

Air Monitoring Directive – Summary of Feedback and Responses for Chapter 3 Site Selection

This feedback was received following the 60-day public review (July – August 2014) of the Air Monitoring Directive Chapter 3, Site Selection.

Chapter 3: Site Selection			
#	Comment	Response from ESRD	Action Taken
1	<p>Section 2.3 – the illustration indicates that the sample inlet must be 20 metres away from trees. In the past we have used a rule of 2 times the height of the obstacle away. Following the old rule if the site were in the vicinity of trees that were 20 metres high, we would need to locate the station 40 metres away. This rule has worked reasonably well so far. If this requirement is changed to a fixed distance of 20 metres, there would likely be impacts if obstructions were very large and hence the monitoring station not sited far enough away. I realize the 30 degree rule can also be used here, I just think that a fixed distance of 20 metres may not be the best approach.</p>	<p>The rule of 2 times the height of the obstacle still applies; see clause SS 2-D; all parts of this clause apply. Therefore, there must also be more than 20 metres to any trees. If trees are only 5 metres high there still must be more than 20 metres between the trees and the station.</p> <p>As per your example if trees are 20 metres high they would have to be 40 metres away.</p>	None.
2	<p>Table 4 – will siting passive samplers 3 feet above the roof of a monitoring station meet the new criteria? There does not seem to be a reference to this. WBEA collects passive data at a number of the continuous stations for comparison purposes. This positioning is intended to align, as closely as possible, to the continuous sample inlet location.</p> <p>Also, it would be useful if there was a criteria for minimum separation distance of passive samplers. Many passive programs sample in duplicate or triplicate. We have been using a separation distance of 1 metre so far, but it would be nice if this criteria were included in the AMD.</p>	<p>The height of the diffusion barrier surface must be a minimum of 1.5 metres to the ground or above the station roof and a maximum of 4 metres above the ground (Table 4). The station height must be considered in the total measurement.</p> <p>Guidance added for horizontal separation.</p>	<p>None.</p> <p>Guidance added for horizontal separation.</p>
3	SS 2K-g – uncertain what is meant by east-west orientation. Please elaborate.	Refers to the orientation of the chassis of the precipitation sampler.	Clarification added to SS-2K-g.
4	Section 2.5.2 – when is the person responsible required to collect “background precipitation” data?	This chapter does not give requirements as to <i>when</i> data must be collected; this type of requirement would be outlined within an operating approval.	None.

Air Monitoring Directive Summary of Feedback and Responses for Chapter 3 (Site Selection)

5	SS 3-C – this clause implies that all electrical circuits in a monitoring shelter must be GFCI. This is typically not done and is currently to code. All receptacles that are located out doors should be GFCI, but receptacles inside the shelter do not require this. If this is firm, please explain.	The clause should read “external to the shelter”.	Wording corrected.
6	SS 3-I – this clause states that the water knockout is to be located at the end of the manifold. There are a number of stations throughout the province that have the knockout located midway through the sample inlet system. Do all these systems have to be replaced with the system outlined in this clause? If so, what time frame would be allowed to complete this? SS 3-I For vertically mounted manifolds, is the knockout acceptable at the end of the manifold if the fan connected via a Tee. Figure 5 shows such a configuration but it is in apparent conflict with SS 3-I.	The requirement was in the 1989 AMD. SS 1-A gives the time frame for compliance (1 year). The illustration does conflict with the clause and has been removed.	Manifold illustrations removed.
7	SS 3-K-d – this clause requires some clarity. Is the 10 seconds the time to travel through the sample lines? Please clarify.	The 10 seconds is the time to travel through the manifold and sample lines from the manifold to the sampling device. This does not include the time to travel from the inlet to the manifold.	None.
8	SS 3-L – the cleaning of the manifold requires that all monitors sampling from the manifold are flagged as not collecting valid data during this process. As this is a monthly requirement, is the time required to complete this task included in the operational time of the analyzer as “up-time” similar to a calibration or daily span time?	Suggest cleaning manifold during monthly calibrations therefore no downtime is incurred. If done separately downtime is incurred as the analyzers are sampling ambient outside air.	Further guidance added.
9	Section 4.0 Site Documentation – there is a reference to site documentation templates that are located on the website. I could not find these. Perhaps a direct link to the location of these templates should be included in the AMD section.	Templates were located on the “AMD Toolbox” page: http://esrd.alberta.ca/air/objectives-directives-policies-and-standards/air-monitoring-directive/amd-toolbox.aspx The site documentation template was removed for finalization.	None.
10	Table 4 - Can’t maintain the elevation angle < 30 degrees if mounting to a post of any kind using the standard brackets, since the bracket and post themselves could be considered “obstacles” Suggest a definition of obstacle be included.	Figure 3 illustrates application of the 30 degree angle, showing the mounting post is not considered an obstacle as long as it does not cause direct interference.	None.

Air Monitoring Directive Summary of Feedback and Responses for Chapter 3 (Site Selection)

11	Section 3.2 Last bullet should begin with “if”.	Agreed.	Corrected.
12	SS 2-E Change wording to match 2.5. Should reflect predominant wind direction.	Current wording is preferred.	None.
	Section 2.5 predominately downwind ‘side’. Currently says downwind site.	Agreed.	Corrected.
13	Section 3.0 Suggest changing ‘sampling lines’ to ‘sampling tubing’ and “composition of particulate filters”	Agreed.	Changed “lines” to “tubing”.
14	SS 3-C GFCI’s are not needed for all equipment housed in a good shelter that is water tight and climate controlled. This could be a huge cost that is unnecessary. GFCI’s should only be required for outdoor circuits.	Should read “located external to the shelter”.	Wording corrected.
15	SS 3-D Suggest expanding the low end temperature to 19 or even 18 degrees for a little more room before action is required. A deviation from this spec, as all other AMD requirements should trigger corrective and preventative actions.	Current temperature requirement will remain.	None.
16	Section 3.2 Clarify calibration line statement. Suggest “If the output from a calibration system is connected into the manifold for the purposes of analyzer calibration, the output tubing should be located so that calibration gases flow past the instruments before the gas is evacuated out of the manifold”.	Agreed.	Changed to suggested wording.
17	SS 3-L (Objection) It may be possible there is no visible dirt in a manifold after 1 month. Why must it be cleaned? Can this requirement defer to an SOP or less frequent cleaning if no discernible dust is evident after 1 month.	This is done to ensure no build up occurs from month to month.	None.
18	Section 4.0 Written descriptions and a history of all changes. Please clarify the intent of this sentence. What type of changes must be logged? Suggested wording: ”history of all location changes” – It should not be necessary to log when a door lock was changed or air conditioner replaced.	This is an introductory sentence (guidance); the clauses indicate what documentation is required and when.	None.
19	SS 4-B Provide some information in the template or appendix on how to list land use by sector, what is a sector? 90 degrees? 45 degrees? Please provide a reference list of standard terms for land use.	Use 90 degrees as a sector. Standard terms would be hard to define as each site is different and best described when the operator is on site.	Clarification included in chapter and Site Documentation form.

Air Monitoring Directive Summary of Feedback and Responses for Chapter 3 (Site Selection)

20	<p>SS 4-C Why do these requirements differ from SS 4-B? Is it a second set of documents for the entire network, additional information required in the documentation for each station within the network or is this all that is needed if a station is part of a network? Better clarity should be provided here.</p> <p>Land use by sector doesn't make sense in the context of an entire airshed map. Land in far off corners of an airshed is somewhat irrelevant Leave that to the site docs for the station only.</p> <p>Specify the required radius that a map must cover from the station(s). 1km, 5 km, 100km?</p> <p>Better clarity for identified industrial and non-industrial pollutant sources is needed. To what radius? How big? According to this wording a back-yard fire pit 10 miles from a station must be documented and plotted. I assume this isn't the intent so some parameters around what must be identified are needed.</p>	<p>SS 4-C is documentation for a network of sites while SS 4-B is documentation required for each monitoring site. Both are required as different information is requested in each clause.</p> <p>This requirement should have been in SS 4-D.</p> <p>SS 4-D indicates for an individual station "map covering an approximate area of one square kilometre (i) with the station at the centre of the map".</p> <p>These are pollutant sources that the operator identifies that could influence the ambient air monitoring.</p>	<p>None.</p> <p>Wording of clauses amended.</p> <p>None.</p> <p>None.</p>
21	<p>The current monitoring stations were designed on what the Directive required at that time.</p> <ul style="list-style-type: none"> • Do facilities need to upgrade current facilities to the new requirements or will there be provisions for upgrades during maintenance activities, etc.? • Consider adding a definition for "downwind" to this chapter for clarity. 	<p>Facilities will have to meet any new requirements of this chapter as indicated in SS 1-A within 1 year.</p> <p>No definition will be added</p>	None.
22	<p>SS 2-D (c) states that the distance from the sample inlet to any air flow obstacle, e.g., buildings, is greater than 2 times the height of the obstacle above the inlet.</p> <ul style="list-style-type: none"> • Need clarity regarding whether or not this clause includes the wind speed tower or the building that the inlet is housed in. 	<p>The requirement was in the 1989 AMD.</p> <p>SS 2-D (c) and Figure 1 specify distance to any obstacle, whereas Table 1 specifies the inlet height in relation to the station housing. The meteorological tower is not considered an obstacle, as long as it does not restrict air flow (see Figure 1).</p>	None.
23	<p>SS 2-D (e) states that air flow is unrestricted in 3 of the 4 wind quadrants</p> <ul style="list-style-type: none"> • Need clarity about whether or not a chain-link fence would be considered a restriction. <p>Consider adding a definition for "unrestricted".</p>	<p>If the fence acts as a direct interference to the sample intake manifold yes, otherwise no.</p>	None.

Air Monitoring Directive Summary of Feedback and Responses for Chapter 3 (Site Selection)

24	<p>SS 2-E states that "When using a portable generator, the person responsible must locate the portable generator exhaust at least 30 metres downwind of the air sample inlet of any ambient air monitoring station.</p> <ul style="list-style-type: none"> • At our stations, we may be required to use a portable generator if there is a power line outage. However, the 30 metre distance requirement puts the portable generator outside of the fenced area, making it unsecure. Is there a provision that will allow facilities to keep the portable generator at the furthest point possible inside the enclosure? 	It is the exhaust of the generator that must be 30 metres downwind, not the generator itself.	None.
25	<p>SS 3-C states that "The person responsible shall use ground-fault circuit-interrupters for all a) sampling and b) monitoring equipment that are located in the shelter in SS 3-A."</p> <ul style="list-style-type: none"> • Our shelters are dry locations with no instruments on the floor and do not require ground-fault circuit interrupters under the Alberta Electrical Code. Please confirm if these interrupters are required and provide clarification for the requirement. • The NAPS Shelter Requirements (4.5.1) states that the shelter must have "a reliable electric power supply" but does not state a requirement to use ground-fault circuit interrupters. 	See comment #5	None.
26	<p>Page 4, Table 2. Are traffic data readily available in Alberta? Please provide a reference to the traffic information source to be used for compliance purposes.</p>	This data should be available from cities, municipalities and Alberta Transportation.	None.
27	<p>Page 9, Table 6. What is the definition of a "large" water body? What is the definition of a "small-scale" pollution source?</p>	The requirement has been reworded to clarify.	Wording amended.
28	<p>Page 12 Subsection 3.2, SS 3-K (f). This last bullet point should read "if this is impossible" instead of "ff this is impossible".</p>	Agreed	Corrected.
29	<p>Page 14 Section 4, SS 4-C(b). What should be the size of the topographic map area or the radius from the monitoring station locations?</p>	1-50,000	None.

Air Monitoring Directive Summary of Feedback and Responses for Chapter 3 (Site Selection)

30	<p>Section 4.0, Site Documentation, Page 13, SS 4-B (j). Site documentation shall include the following information for all monitoring sites, at a minimum: ... (j) site description including: (i) land use by sector; (ii) site elevation (metres); (iii) greatest angle of elevation and direction to nearby buildings (iv) average building height in the area (metres); and (v) distance to the nearest trees (metres). Feedback and Recommendation: Points (iii), (iv), and (v) aren't applicable in every situation. We should suggesting qualifying each of these points with "where applicable" for clarity.</p>	<p>In the site documentation you would make note that these did not apply to that site.</p>	None.
31	<p>"SS 3-D For the shelter in SS 3-A, the person responsible shall maintain the shelter temperature between 20°C and 30°C or as required by the manufacturer of the analyzers or samplers located within the shelter." It is our experience that shelter temps of approximately 18-20°C are preferable to maintain instrument (box) temp at the ideal. Suggest the above range is modified to "... between 18°C and 30°C...."</p>	See comment #15.	None.
32	<p>Page 12: SS 3-K (d). "the residence time of the air sample in the manifold and sample lines to the sampling device must be less than 10 seconds of the total allowable 20 seconds required in SS 3-K (c); If the total residence time is greater than 20 seconds, a larger blower or vacuum pump should be attached to increase the flow rate and decrease the residence time." For many instruments it is not possible to increase flow rates as this is set by the manufacturer and controlled by an orifice. The above guidance is therefore misleading. The justification for a 20 second residence time is questioned given the time-scales that ambient monitoring operates on. A residence time of less than 60 seconds would seem adequate to capture the changes usually encountered.</p>	<p>This applies to manifolds only not analyzer sample flow.</p> <p>No change required.</p>	None.

Air Monitoring Directive Summary of Feedback and Responses for Chapter 3 (Site Selection)

33	<p>Page 13: SS 4-B (j). “site description including: (i) land use by sector; (ii) site elevation (metres); (iii) greatest angle of elevation and direction to nearby buildings; (iv) average building height in the area (metres); and (v) distance to the nearest trees (metres).” Not all of these may be applicable in all situations. Suggest “(where applicable)” be added after (iii), (iv) and (v).</p>	<p>In the site documentation you would note that these did not apply to the site.</p>	None.
34	<p>SS 2-K (e) Why must the diameter of the clearing have to be less than 10 times the height of trees? Does it matter if it’s a larger clearing? Isn’t a larger clearing better?</p>	<p>A clearing that is too large reduces the efficiency of collection.</p>	None.
35	<p>SS 3-G Our stations use a stainless steel manifold design, which is inert to the pollutants that we sample. Is there a process envisioned to review other inlet manifolds, or is it adequate that our station documentation/QAP includes that information?</p>	<p>Glass sample manifolds allow for inspection and ease of cleaning. Stainless Steel manifolds can be affected by other pollutants that may impact pollutants being monitored. They are also difficult to inspect monthly. Note that this clause has not substantially changed from current 1989 AMD requirements.</p>	None.
36	<p>SS 3-L Suggest quarterly (seasonally) or annual manifold and line cleaning should be sufficient.</p>	<p>See comment #17.</p>	None.
37	<p>SS 4-A Is there an expectation to re-submit station documentation for existing stations, or is that step focused on new stations only?</p>	<p>If completed site documentation, as required in this chapter, is already on file it is not necessary to re-submit. SS 4-A applies as indicated.</p>	None.
38	<p>SS 4-D (b) Suggest that a labelled side and front view photo of the station should be sufficient, as opposed to a plan view sketch. An aerial photo showing 500m in either direction would also be better than a sketch.</p>	<p>A plan view sketch shows all details from a side view including heights of objects and distances from the station. Aerial photos and photographs will not show all details clearly since the plan view sketch should indicate heights as well as distances.</p>	None.

Air Monitoring Directive Summary of Feedback and Responses for Chapter 3 (Site Selection)

39	Appendix C referred to in overview however appears to be missing (need to double check ESRD isn't referring to the old AMD)?	Appendix C was removed prior to this draft and a separate Site Documentation Template was provided in the AMD Toolbox website as indicated on page 16. The template will be finalization and re-posted to the website.	None.
40	<p>SS2-D</p> <ul style="list-style-type: none"> • Confirmation needed that ALL distance/angle criteria must be met. I.e., If the elevation angle is <30° from inlet to the top of the nearby canopy, can the station be within 20 metres of these trees? • It is likely that a high percentage of stations in the current Provincial/Airshed networks will not be able to meet the proposed 20 meter tree setback (including former ESRD sites). • The 20 meter setback may pose a problem for LICA's plans to monitor air quality in the town of Bonnyville (and most other urban / non-rural locations) • The 20 meter setback may also pose a problem for rural monitoring locations. Airsheds that use portable monitoring stations in their network often locate these stations on farm properties (for ease of power access) where trees are purposely planted as a windbreak. • What constitutes unrestricted airflow? LICA assumes it involves more than just trees given the previous tree caveats. This could present a major challenge to locating AQHI stations in populated centres. Similar to the tree setback issue, there is likely a very high percentage of existing stations that do not meet the unrestricted airflow requirement. Depending on the definition, LICA's Cold Lake station could be considered restricted in ALL directions. 	<p>All distances and angles must be met to ensure proper sampling occurs. This requirement has not changed from current 1989 AMD requirements.</p> <p>Un-restricted air flow is any obstacle that impacts ambient air being drawn into the intake of the manifold in 3 of the 4 quadrants.</p>	None.
41	<p>SS 2-B</p> <ul style="list-style-type: none"> • "The person responsible shall use dispersion modelling to locate all new continuous ambient air monitoring stations, precipitation samplers, passive, and intermittent samplers for each industrial operation that requires an approval, unless otherwise specified in writing by the Director." • The modelling requirement here may open up expectations for non-approval-based monitoring (i.e., why is modelling required for one application and not others). Perhaps a reference to monitoring decision trees and other considerations in the AMSP? 	This is for siting new stations under industrial requirements.	None.

Air Monitoring Directive Summary of Feedback and Responses for Chapter 3 (Site Selection)

42	<p>Table 6</p> <ul style="list-style-type: none"> • “Station and inlet siting criteria for precipitation samplers ... water bodies ... >40 km from a large water body” • Please define large water body. Cold Lake could certainly be considered a large water body. • ESRD’s precipitation sampler at the Cold Lake PP Ranger Station, which LICA assumes to be a background station due to its 30-40 year sampling record, is practically on the shoreline of Cold Lake. 	See comment #27.	Wording amended.
43	<p>SS 3-C</p> <ul style="list-style-type: none"> • “The person responsible shall use ground-fault circuit-interrupters for all a) sampling and b) monitoring equipment that are located in the shelter in SS 3-A.” • Why GFCI for outlets located inside the station? • Yes ... for intermittent samplers (hi-vols, tipping buckets) on the roof or outside the station, but it may be costly to retrofit all station outlets at this point (ESRD’s included). Installing a GFCI outlet is not simply a matter of replacing the outlet on the wall – there are specific breakers used at the panel for these circuits as well. • Perhaps GFCI required for outside and recommended for inside? 	See comment #5	None.
44	<p>Page 10</p> <ul style="list-style-type: none"> • Recommend removing comment about fenced enclosure. Standalone examples shouldn’t be given here ... LICA does several things to ensure station security including locked ladder/windtower pads, high security door locks, and motion activated web-cams, however LICA does not fence-in monitoring assets. 	The guidance is there to give an example of how a shelter <i>can</i> be secured. It does not preclude operators from using other methods for security.	None.