

AIR SPARGING

UST Permit #: _____

Release #: _____

Do not proceed until the full extent of the contamination for the release has been delineated.

I. Applicability Determination (initial screening)	Effective	Somewhat Effective	Ineffective
<p>1. Is free product present at the site?</p> <p>Air sparging should not be performed in the presence of free product. Free product should be removed before air sparging can be used at a site.</p>	<input type="checkbox"/> NO		<input type="checkbox"/> YES
<p>2. Provide a general description of the Intrinsic Permeability (k)* of soils in the area of remediation measured in cm².</p> <p> <input type="checkbox"/> Based on soil type <input type="checkbox"/> Calculated <input type="checkbox"/> Field/lab test </p> <p><i>Stratified soils may require special consideration in design to ensure less-permeable stratum are addressed. This will require documentation.</i></p>	<input type="checkbox"/> k ≥ 1x10 ⁻⁹	<input type="checkbox"/> 1x10 ⁻⁹ ≥ k ≥ 1x10 ⁻¹⁰	<input type="checkbox"/> k < 1x10 ⁻¹⁰
<p>3. What is the general boiling point range in Celsius (°C) for chemicals subject to remediation at this site?</p> <p><i>For complex mixtures, select the boiling point range that is most representative of the chemicals of concern to be remediated by using this remedy.</i></p>	<input type="checkbox"/> < 250	<input type="checkbox"/> ≥ 250 - ≤ 300	<input type="checkbox"/> ≥ 300
<p>4. What is the total dissolved iron (mg/l) concentration at the site?</p> <p><i>High dissolved iron can diminish the effects of air sparging of petroleum compounds as iron oxide is formed.</i></p>	<input type="checkbox"/> < 10	<input type="checkbox"/> ≥ 10 - ≤ 20	<input type="checkbox"/> > 20
<p>5. Is the soil free of impermeable layers or other conditions that would disrupt air flow?</p>	<input type="checkbox"/> Yes	<input type="checkbox"/> Maybe	<input type="checkbox"/> No
<p>6. What is the vapor pressure range in millimeters (mm) of mercury for the chemicals being remediated?</p> <p><i>For complex mixtures, select the vapor pressure range that is most representative of the chemicals of concern to be remediate.</i></p>	<input type="checkbox"/> ≥ 1	<input type="checkbox"/> > 0.5 - < 1.0	<input type="checkbox"/> < 0.5
<p>7. What is the Henry Laws Constant** (atm) for the chemicals being remediated?</p> <p><i>For complex mixtures, select the Henry's law constant range that is most representative of the chemicals of concern to be remediated.</i></p>	<input type="checkbox"/> > 150	<input type="checkbox"/> ≥ 100 - < 150	<input type="checkbox"/> < 100

* Intrinsic permeability is a measure of the ability of soils to transmit fluids and is an important factor in determining the effectiveness of air sparging.

** Here is a link to an EPA website with common Henry Law Constants for various chemicals. Choose H_{px} (partial pressure/mole fraction)

<https://www3.epa.gov/ceampubl/learn2model/part-two/onsite/esthenry.html>

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I. Applicability Determination (initial screening continued)	Effective	Somewhat Effective	Ineffective
<p>8. If a pilot test is recommended, will the air sparge well used for the pilot testing be in an area of or pilot testing is in an area of contamination that is best described as:</p> <p>Note: Pilot testing is not required. However, if recommended, testing the system in areas of low contamination may provide insufficient data but testing in high areas of contamination can induce migration of contamination.</p>	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low	<input type="checkbox"/> High
<p>9. What is the radius of influence (ROI) in feet for the proposed extraction wells?</p>	<input type="checkbox"/> > 20	<input type="checkbox"/> > 5 - ≤ 20	<input type="checkbox"/> < 5
II. Air Sparge Design			
<p>1. Has the radius of influence (ROI) been calculated for each soil type to the site in the area of contamination?</p>	<input type="checkbox"/> YES		<input type="checkbox"/> NO
<p>2. Is the proposed well density appropriate, given the total area to be cleaned up and the radius of influence of each well?</p>	<input type="checkbox"/> YES		<input type="checkbox"/> NO
<p>3. Will the proposed air sparging pressure be sufficient to overcome the hydraulic head and capillary forces?</p>	<input type="checkbox"/> YES		<input type="checkbox"/> NO
<p>4. Will the air sparge flow rates provide sufficient vapor/dissolved phase partitioning of constituents to achieve cleanup?</p>	<input type="checkbox"/> YES		<input type="checkbox"/> NO
<p>5. Is the proposed well configuration appropriate for the site conditions present?</p>	<input type="checkbox"/> YES		<input type="checkbox"/> NO
<p>6. Is the air compressor selected appropriate for the desired sparge pressure?</p>	<input type="checkbox"/> YES		<input type="checkbox"/> NO
<p>7. Do the proposed well screen intervals match with the contaminant plume location at the site?</p>	<input type="checkbox"/> YES		<input type="checkbox"/> NO
III. Other Remedial Technologies			
<p>1. What other remedial technology will be used in conjunction with air sparging?</p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"><input type="checkbox"/> Soil vapor extraction</div> <div style="width: 50%;"><input type="checkbox"/> Aggressive fluid vapor recovery</div> <div style="width: 50%;"><input type="checkbox"/> Dual phase extraction</div> <div style="width: 50%;"><input type="checkbox"/> Other (identify): _____</div> </div>			

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IV. Evaluation of Operation and Maintenance

The air sparge system should not be started prior to the start of the SVE or other remedial technology being utilized with the air sparge.

Please specify what measurements and the frequency of routine maintenance that may be conducted to ensure that the system is operating as needed. These may include but not be limited to: manifold valve adjustments, pressure and vacuum readings, groundwater depth, dissolved oxygen levels, carbon dioxide levels, pH.

All monitoring information should be provided in the Corrective Action Status Evaluation Report.

V. Sitemap

1. Site map(s) drawn to scale illustrating the following:
 - a. Location of all present and former tanks, piping and dispensers in area of release;
 - b. Footprint of surface and/or subsurface soil contamination;
 - c. Footprint of other structures (buildings, canopies, roads, utilities, etc.);
 - d. Location of treatment systems;
 - e. Location of extraction and air sparging wells;
 - f. Monitoring wells that will be used for sampling;
 - g. Groundwater flow direction;
 - h. North arrow, bar scale, and map legend

