



AIR QUALITY

Fort McKay Specific Assessment

Appendix 2-1 Healing the Earth Strategy (HTES) – Air Section

**Fort McKay
Industry Relations Corporation**

March 2010

DRAFT IRC WORKPLAN and DETAILED STRATEGIES¹
Air Section
(Note: September 2009 Draft – Not for General Use/Distribution)

Fort McKay’s “Healing the Earth Strategy”

Summary: Fort McKay is a community in the midst of change and is facing unique and significant cumulative social, economic, and environmental challenges and issues. The Fort McKay Industry Relations Corporation (IRC), with the input and endorsement of the Community, have developed a Healing the Earth Strategy. This Strategy serves as a guiding document for IRC’s environmental activities. The Healing the Earth Strategy addresses issues relevant to air; land; water; health impacts; fish; wildlife; plants; etc in four strategic areas. The strategic focus areas are:

- **retention** –retaining and protecting key natural areas and resources
- **reclamation** – returning disturbed areas so that landscape function supports the habitat for populations of traditionally important plants and animals to support the traditional land uses, spiritual and other cultural practices
- **improvement** – improving current practices to minimize environmental impacts
- **offset** – setting aside and/or enhancing existing natural areas as offsets to disturbed or lost areas.

The following detailed strategies provide specific requirements and expectations for air issues.

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For air quality management, the emphasis is on retaining air quality at levels as close to natural levels as possible and ensuring air quality does not adversely impact the health and/or well-being of residents of Fort McKay. There is also a focus on ensuring that best efforts are made to improve emissions management thereby reducing the impact of development on the Community’s air quality.

The following outlines Fort McKay’s expectations regarding air quality criteria and targets for the Community and related air quality management practices that it expects companies and regulators to follow.

Introduction: Industrial development in the Fort McMurray region has had an adverse impact on air quality in Fort McKay. The most notable impact has been the frequent incidences of nuisance odours. Recent Environmental Impact Assessments (EIAs) have predicted significant deterioration in air quality in Fort McKay under both a baseline scenario (i.e. existing and approved projects) and a full development scenario (i.e. existing, approved and planned projects). The current and predicted air quality in Fort McKay raises concerns regarding the impact oil sands development is having, and will in the future have, on the quality of life in the community. Fort McKay has therefore included air quality as a key issue in its “Healing the Earth” Strategy and has prepared

¹ This document is intended for internal IRC use only

this appendix to outline its expectations with respect to air quality in the Community and air quality management in the region as it relates to impacts in Fort McKay.

Air Quality Expectations: Fort McKay’s approach and/or expectations related to protecting and managing air quality in the community include:

1. establishing health and odour based air quality criteria for the community,
2. establishing keeping clean areas clean (KCAC) based air quality targets for the community,
3. the tracking of air quality changes and trends in the community relative to the above noted air quality criteria and targets,
4. notification when there is poor air quality in the community or when there are releases that may result in significant air quality impacts in the community, and
5. actions related to pollution prevention/control and continuous improvements in regional emission reduction strategies to minimize the impact of development on air quality in the community.

Details and elaboration on these actions and/or expectations are outlined below.

1. Health and odour based air quality criteria for the community: Fort McKay’s expectation for air quality in its community is that:

“The air smells fresh and contributes to the health of the land and animals and to the health and well-being of the people of Fort McKay”

This expectation is consistent with the provincially adopted CASA vision for air quality in the province². A key element of this expectation is that air quality will contribute to the health of people and that under no circumstance does air quality in the community deteriorate to levels that could adversely affect the health and well-being of residents. The following provides the background on: the need for these types of criteria; the actual health and odour based air quality criteria that Fort McKay will use to determine if its air quality may be adversely affecting health; and how these criteria will be used.

Background: Ambient air quality guidelines or objectives (AAQOs) are widely used as a measure of the acceptability or “safeness” of air quality at a given location and also as a tool to determine the impact and acceptability of existing or proposed air emissions. AAQOs are generally based on a number of factors and therefore may not be fully protective of health. For example Alberta Environment’s AAQOs (June 2008) (<http://environment.gov.ab.ca/info/library/5726.pdf>) state that:

“Objectives are based on an evaluation of scientific, social, technical, and economic factors.”

² CASA’s Vision for air quality is: “The air will have no adverse odour, taste or visual impact and have no measurable short- or long-term adverse effects on people, animals or the environment.” (<http://www.casahome.org>)

The CCME Canada-wide Standards (CWS) for Particulate Matter and Ozone (June 2000) (http://www.ccme.ca/assets/pdf/pmozone_standard_e.pdf) clearly indicate that they may not be fully protective of health.

The location and nature of the Fort McKay settlement is such that its air quality was relatively unaffected by human activity until oil sands development started in the region. With the existing, approved and planned industrial projects in the region, the potential exists for air quality in the community to deteriorate to levels close to, or even above, current Alberta AAQOs. Since the current Alberta AAQOs and CWSs are not fully protective of health, Fort McKay identified the need to establish its own health and odour based air quality criteria for the Community.

Fort McKay’s Health and Odour based Air Quality Criteria: Developing air quality criteria that are strictly health based is a challenging task and one that is beyond the capability of Fort McKay. The community believes that Health Canada’s recently developed health-based air quality index (AQHI) is a positive step in helping to define and assess safe air quality. Fort McKay has adopted the following AQHI based criteria for each of the risk category levels established by Health Canada. (<http://www.ec.gc.ca/cas-aqhi/default.asp?lang=En&n=065BE995-1>)

Table 1: Air Quality Health Index Criteria for the Community of Fort McKay

Risk Category ¹	Goal or Acceptable Frequency of Exceedence	Action Required if Exceeded
Low (AQHI value 1-3)	>95% of the hourly AQHI readings are 3 or less	Reviewed as part of annual trend analysis (see section 3)
Moderate (AQHI value 4-6)	< 30 days per year have any AQHI readings of above 4	Reviewed as part of annual trend analysis (see section 3)
High (AQHI value 7-10)	< 5 days per year have any AQHI readings above 6	Reviewed as part of annual trend analysis (see section 3)
Very High (AQHI value 10+)	no days per year have any AQHI readings above 10	Immediate reporting as per notification protocol (see section 4)

¹ Note: The AQHI values referred to are based on the use of PM_{2.5} in the AQHI formula and not PM₁₀. Fort McKay is prepared to reconsider the criteria in this table as experience on, and data from, the AQHI grows.

The World Health Organization (WHO) has recently updated its air quality guidelines for PM, Ozone, NO₂ and SO₂ (WHO air quality guidelines global update 2005 – EUR/05/5046029) (<http://www.euro.who.int/Document/E87950.pdf>). These updated guidelines are health based and reflect the most current science. Therefore, in addition to the composite health based criteria for PM, Ozone, NO₂ that the AQHI represents, Fort McKay is also adopting these WHO guidelines for PM, Ozone, NO₂ and SO₂ as its minimum expectation for air quality for these parameters in the community (see Table 2). Fort McKay notes that the WHO has indicated that: “... *the epidemiological evidence indicates that the possibility of adverse effects remains, even if the guideline value is achieved, and some countries might select even lower concentrations for their standards*”. Fort McKay recognizes that some impacts on its air quality are an inevitable part of development in the region and is therefore prepared to accept some possibility of

small adverse effects. For carbon monoxide, Fort McKay considers that the Alberta Environment's AAQOs (June 2008) (<http://environment.gov.ab.ca/info/library/5726.pdf>) are protective of health and is therefore adopting these objectives as its minimum expectation for air quality for CO in the community.

For trace air contaminants that are carcinogens, Fort McKay will use a 1 in a million health risk as the acceptable risk level from air exposure related to industrial emissions. Examples of 1 in a million risk levels for some compounds that may be relevant to emissions in the oil sands region are presented in Table 1. These levels are based on risk levels and/or calculations presented in the WHO Air Quality Guidelines for Europe (2nd edition, 2000) (<http://www.euro.who.int/document/e71922.pdf>). For trace air toxics, Fort McKay will expect air quality levels in the community to be at, or below, no effect levels that incorporate appropriate safety factors that reflect the quality and nature of the available toxicity data for the substance or element.

Establishing air quality criteria for odourous compounds is difficult as odour thresholds for compounds vary from individual to individual and the nuisance level of an odourous component may also vary from individual to individual. Finally the response to a mixture of odourous substances is difficult to predict. Fort McKay is adopting the odour-based air quality guideline for hydrogen sulphide from the WHO Air Quality Guidelines for Europe (2nd edition, 2000) (<http://www.euro.who.int/document/e71922.pdf>) as its interim limit for TRS levels in the community (see Table 2). Fort McKay recognizes that this limit may not be protective particularly if odours in the community are related to mercaptan emissions/releases. If this is determined to be the case, then Fort McKay will establish acceptable odour-based thresholds for the relevant mercaptans. This strategy does not address hydrocarbon based odour issues as this is a complex issue and further analysis is required to identify the specific hydrocarbon compounds that contribute to odours in Fort McKay. The community expects that such an analysis will be undertaken in the near future, possibly through the WBEA.

Application of the AQHI, Health and Odour based Air Quality Criteria: Fort McKay will use, and will expect companies and regulators to use, its community-based health and odour based air quality criteria in the following ways:

1. as the air quality level triggers used to determine when Fort McKay is to be notified of possible air quality related adverse health and/or odour situations (see Section 4 –Notification Protocol),
2. as the health and odour based air quality criteria that project proponents have to use in their EIAs to assess the effects of their proposed project, and the cumulative effect of all regional projects, on air quality in Fort McKay,
3. as the minimum acceptable air quality in Fort McKay with exceedences resulting in immediate evaluation of the reasons for the exceedences and the appropriate follow-up actions taken to prevent or minimize the likelihood of similarly caused exceedences in the future (Note: for some parameters more stringent air quality levels may apply as a result of application of the KCAC principle - see Section 2), and

4. as the health and odour based air quality benchmarks against which air quality trends in the Community are assessed (see Section 4)

(Note: Since odours are such a major concern to, and issue for, Fort McKay, the community will be suggesting to WBEA that a study be undertaken to chemically characterize odours in the community. Through the use of community odour panels, a better understanding of the types and nature of the odours that are of most concern/nuisance to community members can be obtained. This will allow the community to work with industry and regulators on establishing meaningful odour related air quality criteria and on eliminating/minimizing normal operation-related odours. It should be noted that the community recognizes that some odour episodes during plant upset conditions are inevitable but the expectation is that all reasonable efforts will be made to minimize such episodes and that these episodes will not represent a health risk.)

2. Keeping Clean Areas Clean (KCAC) based air quality targets: Fort McKay expects that the principle of KCAC will be applied to air quality in its community. Fort McKay defines KCAC as:

“Ensuring that air quality in the Community of Fort McKay is maintained at as close to pre-industrial levels as possible through rigorous pollution prevention and control measures.”

The Community has established clean air targets that it considers to be consistent with this KCAC principle. These targets are below Fort McKay’s health and odour based criteria and reflect the expectation that air quality in the Community can and will be maintained at levels much lower than health and nuisance effect levels. The expectation is that industry and regulators will work with the Community to ensure these target levels are not exceeded. If the clean air target levels are exceeded, it is expected actions will be taken to get air quality in the Community back below these levels. The following outlines the rationale and basis for Fort McKay’s KCAC air quality guidelines.

Background: Fort McKay is a Community, which in the absence of surrounding industrial development, would be considered to have very good air quality. Table 2 provides an estimate of background air quality in the community, i.e. little or no impact from industrial emissions. These background air quality levels are either modeled values or estimated values using community air quality for periods when the influence of industrial emissions is likely minimal i.e. when the wind is from a west or northwest direction. These approaches to estimating background concentrations are necessary because there is no pre-industrial air quality monitoring data available. Table 3 also provides data on the current air quality in the community and future projected air quality, using modeling, for both approved and planned industrial projects in the region.

Table 2: Fort McKay's Health and Odour based Ambient Air Quality Criteria for the Community

Parameter	Averaging Period	Fort McKay's Criteria (ug/m ³)
Sulphur Dioxide (SO ₂)	10 minute (1 hour)	500 ¹ (300) ¹
	24 hr	20 ¹
	Annual	No guideline
Nitrogen Dioxide (NO ₂)	1 hr	200 ¹
	24 hr	No guideline
	Annual	40 ¹
Ozone (O ₃)	1 hr	No guideline
	8 hr daily maximum mean (May – September period)	100 ¹
Particulate Matter (PM _{2.5})	24 hr	30 ²
	99 th % 24 hr annual value	25 ¹
	Annual	10 ¹
Particulate Matter (PM ₁₀)	99 th % 24 hr	50 ¹
	Annual	20 ¹
Carbon Monoxide (CO)	1 hour	15,000 ³
	8 hour	6,000 ³
Benzene	Lifetime	0.17 ⁴
Benzo-a-pyrene	Lifetime	0.012ng/m ³ ⁴
Arsenic	Lifetime	0.66ng/m ³ ⁴
Nickel	Lifetime	2.5ng/m ³ ⁴
Total Reduced Sulphur (TRS)	30 minute	7 ^{4,5}

¹Based on 2005 WHO Air Quality Guideline update (<http://www.euro.who.int/Document/E87950.pdf>) and the 1 hour value is based on the 10 minute value adjusted using an Ontario Ministry of Environment methodology ((Ontario (2004). Air Dispersion Modeling Guideline for Ontario. Ontario Ministry of Environment. April 2004)

²Based on the CCME Canada Wide Standard (http://www.ccme.ca/assets/pdf/pmozone_standard_e.pdf) but applied without averaging

³ Based on Alberta Ambient Air Quality Objectives (June 2008) (<http://environment.gov.ab.ca/info/library/5726.pdf>)

⁴ Based on the WHO Air Quality Guidelines for Europe (2nd edition, 2000) (<http://www.euro.who.int/document/e71922.pdf>) using a 1 in a million risk level except for TRS

⁵ For TRS this 30 minute value is considered equivalent to a 5.8ug/m³ 1 hour value (or a 4.2ppb 1 hour value) adjusted using an Ontario Ministry of Environment methodology ((Ontario (2004). Air Dispersion Modeling Guideline for Ontario. Ontario Ministry of Environment. April 2004)

Fort McKay recognizes that model predictions are at best rough estimates and likely over estimate emission impacts. Nevertheless the actual air quality data and modeling results indicate that existing industrial development has impacted air quality in the Community and that approved and planned projects in the region are likely to significantly impact air quality at Fort McKay in the future. The predicted impacts in Table 3 are, in some cases, near or above Alberta Environment's ambient air quality objectives (AAQOs) (June 2008) (<http://environment.gov.ab.ca/info/library/5726.pdf>) and as such represent a scenario that is inconsistent with the keeping clean areas clean (KCAC) concept, i.e. may result in significant deterioration of air quality in the community to levels that would not generally be considered clean. For this reason Fort McKay has developed a community-based definition of KCAC and related KCAC based air quality levels.

The KCAC Concept in the Context of Fort McKay: Ambient air quality guidelines or objectives (AAQOs) have traditionally been used as a measure of the acceptability or "safeness" of air quality at a given location and also as a tool to determine the relative and absolute impact, and acceptability, of existing or proposed air emissions. This is the case in the oilsands region. The KCAC concept is however increasingly being used in areas that have air quality well below AAQO levels. KCAC offers a more proactive and protective approach to air quality management than AAQOs.

The KCAC concept is based on trying to eliminate or minimize changes to air quality in areas that currently have clean air, which is generally considered to be air that is well below existing AAQO limits.

The rationale behind the KCAC concept is that:

1. AAQOs should not be used as "pollute up to" levels;
2. some current AAQOs are not, or may not be, fully protective of health or the environment;
3. some air contaminants may have effects at any level and therefore minimizing exposure levels is desirable; and
4. the best way to avoid possible air quality related impacts and future problems in unpolluted regions is to minimize air quality changes in these region.

Under the KCAC principle, the significance of AAQOs decreases and the goal is on maintaining current "clean air" levels.

Fort McKay recognizes that the application of the KCAC concept has generally focused on minimizing air emissions through the application of pollution prevention and continuous improvement principles and requiring the best available pollution control technologies. This element of air quality management is covered in Section 5. Some jurisdictions and/or specific air quality management plans have also established numerical air quality limits that are below AAQOs, e.g. the CASA PM and Ozone Management Framework (September 2003)(http://www.casahome.dreamhosters.com/wp-content/uploads/2006/10/PMO3_ManagementFrameworkSEP-18-2003.pdf) and the US Environmental Protection Agency "Prevention of Significant Deterioration" Program (<http://www.epa.gov/nsr/psd.html>) . The purpose of such limits is either to ensure that air

quality in clean areas is not allowed to deteriorate to AAQO levels or to trigger management actions once a certain fraction of an AAQO is reached.

Fort McKay's KCAC based Air Quality Criteria: Fort McKay is establishing KCAC based air quality levels for its Community that represent the amount of deterioration in community air quality that is considered reasonable and acceptable. It should be noted that the Community recognizes that some air quality deterioration is inevitable based on the nature and magnitude of the existing, approved and planned development in the region. The Community's KCAC based air quality levels however put a limit on the amount of air quality deterioration that it considers reasonable. For some parameters and averaging periods the KCAC based air quality targets are the same as Fort McKay's health and odour based air quality criteria (Section 1). For some parameters the levels are less based on the principle of only allowing a certain amount of deterioration in air quality. Fort McKay's KCAC based air quality levels are presented in Table 4.

The general approach used in establishing the KCAC based air quality targets for the Community was as follows.

1. To establish 95th percentile values for certain parameters and averaging periods. These are values which should not be exceeded more than 5% of the time. The intent in establishing 95th percentile KCAC values is to limit the magnitude and frequency of unusual emission release events since these are the types of releases generally captured by the 95th percentile portion of frequency-concentration plots. The 95th percentile values were based on taking the current 98th percentile concentrations for Fort McKay and setting this concentration as the acceptable 95th percentile level which allows more than a doubling in the number of occurrences of concentrations above the current 98th percentile concentration. The 98th percentile concentrations for Fort McKay were taken from the *Ambient Air Quality Trends in Edmonton and Fort McKay, Alberta - Report* recently prepared for the Wood Buffalo Environmental Association (July 2006) and also calculated using data from the Casa Data Warehouse and where there were slight differences the calculated value was used. The values are for the year 2004 which is considered the base year for the KCAC.
2. To establish 50th percentile values for certain parameters and averaging periods. These are values which should not be exceeded more than 50% of the time. The intent in establishing 50th percentile KCAC values is to limit the amount of change in median air quality. The 50th percentile values were based on taking the 65th percentile concentrations for Fort McKay and setting this concentration as the acceptable 50th percentile level which allows an approximate 30% increase in the number of occurrences of concentrations above the current 50th percentile concentration. The 65th percentile concentrations for Fort McKay were taken from the *Ambient Air Quality Trends in Edmonton and Fort McKay, Alberta - Report* recently prepared for the Wood Buffalo Environmental Association (July 2006) and also calculated using data from the Casa Data Warehouse and where there were slight differences the calculated value was used.. The values are for the year 2004 which is considered the base year for the KCAC.

3. To establish annual average levels, or other averaging period levels, that if exceeded would represent a significant change, and deterioration, in air quality from current levels. These values were established based on allowing for some increase from current air quality levels, e.g. 25% to 100% increases, based on consideration of the nature of current and expected emission sources, emission control options available and current air quality levels and trends relative to the Community's health and odour based air quality criteria and Alberta's Ambient Air Quality Objectives(June 2008)
(<http://environment.gov.ab.ca/info/library/5726.pdf>).

Application of Fort McKay's KCAC based Air Quality Targets: Fort McKay will use, and will expect companies and regulators to use, its community-based KCAC air quality targets in the following ways;

1. as the KCAC based air quality targets that project proponents have to use in their EIAs to assess the effects and significance of their proposed project, and the cumulative effect of all regional projects, on air quality in Fort McKay, and
2. as the air quality change benchmarks against which air quality trends in the Community are assessed (see Section 4).

If EIA modeling predictions and/or air quality trend analysis indicates that target levels are being, or may be, exceeded, then Fort McKay would expect a detailed assessment of the causes for the actual or predicted exceedences and a review of actions that are available to prevent and/or correct these conditions. Fort McKay would be prepared, as part of this assessment, to revisit its KCAC air quality targets as necessary to ensure they are appropriate and reasonable.

Table 3 Comparison of Background and Current Air Quality in Fort McKay with Predicted Air Quality for Existing & Approved and Projected Development Cases for SO₂ (sulphur dioxide), NO₂ (nitrogen dioxide), CO (carbon monoxide), TRS (total reduced sulphur) and PM_{2.5} (particulate matter less than 2.5 microns)

Parameter (AAAQO ^a values in brackets) (ug/m ³)	Averaging Period	Background Levels Measured in Fort McKay ^b (ug/m ³)	Estimated Background Level in Fort McKay ^c (ug/m ³)	Current Level in Fort McKay ^d (ug/m ³)	Predicated Level in Fort McKay ^e as a result of:	
					Existing and Approved Projects (ug/m ³)	Existing, Approved & Planned Projects (ug/m ³)
SO₂						
(450)	1-hour	29.1-44.5	1.2	413	41.3	49.7
(150)	24-hour	N/A	0.7	54.3	18.92	25.8
(30)	Annual	0.7-0.9	0.1	3.1	3.45	4.9
NO₂						
(400)	1-hour	60.2-62.1	4.5	80.9	255.5	329
(200)	24-hour	N/A	7.1	50.6	185.6	240
(60)	Annual	4.7-5.2	1.0	12.4	50.58	56.6
CO						
(15,000)	1-hour	N/A	372.5	-	890	1495
(6000)	8-hour	N/A	212	-	814.2	1481
PM_{2.5}						
(30)	24-hour (98%)	N/A	8.6	16.8	34.2	48.4
(No limit)	Annual	4.9-5.4	N/A	5.5	6.3	9.8
TRS						
(14 as H ₂ S)	1 hour maximum	5.6	N/A	25	17.8	30.7
(No limit)	Annual	0.6-0.7	N/A	0.65	1.47	2.32

^a Alberta Ambient Air Quality Objectives (June 2008) <http://environment.gov.ab.ca/info/library/5726.pdf>

^b Taken from the *Report on Estimating Contributions to Ambient Concentrations in Fort McKay* Submitted to: Trace Metal and Air Contaminant (TMAC) Working Group of CEMA May 2005 04-1331-003 by Golder Associates (<http://www.cemaonline.ca/content/view/26/73/>) using community air quality data when the wind direction was from the west or west northwest

^c Taken from Report on Firebag In-situ project –Firebag Update Revised Stage 3 Development (May 2005)

^d Taken from the Petro-Canada MacKay River Expansion Project EIA (Nov. 2005), from the Report on Firebag In-situ project –Firebag Update Revised Stage 3 Development (May 2005) and/or the CASA data warehouse [note: CO values are not measured at Fort McKay]

^e Taken from the Petro-Canada MacKay River Expansion Project EIA (Nov. 2005) and Synenco's Northern Lights Project EIA and Regulatory Applications (2006)

Table 4: Fort McKay's "Keeping Clean Areas Clean" (KCAC) Community based Air Quality Targets¹

Parameter	Averaging Period	Fort McKay's Target (ug/m³)
Sulphur Dioxide (SO₂)	Annual 95 th Percentile 1 hour concentration	31.4
	Annual 50 th Percentile 1 hour concentration	5 (note actual value is 0 but there were a lot of 0 readings and blanks in the 2004 dataset so a value of 5 has been set)
	Annual Average concentration	6
Nitrogen Dioxide (NO₂)	Annual 95 th Percentile 1 hour concentration	51
	Annual 50 th Percentile 1 hour concentration	9.4
	Annual Average concentration	20
Ozone (O₃)	Annual 95 th Percentile 1 hour concentration	44ppb
	Annual 50 th Percentile 1 hour concentration	27ppb
	Annual Average concentration	26ppb
Particulate Matter (PM_{2.5})	Annual 95 th Percentile 1 hour concentration	21
	Annual 50 th Percentile 1 hour concentration	5
	Annual Average concentration	7.5
	98 th Percentile annual 24 hour value average over 3 years	20
Total Hydrocarbons (THC)	Annual 95 th Percentile 1 hour concentration	2.6 ppm
	Annual 50 th Percentile 1 hour concentration	1.9 ppm
	Annual Average concentration	2.2 ppm
Total Reduced Sulphur	Annual 95 th Percentile 1 hour concentration	2.8
	Annual	1

¹Derived based on data from the CASA Data Warehouse; *The Ambient Air Quality Trends in Edmonton and Fort McKay, Alberta* - Report Prepared for: Wood Buffalo Environmental Association by W.B. Kindzierski, M. Gamal El-Din, and K. Faisal (July 2006); and *Trend Analysis of Historical Ambient Air Monitoring Data in Edmonton and Fort McKay, Alberta* by Wen Xu, M. Gamal El-Din and W. B. Kindzierski (AWMA Annual Conference June 2006).

3. Tracking of air quality changes and trends in the community: Fort McKay expects that there will be a formal regional program for tracking air quality trends in the region and in the community of Fort McKay and that this tracking program will use Fort McKay's health-based and KCAC criteria as benchmarks when evaluating air quality levels and trends. Regular tracking of air quality trends allows proactive identification of possible emerging air quality issues and development and implementation of management strategies before serious problems or issues arise. Regular air quality tracking assessments, that use community based criteria, also provide community members with a more meaningful evaluation of air quality changes and their significance. The following outlines Fort McKay's expectations and suggestions for an appropriate air quality tracking approach and methodology.

Background: Fort McKay has had a long standing concern that its air quality has been, and will increasingly be, impacted by industrial development in the region. This is demonstrated by the air quality data and predictions presented in Table 3, Section 2. To date there has been no systematic or regular evaluation of the air monitoring data collected in the region or in Fort McKay. The Community has advocated the need for, and value of, adopting and applying sensitive and meaningful methods to measure and track changes in air quality in the region and in Fort McKay. Air quality changes and trends also need to be evaluated against benchmarks. For Fort McKay these benchmarks are the Keeping Clean Areas Clean Air Quality Targets outlined in Section 2 and the health and odour based air quality criteria outlined in Section 1.

Trend Tracking Methodology: A frequency – distribution approach to examining air quality data, combined with appropriate benchmarks and statistical tools, can be used to assess subtle trends in air quality data and the statistical significance of these trends. The "*Ambient Air Quality Trends in Edmonton and Fort McKay, Alberta – Report*" recently prepared for the Wood Buffalo Environmental Association (July 2006) uses such approaches. Fort McKay endorses the approaches used in that report to analyze air quality trends. In addition, Fort McKay would like annual average concentrations analyzed in the same manner.

Application of Air Quality Trending: Fort McKay believes trend analysis of both the Community's air quality and regional air quality should be conducted each year. In the analysis and reporting of trends in air quality in Fort McKay, the AQHI based criteria and the KCAC based air quality target and health and odour based air quality criteria levels for the Community should be referenced, analyzed for, and trend and absolute concentration results discussed in the context of these levels. Following preparation and release of the annual air quality trend analysis report, Fort McKay proposes to meet collectively with companies and regulators to discuss the results of the analysis, identify any issues and/or concerns, and, if necessary, the appropriate approach for addressing any identified issues.

4. Notification Protocol: Fort McKay expects that it will receive immediate notification when air quality in the Community drops below certain levels or when there are regional emission episodes that could significantly impact air quality in Fort McKay. Fort McKay has had discussions with companies and Alberta Environment regarding a notification

protocol for the community and believes that with some modification the current regional notification protocol can be applied to Fort McKay. The following provides the details on the type of notification protocol Fort McKay would envision being implemented.

Background: Fort McKay has concerns that there are times when air quality in the Community is poor, based on health and/or odour considerations, and yet the Community is not notified of such occurrences because air quality levels are below the Alberta Ambient Air Quality Objectives (AAAQOs). Fort McKay has been meeting with companies and regulators to address this concern. These meetings have resulted in a good level of understanding regarding the issue and some possible strategies to address the issue have been discussed. Fort McKay is proposing a notification protocol as part of its Healing the Earth Strategy related to air quality.

Protocol: Fort McKay recognizes that WBEA has an immediate reporting protocol for the WBEA ambient air monitoring network which includes the continuous air monitoring station in Fort McKay. Fort McKay would like an addition to the protocol, or a separate but similarly structured protocol, that includes or addresses the following:

1. relevant Fort McKay's health and odour based ambient air quality criteria for the Community are also referenced and in the "*Ambient Air Exceedances*" Procedures Section of the current protocol (as per Table 2 in Section 1, for those parameters that have 10 minute (converted to 1 hour) and/or 1, 8 and/or 24 hour criteria) and that these are the immediate notification criteria applying to the air quality data from the Fort McKay continuous air monitoring station;
2. the Fort McKay IRC would be an identified contact for any exceedences in the Community of Fort McKay's health and odour based ambient air quality criteria and also anytime the AQHI value in the Community exceeds 8;
3. the follow-up actions and reporting related to an exceedence event, e.g. who is responsibility for reviewing and reporting on the possible circumstances and/or conditions that were responsible for the exceedence and how quickly the report would be prepared;
4. companies providing the Fort McKay IRC with advanced notice (minimum of 1 week if possible), for any planned operational events, and as soon as possible notice for any unplanned operational events, that have the potential to significantly impact upon air quality in Fort McKay; and
5. having a formal odour incidence reporting and follow-up procedure that could be used as an alternative to AENV's current 24 hour complaint line and associated follow-up investigation procedure.

Fort McKay would review exceedences and odour issues identified through the protocol with the appropriate companies, and possibly the regulators, depending on the nature and magnitude of the issue. Follow-up and discussion on exceedences and odour issues that were considered minor would be deferred to the annual discussion on air quality trends in the Community (see Section 3).

5. Emissions Management: Good air quality is in large part dependent on effective emissions control and management. Fort McKay expects that, as a minimum, the best available emission control technologies will be used at all new developments in the region and that for existing operations there will be continuous improvement i.e.

reductions, in emission intensities over the life of the facility. These expectations are outlined in more detail as follows.

Background: As a Community located in the centre of existing and planned oilsands mining, extraction and/or upgrading developments, Fort McKay is directly affected by the air emissions associated with these developments and therefore has a strong interest in how these emissions are managed and minimized. With respect to emissions management in the region, Fort McKay has concerns related to the following:

1. the use by companies of regulatory emission limits that are in some cases out-of-date and not reflective of currently available emission control options;
2. the use of current regulatory emission control limits and requirements as the maximum standard that companies design and perform to, rather than using these as minimums, and designing and targeting for much better performance;
3. the ignoring of predicted significant deterioration in regional and Community ambient air quality when selecting/establishing emission management requirements;
4. the lack of information provided by companies on all emission control options available and the cost of these options so that there can be informed debate on the best and/or most appropriate emission management options available;
5. the ongoing consideration and, in two cases proposals, to use alternate fuels e.g. asphaltenes, bitumen and/or coke, with associated increases in emissions; and
6. the lack of any formal regional emission reduction-continuous improvement program.

These issues related to emission management have been raised in Fort McKay's review of recent project EIAs and regulatory approval applications and approval renewal applications.

Fort McKay's Position on Emissions Management: Fort McKay has the following expectations with respect to emissions management for projects and developments that influence air quality in the Community:

1. emission limits and/or controls are significantly better than regulatory requirements which are considered provincial minimums that are not applicable in the Fort McMurray region where the intensity of development results in cumulative air emission impacts;
2. consistent with Alberta Environment's Industrial Release Limits Policy (2000) which has as one of its principles:

“Industrial release limits will be established based on limits achievable using the most effective demonstrated pollution prevention/control technologies”

that there therefore be a best available control technology (BACT) review, using the US Environmental Protection Agency RBLC database (<http://cfpub1.epa.gov/rblc/htm/bl02.cfm>), conducted for all individual emission sources of NO_x and/or SO₂ of greater than 100 tonnes per year (total) to help identify the emission control technology or limits that should apply to that source

- (note: details of the RBLC review, related costing information and any other information relevant to evaluating and costing emission elimination and/or reduction information should be part of EIAs and/or project applications);
3. also consistent with Alberta Environment's Industrial Release Limits Policy; (2000) which has as another of its principles:

“Industrial release limits will be established based onthe limits required to meet risk based and scientifically defensible ambient environmental quality guidelines.....”

- that emission sources that contribute to actual or predicted exceedences of Fort McKay's health and odour based air quality criteria for the community (Section 1) be subject to additional emission controls or levels beyond those associated with BACT;
4. a specific design life is established for all significant new and existing air emission sources in the region, including area (e.g. tailings pond), and mobile (e.g. mine fleet vehicles), sources after which the technology controls/limits of the day would apply; and
 5. a formal continuous improvement provision is included in all project approvals which would require the operator to prepare an “*emissions reductions opportunity*” report 2 to 3 years prior to the end of the Alberta Environmental Protection and Enhancement Act approval term. The report would be reviewed with stakeholders and the government. The report would form the basis for the approval renewal and associated air emission performance requirements. The expectation would be that the renewed approval would require implementation, in a reasonable timeframe, of all identified cost-effective improvements.

These positions are those that Fort McKay will take in its review of, and/or interventions on, new project applications or renewal of existing project approvals.