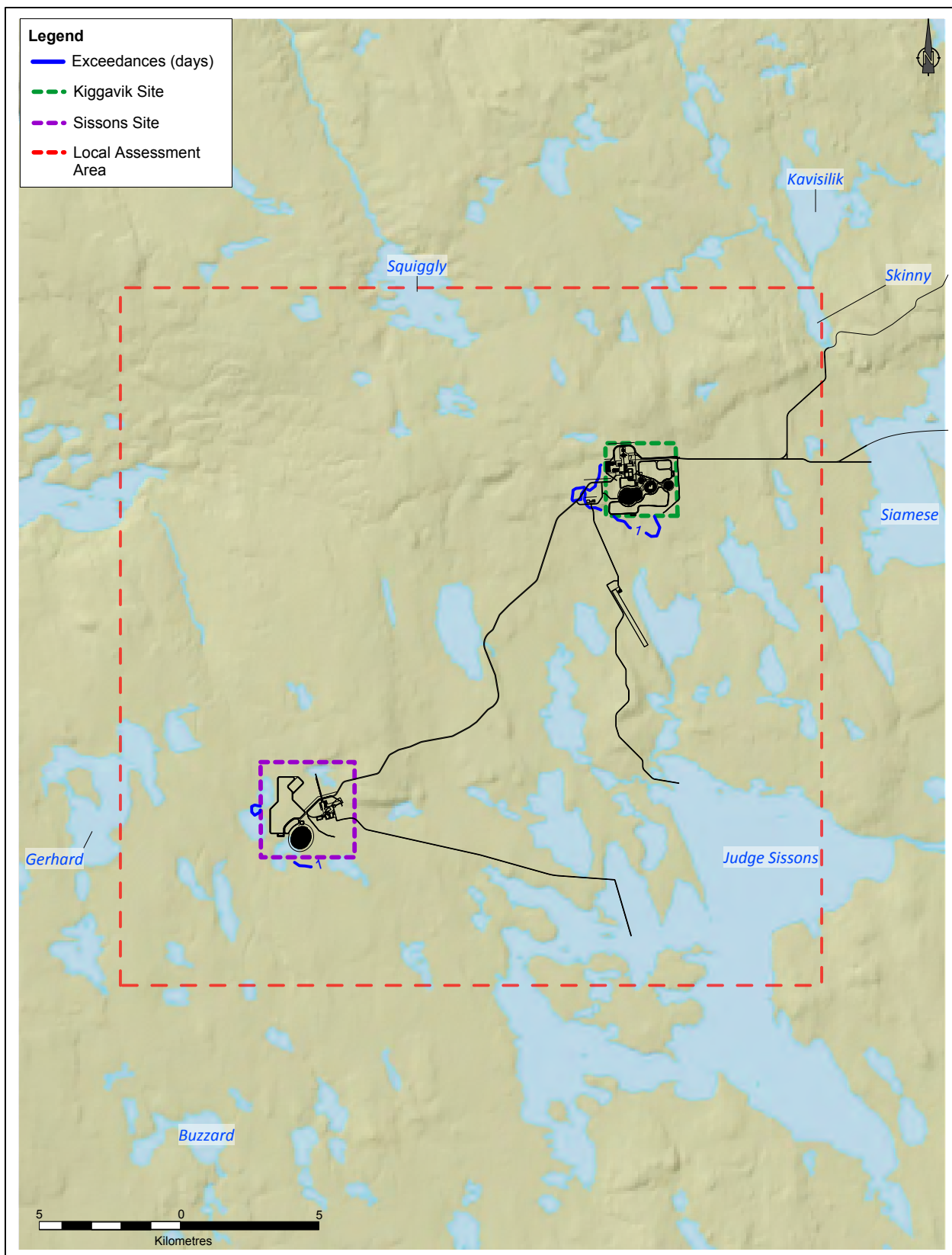


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FIGURE 6.1-13
 Maximum Operations Assessment
 24-hour Uranium (U) Concentration ($\mu\text{g}/\text{m}^3$)
ENVIRONMENTAL IMPACT STATEMENT
VOLUME 4: ATMOSPHERIC ENVIRONMENT
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FIGURE 6.1-14

Maximum Operations Assessment

Exceedances of 24-hour Uranium Indicator Threshold (days)

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

**KIGGAVIK
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Gaseous COPCs

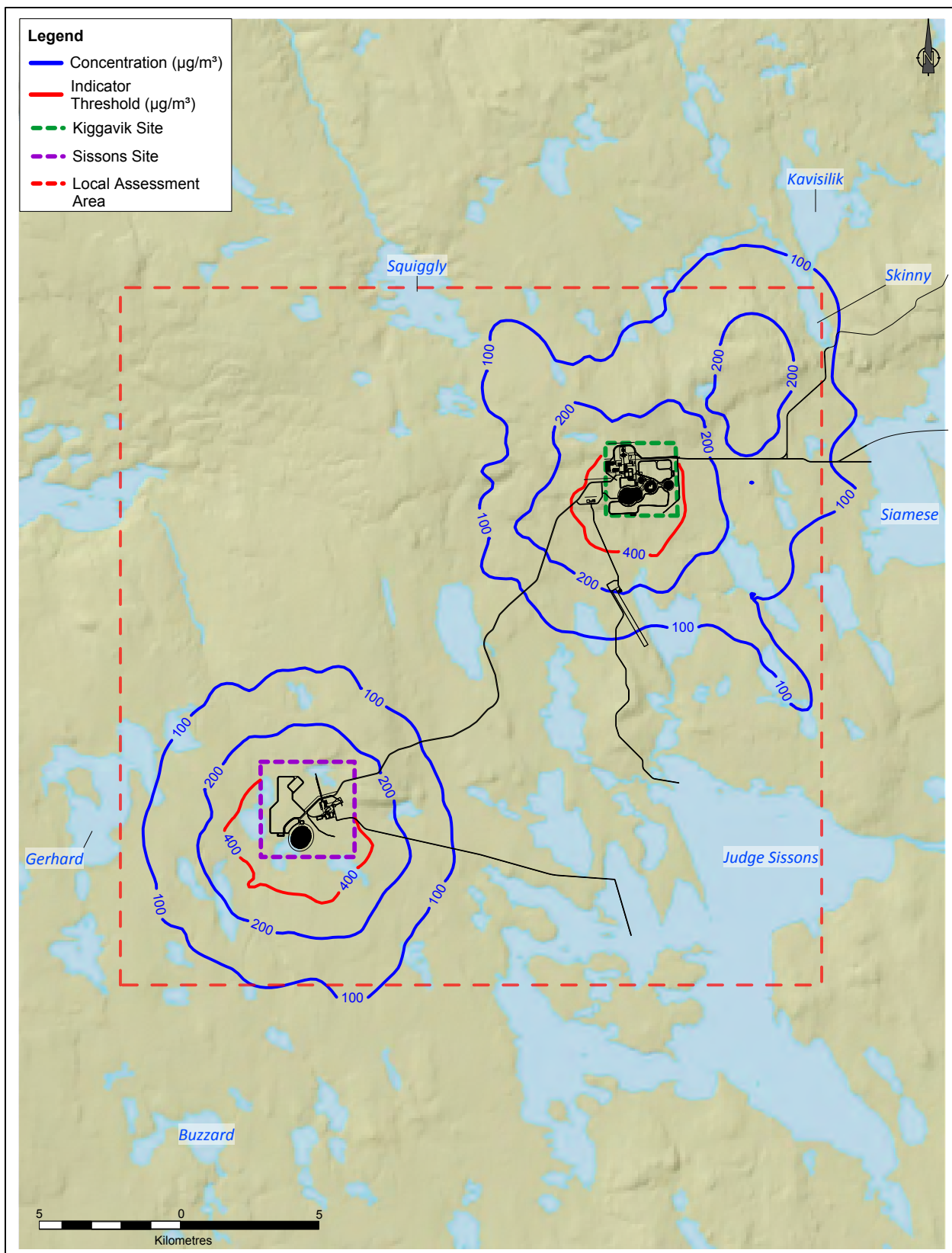
Table 6.1-7 shows that the maximum predicted incremental 1- and 24-hour concentrations of NO₂ and SO₂ are below their respective Indicator Thresholds at all three sensitive POR for the maximum bounding emissions scenario. The results are also presented graphically in the following figures: Figure 6.1-15 (1-hour NO₂), Figure 6.1-16 (24-hour NO₂), Figure 6.1-17 (1-hour SO₂) and Figure 6.1-18 (24-hour SO₂).

As shown in Figures 6.1-17 and 6.1-18, 1- and 24-hour maximum concentrations of SO₂ are well within the limits of the Indicator Thresholds at all receptor locations in the LAA and RAA. In contrast, the 1- and 24-hour NO₂ concentrations exceed their Indicator Thresholds both within the Project Footprint, extending into the LAA. These exceedances can be attributed large emissions of NO_x from the power plants and open pit mining activities, including diesel-powered mining equipment and blasting, and are considered to be a residual effect.

Figure 6.1-19 and Figure 6.1-20 present the frequency analysis for 1- and 24-hour NO₂ concentrations, respectively. As the figures demonstrate, there are very few exceedances of the NO₂ Indicator Thresholds beyond the Project Footprint. In particular, there are no more than 11 days of exceedances of the 24-hour Threshold (or 3% of the time each year) and no more than 140 hours (1.6% of the time each year) when the 1-hour NO₂ Indicator Threshold was exceeded. In addition, exceedances of the 24-hour NO₂ Threshold are limited to an area within 500 m of the Sissons mine site and 900 m of the Kiggavik mine site. Similarly, exceedances of the 1-hour Threshold extend no more than 1.4 km from the Kiggavik mine site and 1.5 km from the Sissons mine site.

With respect to NO₂ concentrations, however, it should be noted that the model conservatively assumed that emissions from regular mining activities and blasting occurred concurrently for each hour over 24 hours a day when in reality, blasting emissions are intermittent and tend to last only minutes. As a result, the tabular results and contours presented here are overestimates of 1-hour NO₂ concentrations. Further discussion is provided in Technical Appendix 4B – Air Dispersion Assessment.

Annual concentrations of NO₂ and SO₂ for each operational phase assessed are shown in Table 6.1-9 at the sensitive POR. The highest annual NO₂ and SO₂ concentrations at the Accommodation Complex occur during Period 1, having concentrations of 13.65 µg/m³ and 1.31 µg/m³, respectively, which are below their applicable Indicator Thresholds. Similar to the trends seen in the annual average TSP concentrations, the spatial variability in annual average concentrations of gaseous COPCs reflect the dependence of emissions on specific mining activities. Annual contour plots for NO₂ and SO₂ can be found in the Technical Appendix 4B – Air Dispersion Assessment.

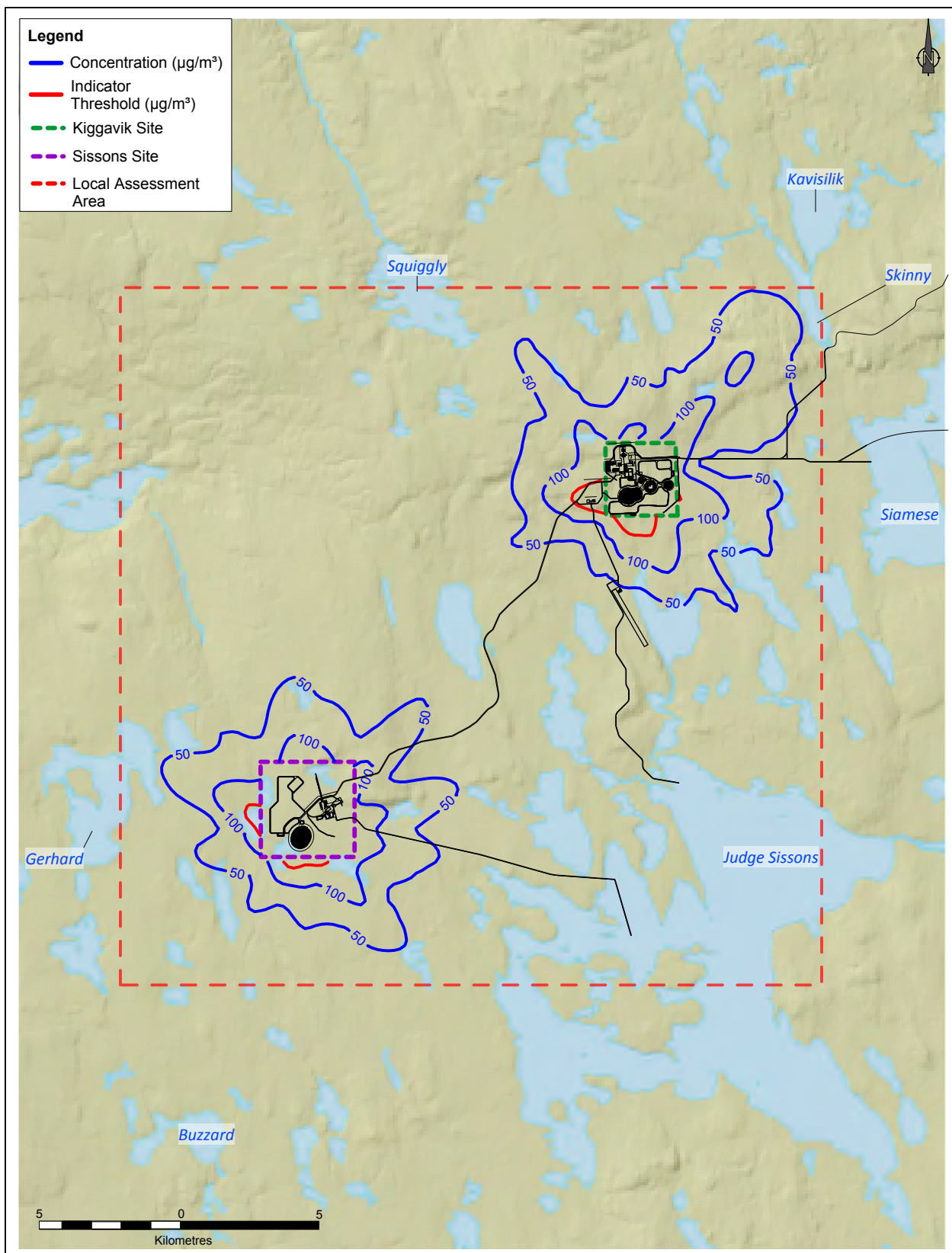


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FIGURE 6.1-15
 Maximum Operations Assessment
 1-hour NO_2 Concentration ($\mu\text{g}/\text{m}^3$)
ENVIRONMENTAL IMPACT STATEMENT
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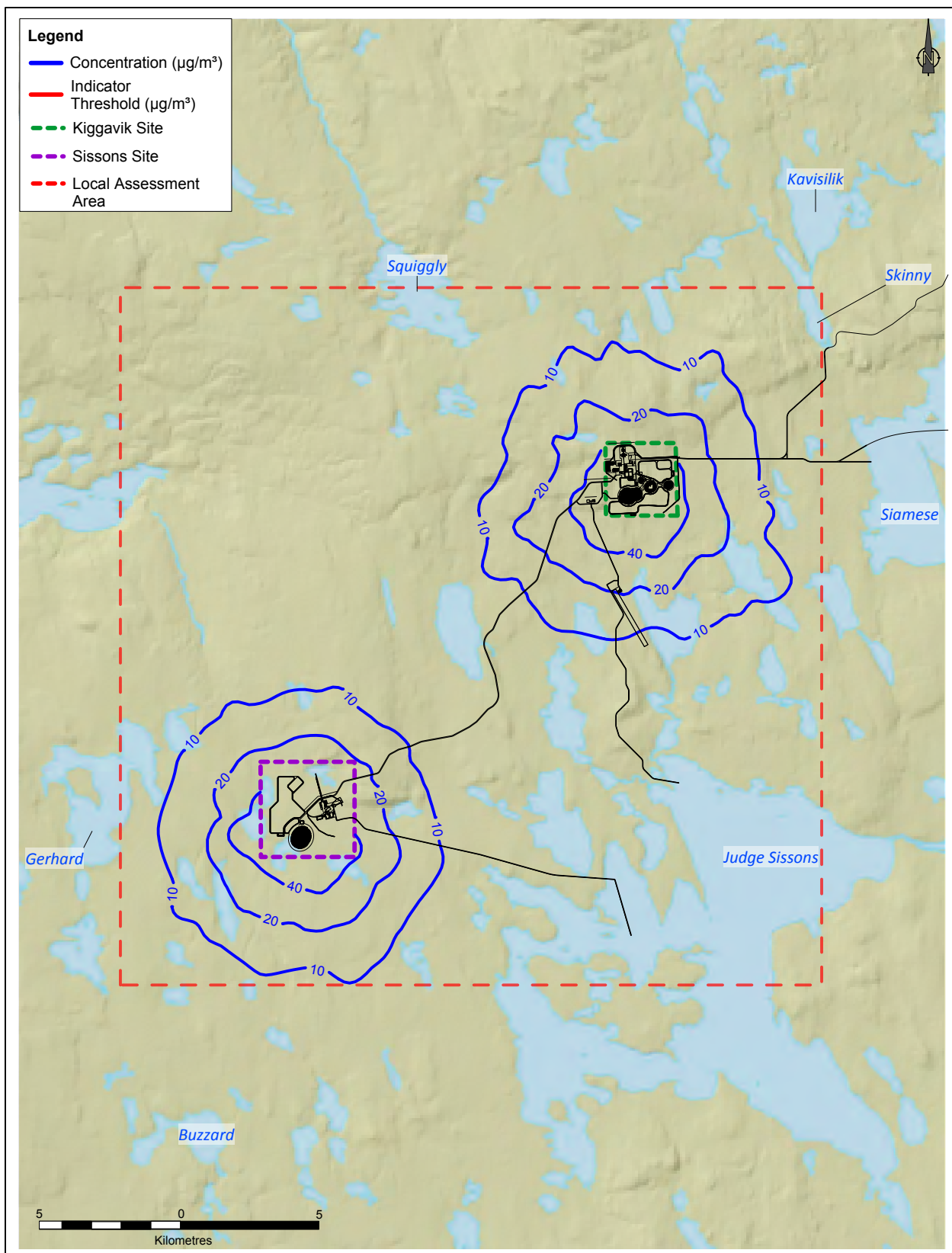
FIGURE 6.1-16

Maximum Operations Assessment
24-hour NO_2 Concentration ($\mu\text{g}/\text{m}^3$)

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

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OPERATION**



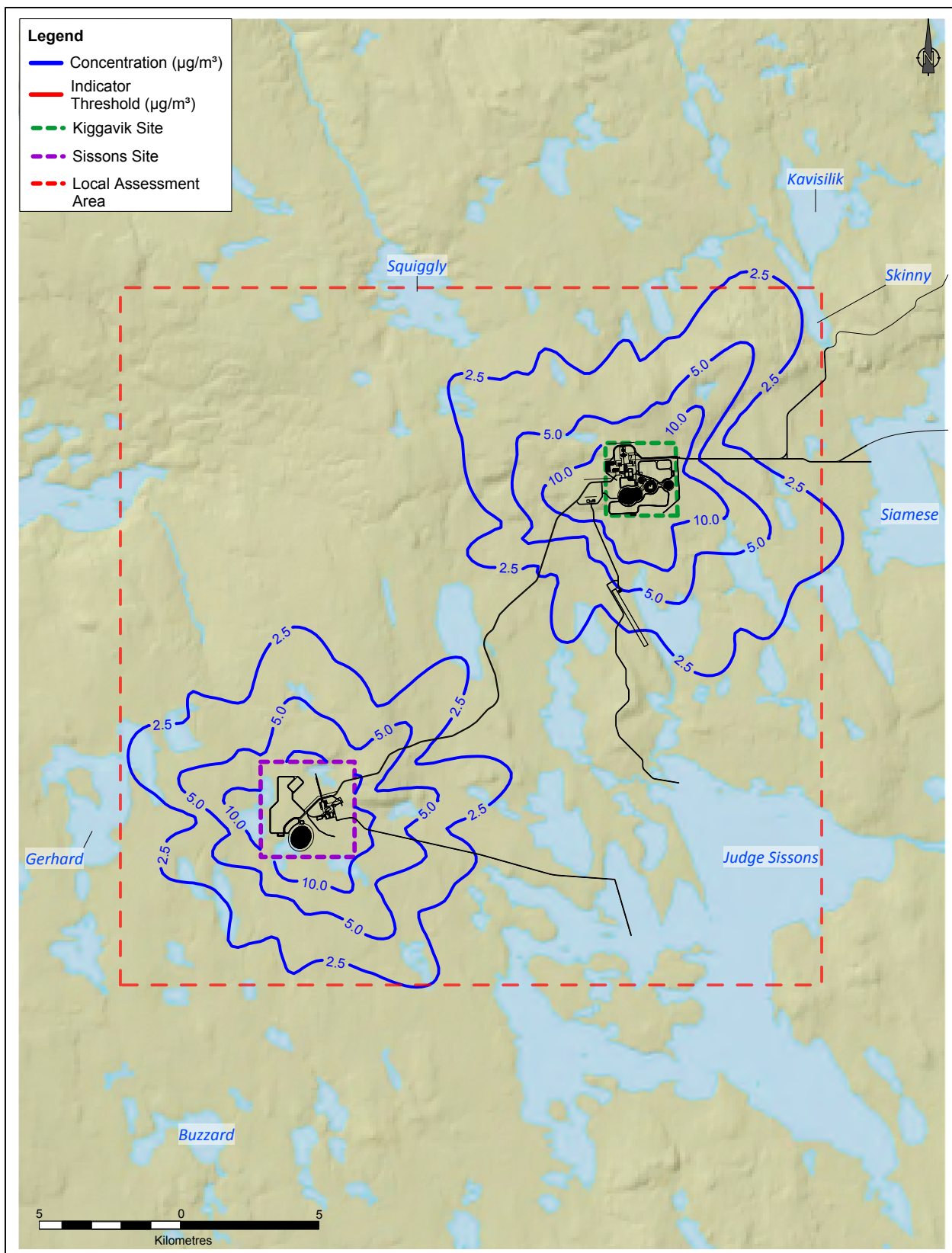


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FIGURE 6.1-17
 Maximum Operations Assessment
 1-hour SO_2 Concentration ($\mu\text{g}/\text{m}^3$)
ENVIRONMENTAL IMPACT STATEMENT
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 Part 4B: AIR QUALITY AND CLIMATE

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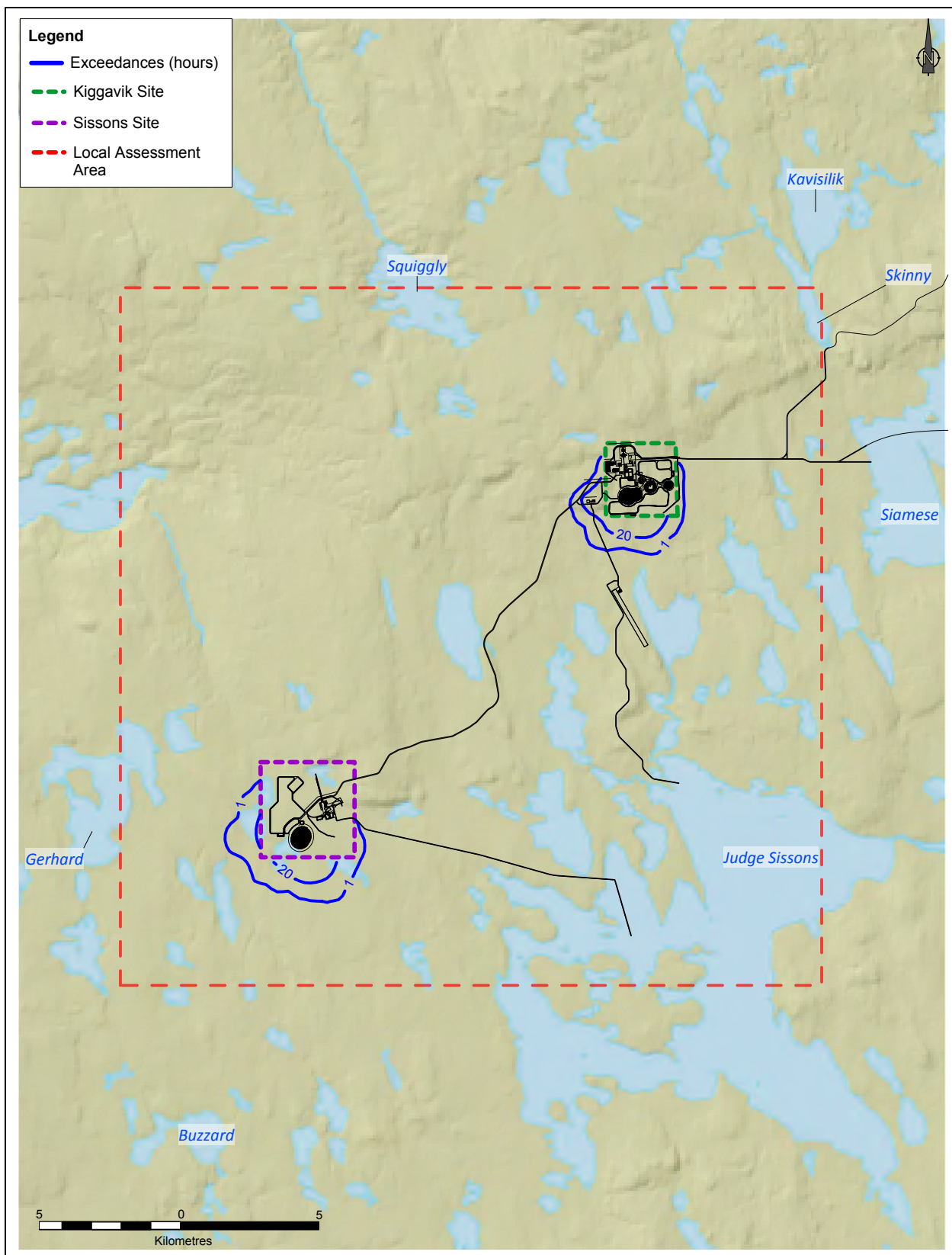


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FIGURE 6.1-18
 Maximum Operations Assessment
 24-hour SO_2 Concentration ($\mu\text{g}/\text{m}^3$)
ENVIRONMENTAL IMPACT STATEMENT
VOLUME 4: ATMOSPHERIC ENVIRONMENT
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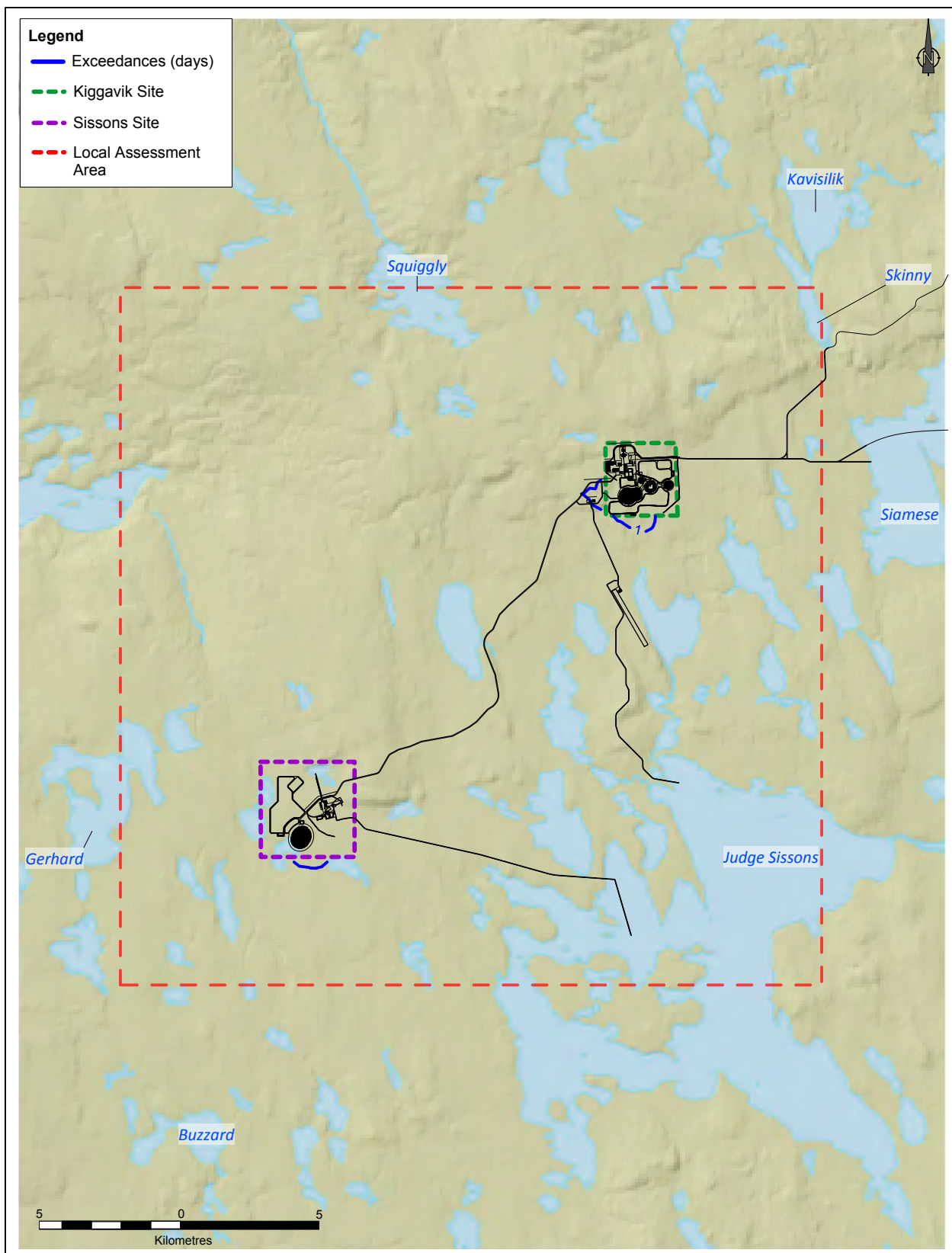


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FIGURE 6.1-19
 Maximum Operations Assessment
 Exceedances of 1-hour NO_2 Indicator Threshold (hours)
ENVIRONMENTAL IMPACT STATEMENT
VOLUME 4: ATMOSPHERIC ENVIRONMENT
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FIGURE 6.1-20
 Maximum Operations Assessment
 Exceedances of 24-hour NO₂ Indicator Threshold (days)
ENVIRONMENTAL IMPACT STATEMENT
VOLUME 4: ATMOSPHERIC ENVIRONMENT
 Part 4B: AIR QUALITY AND CLIMATE

**KIGGAVIK
 OPERATION**



Radionuclides

Table 6.1-8 presents the model predicted annual concentrations of radon, lead-210 and polonium-210. As can be seen in the table, the highest annual concentrations of radionuclides occur at the Accommodation Complex in Period 2 (12.45 Bq/m³ for radon, 3.4E-04 Bq/m³ for Pb-210 and 2.6E-04 Bq/m³ for Po-210). The predicted radionuclide concentrations during operations Period 1 and 2 reflect the influence of both mining activities and mill operations at the Kiggavik mine site. During phases 3 and 4, the predicted radionuclide concentrations are primarily a result of mill emissions, including the ore pile. In Period 2, mill production is ramped up and as a result, emissions from both the ore pile and mill are increased compared to Period 1. Period 2 also has a relatively high uranium grade (0.49%). Although Period 4 had the highest uranium grade (0.67%), mill production was much less than Period 2.

The annual average radon concentrations are also provided graphically in Figure 6.1-21 through 6.1-24 and Figures 6.1-25 through 6.1-28 for Pb-210 to demonstrate the spatial and temporal variability of annual radionuclide concentrations across the lifetime of the Project. Po-210 concentrations follow the same pattern as Pb-210 and are provided in Technical Appendix 4B – Air Dispersion Assessment. As both the figures and Table 6.1-9 show, predicted annual radionuclide concentrations are well below their respective Indicator Thresholds at all receptor locations in the LAA and RAA and at the sensitive POR.

Since radionuclides only have applicable Indicator Thresholds with an annual averaging period, the annual radionuclide concentrations for the maximum emissions scenario are not presented. As discussed previously, annual emissions are overestimated in the maximum emissions scenario, which is only representative for COPCs having 1- and 24-hour Indicator Thresholds.