

## Hazardous Ground Gas

### Overall Phased Procedure of Hazardous Ground Gas Management

| Stage 0<br>Inception                             | Stage 1<br>Preliminary Risk<br>Assessment                                                                                                                                                      | Stage 2<br>Investigation &<br>Monitoring                                                                                                                                                                                                                                                                                | Stage 3<br>Risk Assessment                                                                                                                                                                                                                                                                                                                                                                     | Stage 4<br>Gas Protection –<br>Design & Detailing                                                                                                                   | Stage 5<br>Gas Protection -<br>Specification                                                                                                                                                                                                                                                               | Stage 6<br>Construction<br>Installation &<br>Verification                                                                                                                                                                                                                               |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Define</b><br>Site,<br>Project,<br>Objectives | <b>Carry out</b><br>Desk study<br><br><b>Describe</b><br>Initial conceptual<br>site model<br><br><b>Undertake</b><br>Preliminary risk<br>assessment<br><br><b>Prepare</b> Desk study<br>report | <b>Define</b><br>Objectives and<br>scope of<br>investigation<br><br><b>Prepare</b><br>Specification<br><br><b>Tender</b><br>Invitation and<br>award<br><br><b>Implement</b><br>Ground<br>investigation Post<br>investigation<br>monitoring<br>programme<br><br><b>Prepare</b><br>Factual ground<br>investigation report | <b>Collate</b><br>And assess data<br><br><b>Update</b><br>Conceptual site<br>model<br><br><b>Carry out</b><br>Generic<br>Quantitative Risk<br>Assessment (GQRA)<br><br><b>Carry out</b><br>Detailed<br>Quantitative Risk<br>Assessment (GQRA)<br><br><b>Define</b><br>Level(s) of risk<br><br><b>Identify</b><br>Need for gas<br>protection<br><br><b>Prepare</b><br>Risk assessment<br>report | <b>Describe</b><br>Gas protection<br>system<br><br><b>Design</b><br>Ventilation<br><br><b>Design</b><br>Barrier and<br>detailing<br><br><b>Verification</b><br>Plan | <b>Product</b><br>Consideration<br>Fitness for purpose<br>Performance<br>Vulnerability<br><br><b>Ventilation</b><br>Adequacy Airflow<br><br><b>Barrier</b><br><b>Specification</b><br>Data sheet review<br>Permeation<br>Durability Strength<br>Thickness<br><br><b>Verification</b><br>Plan Scope Testing | <b>Preconstruction</b><br>Kick off meeting<br><br><b>Define</b><br>Verification<br>programme &<br>activities<br><br><b>Installation</b><br>Gas protection<br>system<br><br><b>Implementation</b><br>Verification<br>activities<br><br><b>Prepare and Publish</b><br>Verification report |