

Address: _____
Parcel No.: _____

Determining the Applicability of Phytoremediation and Design Considerations in an Urban Setting

This three tiered form is intended to be used as a tool to provide a community with both a quick qualitative analysis (Tiers I and II) to be completed during a short site visit by non-technical municipal staff and a technical analysis (Tier 3), including soil and/or groundwater sampling, to be completed by an environmental professional experienced with phytoremediation systems. This form may be modified to meet the specific needs of a community.

PARAMETER	CONSIDERATION	METRIC	RANGE OF SCORES	SCORE
TIER I: NON-TECHNICAL, FIRST IMPRESSION				
1. Site Compatible For Planting Trees/Vegetation	Can you physically plant trees/cover? Examples where the answer is "no" : Site water covered or utilities throughout property.	Visual	0 to 1	
2. Evidence of Vegetative Growth	Is there anything growing? Sunlight limited?	Visual	0 to 1	
3. No Observed Structures Other Than Surface Pavement	No demolition (aboveground or belowground) required to plan?	Visual	0 to 1	
4. Known or Suspected Contamination	Stained Areas, Chemical Storage or Business Supporting Chemical Use	Visual	0 to 1	
0=No; 1=Yes				
If Yes to Parameter 1 and 2, 3 or 4, then go to Tier II				
TIER II: NON-TECHNICAL Tier I Score is 2 or Greater				
1. Potential for Contamination	Is there visual evidence to suggest the potential for environmental contamination. To what extent is there visual evidence?	Degree of Contamination	0 to 4	
2. Cover Type	Pervious surface cover?	Percentage of pervious cover	0 to 4	
3. Absence of Structures	Presence or absence of aboveground or belowground structures?	Evidence and Quantity of Structures to No Structures	0 to 4	
4. Surface Water Nearby	Is a surface water or wetland near or adjacent the site?	Adjacent by 1/4 mile increments up to 1 mile or greater	0 to 4	
5. Maintenance of Trees or Vegetation	Is there funding to maintain trees/vegetation?	Yes or No; Grant versus Community Budgeted Funds	0 to 4	
SUBTOTAL:				
If score >10 go to next tier of analysis				
Key for Tier II Criteria				
1. Potential for Contamination: 0 - None 1 - Spot Locations 2 - Light Throughout 3 - Medium Throughout 4 - Heavy Throughout				
2. Cover Type: 0 - Impervious 1 - Some Pervious Cover 2 - Less than 50% Pervious 3 - Greater than 50% Pervious 4 - 100% Pervious				
3. Absence of Structures: 0 - Predominately Covered with Structures 1 - Structures Covering more than 50% of Site 2 - Structures Covering up to 50% of Site 3 - Small Discreet Structures 4 - No Structures				
4. Surface Water Nearby: 0 - Greater than 1 Mile 1 - Less than 1 Mile 2 - Less than 3/4 Mile 3 - Less than 1/2 Mile 4 - Less than 1/4 Mile				
5. Maintenance of Trees or Vegetation: 0 - None Available 1 - Grant Funds Available 2 - Volunteer Group 3 - City Funds Available 4 - Private Organization				

PARAMETER	CONSIDERATION	METRIC	RANGE OF SCORES	SCORE
TIER III: TECHNICAL* Tier II Score of 10 or Greater Requires Tier III and Tier IV Evaluation by Professional				
1. Contaminants of Concern (COCs)	Are the COCs considered treatable by phytoremediation? E.g., ag chemicals, metals, volatiles, semi-volatiles, etc., or are they known to be recalcitrant to phyto mechanisms?	Nitrogen (N), Phosphorus (P), Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), Metals ?	0 - 2	
2. Concentrations of COCs	Are the concentrations of COCs below a level that would be considered toxic to cleanup friendly organisms?	Concentrations < Saturation (C _{sat}) or Solubility?	0 - 2	
3. Final Cleanup Goal	Can phyto achieve final cleanup goal? How long will it take?	Contaminant Concentrations	0 - 2	
4. Riparian Setting	Will the applicability of phyto also aid in the restoration of a riparian buffer?	Potential Degree of Riparian Restoration	0 - 2	
5. Hydrogeologic Setting	Is the hydrogeologic setting understood and reasonable for phyto, e.g., shallow water table, mixing zone effects, etc.?	Sufficient Hydrogeologic Data?	0 - 2	
6. Climate	Is the climate suitable for the intended flora?	Anticipated Suitability	0 - 2	
7. Existing Flora	Is there existing non-invasive flora at the site, and is it desirable to encourage any of this pioneer flora?	Degree of Existing Flora	0 - 2	
TOTAL				
Key for Tier III Criteria:			0 = No, 1 = Maybe, 2 = Yes	
Tier III Scoring Results				
0-4 = Phytoremediation Not Likely	5-9 = Phytoremediation Possible; Get More Data		10-14 = Probable Candidate for Phytoremediation	

* Requires subsurface sample results

References:

“Technical/Regulatory Guidance: Phytotechnology Technical and Regulatory Guidance and Decision Trees”, Revised, Interstate Technology & Regulatory Council, February 2005
 “Phytoremediation as an Interim Solution for Smaller Orphan Sites,” Daniel B. Dickel, City Tree Project, Hennepin County Community Works, Minnesota, November 2000

Form designed by Environmental Consulting & Technology, Inc. (ECT) for the City of Ypsilanti as part of a grant from the United States Department of Agriculture Forest Service, Great Lakes Restoration Initiative.