### *2.3.2. Particulate Matter Emission*

17. Particulate Matter (PM) emission in the CFG-3 plant will be from prill tower in the form of urea dust. Comparison of PM emissions from prill tower stack has been presented in **Table 2.3** for both initial assessment and with revised capacities:

**Table 2.3 : PM Emissions**

| Stack | Particular | Unit | Initial Assessment | Revised | Percentage Increase |
|---|---|---|---|---|---|
| Prill Tower | Production | MTPD | 3500 | 4000 | 14% |
| | Flue Gas | Nm3/hr | 1,320,000 | 1,450,000 | 10% |
| | PM Emission | kg/hr | 66 | 72.5 | 10% |
| | | mg/Nm3 | 50 | 50 | |
| | | kg/MT Urea | 0.45 | 0.44[2] | |

### *2.3.3. Ammonia Emission*

18. Ammonia emission in the CFG-3 plant will be from prill tower. Comparison of ammonia emissions from prill tower stack has been presented in **Table 2.4** for both initial assessment and with revised capacities:

**Table 2.4 : Ammonia Emissions ***

| Stack | Particular | Unit | Initial Assessment | Revised | Percentage Increase |
|---|---|---|---|---|---|
| Prill Tower | Production | MTPD | 3500 | 4000 | 14% |
| | Flue Gas | Nm3/hr | 1,320,000 | 1,450,000 | 10% |
| | PM Emission | kg/hr | 66 | 72.5 | 10% |
| | | mg/Nm3 | 50 | 50 | |
| | | kg/MT Urea | 0.45 | 0.44[3] | |

* Ammonia emissions are on adhoc / current basis and in future legistation, if any shall be complied with

### *2.3.4. Impact on Air Quality*

19. To assess the impact in air quality due to stack emissions in the proposed CFG-3 project with the initial capacities as well as revised capacities, mathematical modelling was conducted with the help of ISC-AERMOD View software. The stack emission details used in the model for both the cases has been presented in **Table 2.5** and **Table 2.6**, respectively: The meteorological data was taken same as reported in the EIA study. Predicted ground level concentrations (GLC) for both the cases has been presented in **Table 2.5** and **Table 2.6**, respectively. Isopleths of NOx, PM and Ammonia based on initial assessment has been presented in **Figure 2.4**, **Figure 2.5**, and **Figure 2.6**, respectively. Isopleths of NOx, PM and Ammonia based on revised capacities has been presented in **Figure 2.7**, **Figure 2.8**, and **Figure 2.9**, respectively.

[2] No increase in emissions per ton of product
[3] No increase in emissions per ton of product

**Table 2.5 : Stack Emission Details (Initial Assessment)**

| Stack | Height (m) | Diameter (m) | Exit Velocity (m/s) | Exit Temperature (K) | Stack Emission (g/s) | | |
|---|---|---|---|---|---|---|---|
| | | | | | NOx | PM | $NH_3$ |
| Prilling Tower G-III | 120 | 26 | 0.63 | 321 | | 18.3 | 18.3 |
| Reformer Stack G-III | 40 | 4.1 | 12.1 | 416 | 16.4 | | |
| HRSG - III | 30 | 3 | 18.5 | 466 | 20.7 | | |

**Table 2.6 : Stack Emission Details (Revised Capacity)**

| Stack | Height (m) | Diameter (m) | Exit Velocity (m/s) | Exit Temperature (K) | Stack Emission (g/s) | | |
|---|---|---|---|---|---|---|---|
| | | | | | NOx | PM | $NH_3$ |
| Prilling Tower G-III | 130 | 28 | 0.85 | 321 | | 20.1 | 20.1 |
| Reformer Stack G-III | 40 | 4.1 | 12.1 | 416 | 18.0 | | |
| HRSG - III | 30 | 3 | 18.5 | 466 | 20.7 | | |

**Table 2.7 : Contribution to GLC from CFG-3 Stacks (Initial Assessment)**

| Description | Maximum Ground Level Concentration (µg/m3) | | |
|---|---|---|---|
| | NOx | PM | Ammonia |
| Primary Reformer - III<br>HRSG - III<br>Prill Tower - III | 9.49 | 5.8 | 5.8 |
| Distance of Occurrence (km) | 10.3 | 1.8 | 1.8 |
| Direction of Occurrence (km) | NW | WNW | WNW |

**Table 2.8 : Contribution to GLC from CFG-3 Stacks (Revised Assessment)**

| Description | Maximum Ground Level Concentration (µg/m3) | | |
|---|---|---|---|
| | NOx | PM | Ammonia |
| Primary Reformer - III<br>HRSG - III<br>Prill Tower - III | 9.96 | 4.3 | 4.3 |
| Distance of Occurrence (km) | 10.1 | 2.1 | 2.1 |
| Direction of Occurrence (km) | NW | WNW | WNW |

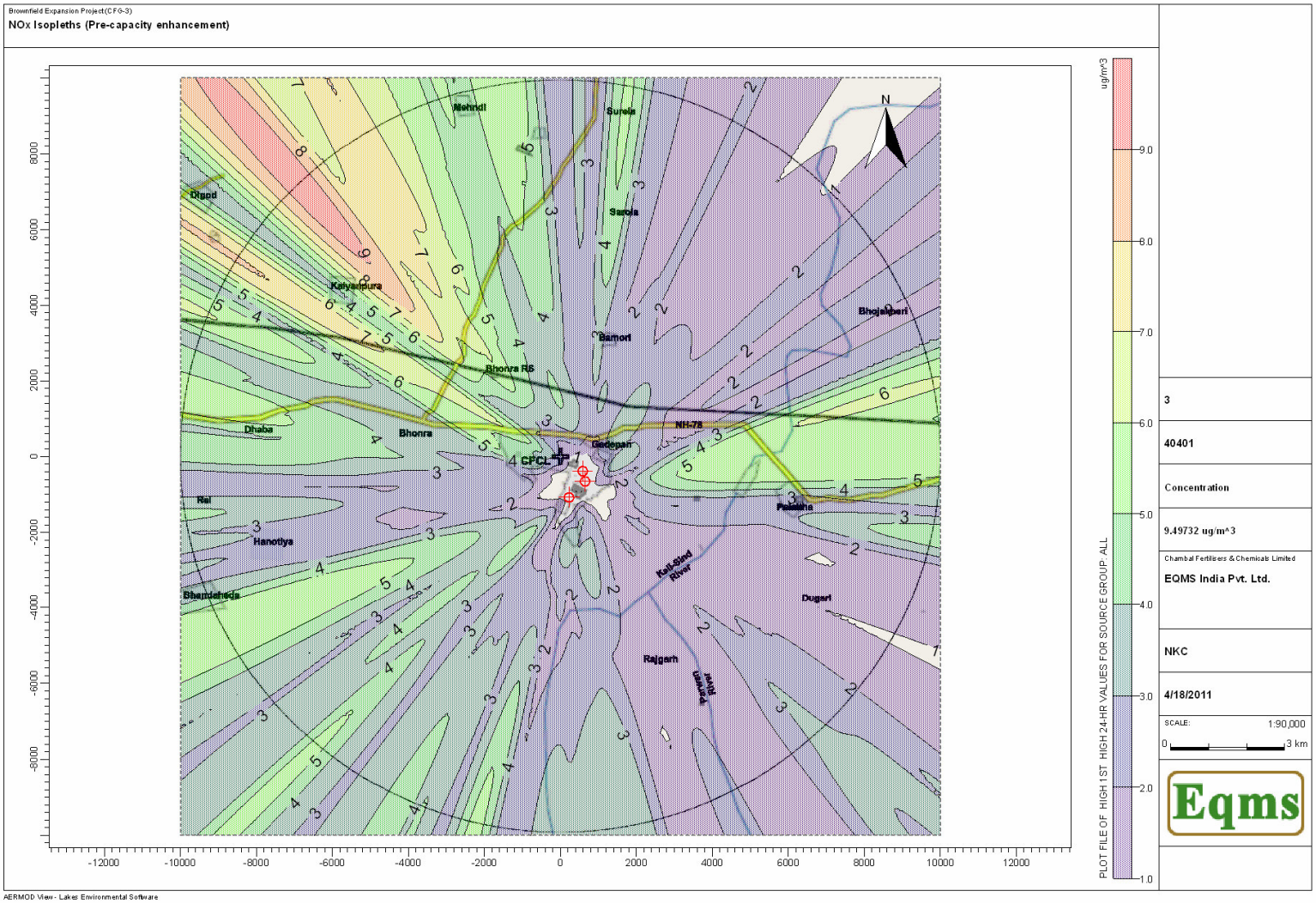


**Figure 2.4 : NOx Isopleths (Initial Assessment)**

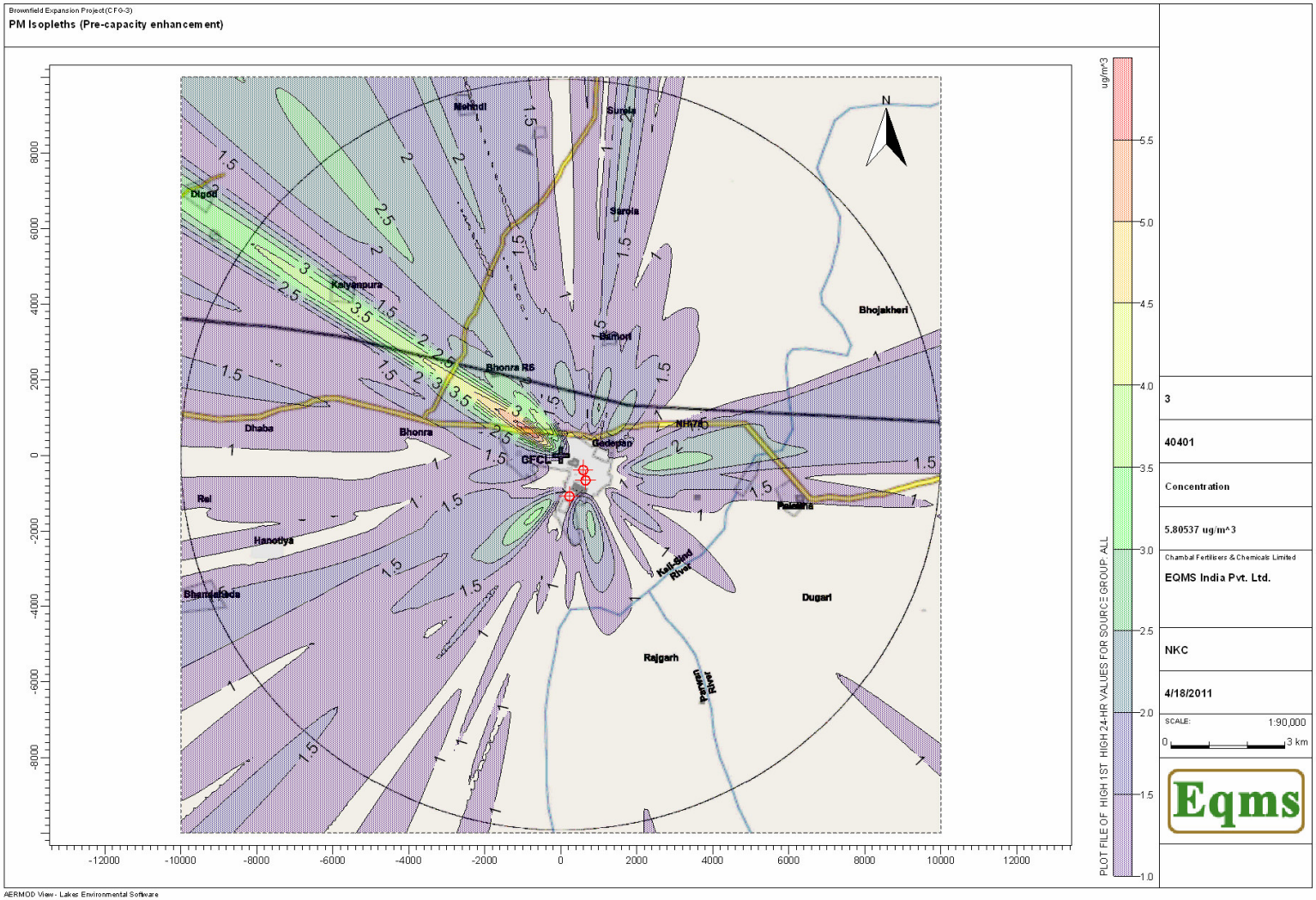


**Figure 2.5 : PM Isopleths (Initial Assessment)**

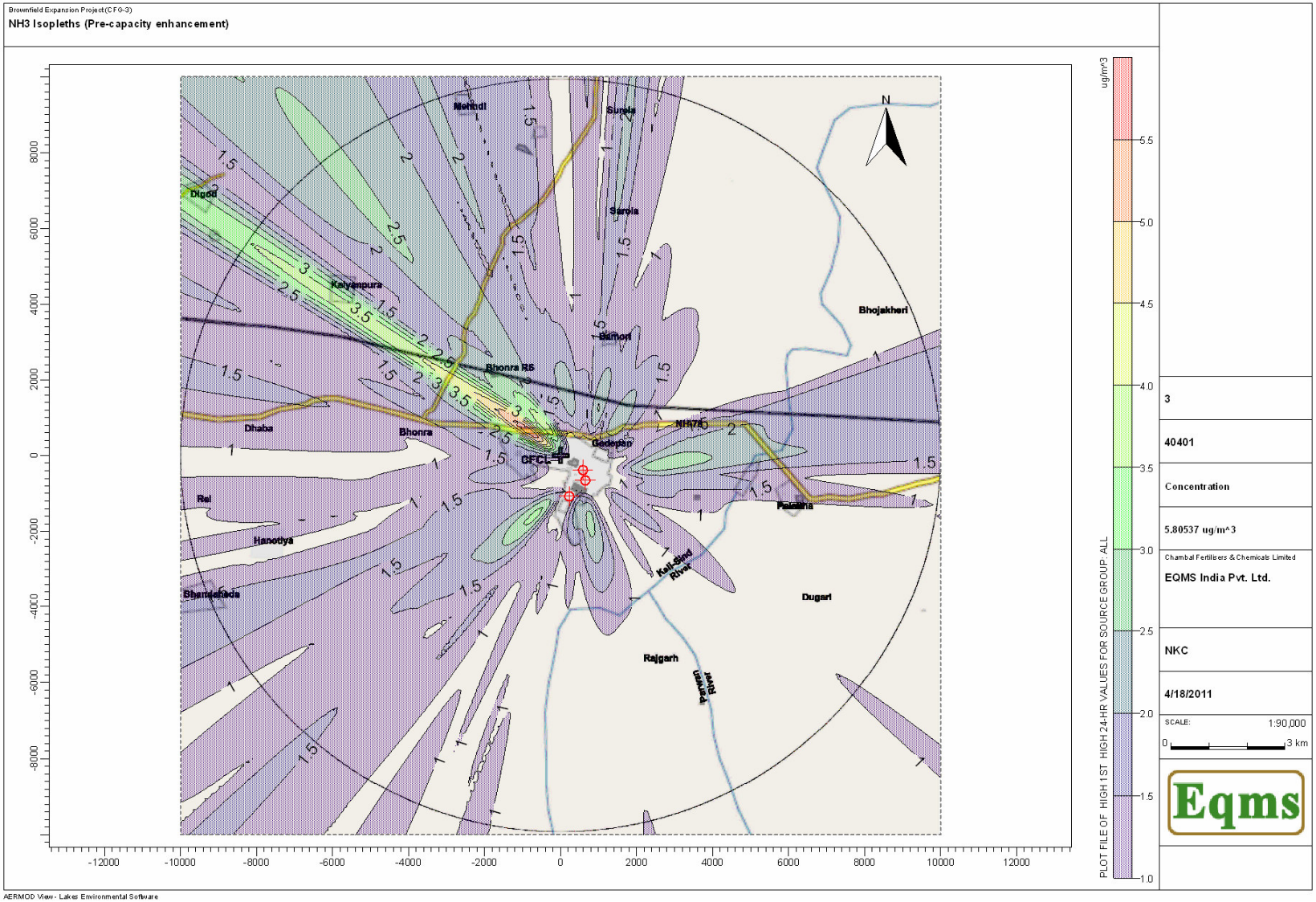


**Figure 2.6 : Ammonia Isopleths (Initial Assessment)**

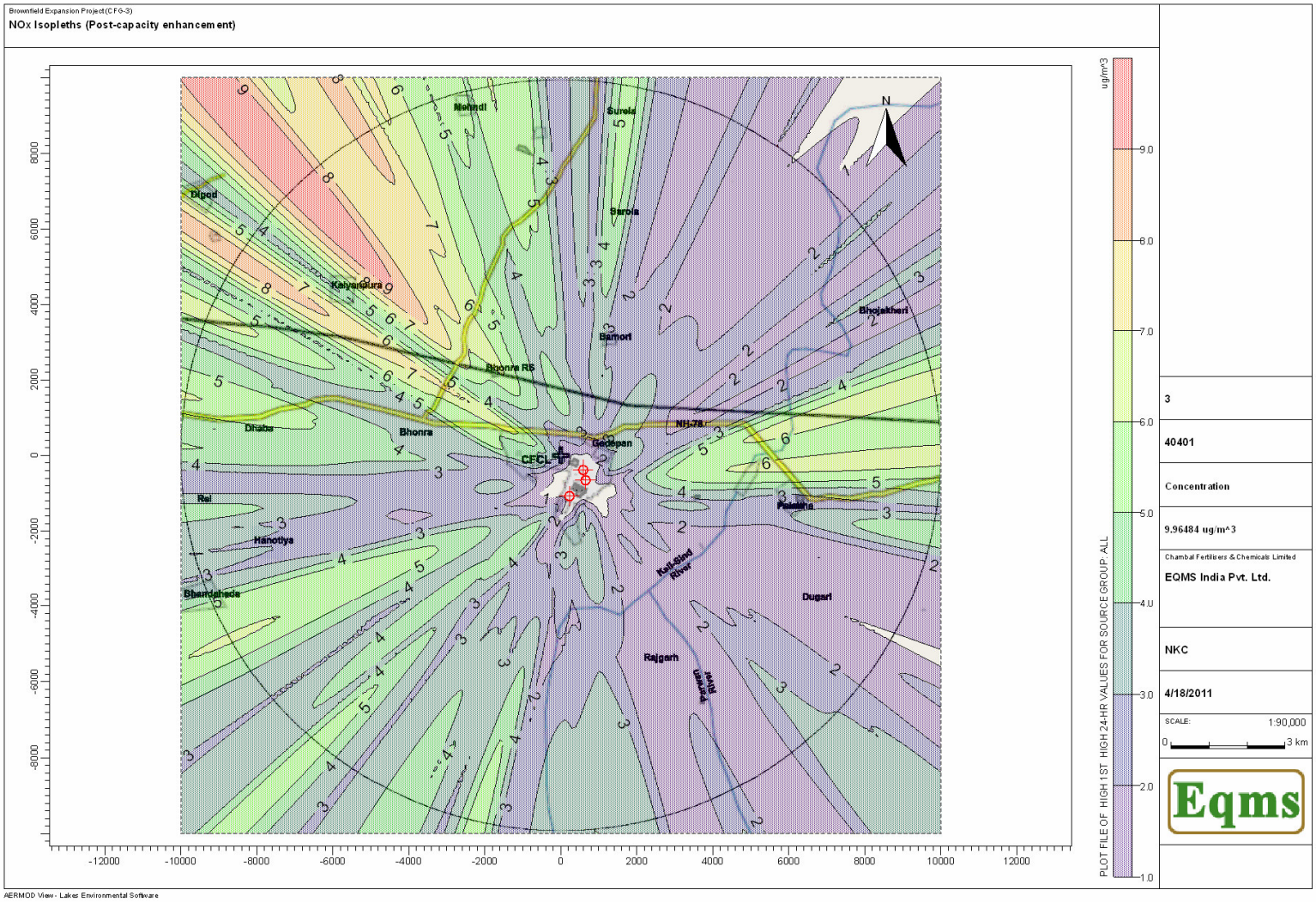


**Figure 2.7 : NOx Isopleths (Revised Assessment)**

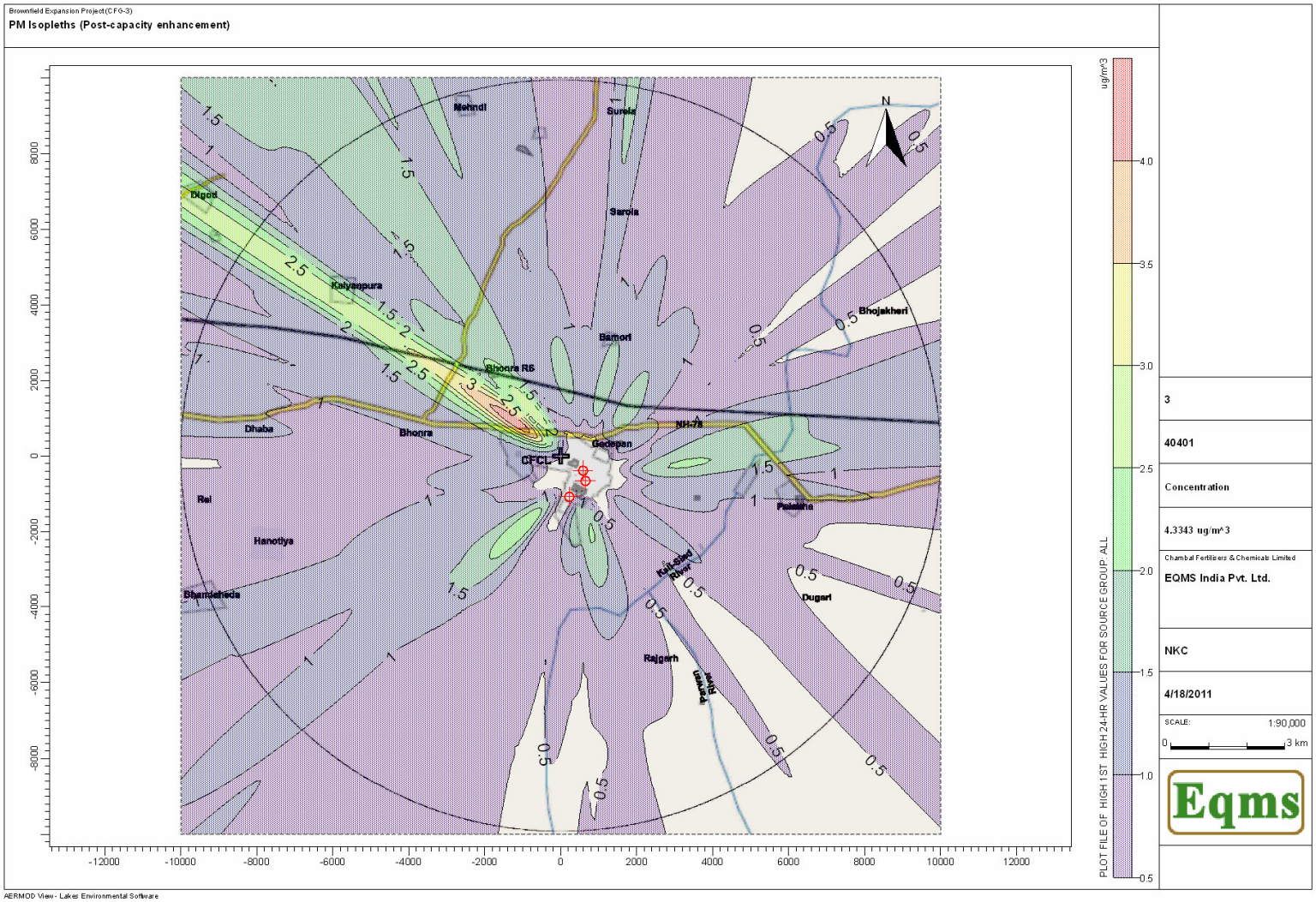


**Figure 2.8 : PM Isopleths (Revised Assessment)**

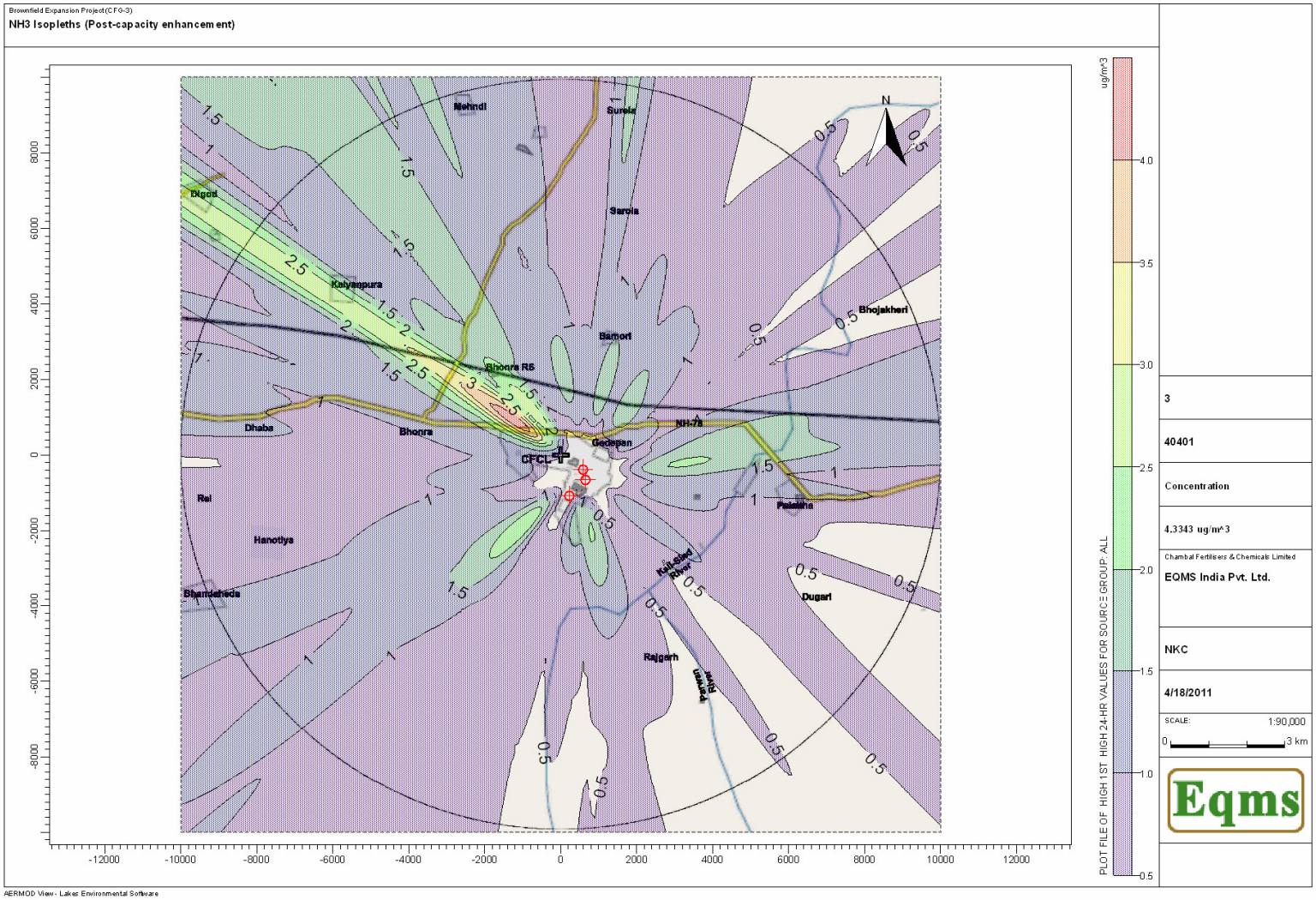


**Figure 2.9 : Ammonia Isopleths (Revised Assessment)**

20. During the baseline monitoring study conduted in winter season for the CFG-3 project, baseline air quality with respect to NOx, PM and Ammonia was monitored at 6 locations. To assess the cumulative impact after commissioning of CFG-3 project, a comparison has been made with respect to the National Ambient Air Quality Standards with measured maximum baseline concentration + maximum predicted ground level concentration for initial as well as revised assessment and the same is presented below:

| Pollutant | NAAQS ($\mu g/m^3$) | Maximum Baseline Concentration ($\mu g/m^3$) | Location | Cumulative Impact | |
|---|---|---|---|---|---|
| | | | | Initial Assessment ($\mu g/m^3$) | Revised Assessment ($\mu g/m^3$) |
| **NOx** | **80** | 42.3 | Palaytha | 51.79 | 52.26 |
| **PM** | **100** | 92.5 | CFCL | 98.3 | 96.8 |
| **Ammonia** | **100** | 57.3 | Simaliya | 63.1 | 61.6 |

### *2.3.5. Conclusion*

21. It is evident from the comparison of the dispersion modelling results that due to higher stack of prill tower in the capacity enhancement, PM and Ammonia ground level concentrations are decreasing even after increase of pollution load. Only there is marginal increase in NOx ground level concentration (~0.5 µg/m3) due to capacity increase. Also, the cumulative impact shows that the air quality will be well within the National Ambient Air Quality Standards.