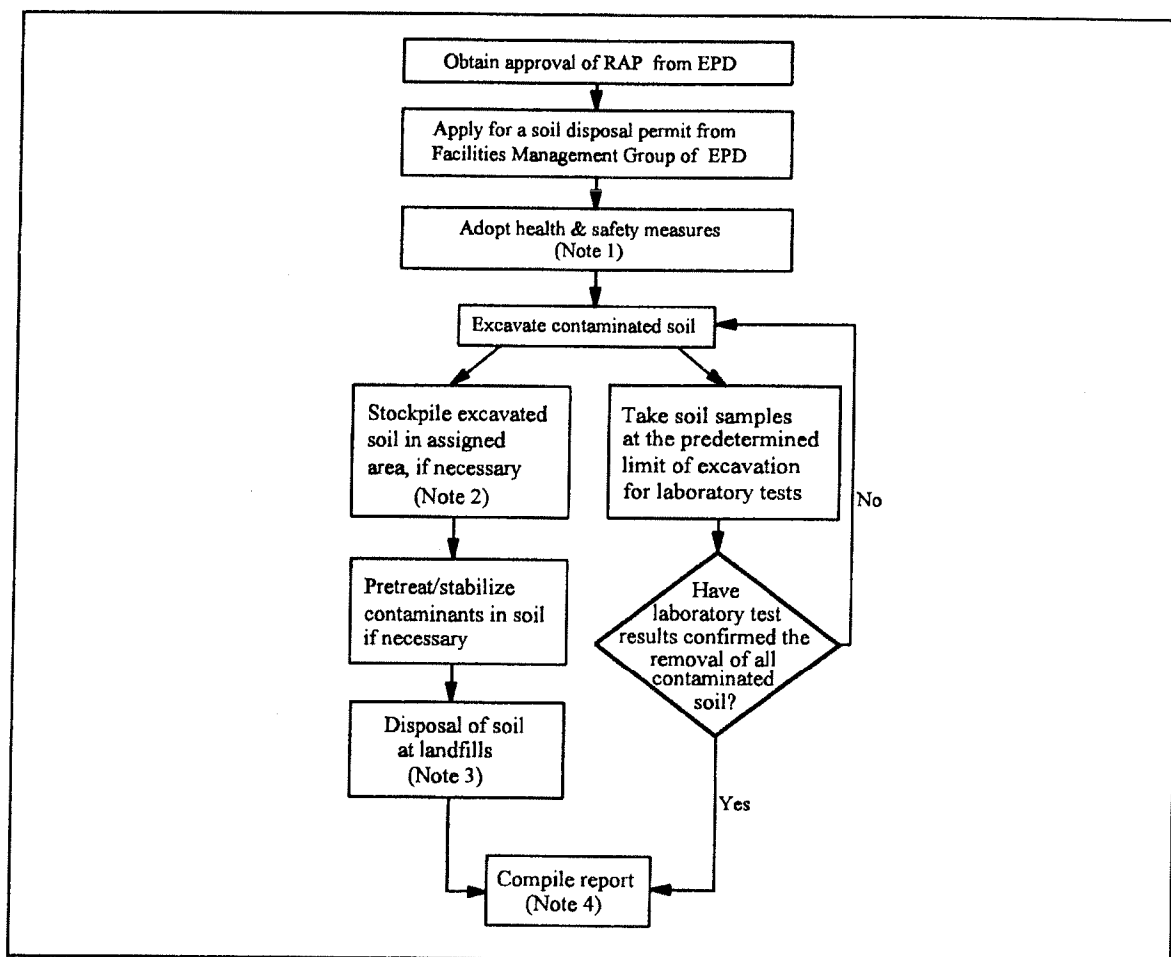


## 7.2 Excavation and Landfill Disposal

The essential steps involved in the implementation of the excavation and landfill disposal option are given in Figure 7.2. A more detailed description of this option is in Annex E.

**Figure 7.2 Essential Steps of Excavation and Landfill Disposal**



*Note 1: Example of excavation safety measures can be found in OSHA Excavations Rule 29 CFR 1926 SUBPART P. Further guidance is set out in Section 8.*

*Note 2: Excavated soil intended for disposal should be placed in an assigned area with warning posted. Assigned areas are those in which the general public and site staff cannot readily gain access. In any event, the soil should be stockpiled in a safe and effective manner. This requires a proper setup on an impervious surface with provision to deal with leachate and runoff properly. The stockpile should be covered with a plastic sheet to keep off wind and rain.*

*Note 3: Due care must be exercised during the transportation of the excavated contaminated soil to the landfill for disposal. The soil should be properly contained and covered to avoid spillage during transport. Suitable warning signs about the nature of the contaminated soil should be displayed on both the vehicle and the soil itself.*

*Note 4: A Remediation Report should be prepared and submitted to EPD to demonstrate that the clean-up is adequate. Information such as soil disposal records, sampling results, photographs and certification of independent checker should be included in the report.*

TCLP or other relevant tests on soil samples should be included during the early stage of contamination assessment. Table E2 below summarizes the appropriate action at each stage of assessment and remediation.

**Table E2 Procedure of Contaminated Soil Disposal**

Stage	Action
Preparation of CAP	<p>a. If exceedance of the relevant land contamination standards is likely, and excavation and disposal is envisaged to be the only suitable cleanup method during site appraisal, then the investigation plan should include TCLP or other relevant tests on every soil sample that will be analyzed for land contamination standards. Furthermore, TCLP or other relevant <b>screening tests</b> must be done on at least <b>3</b> samples from the most contaminated areas. A <b>screening test</b> is one that analyzes for the full suite of parameters in Table E1 irrespective of whether a parameter has been identified as a contaminant of concern during site appraisal.</p> <p>b. If the most suitable cleanup method has not been identified during site appraisal, extra soil samples should be collected and stored for TCLP or other relevant tests in the future (except the parameter of mercury, see note to Table E1), should exceedance of land contamination standards be confirmed and excavation and disposal be selected as the cleanup method. This approach may save the costs of unnecessary TCLP or other relevant tests during the CAP stage, but would require extra time in the project programme if TCLP or other relevant tests become necessary during CAR and RAP preparation.</p>
Preparation of CAR and RAP	If any TCLP or other relevant test results exceed the disposal criteria, the "non-complying" part of contaminated soil must first be pretreated or stabilized before disposal. The RAP should propose the most suitable method of pretreatment or stabilization.
After approval of CAR and RAP	A copy of the approved CAR and RAP must be submitted together with an application to Facilities Management Group (FMG) of EPD 3 months before disposal. FMG may limit the daily disposal quantity and require additional testing to confirm that other pollutants of concern are not present.
Implementation of RAP	The authorized person or resident engineer on site will be required to certify on an admission ticket that excavation, segregation and delivery of soil for disposal is done according to the approved RAP. For soils requiring pretreatment or stabilization, typically one sample per 400 tonnes of treated or stabilized soil is to be taken and subjected to TCLP or other relevant tests to confirm that the soil can be accepted at landfills according to the criteria in Table E1 or other relevant criteria. Only those parameters with concentrations exceeding the criteria during the initial testing need to be included in the confirmatory test. Every load of contaminated soil to be disposed of at landfills should be accompanied by an admission ticket and if applicable, confirmatory test results.

\* For former petrol filling station, boatyard and vehicle repairing/dismantling workshop sites