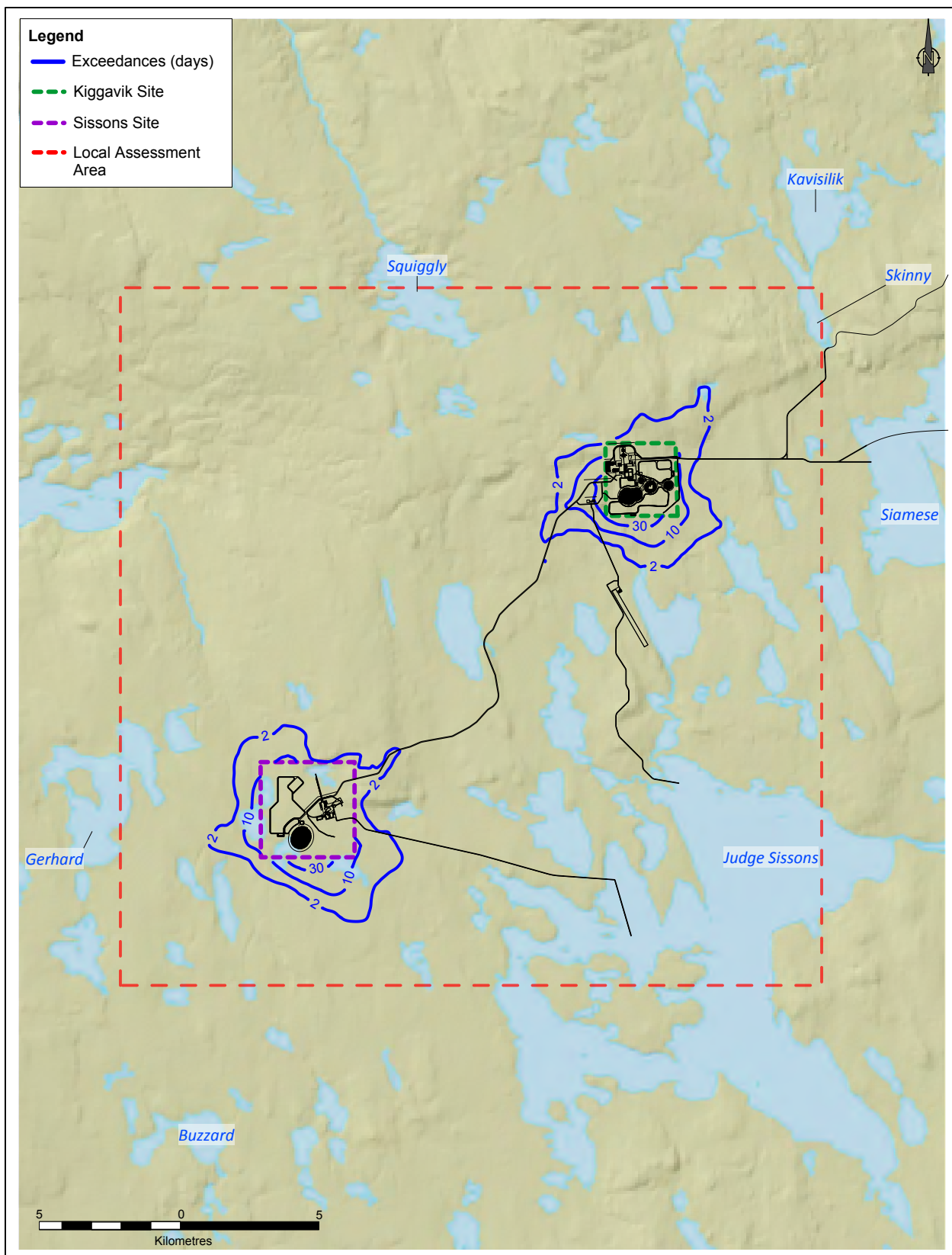


Projection: NAD 1983 UTM Zone 14N  
 Compiled: SENES Consultants  
 Date: 05/05/2014  
 Data Sources: Natural Resources Canada, Geobase®, Nation  
 Topographic Database, AREVA Resources Canada Inc.

**FIGURE 6.1-5**  
 Maximum Operations Assessment  
 24-hour  $\text{PM}_{2.5}$  Concentration ( $\mu\text{g}/\text{m}^3$ )  
 ENVIRONMENTAL IMPACT STATEMENT  
 VOLUME 4: ATMOSPHERIC ENVIRONMENT  
 Part 4B: AIR QUALITY AND CLIMATE

**KIGGAVIK  
 OPERATION**





Projection: NAD 1983 UTM Zone 14N

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Date: 05/05/2014

Data Sources: Natural Resources Canada, Geobase®, Nation  
Topographic Database, AREVA Resources Canada Inc.

#### FIGURE 6.1-6

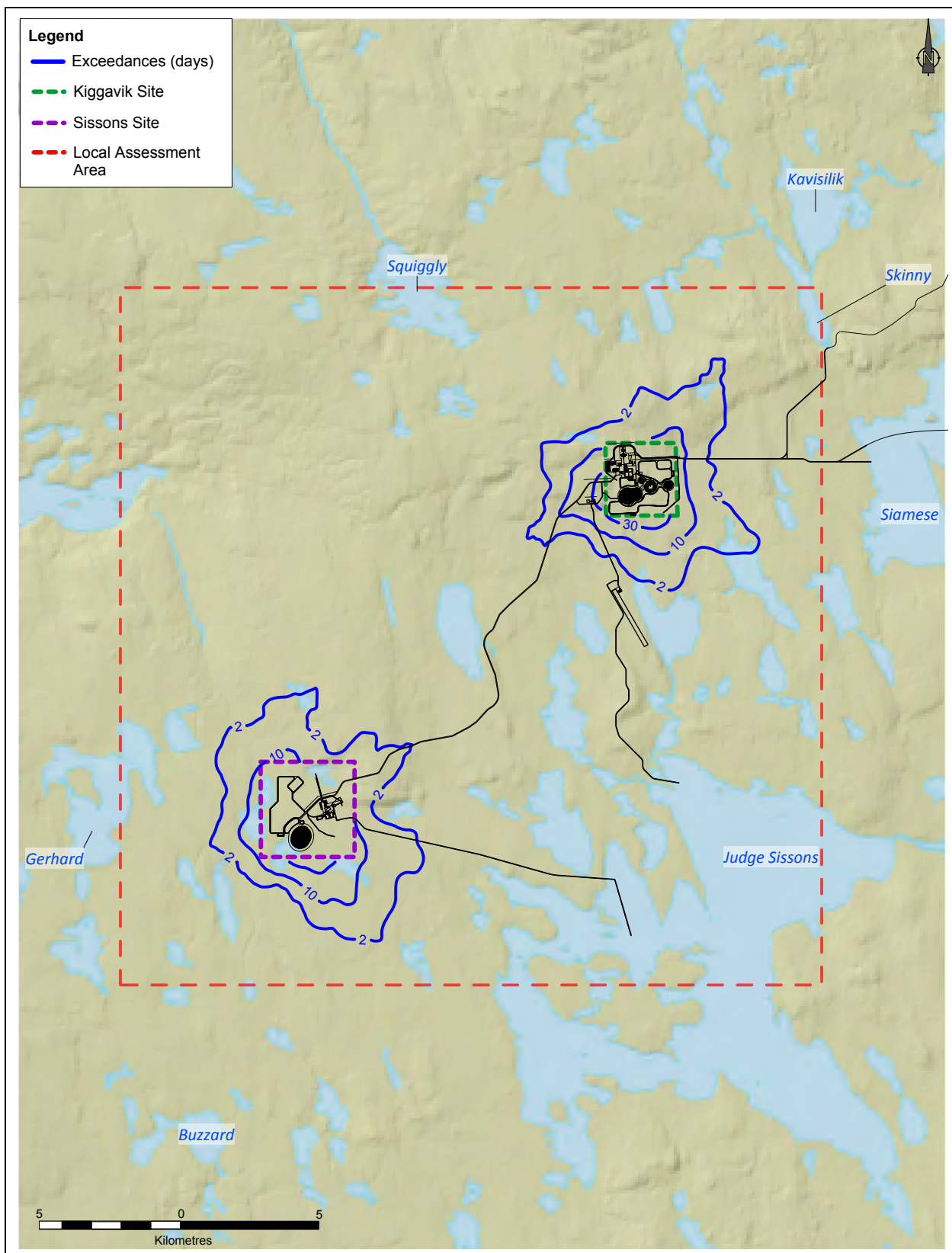
Maximum Operations Assessment

Exceedances of 24-hour TSP Indicator Threshold (days)

**ENVIRONMENTAL IMPACT STATEMENT**  
**VOLUME 4: ATMOSPHERIC ENVIRONMENT**  
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**KIGGAVIK  
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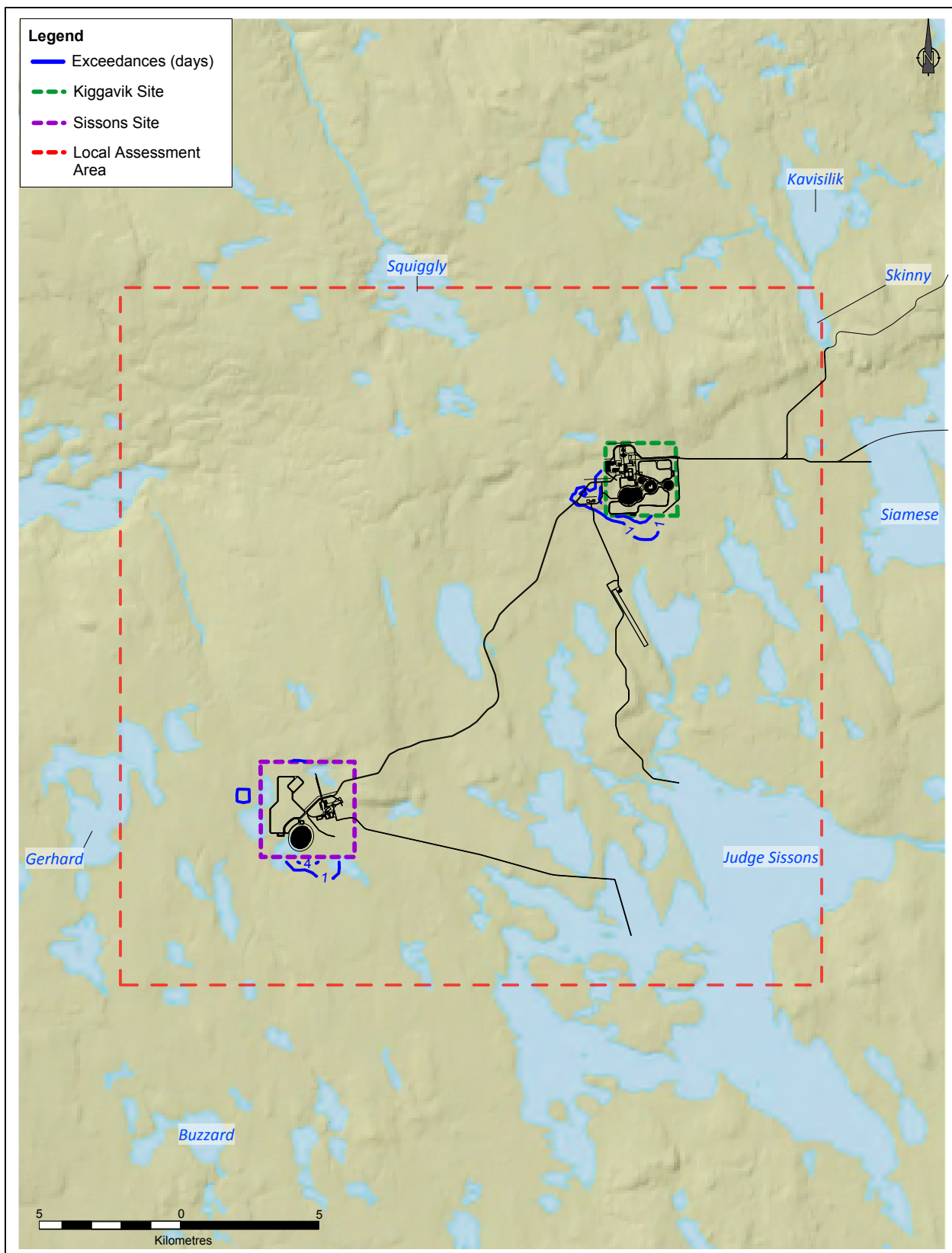


Projection: NAD 1983 UTM Zone 14N  
 Compiled: SENES Consultants  
 Date: 05/05/2014  
 Data Sources: Natural Resources Canada, Geobase®, Nation  
 Topographic Database, AREVA Resources Canada Inc.

**FIGURE 6.1-7**  
 Maximum Operations Assessment  
 Exceedances of 24-hour PM<sub>10</sub> Indicator Threshold (days)  
**ENVIRONMENTAL IMPACT STATEMENT**  
**VOLUME 4: ATMOSPHERIC ENVIRONMENT**  
 Part 4B: AIR QUALITY AND CLIMATE

**KIGGAVIK  
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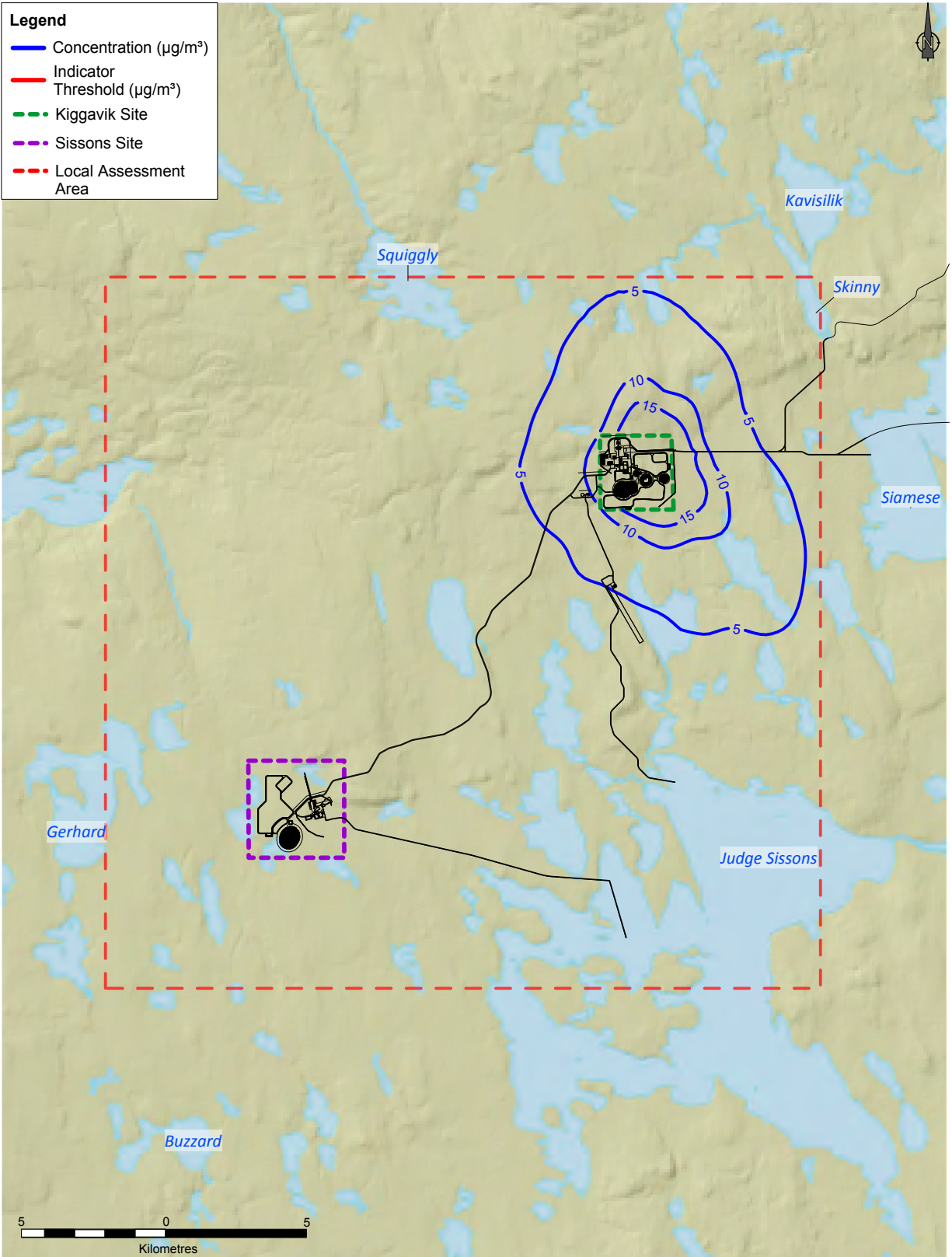


Projection: NAD 1983 UTM Zone 14N  
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 Date: 05/05/2014  
 Data Sources: Natural Resources Canada, Geobase®, Nation  
 Topographic Database, AREVA Resources Canada Inc.

**FIGURE 6.1-8**  
 Maximum Operations Assessment  
 Exceedances of 24-hour  $PM_{2.5}$  Indicator Threshold (days)  
**ENVIRONMENTAL IMPACT STATEMENT**  
**VOLUME 4: ATMOSPHERIC ENVIRONMENT**  
 Part 4B: AIR QUALITY AND CLIMATE

**KIGGAVIK  
 OPERATION**



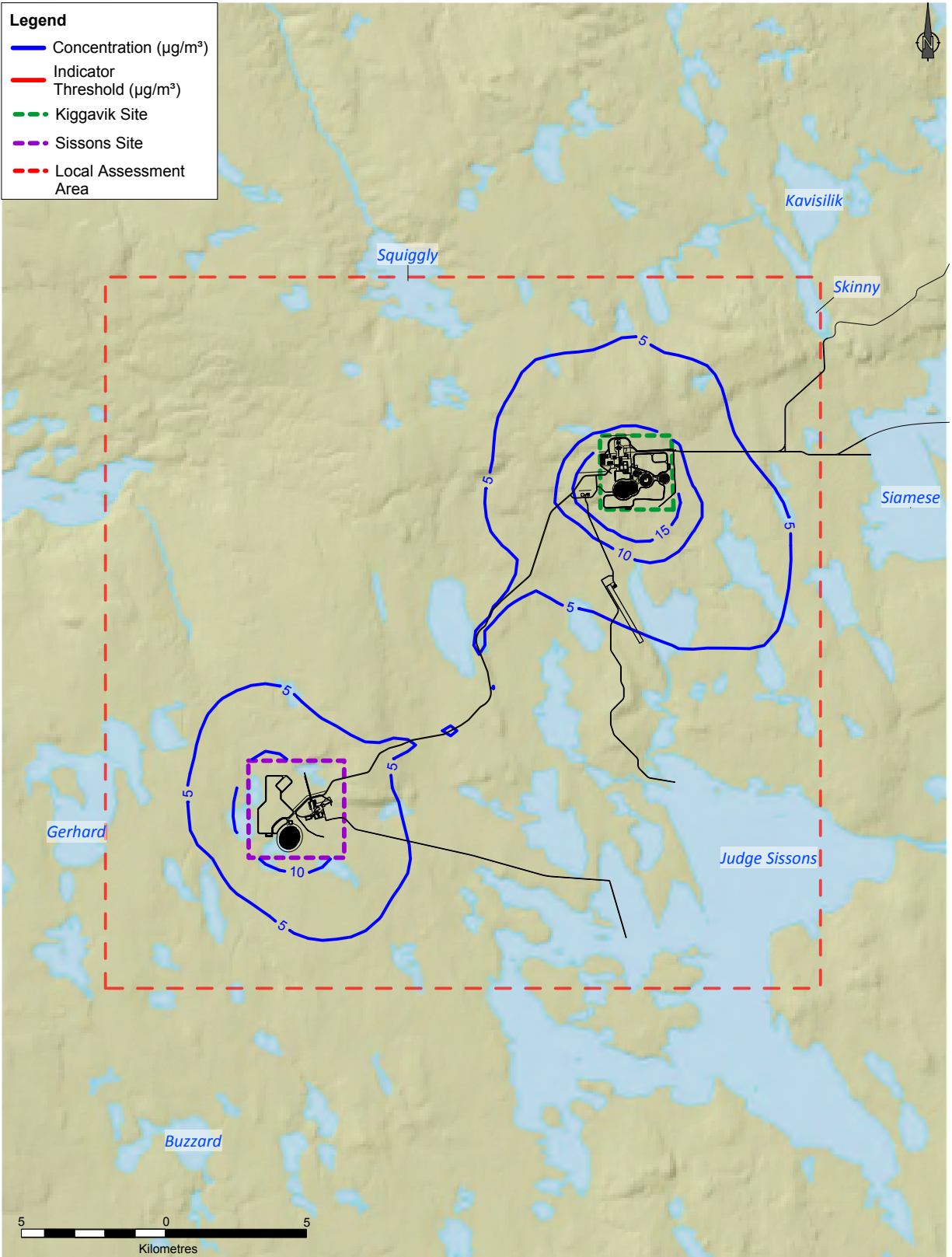


Projection: NAD 1983 UTM Zone 14N  
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 Date: 05/05/2014  
 Data Sources: Natural Resources Canada, Geobase®, Nation  
 Topographic Database, AREVA Resources Canada Inc.

**FIGURE 6.1-9**  
 Operation Assessment - Phase 1  
 Annual TSP Concentration ( $\mu\text{g}/\text{m}^3$ )  
**ENVIRONMENTAL IMPACT STATEMENT**  
**VOLUME 4: ATMOSPHERIC ENVIRONMENT**  
 Part 4B: AIR QUALITY AND CLIMATE

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#### FIGURE 6.1-10

Operation Assessment - Phase 2  
Annual TSP Concentration ( $\mu\text{g}/\text{m}^3$ )

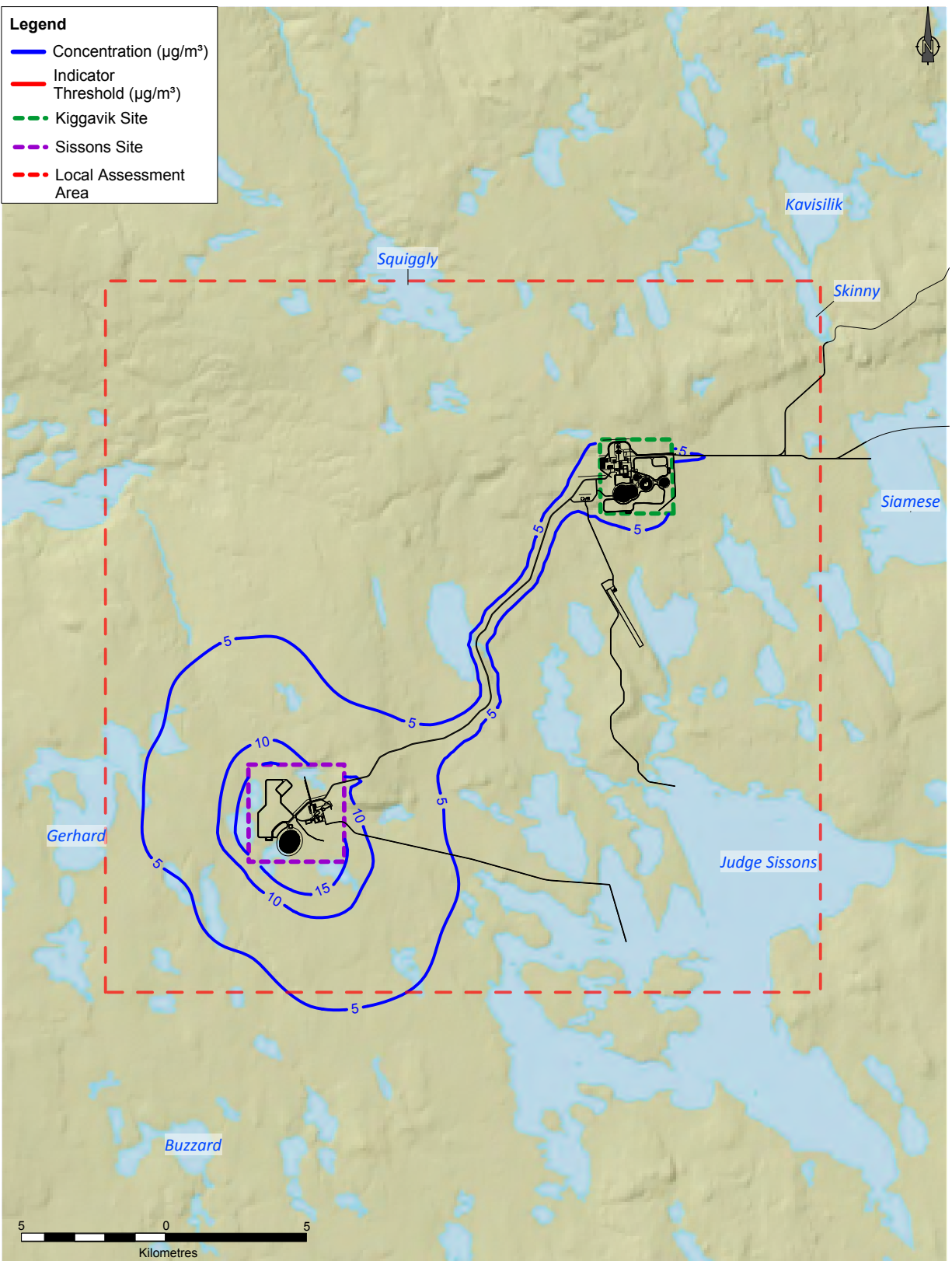
ENVIRONMENTAL IMPACT STATEMENT  
VOLUME 4: ATMOSPHERIC ENVIRONMENT  
Part 4B: AIR QUALITY AND CLIMATE

**KIGGAVIK  
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**Legend**

- Concentration ( $\mu\text{g}/\text{m}^3$ )
- Indicator Threshold ( $\mu\text{g}/\text{m}^3$ )
- Kiggavik Site
- Sissons Site
- Local Assessment Area



Projection: NAD 1983 UTM Zone 14N  
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 Data Sources: Natural Resources Canada, Geobase®, Nation  
 Topographic Database, AREVA Resources Canada Inc.

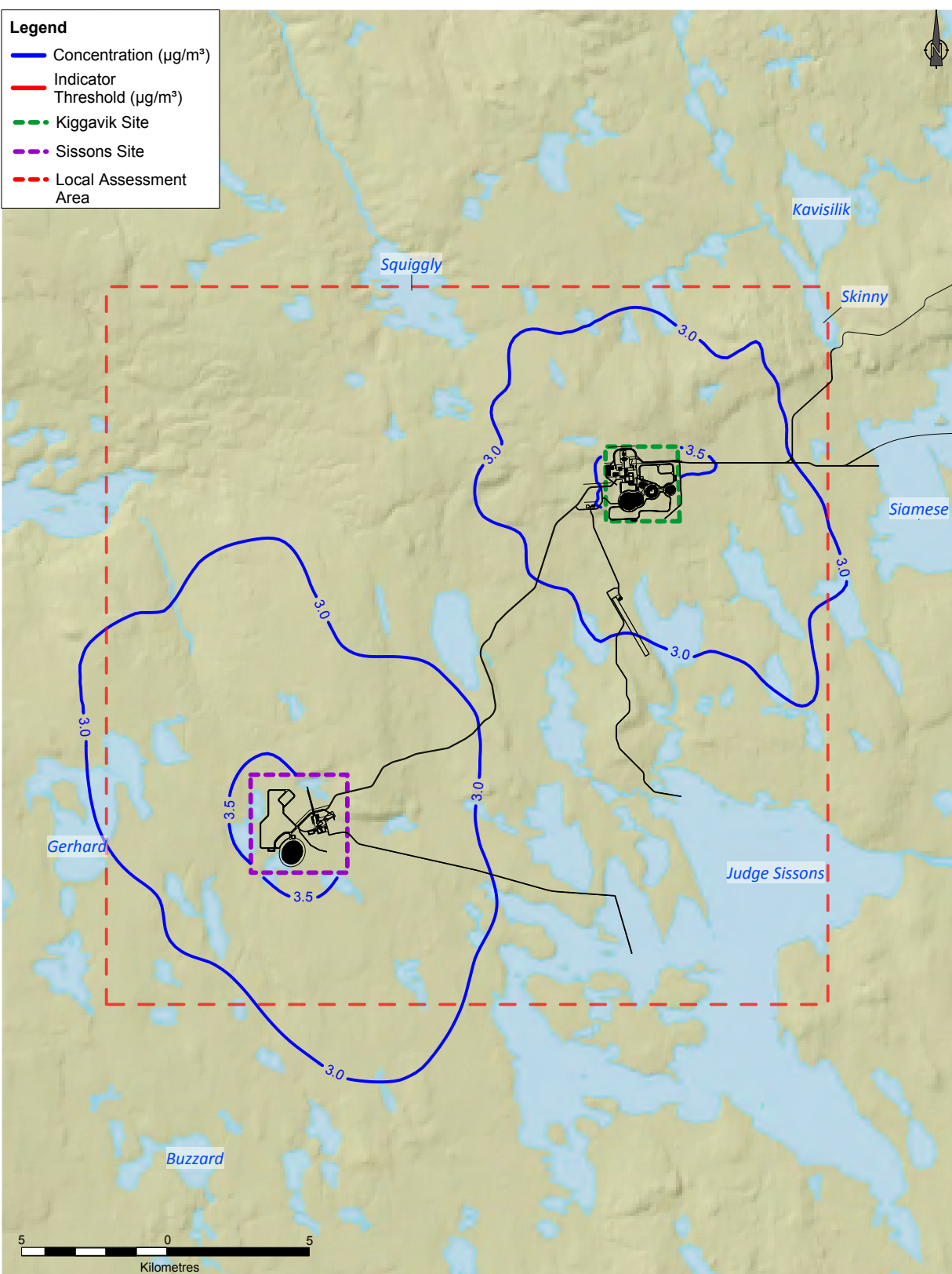
**FIGURE 6.1-11**  
 Operation Assessment - Phase 3  
 Annual TSP Concentration ( $\mu\text{g}/\text{m}^3$ )  
**ENVIRONMENTAL IMPACT STATEMENT**  
**VOLUME 4: ATMOSPHERIC ENVIRONMENT**  
 Part 4B: AIR QUALITY AND CLIMATE

**KIGGAVIK  
 OPERATION**



# **Legend**

- Concentration ( $\mu\text{g}/\text{m}^3$ )
- Indicator Threshold ( $\mu\text{g}/\text{m}^3$ )
- Kiggavik Site
- Sissons Site
- - - Local Assessment Area



Projection: NAD 1983 UTM Zone 14N

Compiled: SENES Consultants

Date: 05/05/2014

Data Sources: Natural Resources Canada, Geobase®, Nation  
Topographic Database, AREVA Resources Canada Inc.

## **FIGURE 6.1-12**

Operation Assessment - Phase 4  
Annual TSP Concentration ( $\mu\text{g}/\text{m}^3$ )

**ENVIRONMENTAL IMPACT STATEMENT**  
**VOLUME 4: ATMOSPHERIC ENVIRONMENT**  
Part 4B: AIR QUALITY AND CLIMATE

**KIGGAVIK  
OPERATION**



## ***Uranium and Metals***

Table 6.1-7 shows that the maximum 24-hour uranium concentration predicted for the maximum emission bounding scenario at the Accommodation Complex is  $0.31 \mu\text{g}/\text{m}^3$ , which is slightly above the applicable Indicator Threshold of  $0.3 \mu\text{g}/\text{m}^3$ . The number of exceedances is also indicated in the table. However, as discussed previously, exceedances of the Indicator Thresholds within the Project Footprint are not a measure of potential changes to air quality in the LAA and RAA. The potential effects to human health resulting from changes in air concentrations of uranium and other COPCs at the Accommodation Complex have been assessed in Volume 8.

The maximum predicted 24-hour average concentration of uranium is also presented graphically in Figure 6.1-13 for the maximum bounding scenario. The figure illustrates that the maximum predicted uranium concentrations are above the Indicator Threshold beyond the Project Footprint, into the LAA, which is considered to be a residual effect. The frequency of exceedances within the LAA is presented graphically in Figure 6.1-14. This figure shows that the number of exceedances within approximately 1,100 m of the Kiggavik mine site is limited to a single day. Similarly, within about 500 m or less of the Sissons mine site, exceedances are also limited to one day.

Maximum predicted 24-hour concentrations of metals are presented in Table 6.1-8 at the sensitive POR locations for the maximum bounding scenario. As can be seen in the table, all predicted concentrations are well within their applicable 24-hour Indicator Thresholds at these locations. Since uranium and metals were calculated as a fraction of TSP, the contour plots for each of the metals assessed tend to follow a similar pattern to the uranium contour plot (Figure 6.1-13). Additionally, the maximum predicted 24-hour concentrations for all metals are below the Indicator Thresholds within the Project Footprint as well as at all LAA and RAA receptor locations. As such, the plots are not presented here, but can be found in Technical Appendix 4B – Air Dispersion Assessment.

Annual concentrations of uranium for operation phases 1 to 4 are provided in Table 6.1-9 and in Table 6.1-10 for metals, respectively. As can be seen in the tables, during each phase, all of the predicted concentrations are well below their respective Indicator Thresholds at the sensitive POR. There are also no exceedances of either the uranium or metal Indicator Thresholds at any off-site receptor locations within the LAA and RAA. Annual uranium and metal contour plots follow similar patterns to annual TSP contour plots and are provided in Technical Appendix 4B – Air Dispersion Assessment.