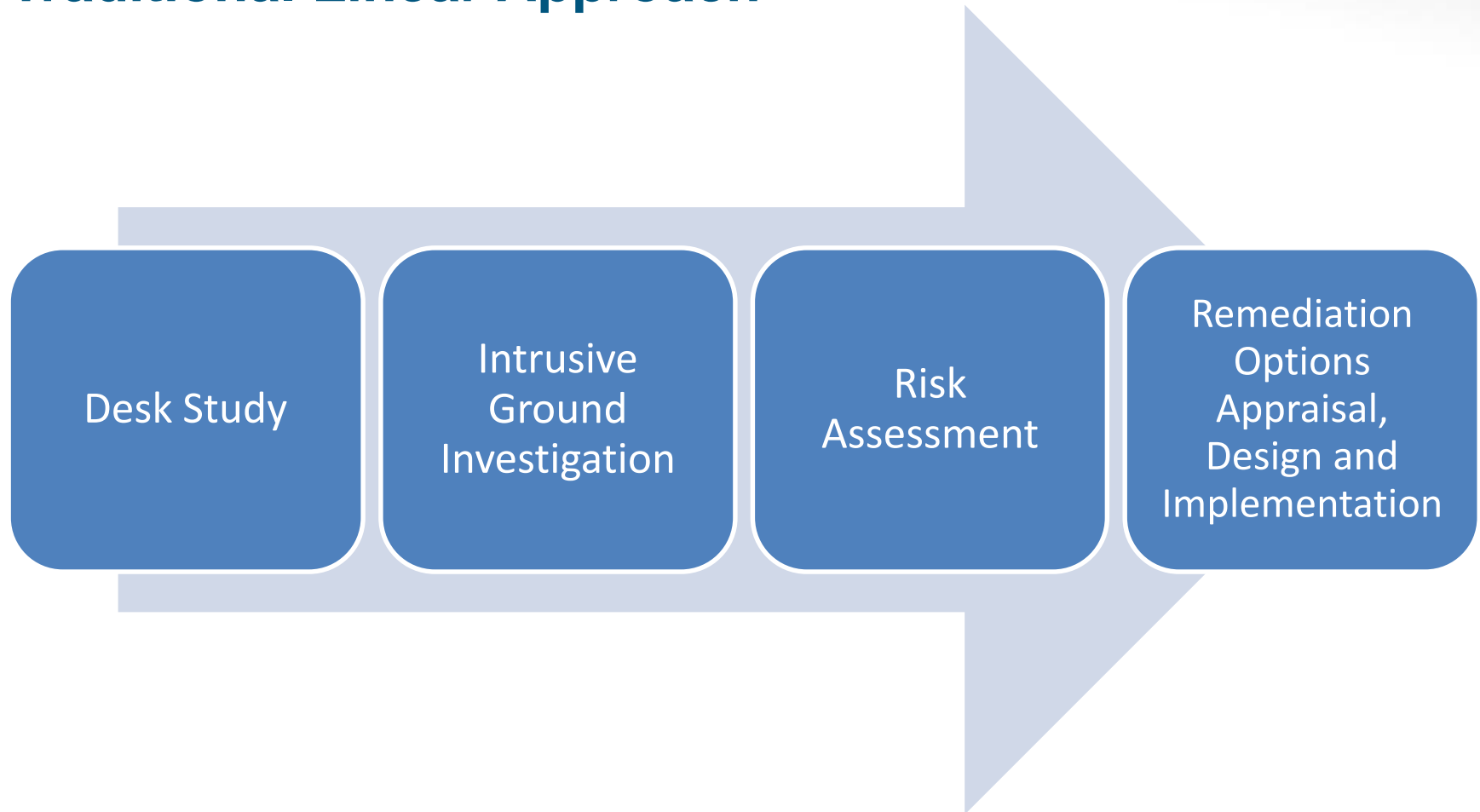









# Site Investigation for Remediation Design

July 2014

# Traditional Linear Approach



# What do Remediation Designers Need?

-  Site History
-  Contaminant Profile and Distribution
-  Geological and Hydrogeological Profile
-  Proposed site use and restrictions
-  Remediation drivers – source/pathway/receptor
-  Remediation aims and objectives
-  Timescales available



# Key Questions From Designers

We need characterisation of the groundwater chemistry. Secondary reagents can mean the difference between success and failure.

Where is the source? Have we accurately defined the area of concern?

What is the mass of contaminant present and what is distribution between vadose zone, dissolved and as NAPL

What is the expected future use of the property?  
What are the restrictions?

Have we defined the migration pathways?



# Groundwater Chemistry

## Basic Field Parameters

- Dissolved oxygen
- pH
- Redox Potential

## Basic Laboratory Parameters

- Daughter products
- Reaction by-products (e.g. Chromium)
- Metals – Fe, Mn, Mg, Ca
- Anions – chloride, sulphate, nitrate
- Total organic carbon

## Additional Laboratory Parameters

- BOD, COD
- Alkalinity
- Hardness
- Volatile fatty acids
- Dissolved gases

# Advanced Site Diagnostic Tools



# Investigating NAPL



Many variables affecting LNAPL detection:

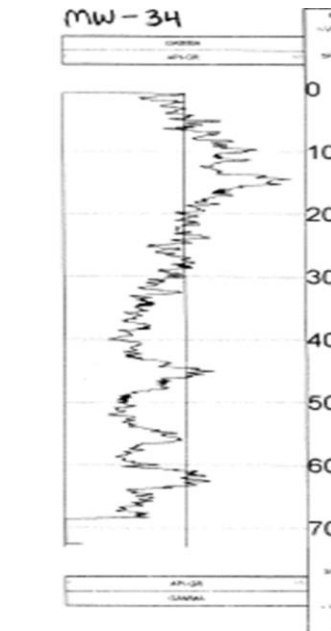
- Drilling method
- Well design and construction
- Age of well

Bail down tests

Apply caution to LNAPL thickness



# Investigating Migration Pathways and Distribution



- Geophysical borehole logging
- MIP / LIF investigations
- Explore discrete lithology
- Worst case – employ a diligent engineer armed with a PID





Thank you

Questions?

---