ELAN ENERGY MANAGEMENT

Air Quality Assessment

Prepared for Strategen
By Sigma Theta
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1. Introduction

1.1. Background

Elan Energy Management proposes to develop a Tyre Resource Recycling Facility (TRRF) to recover carbon black, wire and oil from processing of used tyres. The TRRF will be operated at Lot 60, 9 Fargo Way, Welshpool, for 24 hrs per day, 7 days per week.

The TRRF will process shredded waste tyres using an indirect fired Thermal Conversion Unit (TCU) to produce char, steel wire, oil and gas; with the char upgraded to carbon black. Recovered products will be sold to Australian or international markets.

The process gas stream containing hydrogen, carbon monoxide and methane will be combusted in a high efficiency thermal oxidiser (SACTO) with heat recovery installed to preheat combustion air for the TCU operation. Exhaust gases from the SACTO and the TCU combustion chamber will be discharged to atmosphere via a 15 m tall stack. The impacts from those emissions at nearby residential areas have been assessed using air dispersion modelling.

1.2. Purpose of this Report

This report presents the assessment of the potential air quality impacts arising from atmospheric emissions from the proposed development of the TRRF, including the approach, methodology and results of the air dispersion modelling. During operation, the project could emit to the air trace components of SO_2, NO_x, HCl, heavy metals and dioxins. Material handling operations occur inside the closed building and emissions from the stack have been considered in isolation.

1.3. Site Description

The site is in a light industrial area of Welshpool bound by Roe and Leach highways to the east and west and Welshpool Road to the south. The nearest residential areas are approximately half a kilometre to the southeast and one kilometre to the south-west, (Google Earth, 2016).

1.4. Topography

The site is situated approximately two kilometres from the base of the Perth hills. The topography is flat in the immediate vicinity of the site and there are no expected impacts from topography-induced wind-flows.

1.5. Climate and Meteorology

The nearby BOM site at the Perth airport is assumed representative of the climatology of the region. Coastal wind patterns influence local meteorological conditions creating a diurnal flow. Winds vary each season in direction and strength. Summer is the windiest, with westerly winds dominant in summer, and to a lesser extent in spring and autumn.

1.6. Flora/Fauna

Residential development has displaced the natural vegetation of the area. As such, no threatened species are expected in the immediate vicinity. However, there may be small colonies in the nearby, "bush forever", region along the Perth hills escarpment.

1.7. Project Description

Figure 1 depicts an overview of the site in relation to its neighbours. Batch loads of tyres and product will be supplied and collected at irregular intervals. Delivery vehicles drive on bitumen and are therefore not considered large dust sources. All material handling will be done indoors and hence the only significant emission source is predicted from the stack emissions.

The proposed stack height of 15 m is slightly smaller than the "Good Engineering Practice" (US-EPA, 1981) guidance given the height of the existing buildings. Raising the stack height is not deemed feasible given the site location in relation to the airport and this required building downwash to be included in the modelling.

The process is planned to run continually except for the occasional maintenance (or accidental) start-up and shutdown activities. Emission estimates were generated from information supplied by Strategen on 19 June 2016.

2. Air Quality Criteria

2.1. Ambient Air Quality Guidelines

In June 1998, the National Environment Protection Council (NEPC) set uniform standards for ambient air quality to allow for the adequate protection of human health and wellbeing. This was achieved via the creation of the National Environmental Protection (Ambient Air Quality) Measure (NEPM) (NEPC, 2003) which defined ambient air quality standards for criteria pollutants, including (but not limited to) NO_2, CO, SO_2 and particulates (as particles less than 10 µm in equivalent aerodynamic diameter, PM_{10}). Amendments were made to the Ambient Air Quality NEPM in 2015 to include advisory reporting standards for particles less than 2.5 µm in equivalent aerodynamic diameter ($PM_{2.5}$) (NEPC, 2015).

The Western Australian State Government has recommended the adoption of these NEPM standards for ambient air quality as part of the draft State Environmental (Ambient Air) Policy 2009 (WA-EPA, 2009). The NEPM standards are presented in Table 1.

Table 1: NEPM Ambient Air Quality Standards and Goals

Pollutant	Averaging Period	Standard	Units [1]	Goals [2]
NO_2	1-hour	0.12	ppm	1 day a year
	Annual	0.03	ppm	none
CO	8-hour	9.0	ppm	1 day a year
SO2	1-hour	0.20	ppm	1 day a year
	24-hour	0.08	ppm	1 day a year
	Annual	0.02	ppm	none
PM_{10}	24-hour	50	µg/m^3	5 days a year
$PM_{2.5}$ [3]	24-hour	25	µg/m^3	

Notes

1. µg/m^3 referenced to 0ºC, and 101.3 kPa.
2. Maximum number of allowable exceedances.
3. Advisory reporting standards.

2.2. Acid Gas, Metal and Dioxin Guidelines

In addition to the NEPM, various guidelines exist for other compounds and these are depicted in Table 2. This includes the WA Health Guideline (2007) concentrations, which are based on a Department of Health internal document (*Acid Gas Criteria*, *Internal document, Toxicology WA Department of Health*, Shenton Park, WA (DOH, 2007)) (see (DER-W5925/2015/1, 2015)) which has been previously referenced in other air quality assessments submitted to DER.

Table 2: Air Quality Assessment Criteria

Pollutant	Period	Criteria (µg/m³)	WA relevant guideline
NO_2	1 hour	246	AAQ NEPM (NEPC 2003)
	Annual	61.6	AAQ NEPM (NEPC 2003)
SO_2	10 min	500	WHO guidelines for air quality (WHO 2000), WHO AQ guidelines global update (WHO, 2005)
	1 hour	571.8	AAQ NEPM (NEPC 2003)
	24 h	228.7	AAQ NEPM (NEPC 2003)
	Annual	57.2	AAQ NEPM (NEPC 2003)
CO	15 min	100,000	WHO guidelines for air quality (WHO, 2000)
	30 min	60,000	WHO guidelines for air quality (WHO 2000)
	1 hour	30,000	WHO guidelines for air quality (WHO 2000)
	8 hour	11,249	AAQ NEPM (NEPC 2003)
HCl	1 hour	100	WA DoH - Acid Gases 2007 (DoH 2007)
HF	1 hour	100	WA DoH - Acid Gases 2007 (DoH 2007)
As	1 hour	0.09	Approved methods for the assessment of air pollutants in NSW (DEC NSW, 2005)
	24-hour	0.03	Air guideline values for selected substances (Toxikos, 2010)
	Annual	0.003	Air guideline values for selected substances (Toxikos 2010)
Cd	1 hour	0.018	Approved methods for the assessment of air pollutants in NSW (DEC NSW 2005)
	Annual	0.005	WHO guidelines for air quality (WHO 2000)
Co	24 hour	0.1	Ontario's Ambient Air Quality Criteria (Ontario MOE, 2008)
Cr^{VI}	Annual	0.0002	Air guideline values for selected substances (Toxikos 2010)
Cr^{III}	1-hour	10	Air guideline values for selected substances (Toxikos 2010)
	24-hour	0.05	Air guideline values for selected substances (Toxikos 2010)
Cu	24 hour	1	Air guideline values for selected substances (Toxikos 2010)
Hg	1 hour	1.8	Approved methods for the assessment of air pollutants in NSW (DEC NSW 2005)
	Annual	0.2	Air guideline values for selected substances (Toxikos 2010)
Mn	1 hour	18	Approved methods for the assessment of air pollutants in NSW (DEC NSW 2005)
	Annual	0.15	WHO guidelines for air quality (WHO 2000), Air guideline values for selected substances (Toxikos 2010)
Ni	1 hour	0.18	Approved methods for the assessment of air pollutants in NSW (DEC NSW 2005)
	Annual	0.003	DOH Esperance Ni annual guideline (DOH, 2011)
Pb	Annual	0.5	AAQ NEPM (NEPC 2003), WHO guidelines for air quality (WHO 2000)
Sb	1 hour	9	Approved methods for the assessment of air pollutants in NSW (DEC NSW 2005)
Tl	1 hour	1	TCEQ Effect Screening Levels (TCEQ, 2011)
	Annual	0.1	TCEQ Effect Screening Levels (TCEQ 2011)
V	24 hour	1	WHO guidelines for air quality (WHO 2000)
TSP	24 hour	90	Kwinana Environmental Protection Policy 1992 (TSP Area C) (WA Goverment, 1992)
PM_{10}	24 hour	50	AAQ NEPM (NEPC 2003), WHO AQ guidelines global update (WHO 2005)
$PM_{2.5}$	24 hour	25	AAQ NEPM (NEPC 2003), WHO AQ guidelines global update (WHO 2005)
	Annual	8	AAQ NEPM (NEPC 2003)
Dioxins (TEQ)	1 hour	0.000001	Air guideline values for selected substances (Toxikos 2010)

3. Modelling Methodology

3.1. Air Dispersion Model

The air dispersion modelling has been conducted using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) version 15181 (US-EPA, 2015). AERMOD is a United States Environmental Protection Agency (US-EPA) recommended air dispersion model that has been designed to support regulatory modelling programs in the United States. It is widely used throughout Australia and internationally for regulatory modelling applications.

AERMOD is a current-generation air dispersion model that incorporates concepts such as planetary boundary layer theory and advanced methods for handling complex terrain. AERMOD incorporates the Plume Rise Model Enhancements (PRIME) building downwash algorithms, which provide a more realistic handling of downwash effects than previous approaches.

3.2. Meteorological Data

The Bureau of Meteorology supplied five years of meteorological data (2010 to 2015) for the Perth Airport site situated approximately 20 km to the north (BOM, 2016). Figure 3 presents the wind roses for each season and a total combined annual rose. These were derived from the regional hourly average wind speed and direction data. Winds in the region are predominantly east and westerly winds as depicted in the wind roses. Figure 3, also shows the seasonal wind fluctuations. During summer and spring, the winds are predominantly from the southwest and east, and relatively strong. In contrast, during winter, the winds are predominantly from the northeast, and winds tend to be lighter in strength.

3.3. Modelling Approach

Air dispersion modelling was used to predict ground level concentrations (GLCs) across the model domain. The air quality impacts associated with emissions from the TRRF were considered in isolation.

3.4. Model Parameterisation

AERMOD (Version 15181) was used to predict GLCs across the model domain. Owing to the distance to the nearest residences, a fine grid of 5 km x 5 km x 100 m was used. Terrain elevation data, 30 m resolution, for the model domain was obtained from the US National Aeronautics and Space Administration's (NASA) Shuttle Radar Topography Mission (SRTM3/SRTM1), and incorporated into AERMOD using the AERMAP terrain processor.

Urban dispersion coefficients were used in the AERMOD simulation because of the proximity of residential houses in the immediate area. Three specific sensitive receptors sites, as depicted in Figure 2, were selected from an initial screening model run which identified where the maximum concentrations was predicted to occur in the residential area.

4. Atmospheric Emissions

This study has considered emissions from the TRRF under the proposed operating conditions. The emission information and stack release parameters used as inputs to the modelling (Table 5) were supplied by Strategen. No nearby significant sources of HCl or HF were identified in the National Pollution Inventory database. Therefore, this study, has considered the proposed stack in isolation.

Table 3: Stack Parameters

Parameter	Value	Units
Height	15	m
Internal diameter	0.8	m
Velocity	15.4	m/s
Temperature	400	deg C

Table 4: Stack Emission Rates

Element/Compound	Units	Value
NO_x	g/s	2.84E-01
SO_2	g/s	6.83E-01
CO	g/s	1.20E-01
HCl	g/s	3.58E-02
HF	g/s	3.65E-04
Hg	g/s	2.72E-06
Cd	g/s	2.11E-05
Tl	g/s	0
Sb	g/s	1.39E-05
As	g/s	6.08E-06
Cr	g/s	2.84E-05
Co	g/s	8.93E-05
Cu	g/s	1.10E-04
Pb	g/s	5.60E-04
Mn	g/s	1.49E-05
Ni	g/s	1.82E-04
V	g/s	6.94E-06
Particulates	g/s	1.92E-02
Dioxins	g TEQ/s	6.43E-13
Ethane	g/s	7.38E-03
Propane	g/s	3.81E-03
Butane	g/s	5.00E-03
Pentane	g/s	6.19E-03
Hexane	g/s	4.28E-03
Benzene	g/s	5.00E-06
Toluene	g/s	8.09E-06

5. AERMOD Results

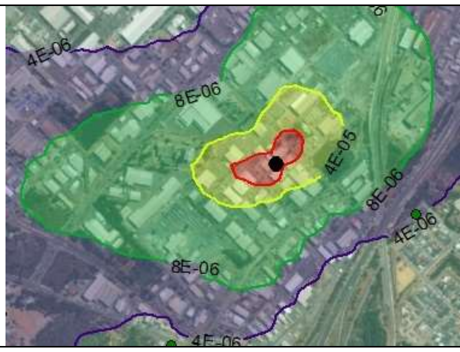
The ground level concentrations for the pollutants of interest are compared to standard criteria in Table 2 for the proposed stack. With the exception of the ten-minute SO_2, 24-hourly SO_2 and annual Cr (VI) and Ni all other pollutants are significantly below guideline limits at all grid points for all periods. Isopleths of the predicted concentrations from the proposed stack are presented in Figure 4 to Figure 36.

A detailed investigation of the isopleths noted that four pollutants/periods were predicted to have high concentrations at the immediate grid points nearest the stack. These four isopleths identify that approximately 20% of the guideline could be reached at the grid points nearest the stack (100 m), but the concentrations are predicted to drop rapidly reaching about 1 % of the guidelines at the nearest residential areas which are about 500 m away. As such, the predicted highs are related to problems with modelling near-source receptors and would usually be contained (and ignored) within the site boundaries. However, in the light-industrial region, there is no buffer and buildings extend to the property boundary.

Table 5: Maximum Predicted Ground Level Concentrations (µg/m3)

Pollutant	Period	µg/m³	%	Criteria (µg/m3)	Thumbnails[1]
NO_2	1-hour	28.6	11.6%	246	
	Annual	2.45	4.0%	61.6	
SO_2	10-min	98.5	19.7%	500	
	1-hour	68.9	12.0%	571.8	
	24-hour	46.9	20.5%	228.7	
	Annual	5.88	10.3%	57.2	
CO	15 min[2]	15.9	0.0%	100000	
	30 min	13.9	0.0%	60000	
	1-hour	12.1	0.0%	30000	
	8-hour	10.1	0.1%	11249	
HCl	1-hour	3.61	3.6%	100	

[1] Only isopleths of potential concern (i.e. near-source) are shown in the thumbnails
[2] Sub hourly Concentration = C_{Hour} X $(60/Minutes)^{0.2}$ (EPA-Vic)

HF	1-hour	0.0368	0.0%	100	
As	1-hour	0.000613	0.7%	0.09	
	24-hour	4.17E-04	1.4%	0.03	
	Annual	5.24E-05	1.7%	0.003	
Cd	1-hour	0.00213	11.8%	0.018	
	Annual	0.000182	3.6%	0.005	
Co	24-hour	0.009	9.0%	0.1	
Cr^{VI}	Annual	0.0000245	12.3%	0.0002	
Cr^{III}	1-hour	0.00286	0.0%	10	
	24-hour	0.00195	3.9%	0.05	
Cu	24-hour	0.00755	0.8%	1	
Hg	1-hour	0.000274	0.0%	1.8	
	Annual	2.34E-05	0.0%	0.2	
Mn	1-hour	0.00152	0.0%	18	
	Annual	0.000128	0.1%	0.15	
Ni	1-hour	0.0184	10.2%	0.18	
	Annual	0.00157	52.3%	0.003	
Pb	Annual	0.00482	1.0%	0.5	
Sb	1-hour	0.0014	0.0%	9	
Tl	1-hour	0	0.0%	1	
	Annual	0	0.0%	0.1	
V	24-hour	4.76E-04	0.0%	1	
TSP[3]	24-hour	1.32	1.5%	90	
PM_{10}	24-hour	1.32	2.6%	50	
$PM_{2.5}$	24-hour	1.32	5.3%	25	
	Annual	0.165	2.1%	8	
Dioxins (TEQ)	1-hour	6.48E-11	0.0%	0.000001	

[3] TSP, PM_{10} and $PM_{2.5}$ have all been conservatively modelled as 100% TSP

6. Conclusions

Air dispersion modelling has been completed to assess the potential air quality impacts associated with emissions from the TRRF. The air dispersion model, AERMOD, has been used to predict GLCs across the model domain using the proposed stack configurations for the modelling assessment.

Near-source modelling abnormalities (i.e. within about 100 m from source) as noted for SO_2 (ten minute and daily) and annual Cr and Ni are predicted to be about 20% of the applicable guideline, but this drops rapidly to about 1 % of the guideline at the nearest residential areas about 500 m away. With the exception of the near-source abnormalities, the results of the modelling indicate that the air quality impacts due to emissions from the TRRF, in isolation, are predicted to be well below the relevant ambient criteria at all grid locations for all pollutants and all averaging periods.

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8. Limitations

Sigma Theta prepared this report in accordance with the scope of work as outlined in our proposal to Strategen dated 24 February 2016 and in accordance with our understanding and interpretation of current regulatory standards.

The conclusions presented in this report represent Sigma Theta's professional judgment based on information made available during the course of this assignment, are true and correct to the best of Sigma Theta's knowledge, as at the date of the assessment.

Sigma Theta did not independently verify all of the written or oral information provided to Sigma Theta during the course of this investigation. While Sigma Theta has no reason to doubt the accuracy of the information provided to it, the report is complete and accurate only to the extent that the information provided to Sigma Theta was itself complete and accurate. This report does not purport to give legal advice. Qualified legal advisors can only give this advice.

8.1. User Reliance

This report has been prepared exclusively for Strategen and may not be relied upon by any other person or entity without Sigma Theta's express written permission.

Appendix A: Figures

Figure 1: Overview of the proposed site

Figure 2: Aerial Overview of the Region

Source: (Google Earth, 2016)

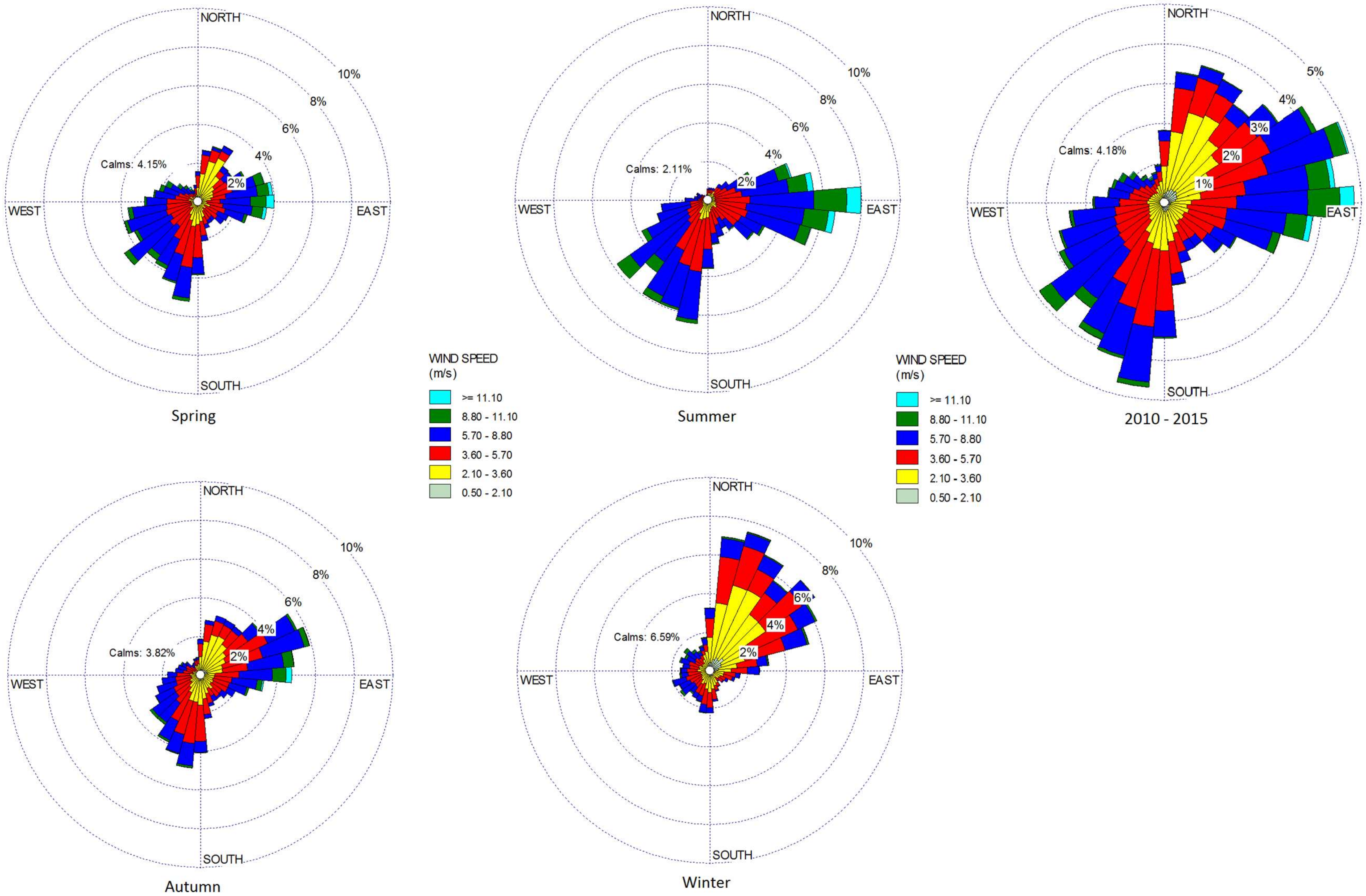

Figure 3: Wind Rose Perth Airport: Seasons and Annual

Figure 4: Maximum NO_2 1-hr Ground Level Concentration µg/m³ (standard 246 µg/m³)

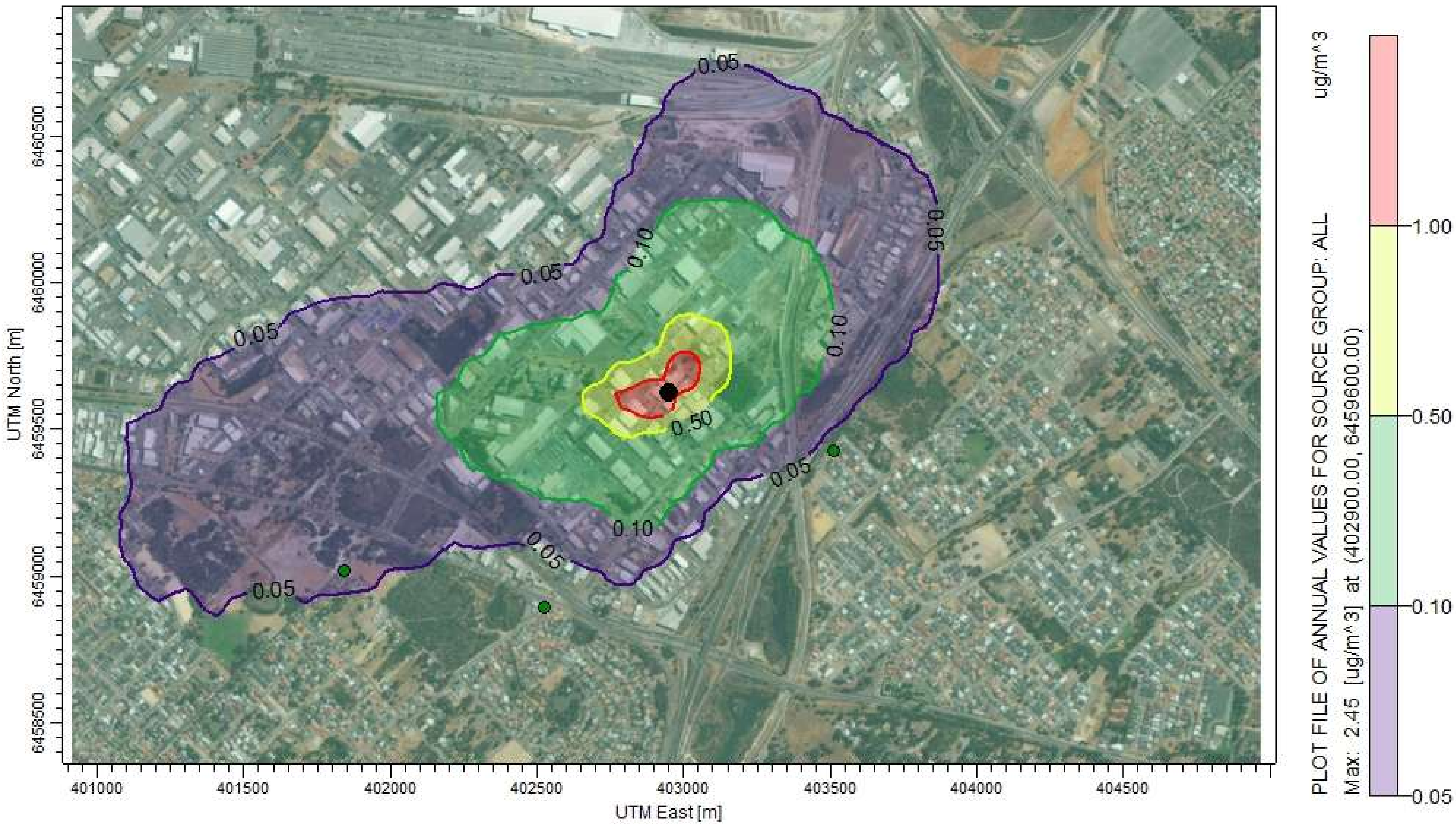

Figure 5: NO_2 Annual Average Ground Level Concentration µg/m³ (standard 61.6 µg/m³)

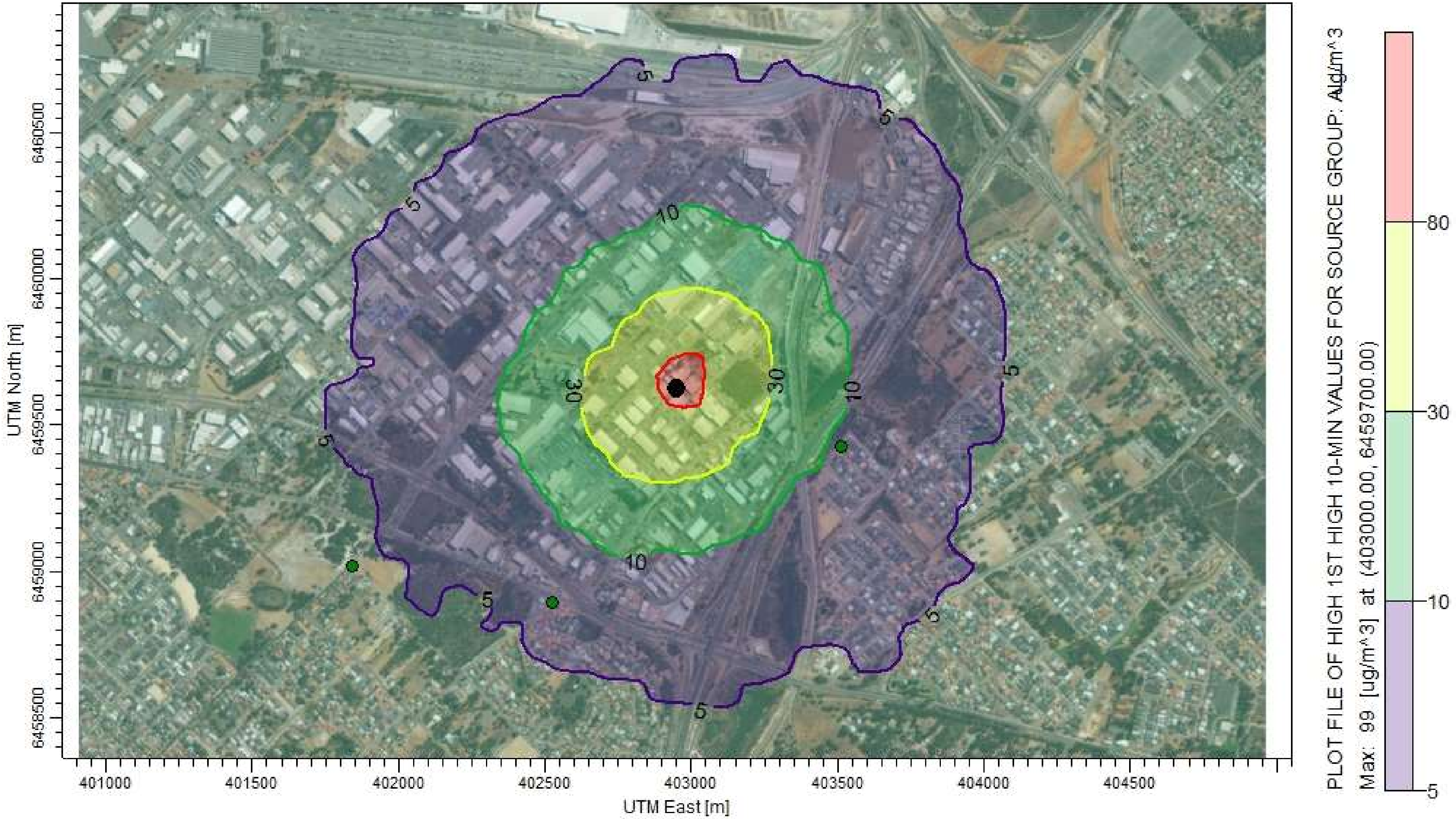

Figure 6: Maximum SO_2 10-Min Ground Level Concentration µg/m³ (standard 500 µg/m³)

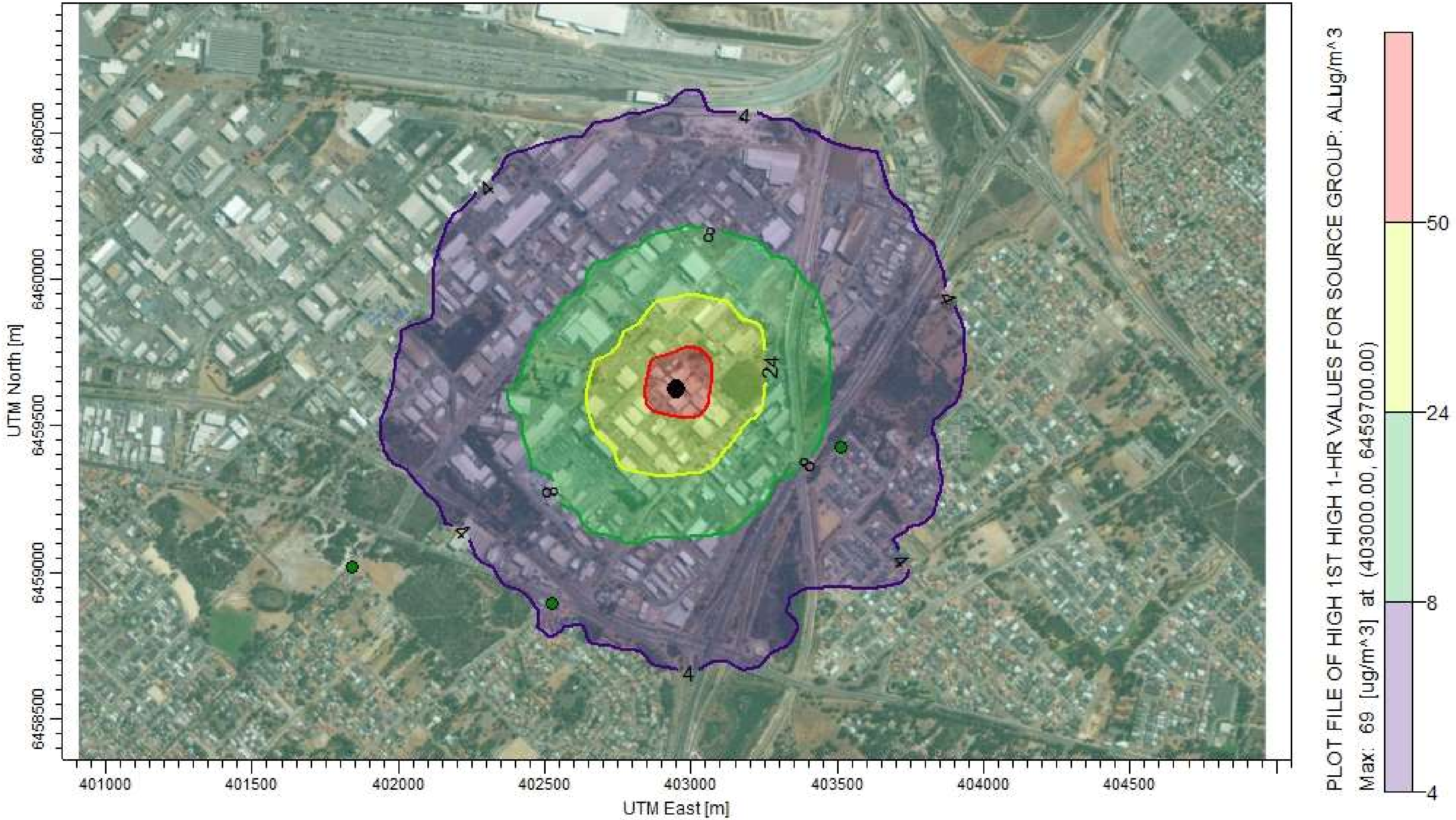

Figure 7: Maximum SO_2 1-hr Ground Level Concentration µg/m³ (standard 571.8 µg/m³)

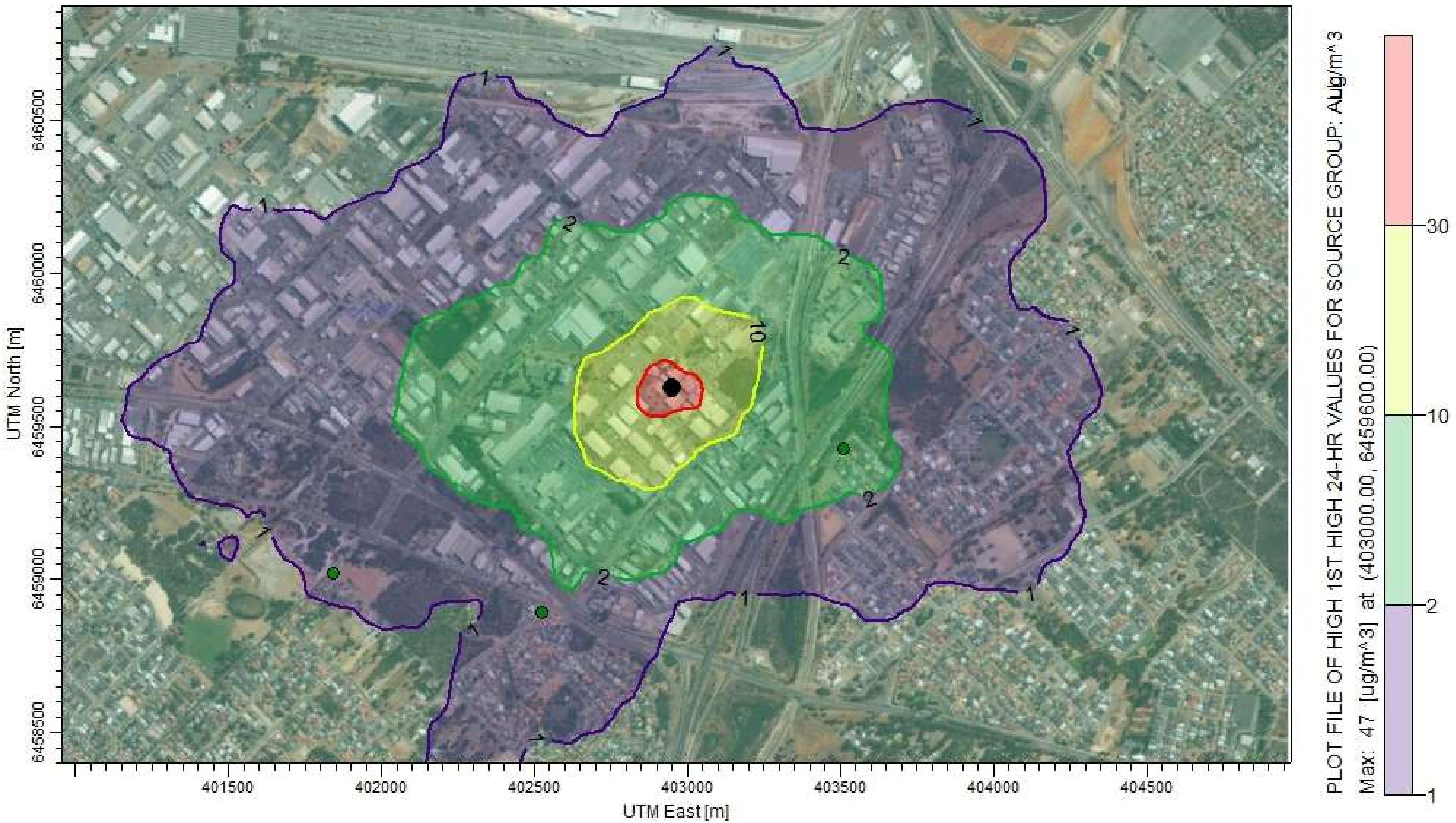

Figure 8: Maximum SO_2 24-hr Ground Level Concentration µg/m³ (standard 228.7 µg/m³)

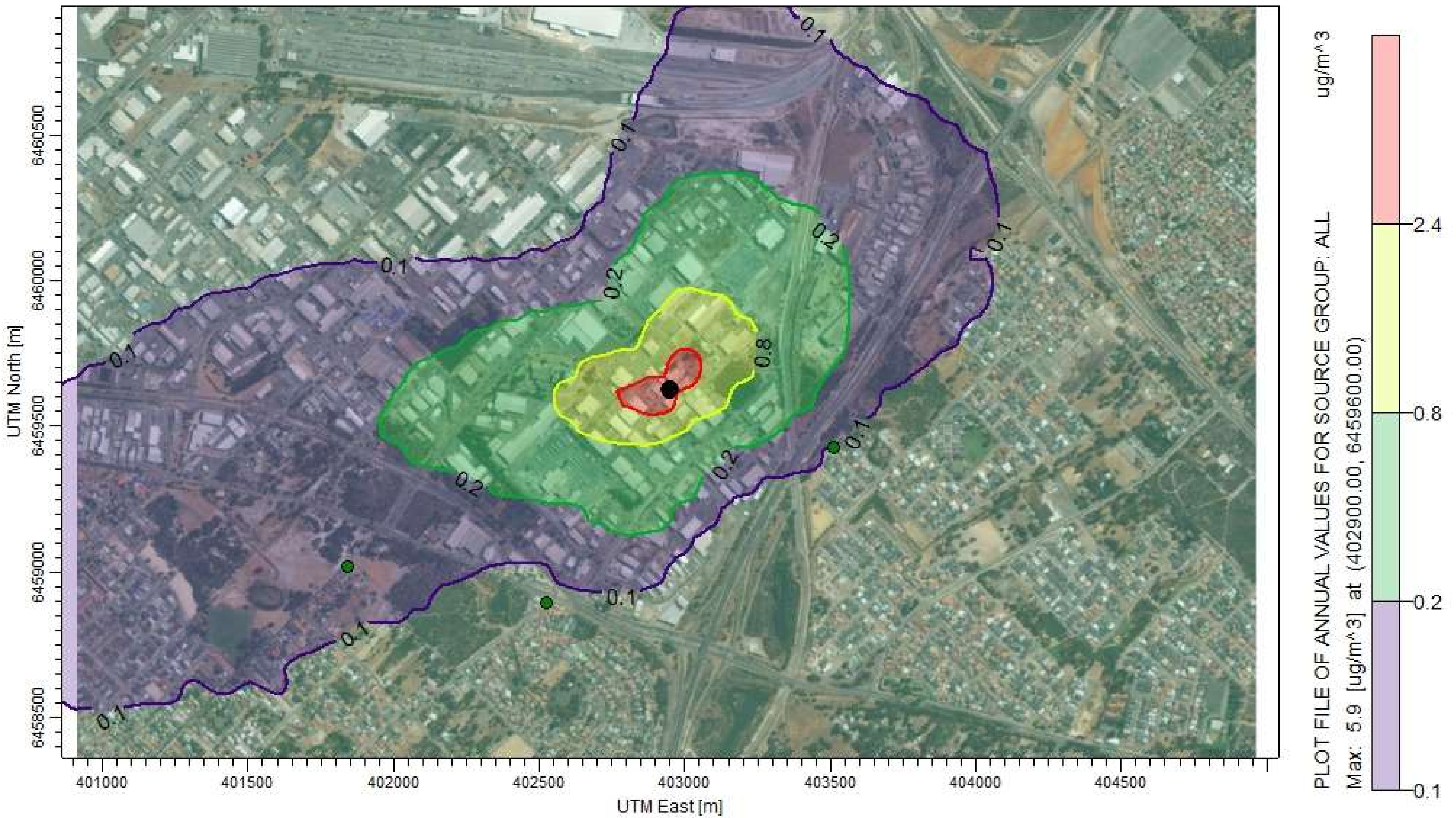

Figure 9: SO_2 Annual Average Ground Level Concentration µg/m³ (standard 57.2 µg/m³)

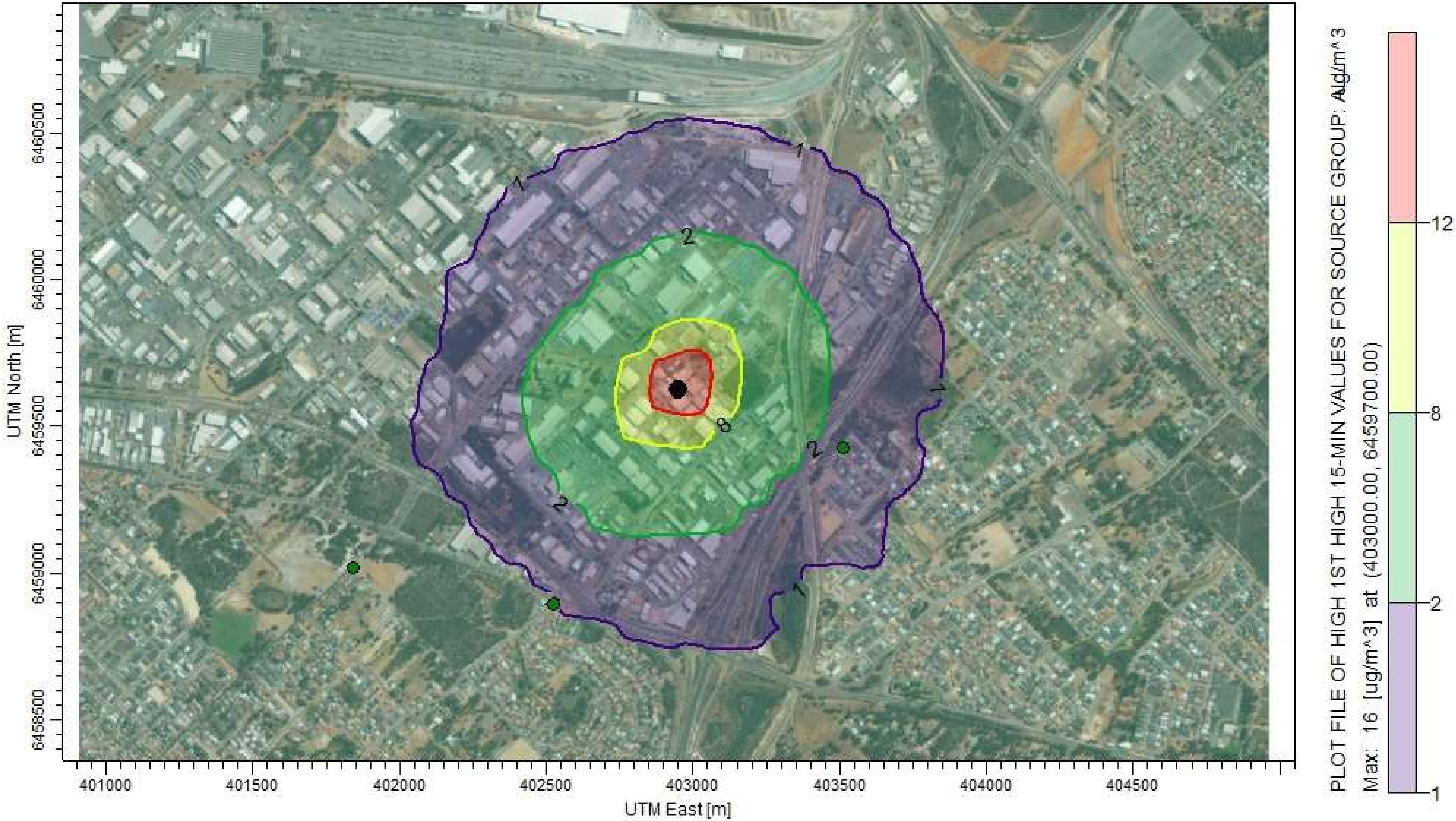

Figure 10: Maximum CO 15-Min Ground Level Concentration µg/m³ (standard 100,000 µg/m³)

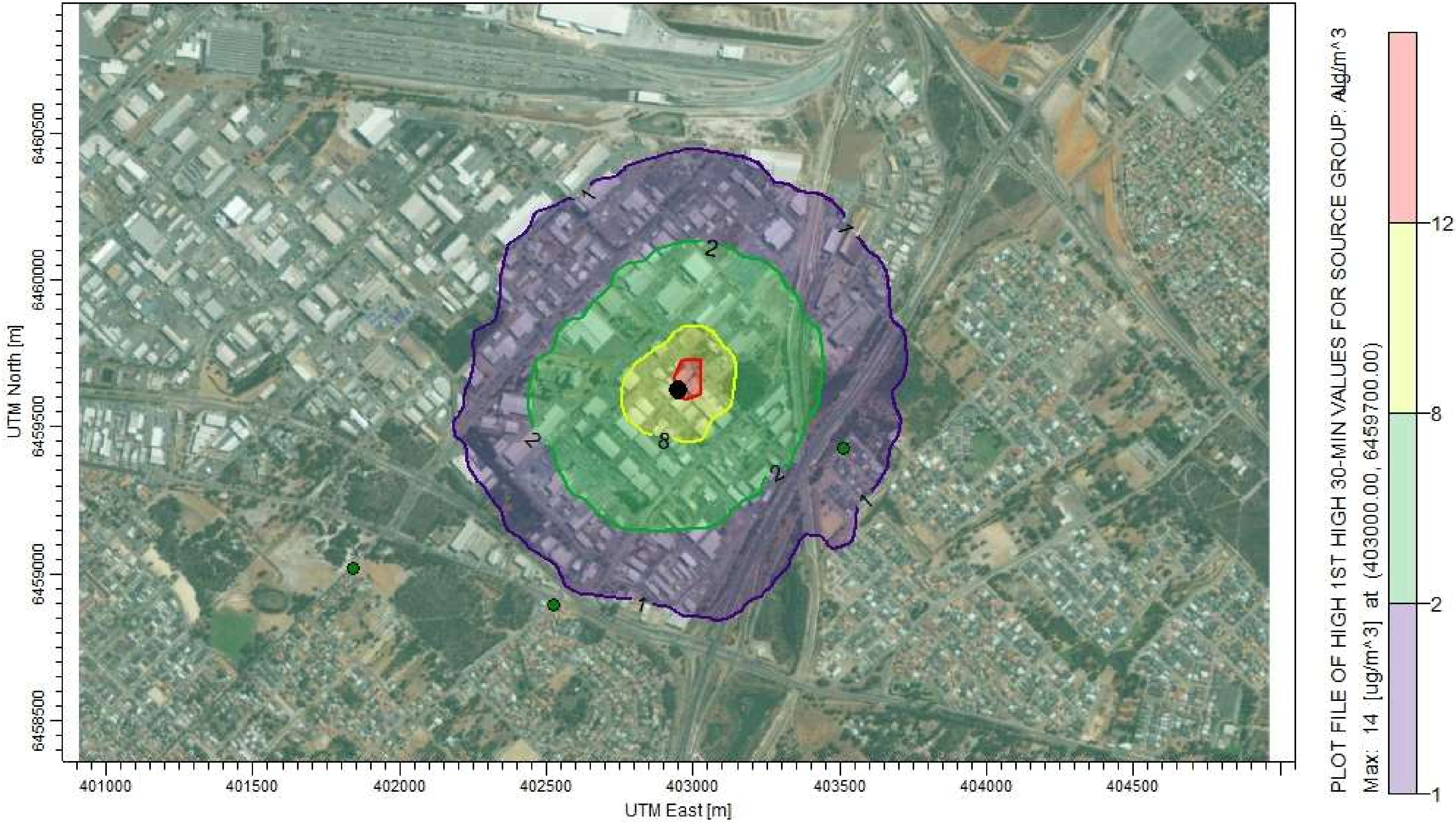

Figure 11: Maximum CO 30-Min Ground Level Concentration µg/m³ (standard 60,000 µg/m³)

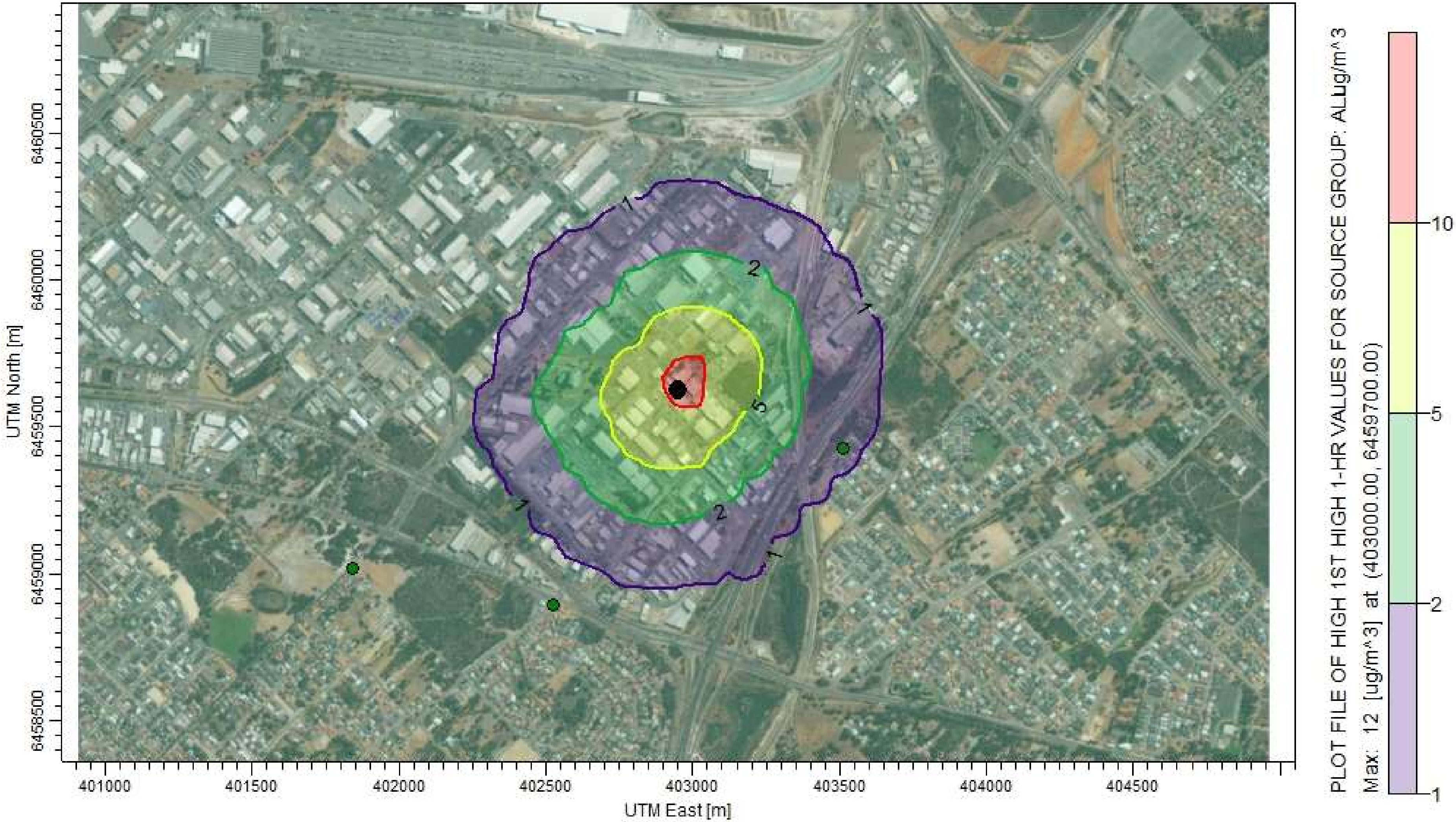

Figure 12: Maximum CO 1-hr Ground Level Concentration µg/m³ (standard 30,000 µg/m³)

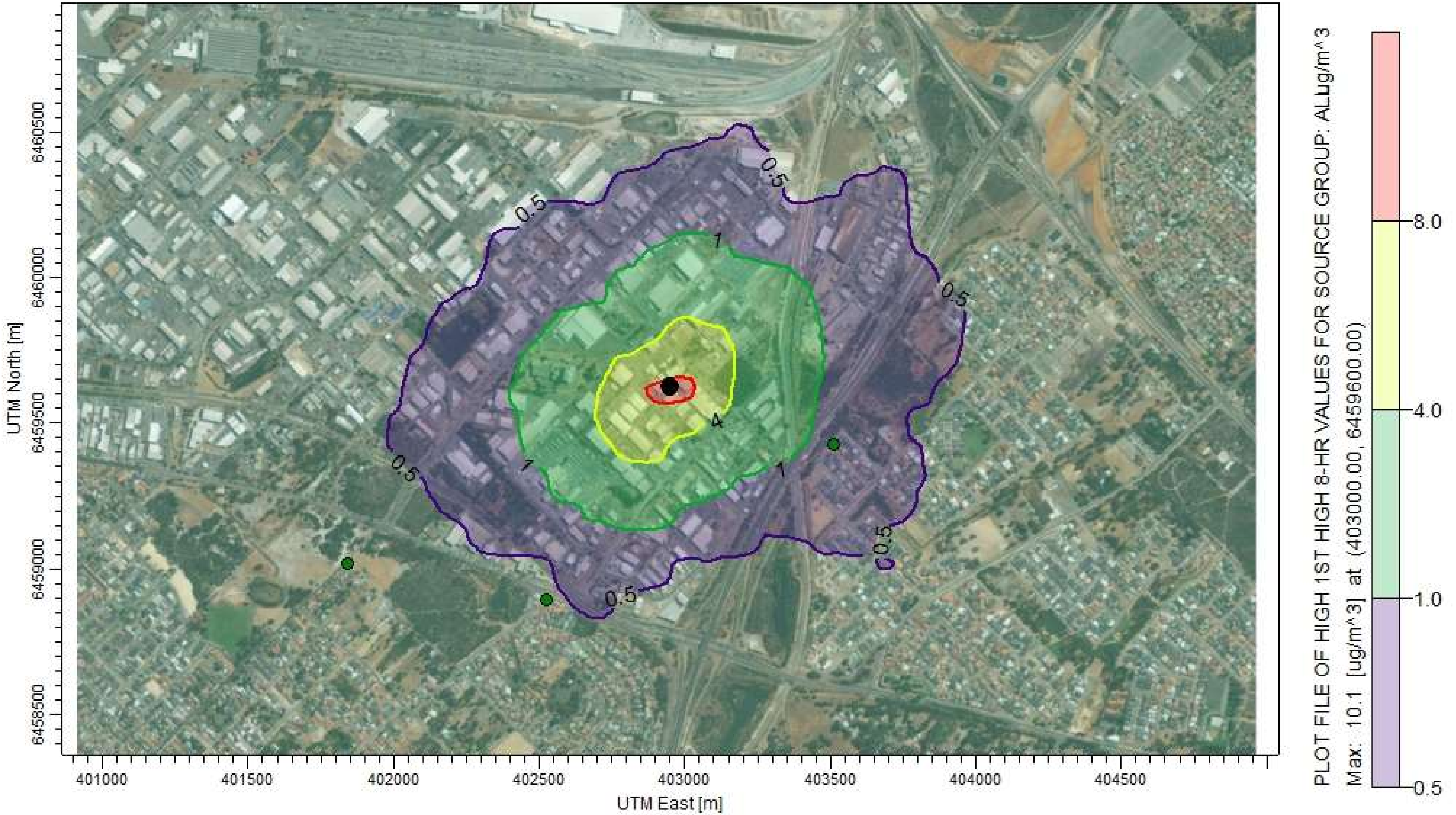

Figure 13: Maximum CO 8-hr Ground Level Concentration µg/m³ (standard 11,249 µg/m³)

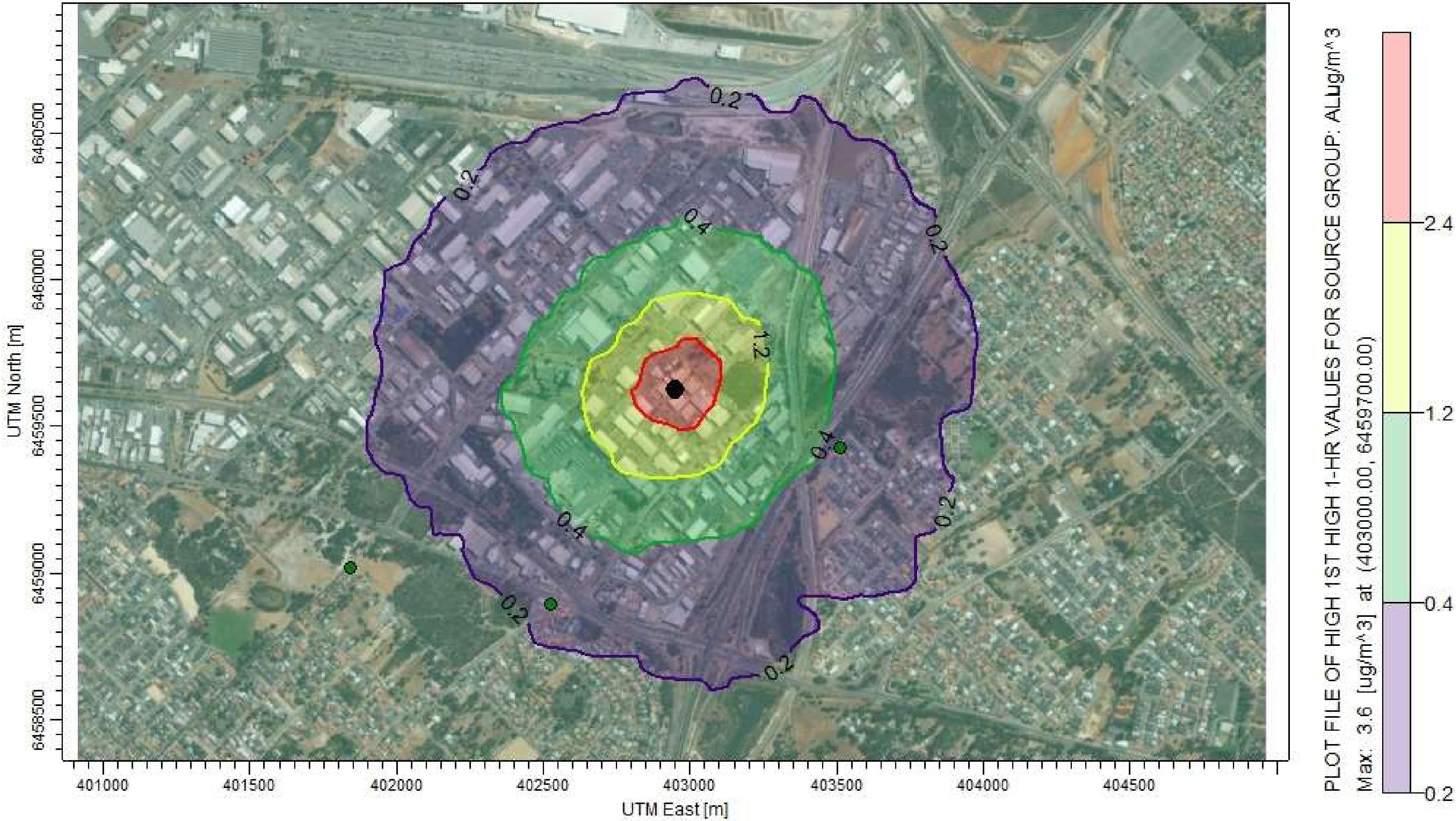

Figure 14: Maximum HCl 1-hr Ground Level Concentration µg/m³ (standard 100 µg/m³)

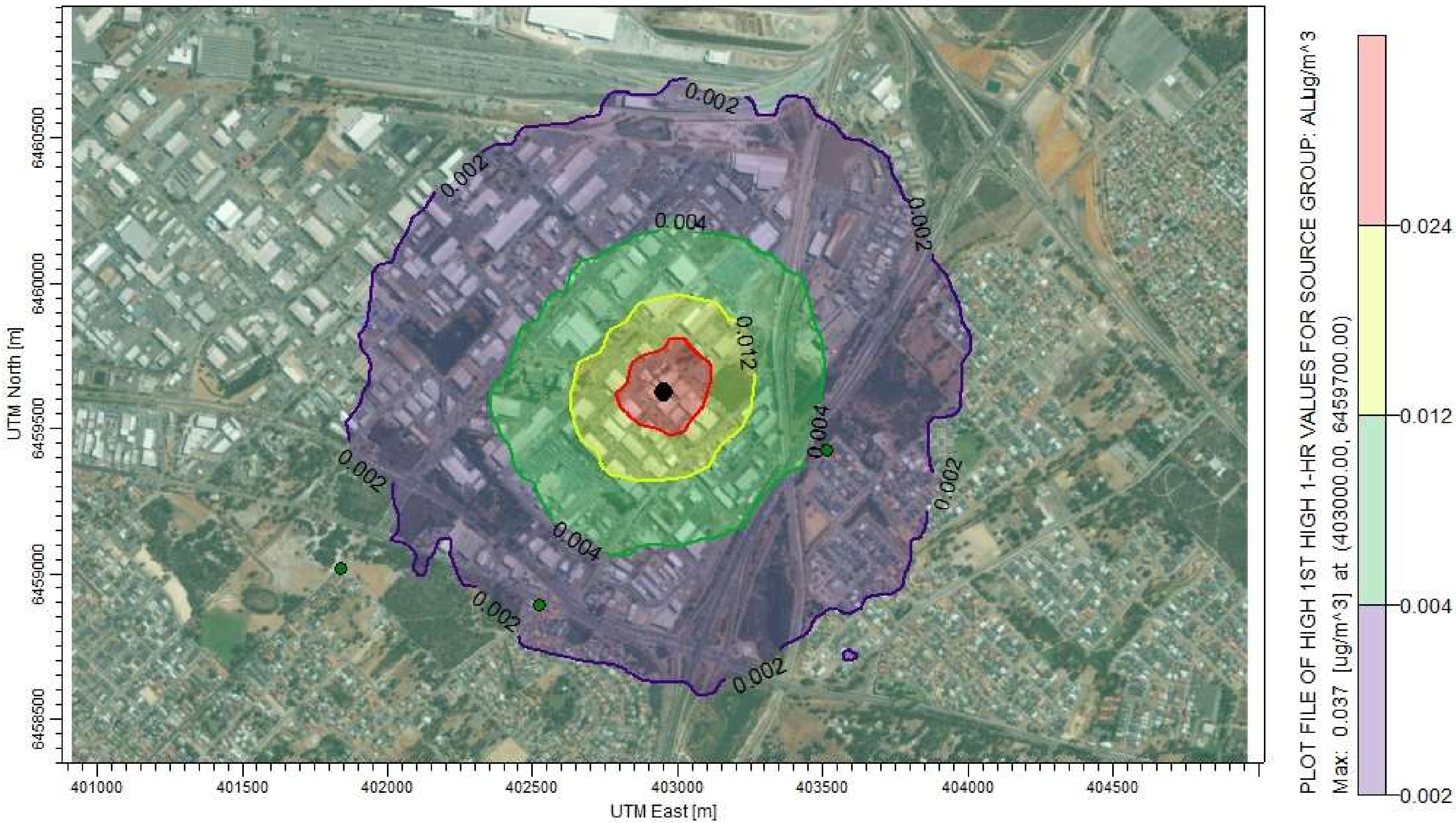

Figure 15: Maximum HF 1-hr Ground Level Concentration µg/m³ (standard 100 µg/m³)

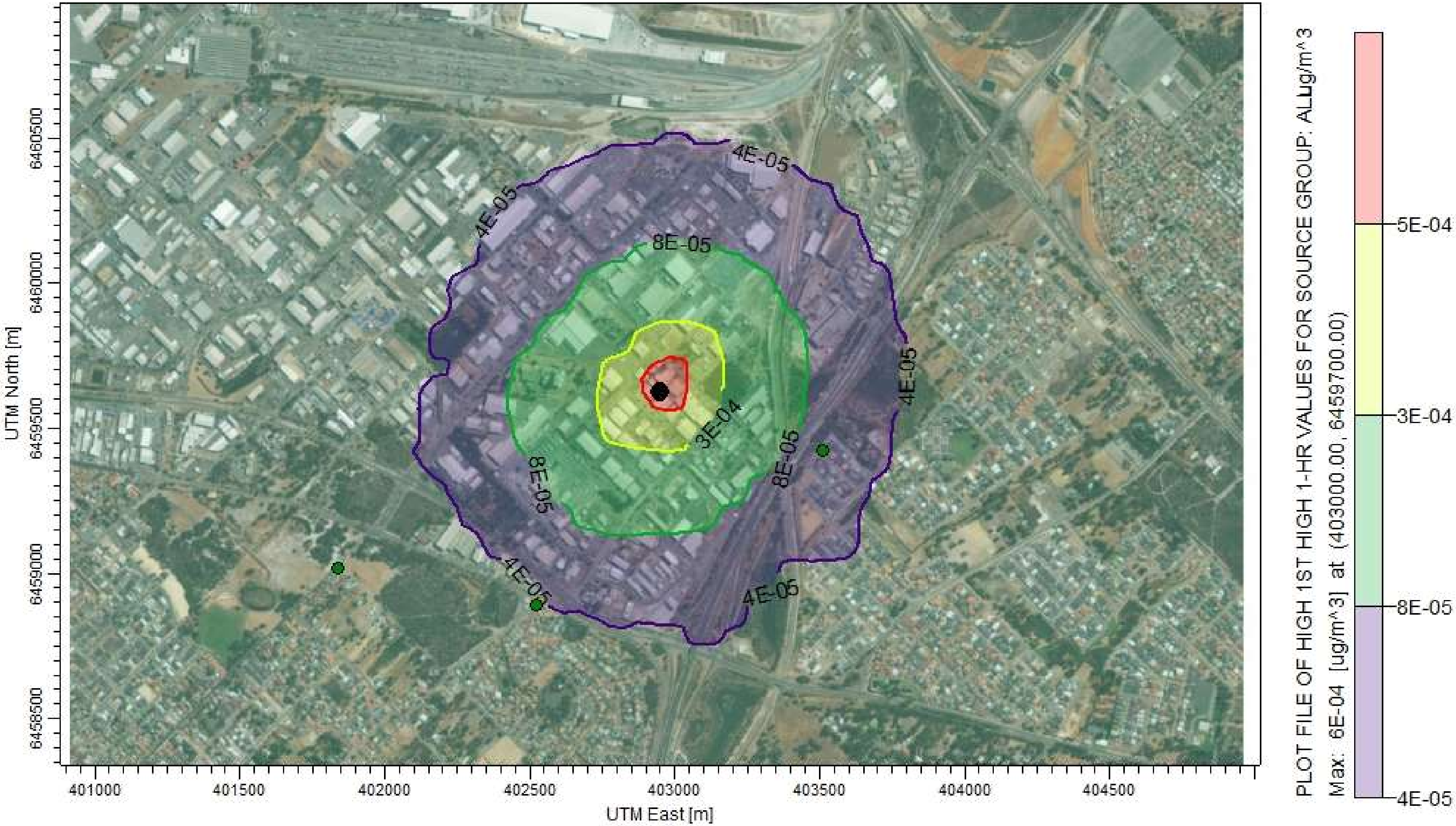

Figure 16: Maximum As 1-hr Ground Level Concentration µg/m³ (standard 0.09 µg/m³)

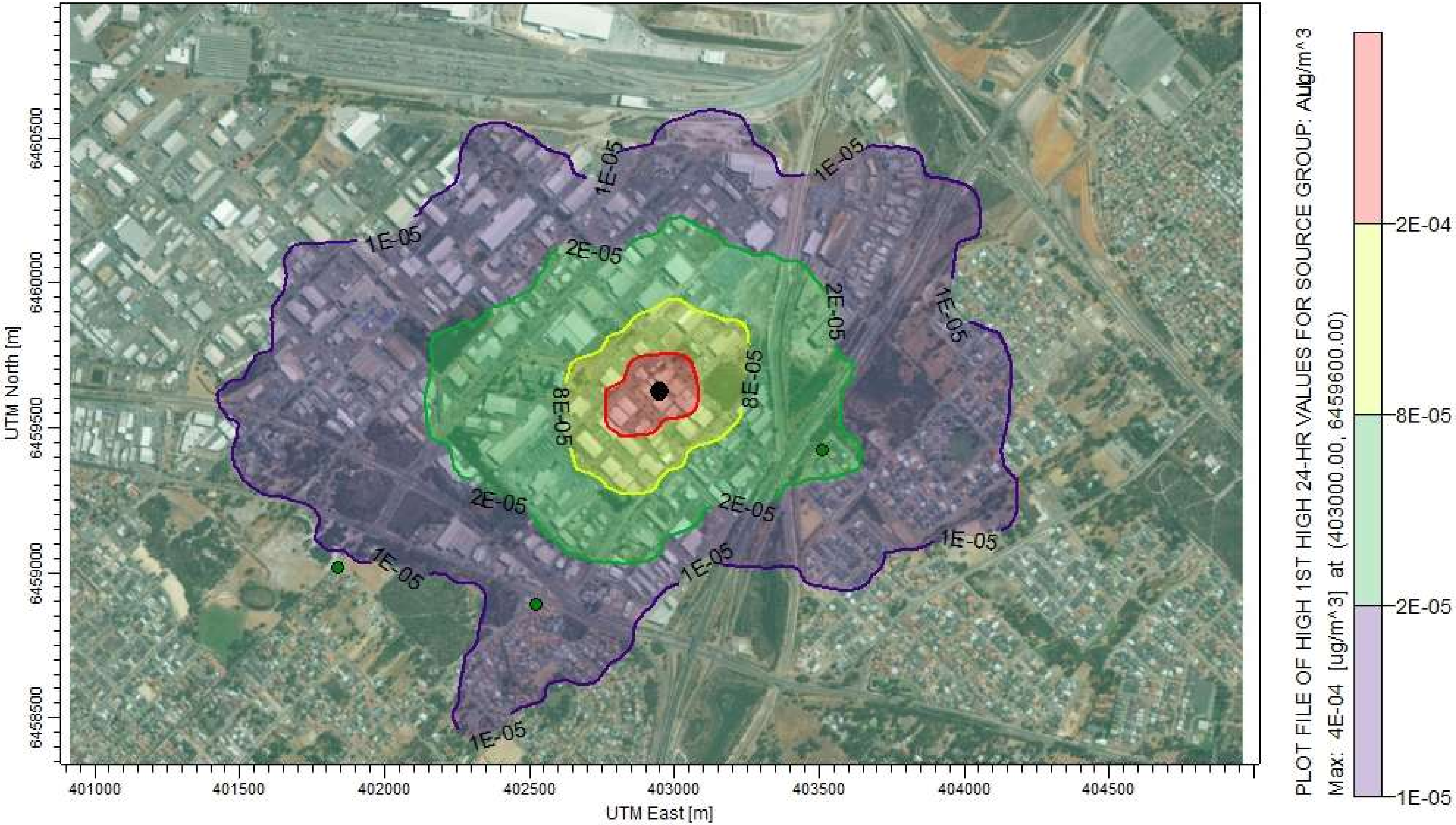

Figure 17: Maximum As 24-hr Ground Level Concentration µg/m³ (standard 0.03 µg/m³)

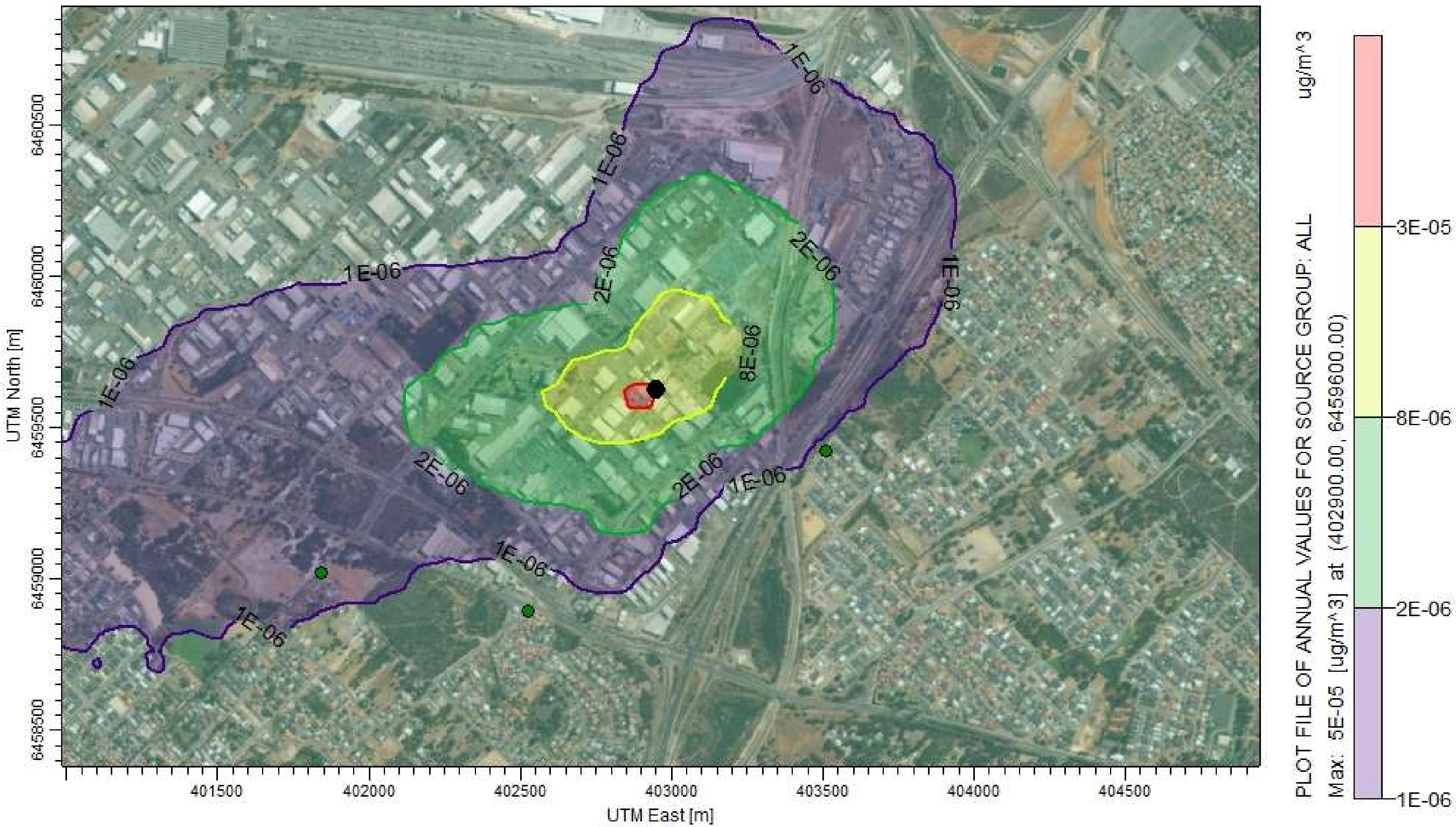

Figure 18: As Annual Average Ground Level Concentration µg/m³ (standard 0.003 µg/m³)

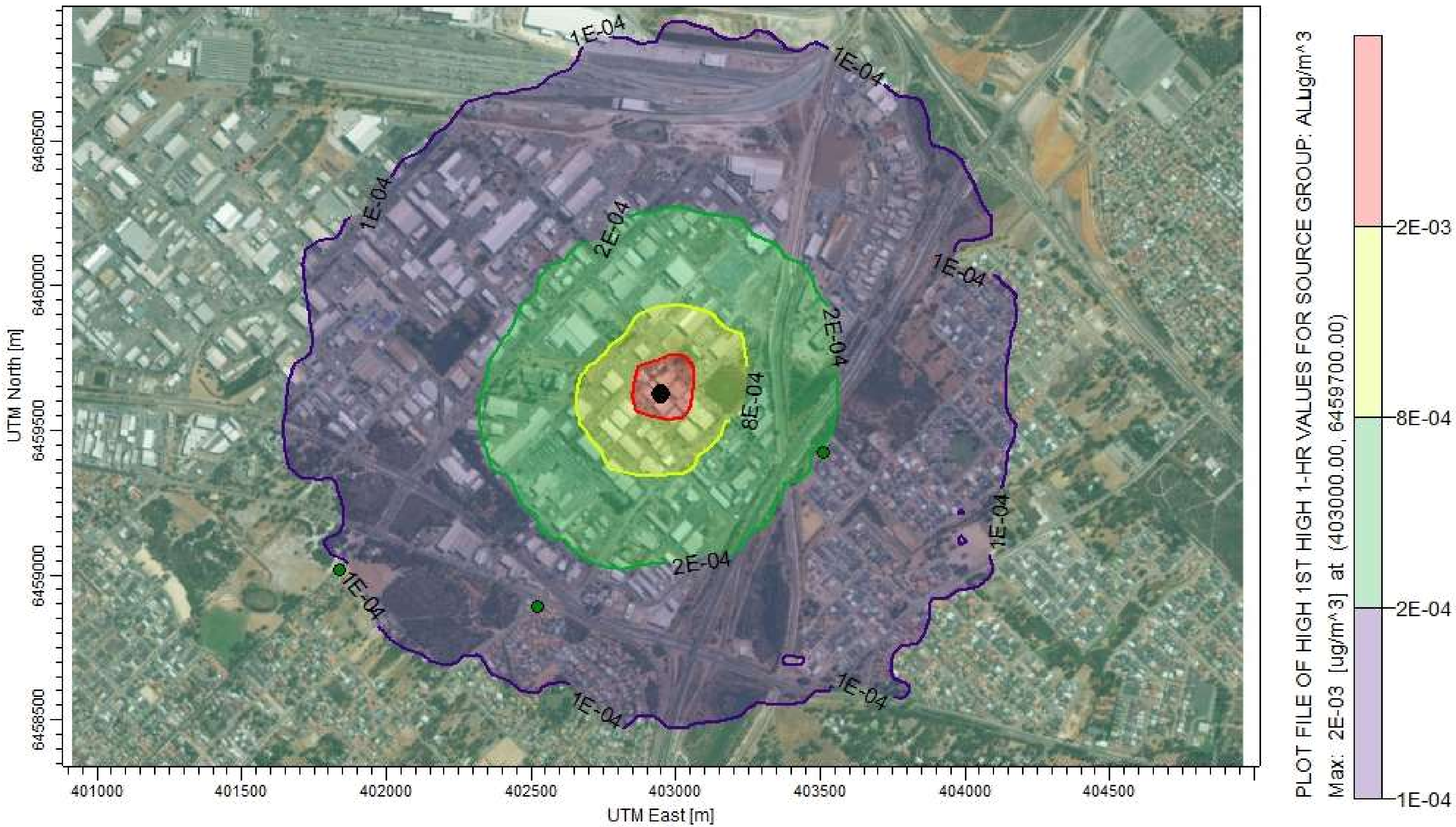

Figure 19: Maximum Cd 1-hr Ground Level Concentration µg/m³ (standard 0.018 µg/m³)

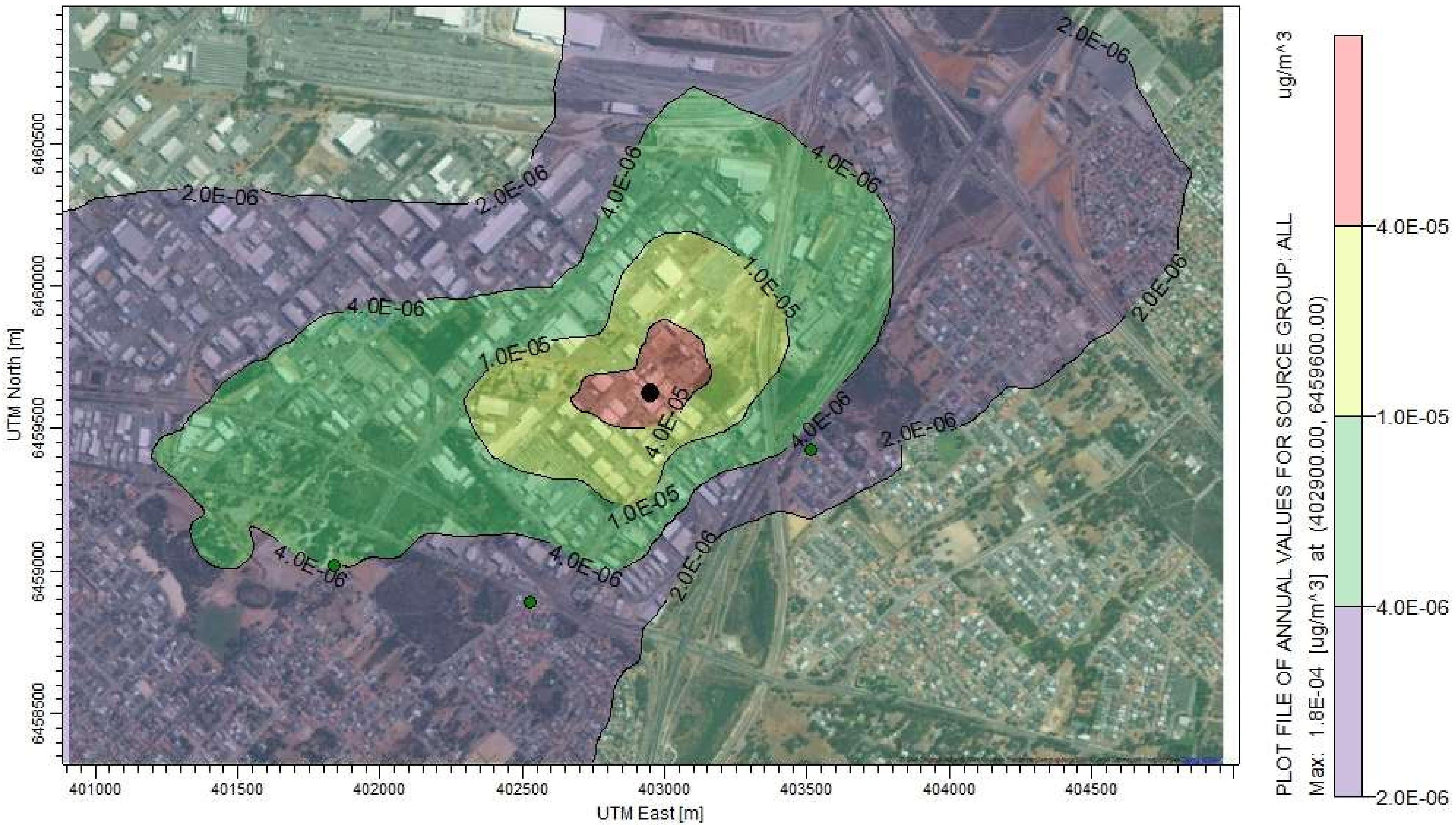

Figure 20: Cd Annual Average Ground Level Concentration μg/m³ (standard 0.005 μg/m³)

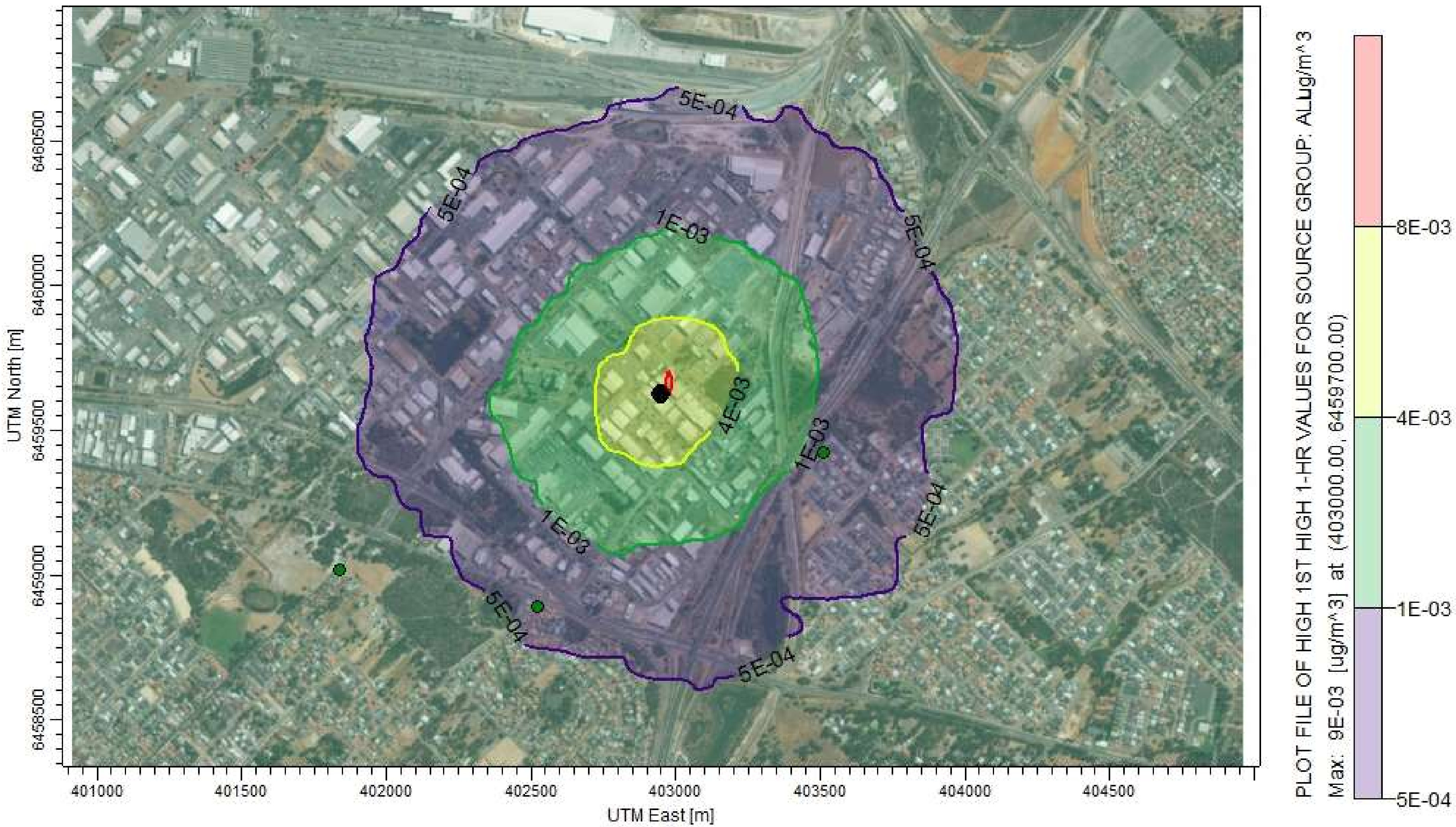

Figure 21: Maximum Co (Cobalt) 24-hr Ground Level Concentration µg/m³ (standard 0.1 µg/m³)

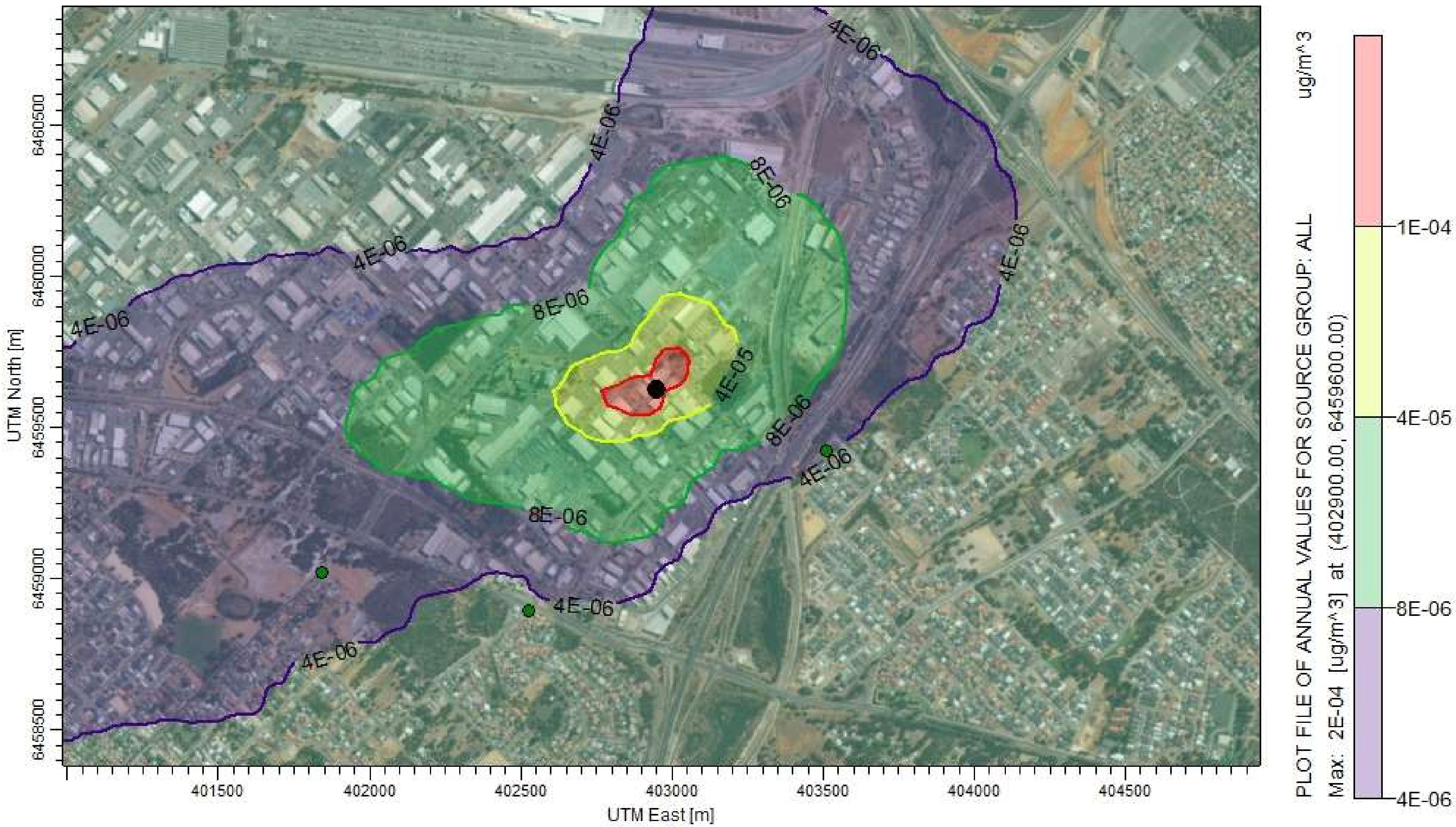

Figure 22: Cr (VI) Annual Average Ground Level Concentration µg/m³ (standard 0.0002 µg/m³)

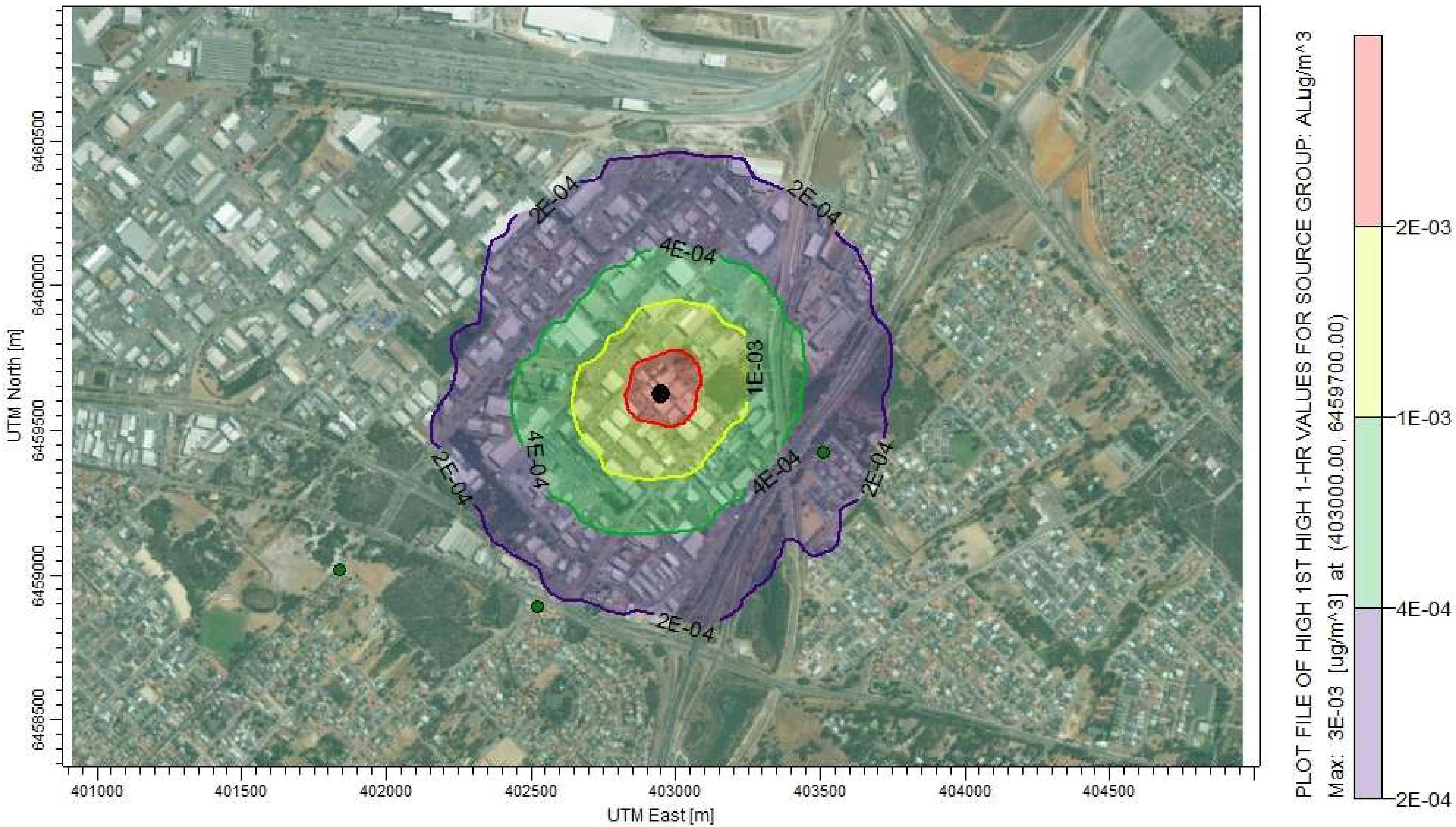

Figure 23: Maximum Cr (III) 1-hr Ground Level Concentration µg/m³ (standard 10 µg/m³)

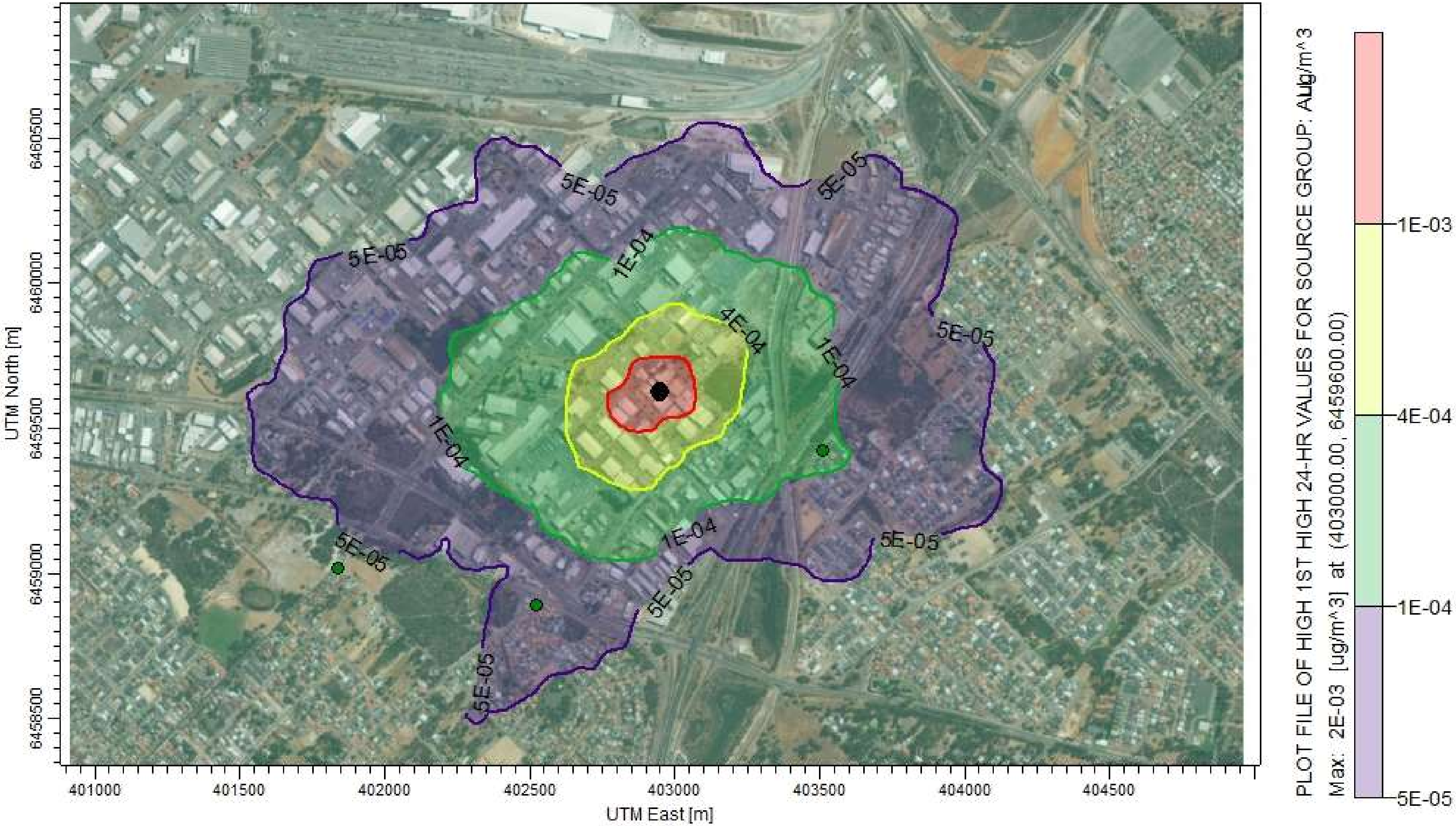

Figure 24: Maximum Cr (III) 24-hr Ground Level Concentration µg/m³ (standard 0.05 µg/m³)

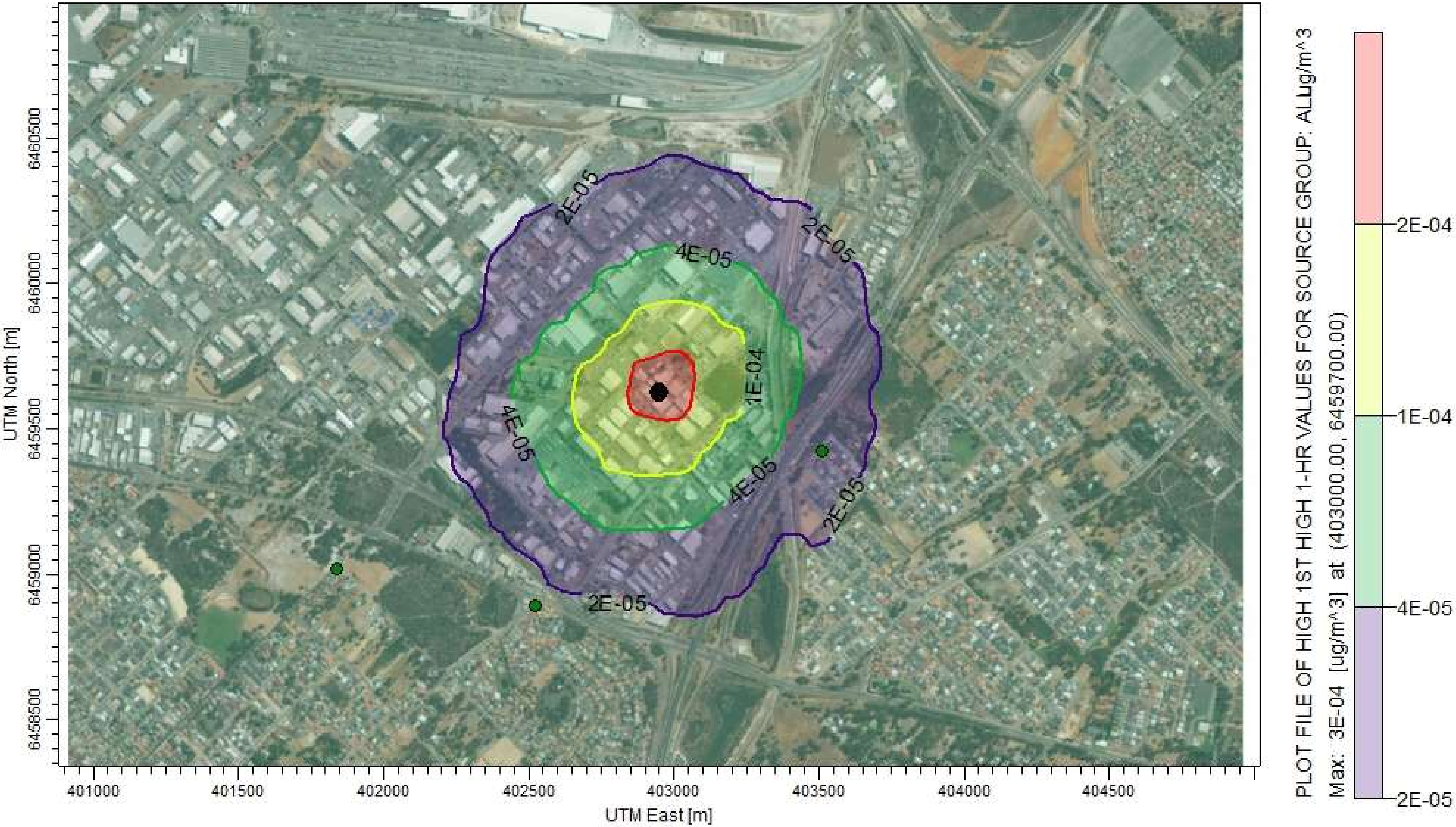

Figure 25: Maximum Hg 1-hr Ground Level Concentration µg/m³ (standard 1.8 µg/m³)

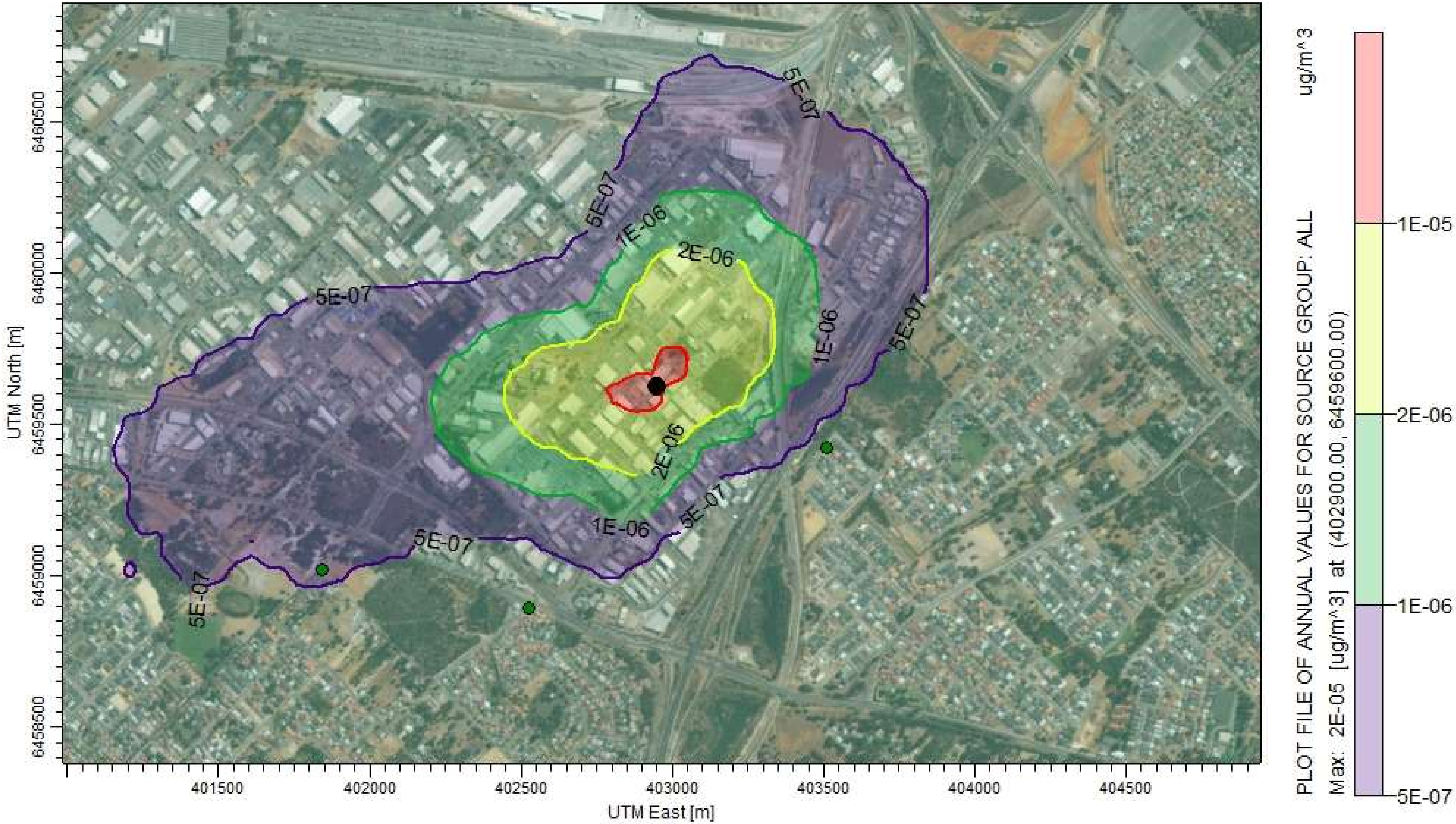

Figure 26: Hg Annual Average Ground Level Concentration μg/m³ (standard 0.2 μg/m³)

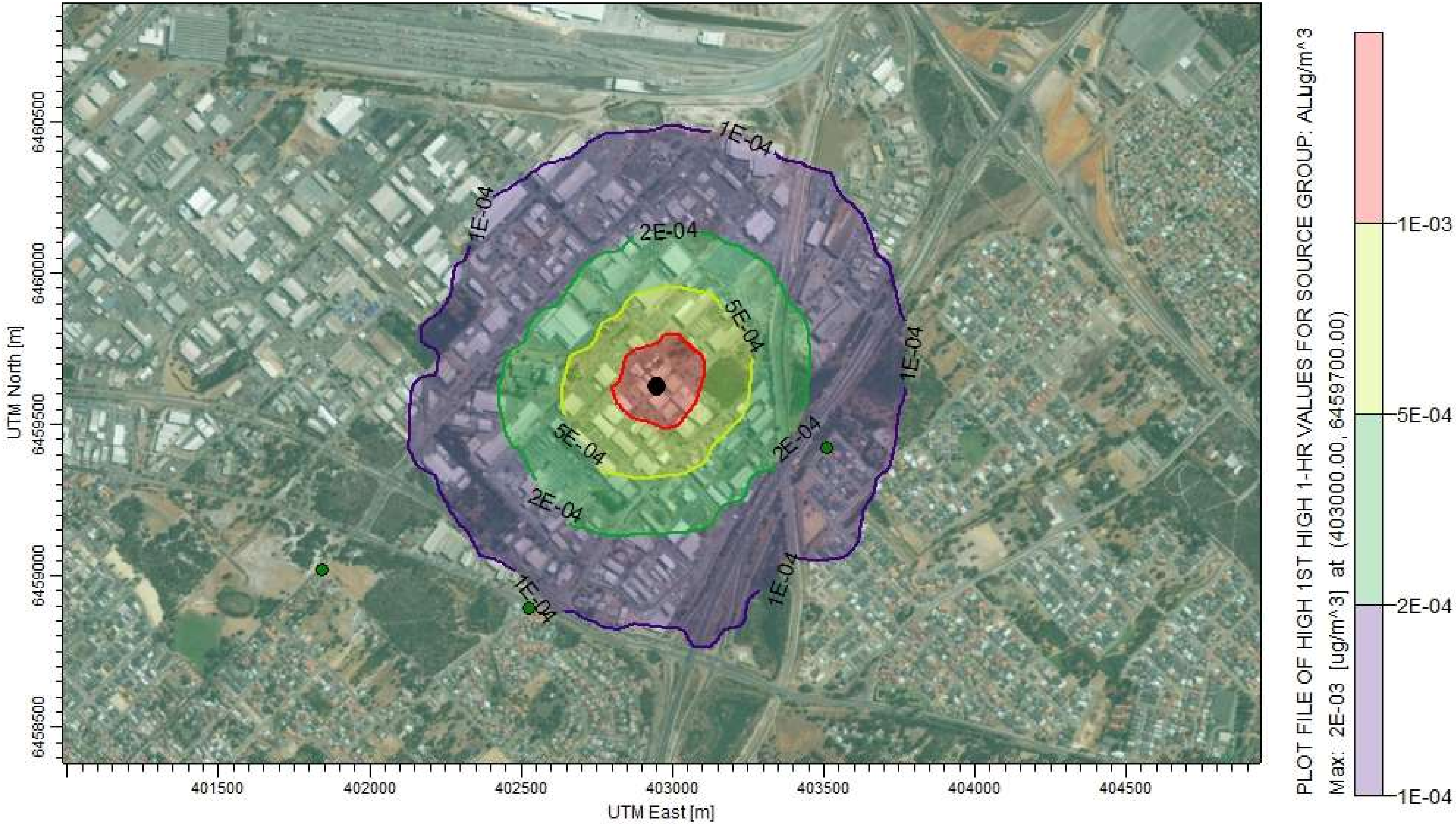

Figure 27: Maximum Mn 1-hr Ground Level Concentration µg/m³ (standard 18 µg/m³)

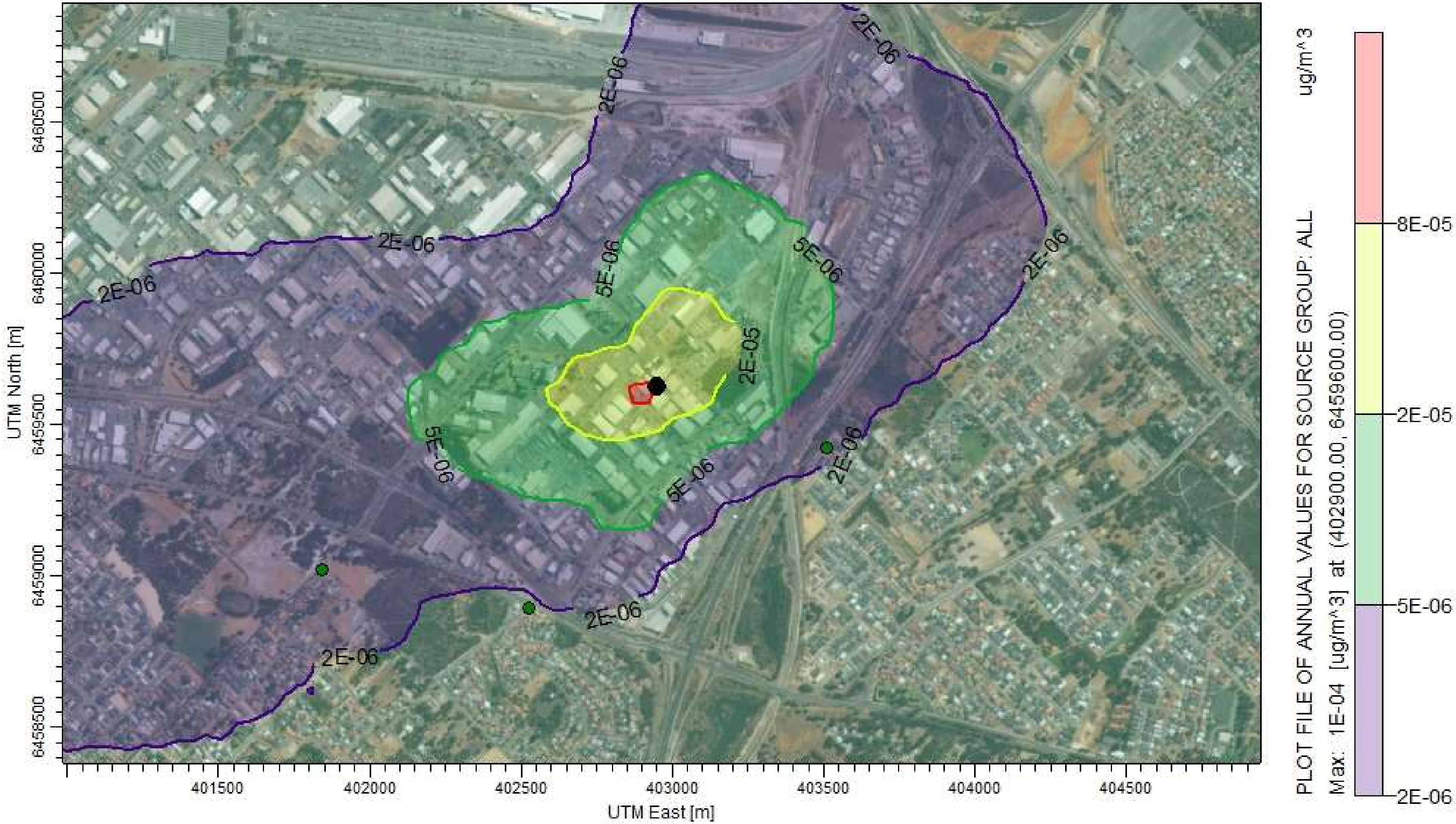

Figure 28: Mn Annual Average Ground Level Concentration µg/m³ (standard 0.15 µg/m³)

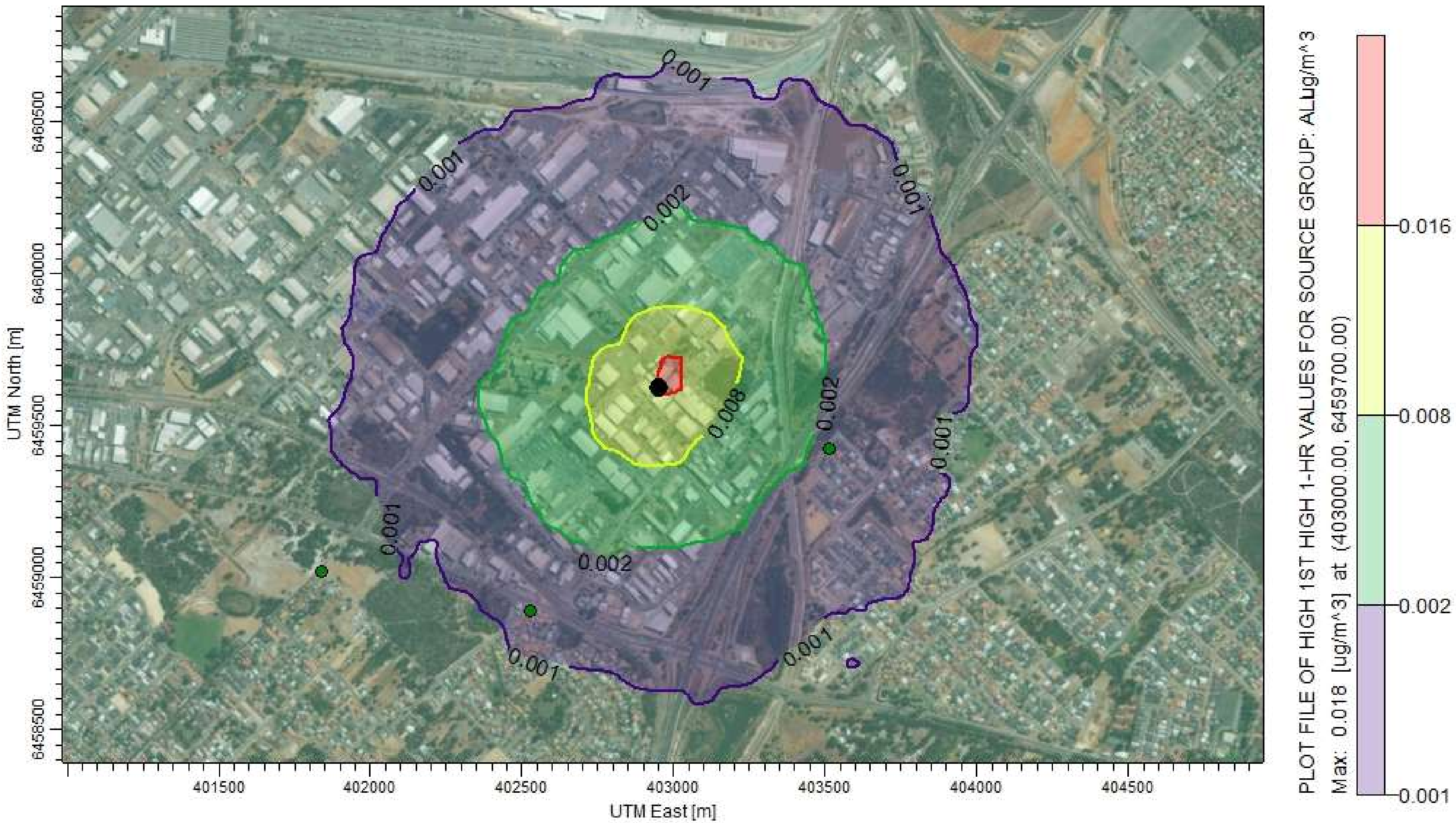

Figure 29: Maximum Ni 1-hr Ground Level Concentration μg/m³ (standard 0.18 μg/m³)

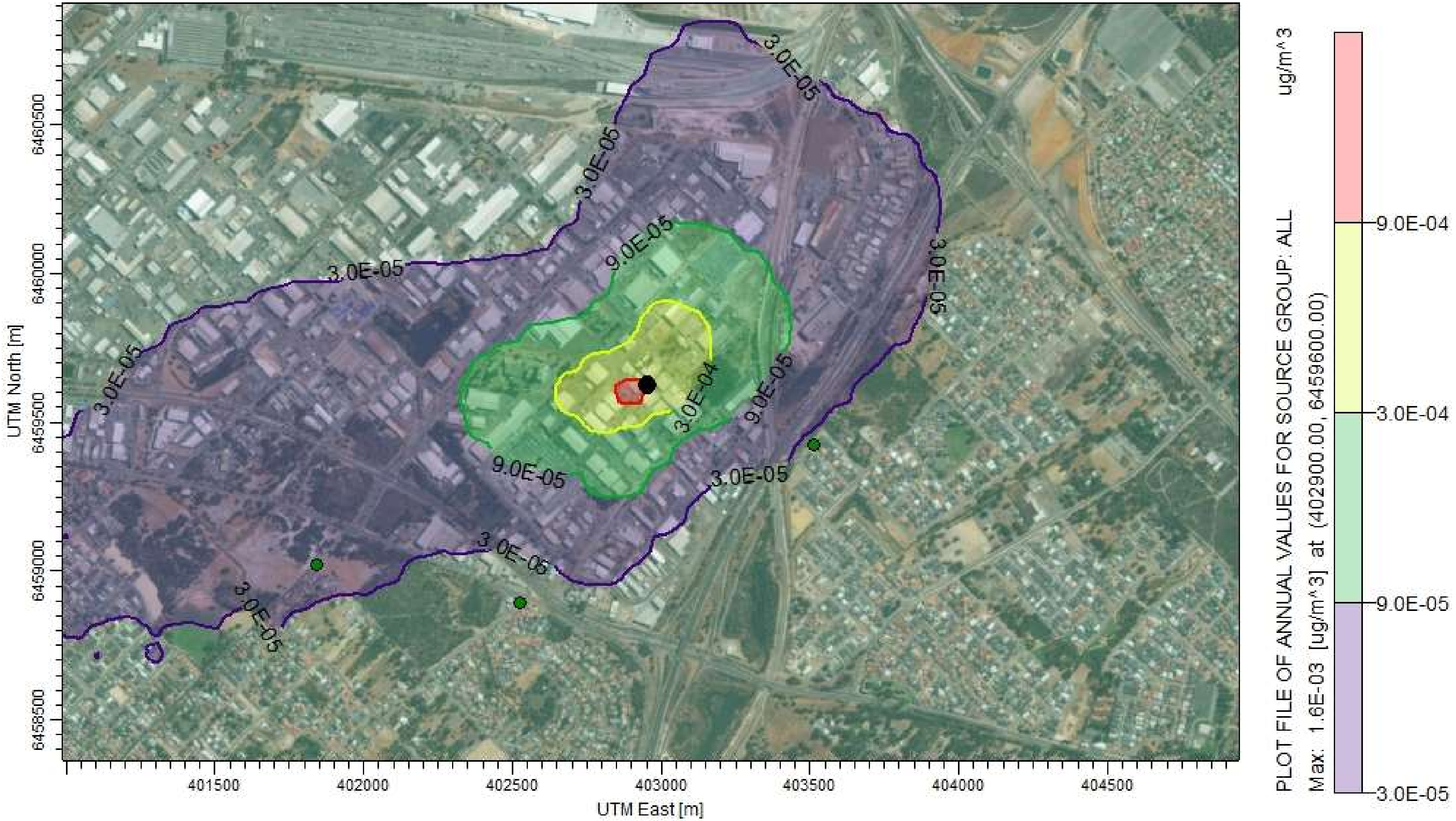

Figure 30: Ni Annual Average Ground Level Concentration µg/m³ (standard 0.003 µg/m³)

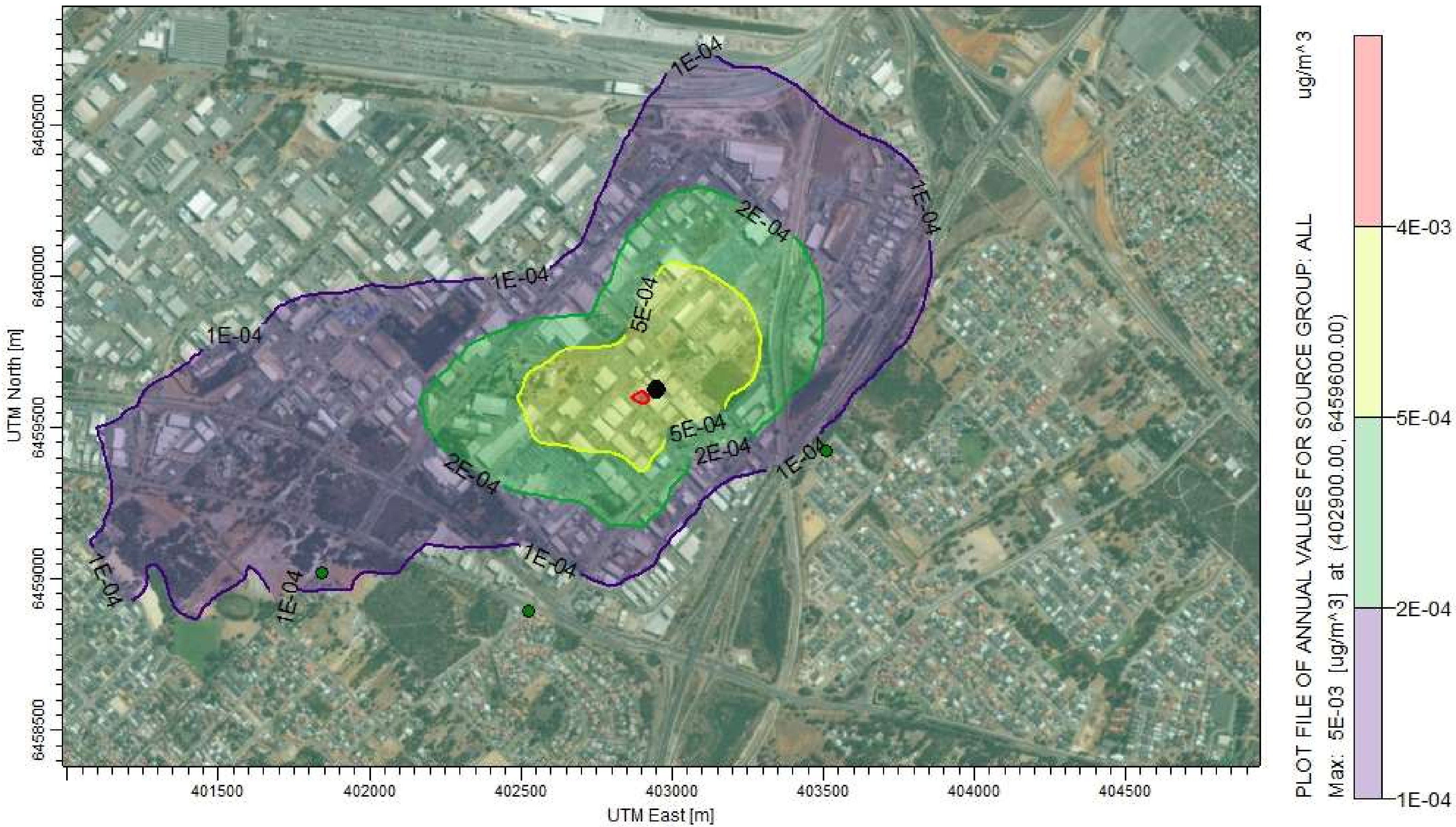

Figure 31: Pb Annual Average Ground Level Concentration µg/m³ (standard 0.5 µg/m³)

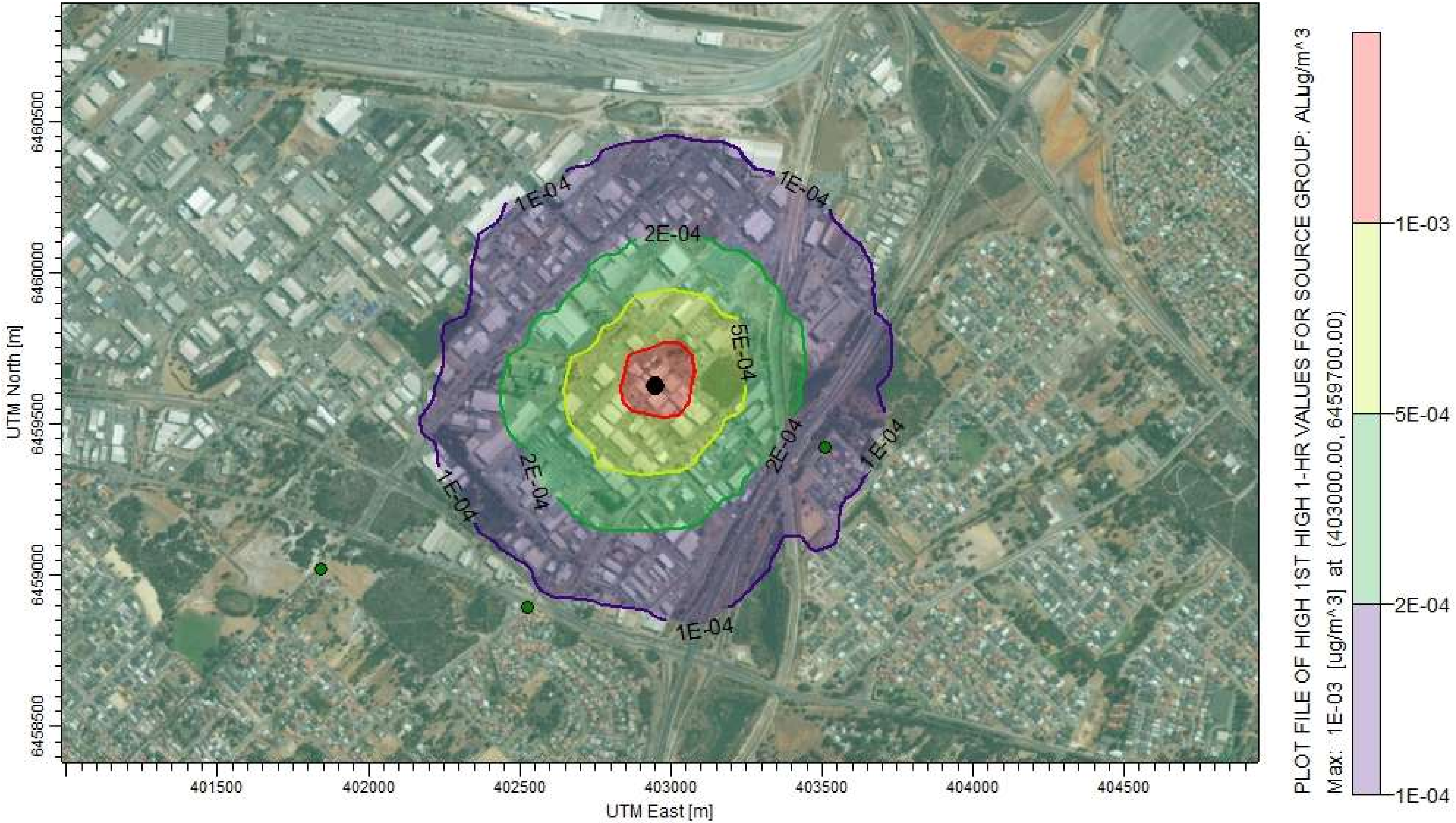

Figure 32: Maximum Sb 1-hr Ground Level Concentration µg/m³ (standard 9 µg/m³)

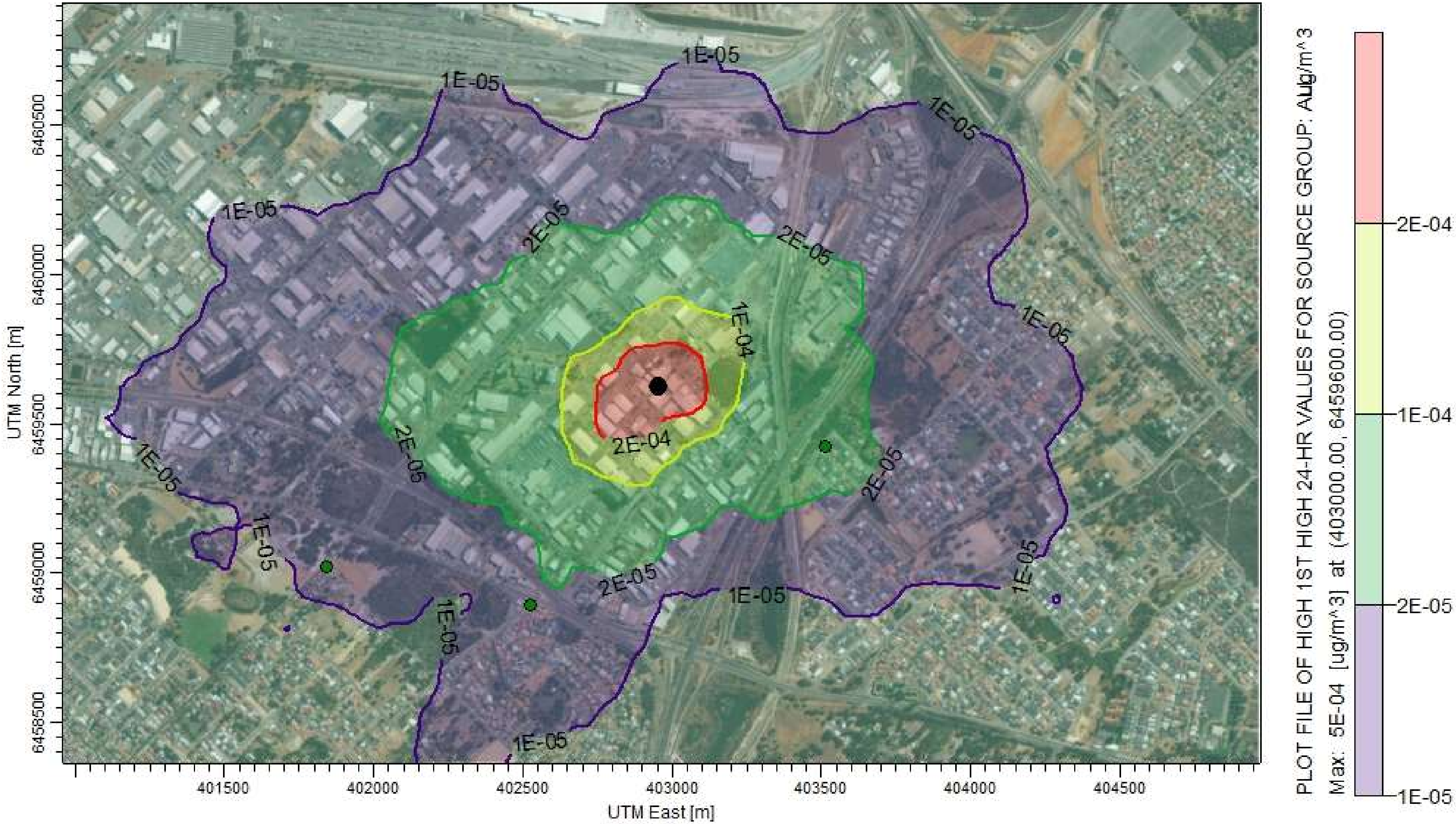

Figure 33: Maximum V 24-hr Ground Level Concentration μg/m³ (standard 1 μg/m³)

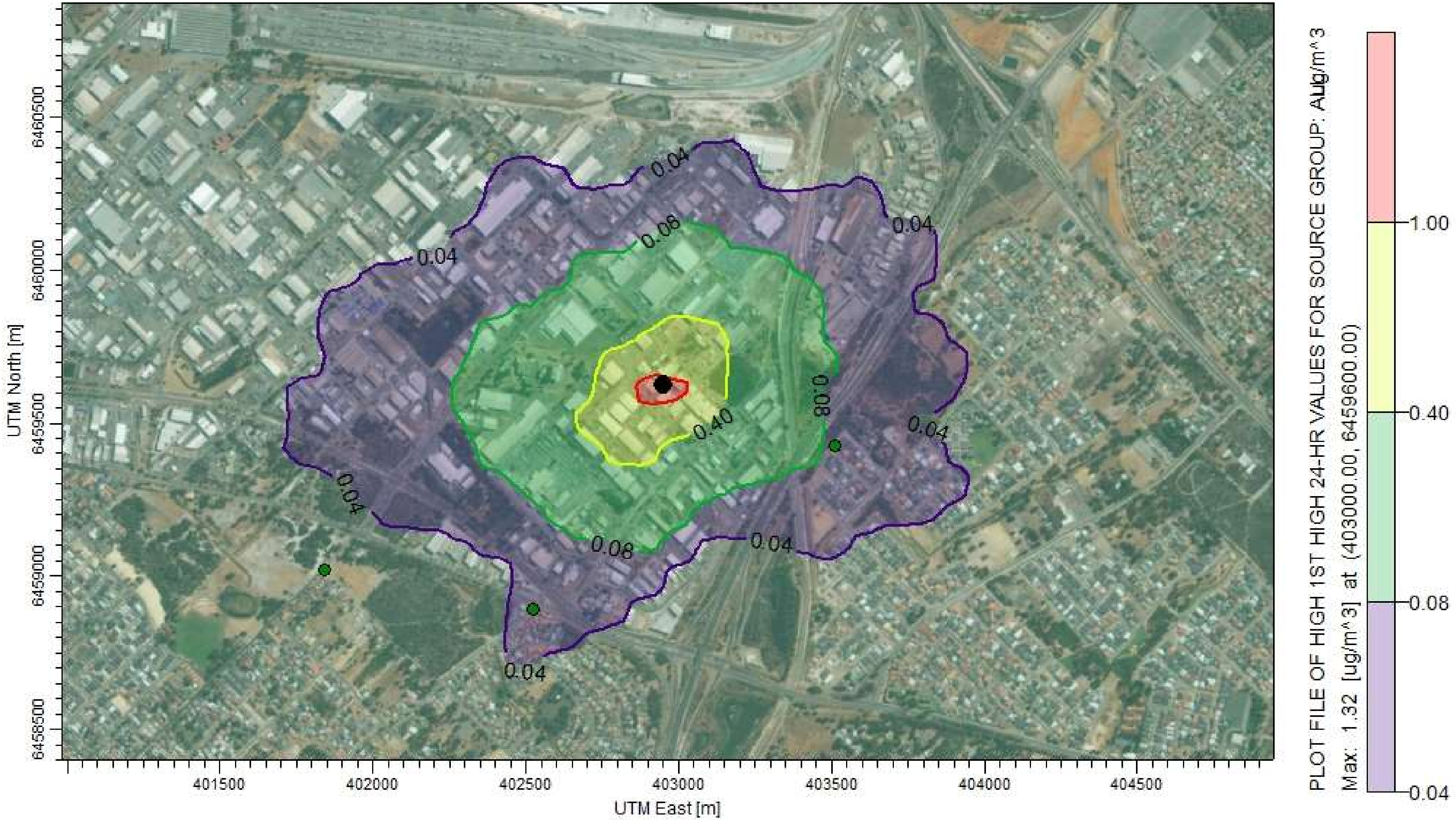

Figure 34: Maximum PM 24-hr Ground Level Concentration µg/m³ (90$_{TSP}$, 50$_{10}$, 25$_{2.5}$ µg/m³)

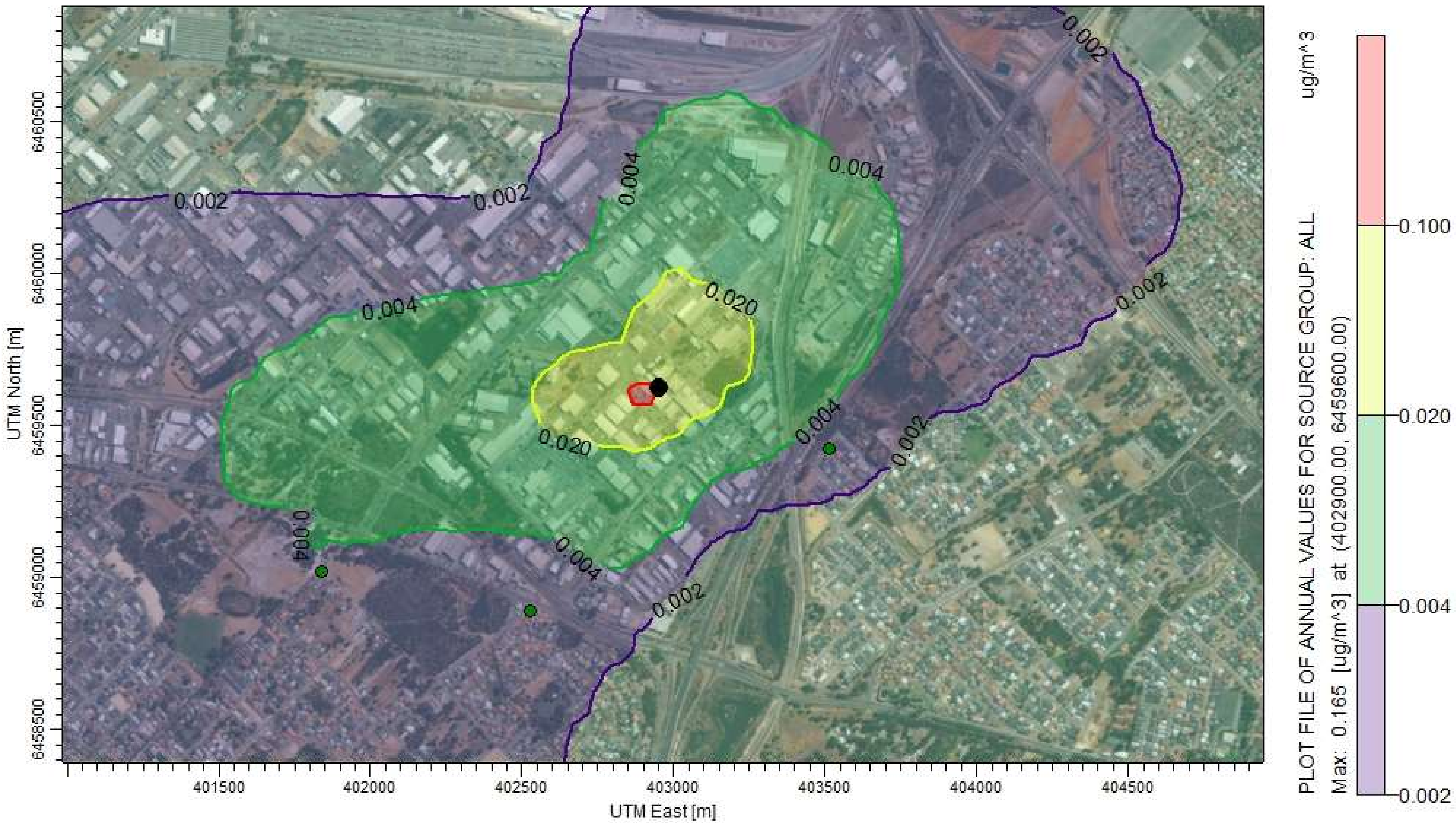

Figure 35: PM Annual Average Ground Level Concentration µg/m³ ($PM_{2.5}$ standard 8 µg/m³)

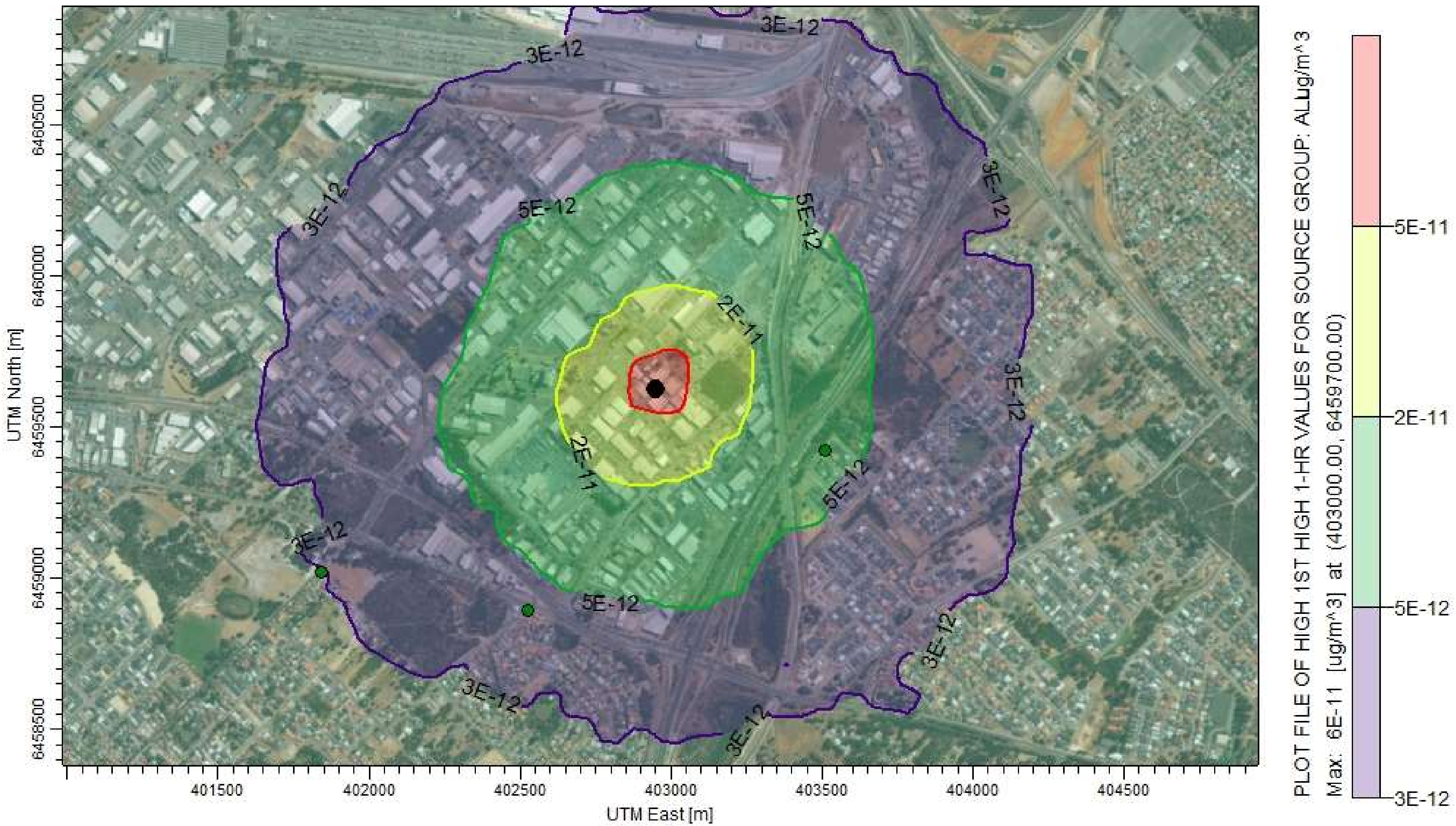

Figure 36: Maximum Dioxins (TEQ) 1-hr Ground Level Concentration µg/m³ (standard 1E-6 µg/m³)

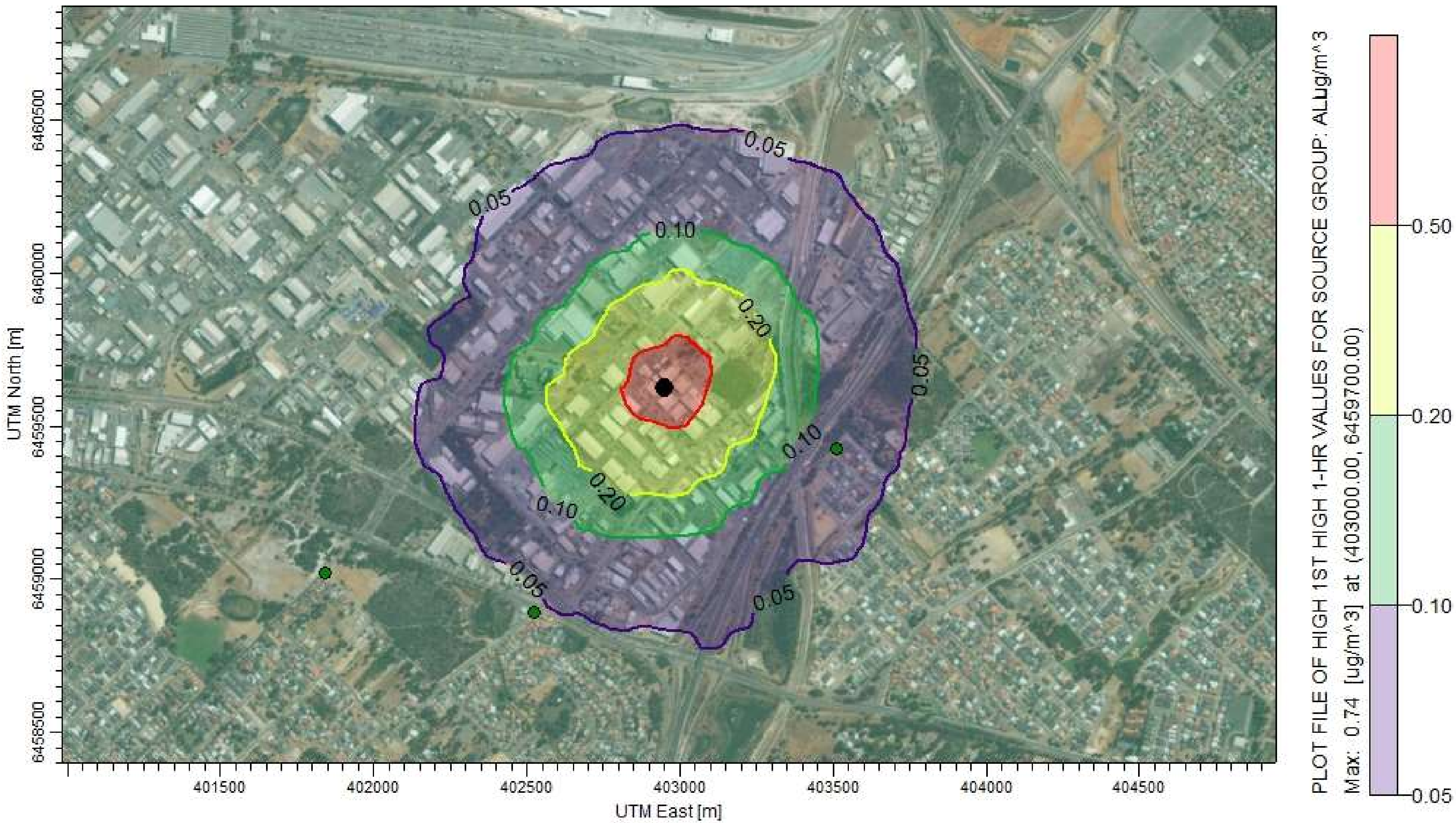

Figure 37: Maximum Ethane 1-hr Ground Level Concentration µg/m³ (no standard µg/m³)

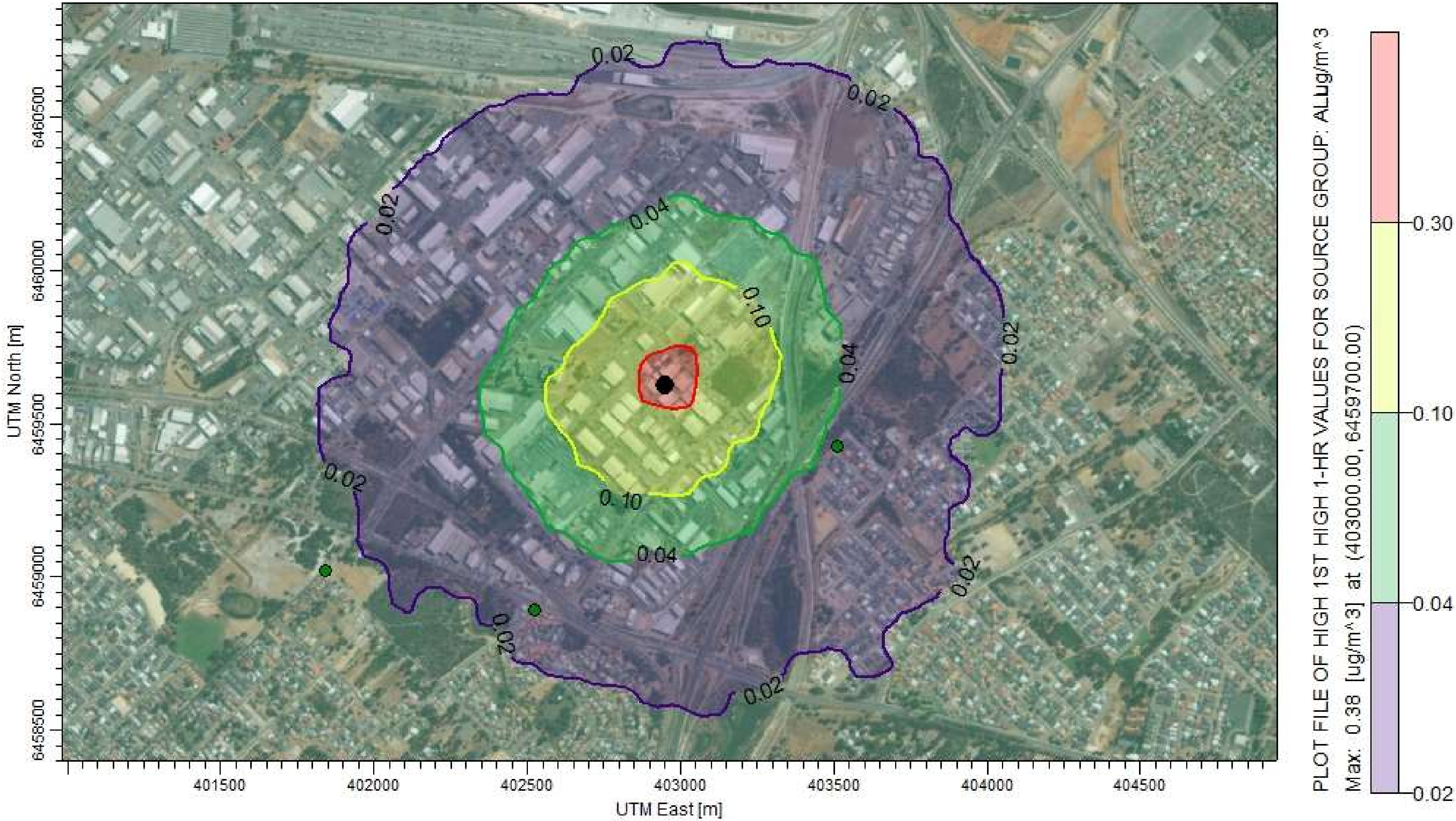

Figure 38: Maximum Propane 1-hr Ground Level Concentration µg/m³ (no standard µg/m³)

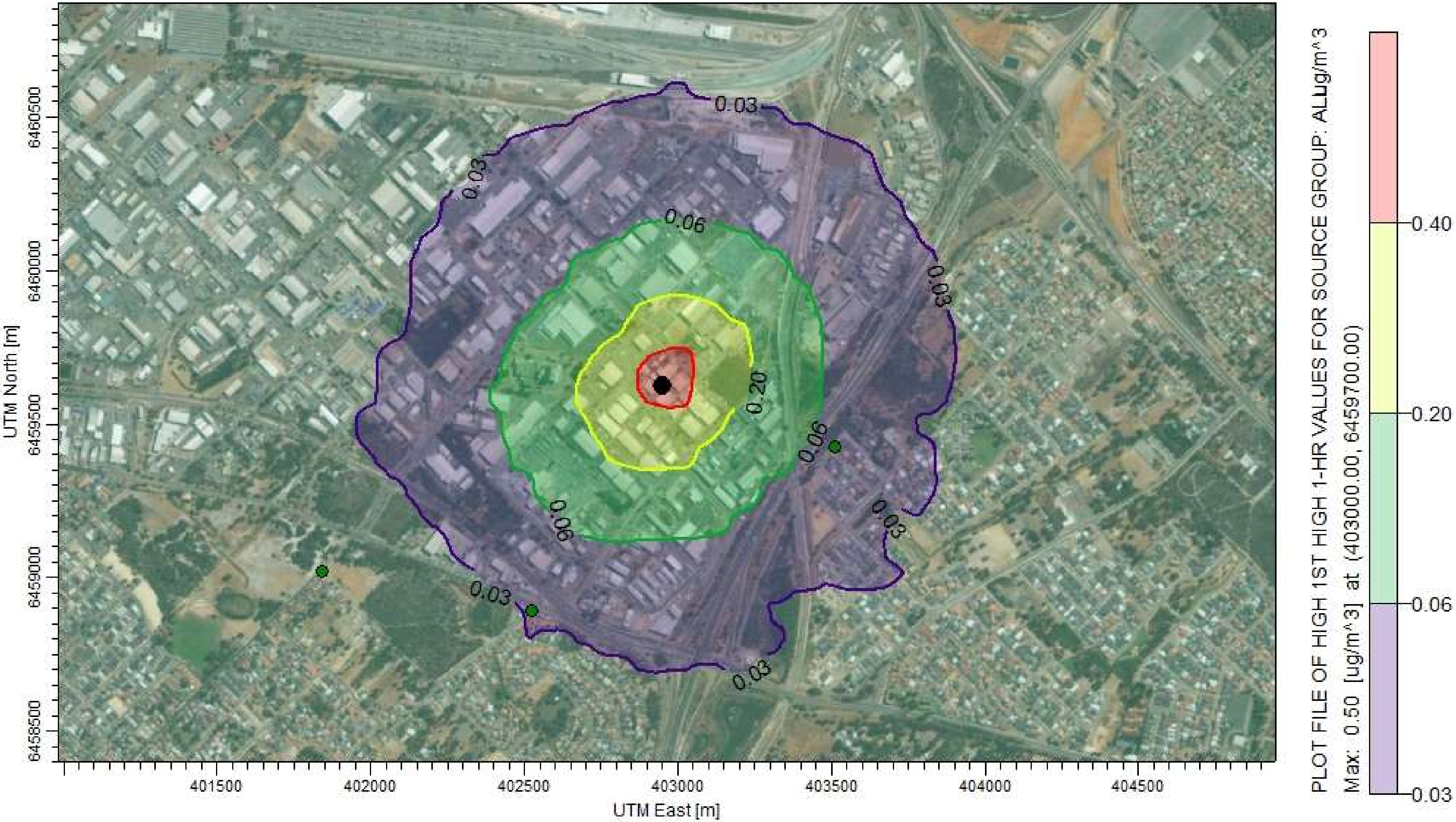

Figure 39: Maximum Butane 1-hr Ground Level Concentration µg/m³ (no standard µg/m³)

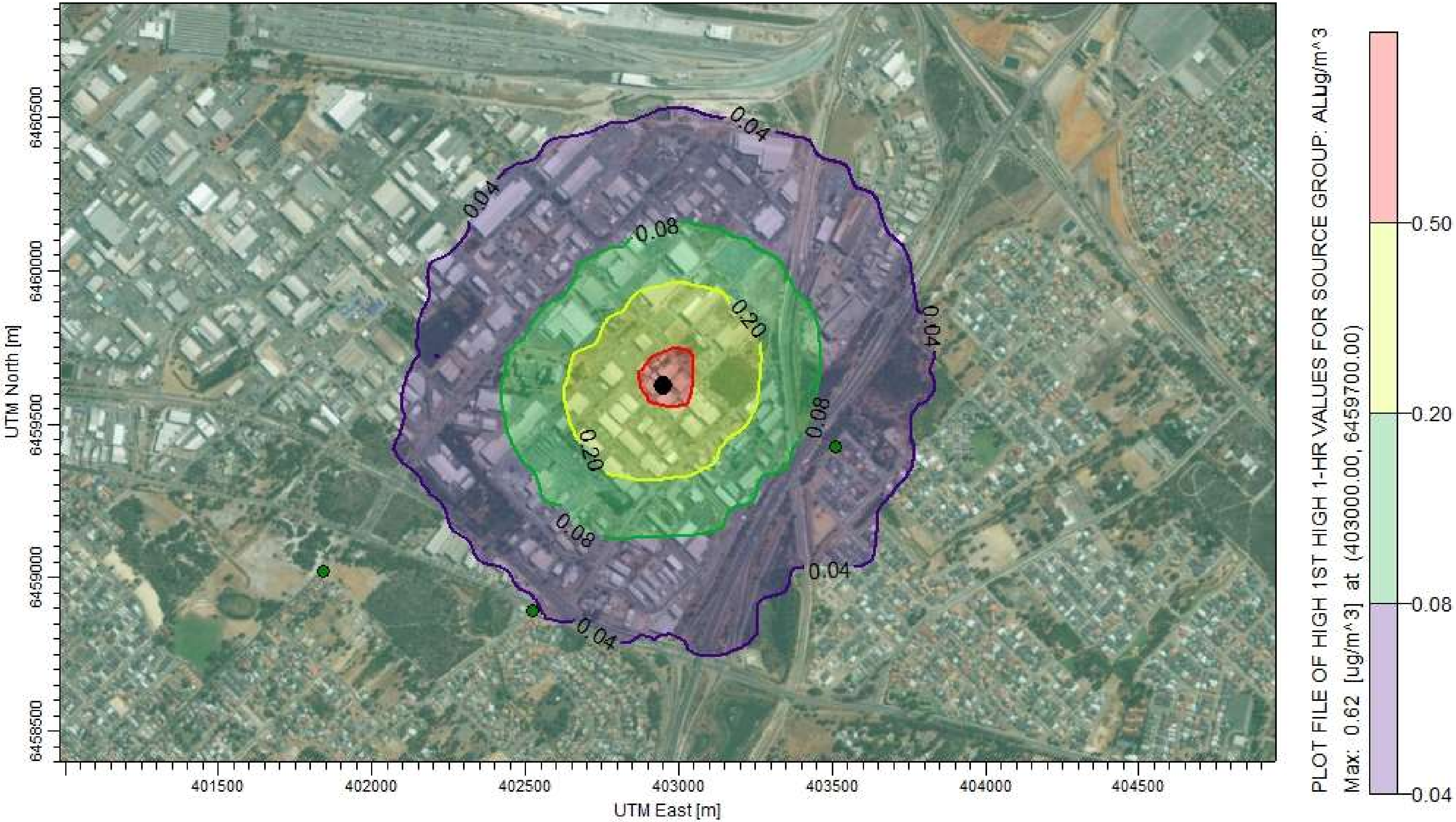

Figure 40: Maximum Pentane 1-hr Ground Level Concentration µg/m³ (no standard µg/m³)

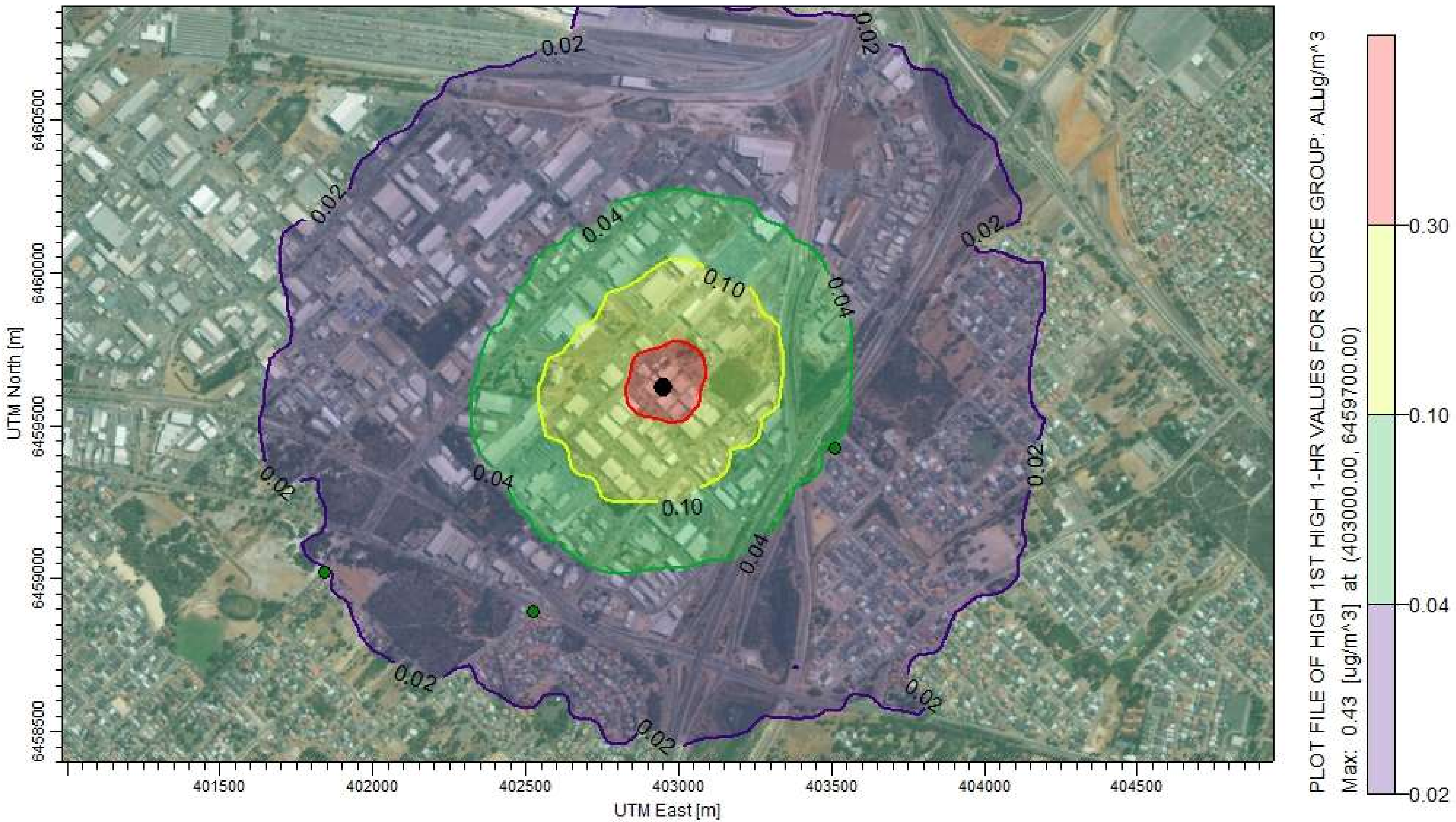

Figure 41: Maximum Hexane 1-hr Ground Level Concentration μg/m³ (no standard μg/m³)

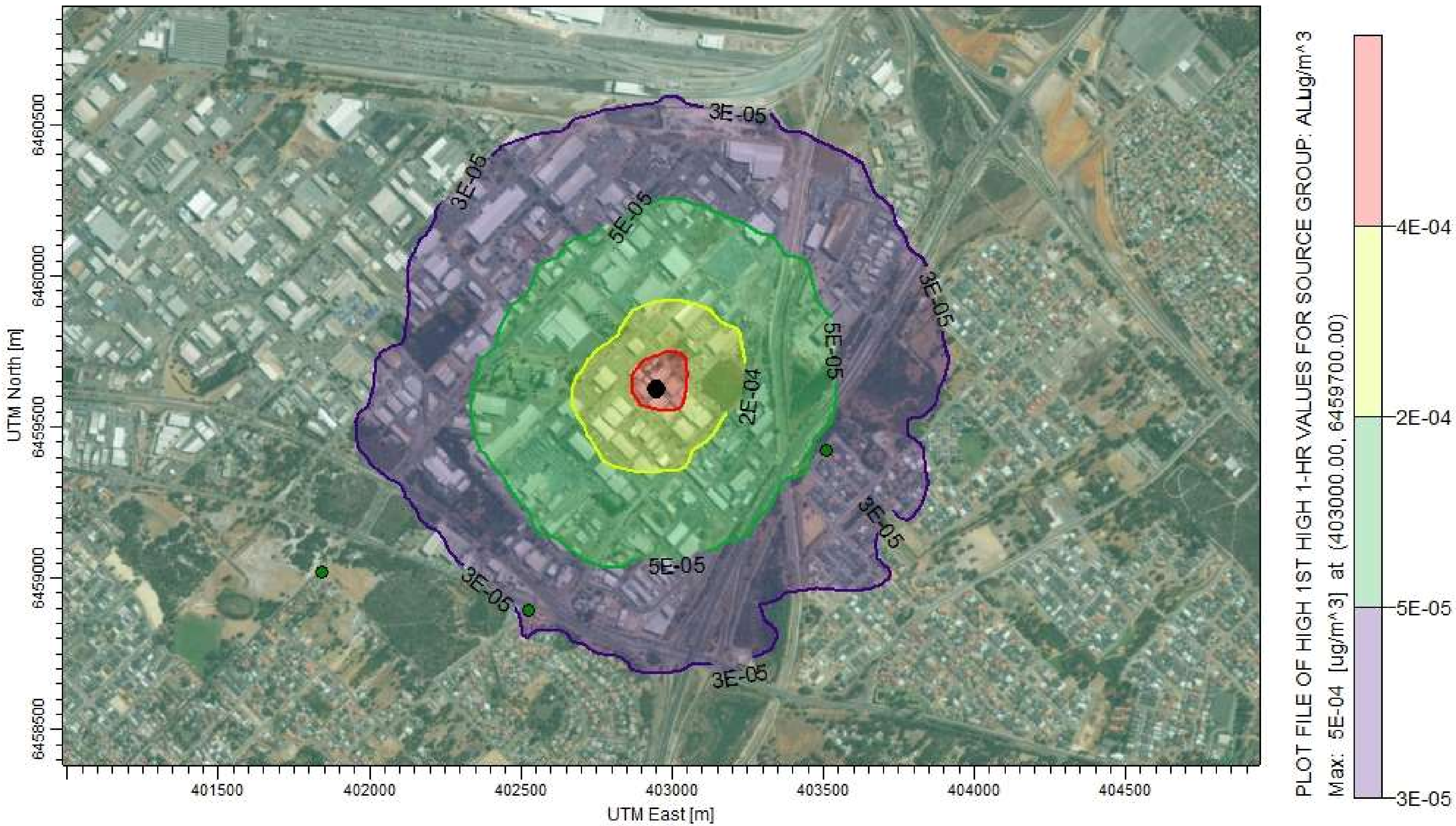

Figure 42: Maximum Benzene 1-hr Ground Level Concentration μg/m³ (no standard μg/m³)

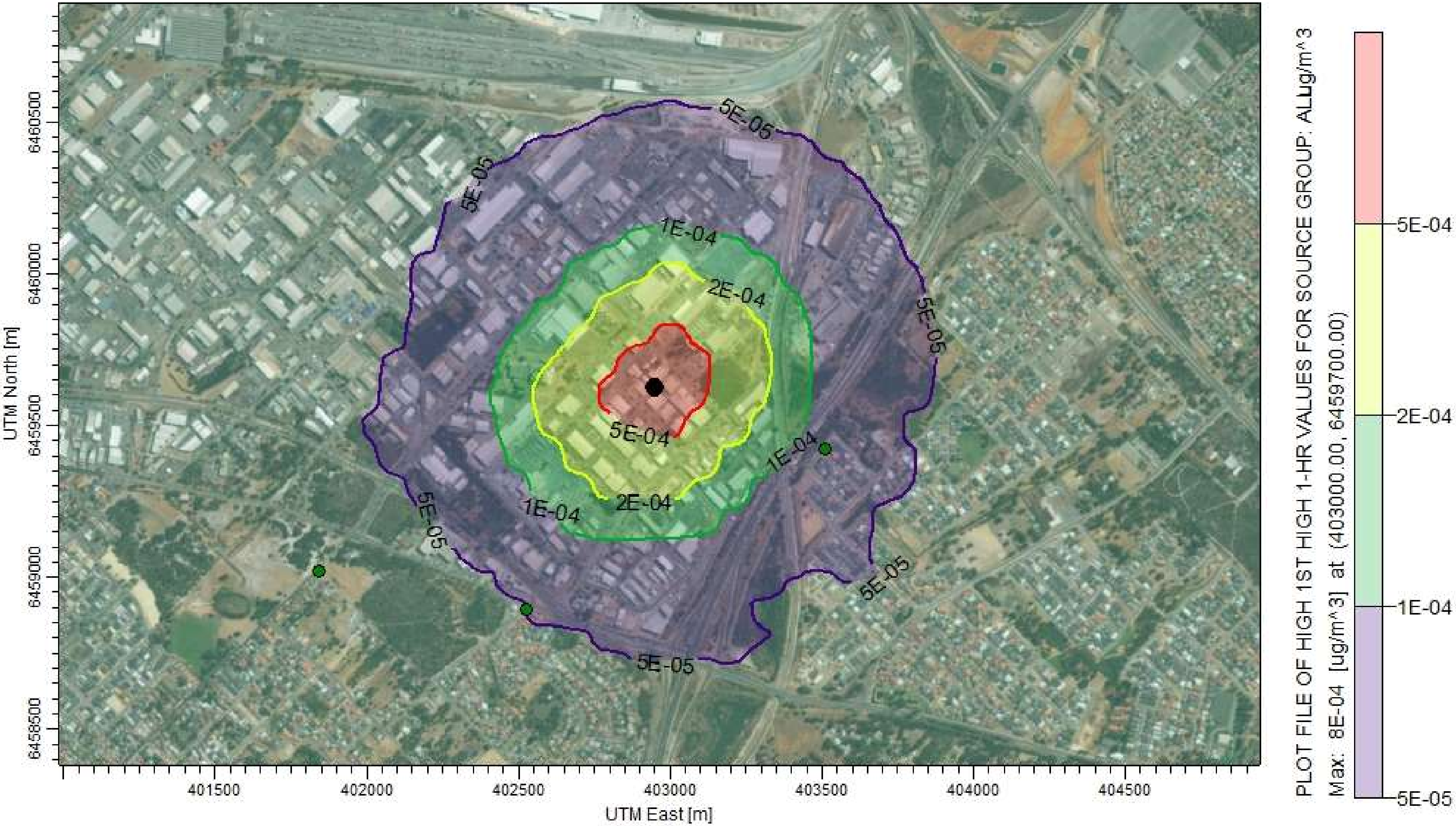

Figure 43: Maximum Toluene 1-hr Ground Level Concentration µg/m³ (no standard µg/m³)

Appendix B: AERMOD Input File

```
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** AERMOD Input Produced by:
** AERMOD View Ver. 9.1.0
** Lakes Environmental Software Inc.
** Date: 28/06/2016
** File: 400Deg.ADI
****************************************

****************************************
** AERMOD Control Pathway
****************************************
CO STARTING
   TITLEONE 400Deg.isc
   MODELOPT DFAULT CONC
   AVERTIME 1 8 24 ANNUAL
   URBANOPT 1000000
   POLLUTID TRACER
   RUNORNOT RUN
   ERRORFIL 400Deg.err
CO FINISHED

****************************************
** AERMOD Source Pathway
****************************************
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION STACK       POINT      402950.000  6459625.000      21.110
** DESCRSRC Stack
** Source Parameters **
   SRCPARAM STACK           1.0    15.000   673.150  15.40000     0.800

** Building Downwash **
   BUILDHGT STACK         8.00     8.00     8.00     8.00     8.00     8.00
   BUILDWID STACK        49.16    50.59    50.49    48.84    50.27    50.69
   BUILDLEN STACK        37.52    31.02    23.58    15.42    22.00    29.61
   XBADJ    STACK       -17.98   -14.74   -11.05    -7.03   -10.39   -14.29
   YBADJ    STACK        -0.01     0.12     0.26     0.38     0.50     0.59

   URBANSRC ALL
   SRCGROUP ALL
SO FINISHED

****************************************
** AERMOD Receptor Pathway
****************************************
RE STARTING
   INCLUDED 400Deg.rou
RE FINISHED

****************************************
** AERMOD Meteorology Pathway
****************************************
ME STARTING
```

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   SURFFILE ..\Perth.SFC
** Profile File Path: ..\
   PROFFILE ..\Perth.PFL
   SURFDATA 0 2010 Perth
   UAIRDATA 1 2010
   SITEDATA 1 2010
   PROFBASE 23.0 METERS
ME FINISHED

****************************************
** AERMOD Output Pathway
****************************************
OU STARTING
   RECTABLE ALLAVE 1ST
   RECTABLE 1 1ST
   RECTABLE 8 1ST
   RECTABLE 24 1ST
** Auto-Generated Plotfiles
   PLOTFILE 1 ALL 1ST 400DEG.AD\01H1GALL.PLT 31
   PLOTFILE 8 ALL 1ST 400DEG.AD\08H1GALL.PLT 32
   PLOTFILE 24 ALL 1ST 400DEG.AD\24H1GALL.PLT 33
   PLOTFILE ANNUAL ALL 400DEG.AD\AN00GALL.PLT 34
   SUMMFILE 400Deg.sum
OU FINISHED

****************************************
** Project Parameters
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** PROJCTN  CoordinateSystemUTM
** DESCPTN  UTM: Universal Transverse Mercator
** DATUM    World Geodetic System 1984
** DTMRGN   Global Definition
** UNITS    m
** ZONE     -50
** ZONEINX  0
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