New SMR Power Plant at the Temelín site

Air Dispersion Study

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Table of Contents

1 INTRODUCTION 9
2 AREA CHARACTERISTICS 10
2.1 Project Location 10
2.2 Specification of the Calculation Area 11
3 INPUT DATA FOR MODEL CALCULATIONS 12
3.1 Terrain Topography Data 12
3.2 Meteorological Data 13
3.3 Specification of the Calculation Grid 14
3.4 Characteristics of Air Pollution Sources 16
3.4.1 Road Traffic on the Public Road Network 16
3.4.2 Stationary sources 24
3.4.3 Construction activities 26
4 AIR POLLUTION CALCULATION METHOD 40
4.1 Model Characteristics 40
4.2 Determination of Relevant Pollutants 41
4.3 Air Quality Limits Used 41
4.4 Calculated Air Pollution Characteristics 41
5 ANALYSIS AND ASSESSMENT OF THE AMBIENT CONCENTRATION SITUATION 42
5.1 Existing Condition 43
5.1.1 Ambient air pollution burden from nitrogen dioxide 43
5.1.2 Ambient air pollution burden from particulate matter 44
5.1.3 Ambient air pollution burden from benzene 47
5.1.4 Ambient air pollution burden from benzo(a)pyrene 48
5.2 Construction period – year 2034 49
5.2.1 Ambient air pollution burden from nitrogen dioxide 49
5.2.2 Ambient air pollution burden from particulate matter 55
5.2.3 Ambient air pollution burden from benzene 65
5.2.4 Ambient air pollution burden from benzo(a)pyrene 68
5.3 Operation period – year 2040 71
5.3.1 Ambient air pollution burden from nitrogen dioxide 71
5.3.2 Ambient air pollution burden from particulate matter 77
5.3.3 Ambient air pollution burden from benzene 86
5.3.4 Ambient air pollution burden from benzo(a)pyrene 89
5.4 Operation period – year 2042 92
5.4.1 Ambient air pollution burden from nitrogen dioxide 92
5.4.2 Ambient air pollution burden from particulate matter 98
5.4.3 Ambient air pollution burden from benzene 107
5.4.4 Ambient air pollution burden from benzo(a)pyrene 110
5.5 Compensatory Measures 113
6 CONCLUSION 115
7 INFORMATION SOURCES USED 117

List of Tables

Tab. 1 Stability-Classified Wind Rose for the Temelín site (2015–2024) 13
Tab. 2 Description of the assessed locations of the most affected residential development 15
Tab. 3 Identification of the affected road network 17
Tab. 4 Traffic volumes – existing condition 18
Tab. 5 Traffic volumes – zero options 19
Tab. 6 Traffic volumes – active options 19
Tab. 7 Emission factors for passenger cars (OA), light trucks (LN), and heavy trucks (TN) for the calculation year 2025 20
Tab. 8 Emission factors for passenger cars (OA), light trucks (LN), and heavy trucks (TN) for the calculation year 2034 21
Tab. 9 Emission factors for passenger cars (OA), light trucks (LN), and heavy trucks (TN) for the calculation year 2040 and higher 21
Tab. 10 Emission balance of road traffic in the affected area for individual calculation scenarios 23
Tab. 11 Proposed emission standards applicable to generator engines from 2019 24
Tab. 12 Emission characteristics of diesel generators during operation of SMR ETE 24
Tab. 13 Estimated quantity of machinery used and its mileage during topsoil stripping 29
Tab. 14 Estimated quantity of machinery and its mileage during transport of stripped topsoil to the stockpile 30
Tab. 15 Estimated quantity of machinery and its mileage during bulk earthworks 30
Tab. 16 Estimated quantity of machinery and its mileage during transport of unusable soil from excavations 31
Tab. 17 Estimated quantity of machinery and its mileage during construction of construction site facilities 31
Tab. 18 Estimated quantity of machinery and its mileage during construction of SMR ETE 35
Tab. 19 Deployment of construction machinery for MTB construction 39
Tab. 20 Legislative air quality limits for selected pollutants 41
Tab. 21 Ambient air quality monitoring results in 2024 44
Tab. 22 Results of the assessment for selected locations – average annual NO_2 concentrations – year 2034 52
Tab. 23 Results of the assessment for selected locations – maximum hourly NO_2 concentrations – year 2034 55
Tab. 24 Results of the assessment for selected locations – average annual PM_{10} concentrations – year 2034 58
Tab. 25 Results of the assessment for selected locations – maximum daily PM_{10} concentrations – year 2034 62
Tab. 26 Results of the assessment for selected locations – average annual $PM_{2.5}$ concentrations – year 2034 65
Tab. 27 Results of the assessment for selected locations – average annual benzene concentrations – year 2034 68
Tab. 28 Results of the assessment for selected locations – average annual benzo(a)pyrene concentrations – year 2034 71
Tab. 29 Results of the assessment for selected locations – average annual NO_2 concentrations – year 2040 74
Tab. 30 Results of the assessment for selected locations – maximum hourly NO_2 concentrations – year 2040 77

Tab. 31 Results of the assessment for selected locations – average annual PM_{10} concentrations – year 2040 80
Tab. 32 Results of the assessment for selected locations – maximum daily PM_{10} concentrations – year 2040 83
Tab. 33 Results of the assessment for selected locations – average annual $PM_{2.5}$ concentrations – year 2040 86
Tab. 34 Results of the assessment for selected locations – average annual benzene concentrations – year 2040 89
Tab. 35 Results of the assessment for selected locations – average annual benzo(a)pyrene concentrations – year 2040 92
Tab. 36 Results of the assessment for selected locations – average annual NO_2 concentrations – year 2042 95
Tab. 37 Results of the assessment for selected locations – maximum hourly NO_2 concentrations – year 2042 98
Tab. 38 Results of the assessment for selected locations – average annual PM_{10} concentrations – year 2042 101
Tab. 39 Results of the assessment for selected locations – maximum daily PM_{10} concentrations – year 2042 104
Tab. 40 Results of the assessment for selected locations – average annual $PM_{2.5}$ concentrations – year 2042 107
Tab. 41 Results of the assessment for selected locations – average annual benzene concentrations – year 2042 110
Tab. 42 Results of the assessment for selected locations – average annual benzo(a)pyrene concentrations – year 2042 113

List of Figures

Fig. 1 Project Location 10
Fig. 2 Definition of the Calculation Area 11
Fig. 3 Illustration of the Terrain Relief of the Area under Assessment 12
Fig. 4 Calculation grid in the affected area for calculating the effect of stationary sources and the effect of construction activities 14
Fig. 5 Identification of the nearest development locations 15
Fig. 6 Schematic of the affected road network 17
Fig. 7 Relationship between road surface dust loading and traffic volume 22
Fig. 8 Location of new stationary sources (DG) in the area of SMR ETE 25
Fig. 9 Division of areas for the construction of SMR ETE 26
Fig. 10 Model schedule for the topsoil stripping phase 28
Fig. 11 Model schedule for the bulk earthworks phase 28
Fig. 12 Model schedule for the construction of construction site facilities phase 29
Fig. 13 Model schedule for the SMR ETE construction phase 35
Fig. 14 Average annual NO_2 concentrations [$\mu g \cdot m^{-3}$] – existing condition 43
Fig. 15 Average annual PM_{10} concentrations [$\mu g \cdot m^{-3}$] – existing condition 45
Fig. 16 36th highest daily PM_{10} concentration [$\mu g \cdot m^{-3}$] – existing condition 46
Fig. 17 Average annual $PM_{2.5}$ concentrations [$\mu g \cdot m^{-3}$] – existing condition 47
Fig. 18 Average annual benzene concentrations [$\mu g \cdot m^{-3}$] – existing condition 48
Fig. 19 Average annual benzo(a)pyrene concentrations [$ng \cdot m^{-3}$] – existing condition 49

Fig. 20 Change in average annual NO_2 concentration [µg·m^{-3}] due to traffic – period 2034 without the Project 50
Fig. 21 Contribution of SMR ETE to the average annual NO_2 concentration [µg·m^{-3}] – period 2034 – construction of SMR ETE 51
Fig. 22 Change in maximum hourly NO_2 concentration [µg·m^{-3}] due to traffic – period 2034 without the Project 53
Fig. 23 Contribution of SMR ETE to the maximum hourly NO_2 concentration [µg·m^{-3}] – period 2034 – construction of SMR ETE 54
Fig. 24 Change in average annual PM_{10} concentration [µg·m^{-3}] due to traffic – period 2034 without the Project 56
Fig. 25 Contribution of SMR ETE to the average annual PM_{10} concentration [µg·m^{-3}] – period 2034 – construction of SMR ETE 57
Fig. 26 Change in maximum daily PM_{10} concentration [µg·m^{-3}] due to traffic – period 2034 without the Project 59
Fig. 27 Contribution of SMR ETE to the maximum daily PM_{10} concentration [µg·m^{-3}] – construction of SMR ETE – MTB construction period 61
Fig. 28 Change in average annual $PM_{2.5}$ concentration [µg·m^{-3}] due to traffic – period 2034 without the Project 63
Fig. 29 Contribution of SMR ETE to the average annual $PM_{2.5}$ concentration [µg·m^{-3}] – period 2034 – construction of SMR ETE 64
Fig. 30 Change in average annual benzene concentration [µg·m^{-3}] due to traffic – period 2034 without the Project 66
Fig. 31 Contribution of SMR ETE to the average annual benzene concentration [µg·m^{-3}] – period 2034 – construction of SMR ETE 67
Fig. 32 Change in average annual benzo(a)pyrene concentration [ng·m^{-3}] due to traffic – period 2034 without the Project 69
Fig. 33 Contribution of SMR ETE to the average annual benzo(a)pyrene concentration [ng·m^{-3}] – period 2034 – construction of SMR ETE 70
Fig. 34 Change in average annual NO_2 concentration [µg·m^{-3}] due to traffic – period 2040 without the Project 72
Fig. 35 Contribution of SMR ETE to the average annual NO_2 concentration [µg·m^{-3}] – period 2040 – operation of SMR ETE 73
Fig. 36 Change in maximum hourly NO_2 concentration [µg·m^{-3}] due to traffic – period 2040 without the Project 75
Fig. 37 Contribution of SMR ETE to the maximum hourly NO_2 concentration [µg·m^{-3}] – period 2040 – operation of SMR ETE 76
Fig. 38 Change in average annual PM_{10} concentration [µg·m^{-3}] due to traffic – period 2040 without the Project 78
Fig. 39 Contribution of SMR ETE to the average annual PM_{10} concentration [µg·m^{-3}] – period 2040 – operation of SMR ETE 79
Fig. 40 Change in maximum daily PM_{10} concentration [µg·m^{-3}] due to traffic – period 2040 without the Project 81
Fig. 41 Contribution of SMR ETE to the maximum daily PM_{10} concentration [µg·m^{-3}] – period 2040 – operation of SMR ETE 83
Fig. 42 Change in average annual $PM_{2.5}$ concentration [µg·m^{-3}] due to traffic – period 2040 without the Project 84
Fig. 43 Contribution of SMR ETE to the average annual $PM_{2.5}$ concentration [µg·m^{-3}] – period 2040 – operation of SMR ETE 85
Fig. 44 Change in average annual benzene concentration [µg·m^{-3}] due to traffic – period 2040 without the Project 87

Fig. 45 Contribution of SMR ETE to the average annual benzene concentration [µg·m^{-3}] – period 2040 – operation of SMR ETE 88
Fig. 46 Change in average annual benzo(a)pyrene concentration [ng·m^{-3}] due to traffic – period 2040 without the Project 90
Fig. 47 Contribution of SMR ETE to the average annual benzo(a)pyrene concentration [ng·m^{-3}] – period 2040 – operation of SMR ETE 91
Fig. 48 Change in average annual NO_2 concentration [µg·m^{-3}] due to traffic – period 2042 without the Project 93
Fig. 49 Contribution of SMR ETE to the average annual NO_2 concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE 94
Fig. 50 Change in maximum hourly NO_2 concentration [µg·m^{-3}] due to traffic – period 2042 without the Project 96
Fig. 51 Contribution of SMR ETE to the maximum hourly NO_2 concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE 97
Fig. 52 Change in average annual PM_{10} concentration [µg·m^{-3}] due to traffic – period 2042 without the Project 99
Fig. 53 Contribution of SMR ETE to the average annual PM_{10} concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE 100
Fig. 54 Change in maximum daily PM_{10} concentration [µg·m^{-3}] due to traffic – period 2042 without the Project 102
Fig. 55 Contribution of SMR ETE to the maximum daily PM_{10} concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE 103
Fig. 56 Change in average annual $PM_{2.5}$ concentration [µg·m^{-3}] due to traffic – period 2042 without the Project 105
Fig. 57 Contribution of SMR ETE to the average annual $PM_{2.5}$ concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE 106
Fig. 58 Change in average annual benzene concentration [µg·m^{-3}] due to traffic – period 2042 without the Project 108
Fig. 59 Contribution of SMR ETE to the average annual benzene concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE 109
Fig. 60 Change in average annual benzo(a)pyrene concentration [ng·m^{-3}] due to traffic – period 2042 without the Project 111
Fig. 61 Contribution of SMR ETE to the average annual benzo(a)pyrene concentration [ng·m^{-3}] – period 2042 – operation of SMR ETE 112

List of abbreviations

Abbreviation	Abbreviation description
ACT	active option with the Project
BaP	Benzo(a)pyrene
CHMI	Czech Hydrometeorological Institute
ČR	Czech Republic
DG	dieselgenerator
EEA	European Environment Agency
EIA	Environmental Impact Assessment
EMEP	European Monitoring and Evaluation Programme
EPA	Environmental Protection Agency
ETE1,2	Temelín Nuclear Power Plant
HTÚ	bulk earthworks
MTB	main technological building
LN	light-duty freight vehicle
LHO	light heating oil
LV	limit value
MŽP	Ministry of the Environment
New NPP ETE	New Nuclear Power Plant at the Temelín site
NUL	zero option without the Project
OA	passenger car
OZKO	areas with deteriorated air quality
PM	particulate matter / solid pollutants
PZKO	Air Quality Improvement Programme
REZZO	Register of Emissions and Air Pollution Sources
SMR	small modular reactor
SMR ETE	New SMR Power Plant at the Temelín site
TN	heavy truck
TZL	solid pollutants
VoL	number of days exceeding the 24-hour limit
ZS	construction site facilities

1 Introduction

This Air Dispersion Study has been prepared pursuant to Act No. 201/2012 Coll., on Air Protection, as amended[1], and complies with the Methodological Guideline of the Air Protection Department of the Ministry of the Environment for the Preparation of Air Dispersion Studies[2]. The study serves as a source document for the documentation within the environmental impact assessment process for the Project of New SMR Power Plant at the Temelín site (SMR ETE) pursuant to Act No. 100/2001 Coll., on environmental impact assessment and on the amendment of certain related acts, as amended[3].

The subject of the Project is the construction of a new SMR-type power plant, including all related building structures and operational units (technological equipment) serving the generation and evacuation of electrical energy and ensuring the safe operation of the nuclear facility.

The study addresses the effect of all non-radioactive stationary, line and area sources from both the operation of SMR ETE and the construction of the Project itself, while also assessing the effect of generated road traffic. The calculations assess both the contribution of the implementation of SMR ETE and the potential overall change in the ambient air pollution burden of all pollutants for which the described technological equipment and activities (including traffic) are a relevant source, including the cumulative effects of the planned New Nuclear Power Plant at the Temelín site (New NPP ETE).

2 Area Characteristics

2.1 Project Location

The existing Temelín Nuclear Power Plant (ETE1,2) is located in the South Bohemian Region on an area extending between the municipalities of Temelín, Zvěrkovice, and Kočín, in close proximity to Road II/105. Other surrounding municipalities, Litoradlice, Malešice, and Sedlec, are also located near the power plant. A larger residential agglomeration is located to the north at a distance of approximately 5 km, in the town of Týn nad Vltavou.

The Project is to be located in an area directly adjoining the existing Temelín power plant site (the ETE1,2 site). The reason for this location is both the land-use planning readiness and availability of the areas and the connection to the necessary infrastructure systems.

The overview situation of the Project location is shown in Figure 1.

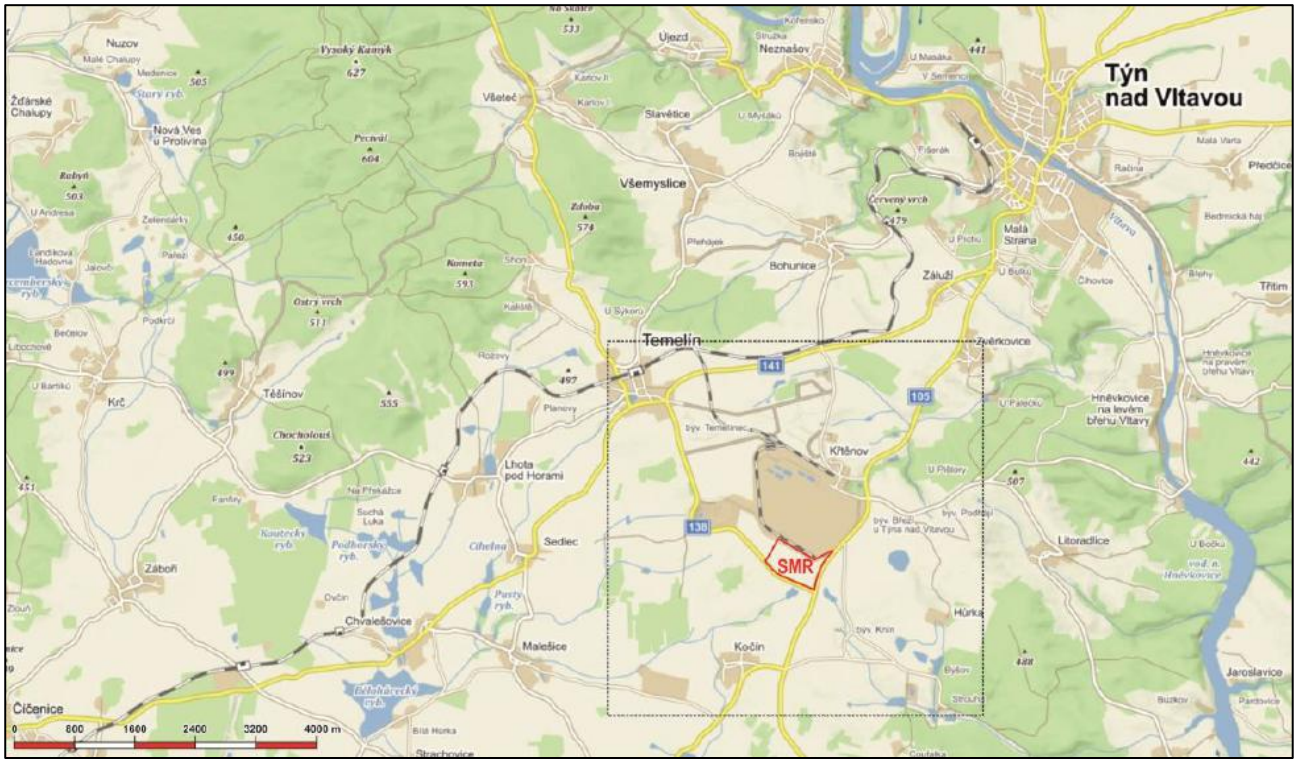


Fig. 1 Project Location

2.2 Specification of the Calculation Area

The calculation area is defined by a 12 × 12 km rectangle oriented according to geographical coordinates (see the full Fig. 2 shown). This area was selected as a potentially affected part of the territory. The reason for selecting the defined extent was the ability to capture locations where, taking into account the technological sources, the scope of construction activities, and the distribution of generated traffic volumes due to the implementation of the Project, a more significant contribution of the relevant pollutants may be expected.

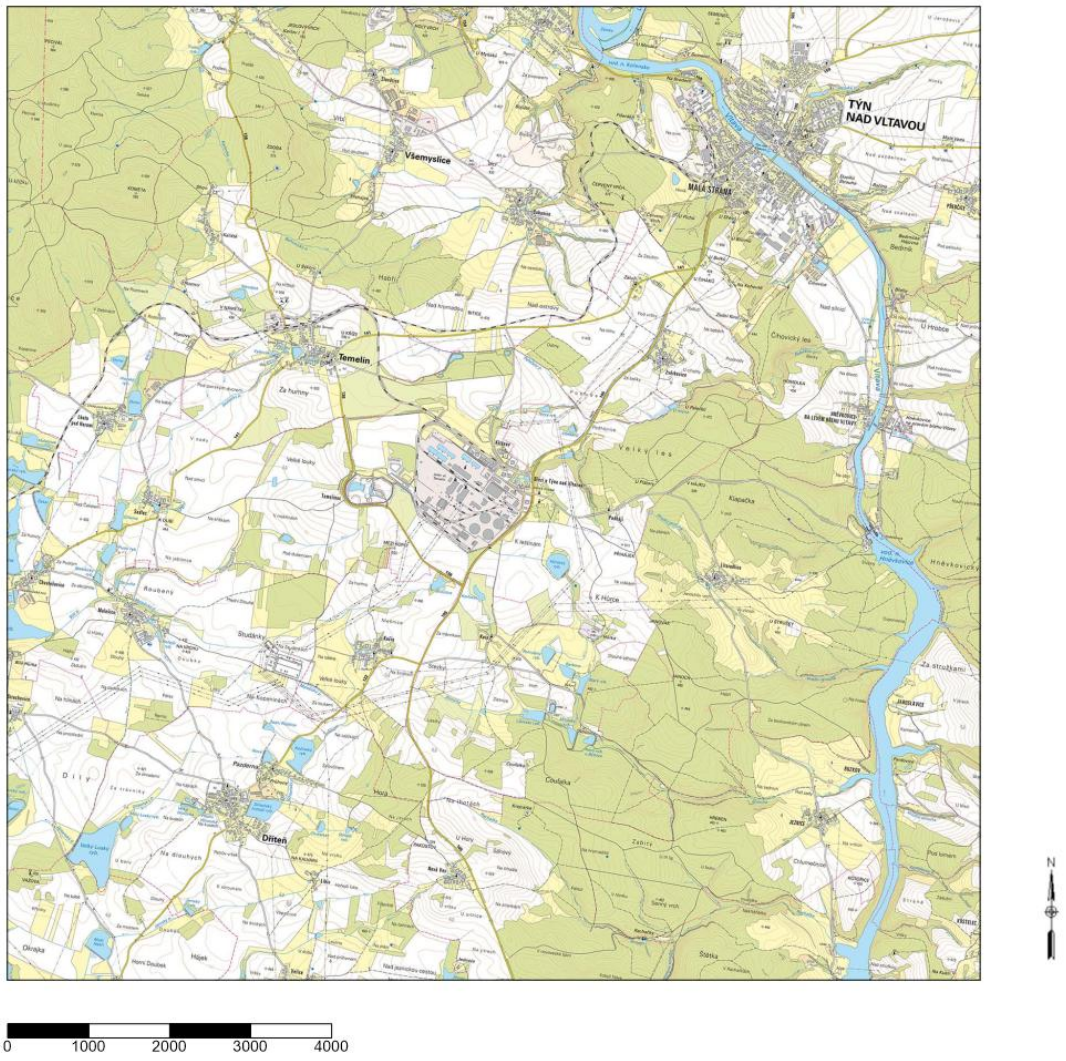


Fig. 2 Definition of the Calculation Area

3 Input Data for Model Calculations

3.1 Terrain Topography Data

The Project under assessment is located on a flat area between Týn nad Vltavou and České Budějovice. The terrain near the power plant reaches approximately 500 m above sea level; the altitude of the entire affected area reaches approximately 350–650 m a.s.l., as documented by the Vltava River incision and the Tábor Uplands (see Fig. 3). In the immediate vicinity of the Project, the area is therefore relatively well ventilated.

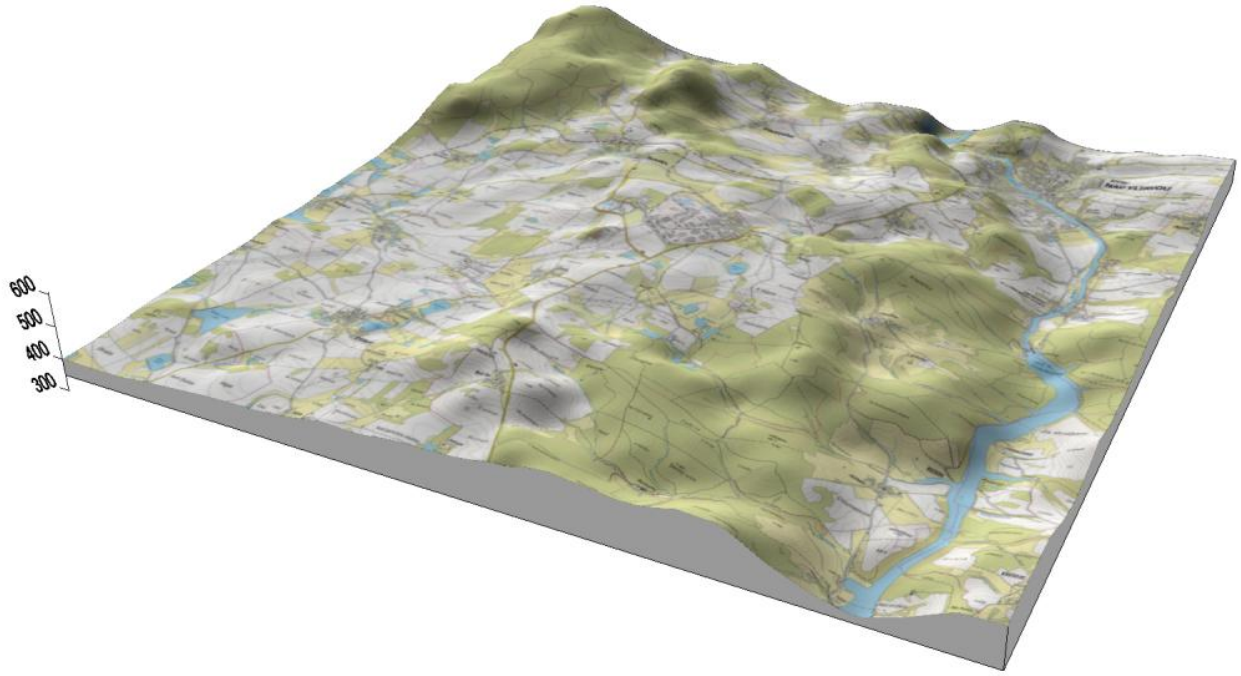


Fig. 3 Illustration of the Terrain Relief of the Area under Assessment

3.2 Meteorological Data

The rate of dispersion of pollutants in the atmosphere mainly depends on two variables: wind speed and the intensity of thermal turbulence. Since the intensity of thermal turbulence directly depends on the thermal stability of the atmosphere, the most important climatic input is a wind rose differentiated by wind speed and atmospheric thermal stability. This wind rose must be representative of the given site and, in accordance with the SYMOS methodology[4], is divided into three wind speed classes and five atmospheric stability classes according to the Bubník and Koldovský classification.

A detailed wind rose broken down by stability and wind speed, prepared by the Czech Hydrometeorological Institute in Prague, Department of Modelling and Expert Assessments, was used for the calculation. The tabular data of this wind rose are presented in Tab. 1.

Tab. 1 Stability-Classified Wind Rose for the Temelín site (2015–2024)

Stability Class I – very stable										
$m \cdot s^{-1}$	N	NE	E	SE	S	SW	W	NW	Calm	Total
1.7	1.52	3.7	2.23	1.71	2.09	7.13	4.03	1.49	0.54	24.44
5	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
Total	1.52	3.7	2.23	1.71	2.09	7.13	4.03	1.49	0.54	24.44
Stability Class II – stable										
$m \cdot s^{-1}$	N	NE	E	SE	S	SW	W	NW	Calm	Total
1.7	0.11	0.17	0.1	0.09	0.11	0.32	0.2	0.08	0.03	1.21
5.0	3.28	3.95	2.84	2.25	0.73	3.89	8.66	2.86	0	28.46
11.0	0	0	0	0	0	0	0	0	0	0
Total	3.39	4.12	2.94	2.34	0.84	4.21	8.86	2.94	0.03	29.67
Stability class III – isothermal										
$m \cdot s^{-1}$	N	NE	E	SE	S	SW	W	NW	Calm	Total
1.7	0.1	0.23	0.13	0.08	0.13	0.3	0.18	0.08	0.03	1.26
5.0	0.22	0.27	0.23	0.18	0.1	0.31	0.64	0.19	0	2.14
11.0	0.01	0.01	0.01	0.01	0	0.03	0.37	0.03	0	0.47
Total	0.33	0.51	0.37	0.27	0.23	0.64	1.19	0.3	0.03	3.87
Stability class IV – normal										
$m \cdot s^{-1}$	N	NE	E	SE	S	SW	W	NW	Calm	Total
1.7	0.01	0.03	0.02	0.01	0.03	0.04	0.02	0.01	0.01	0.18
5.0	0.03	0.04	0.04	0.02	0.01	0.04	0.07	0.02	0	0.27
11.0	0.08	0.03	0.17	0.16	0.02	0.17	1.34	0.17	0	2.14
Total	0.12	0.1	0.23	0.19	0.06	0.25	1.43	0.2	0.01	2.59
Stability class V – convective										
$m \cdot s^{-1}$	N	NE	E	SE	S	SW	W	NW	Calm	Total
1.7	1.03	2.94	1.63	1.08	1.61	4.29	2.07	1.02	0.27	15.94
5.0	2.47	2.93	3.08	1.83	1.13	2.96	6.39	2.7	0	23.49
11.0	0	0	0	0	0	0	0	0	0	0
Total	3.5	5.87	4.71	2.91	2.74	7.25	8.46	3.72	0.27	39.43
Wind rose total										
$m \cdot s^{-1}$	N	NE	E	SE	S	SW	W	NW	Calm	Total
1.7	2.77	7.07	4.11	2.97	3.97	12.08	6.5	2.68	0.88	43.03
5.0	6	7.19	6.19	4.28	1.97	7.2	15.76	5.77	0	54.36
11.0	0.09	0.04	0.18	0.17	0.02	0.2	1.71	0.2	0	2.61
Total	8.86	14.3	10.48	7.42	5.96	19.48	23.97	8.65	0.88	100

3.3 Specification of the Calculation Grid

The calculation was carried out for a regular grid of reference points spaced 500 m apart. At all reference points, the calculation was performed at a height of approximately 1.5 m above ground level.

In addition, this grid was supplemented by a denser grid near the assessed Project. The inner reference-point area measuring 5 × 5 km then has a calculation step of 100 m. Reference points were also added along all assessed routes, at distances of 25 m, 100 m, 200 m, 300 m, 400 m, and 500 m.

The position of the selected reference points is shown graphically in Fig. 4.

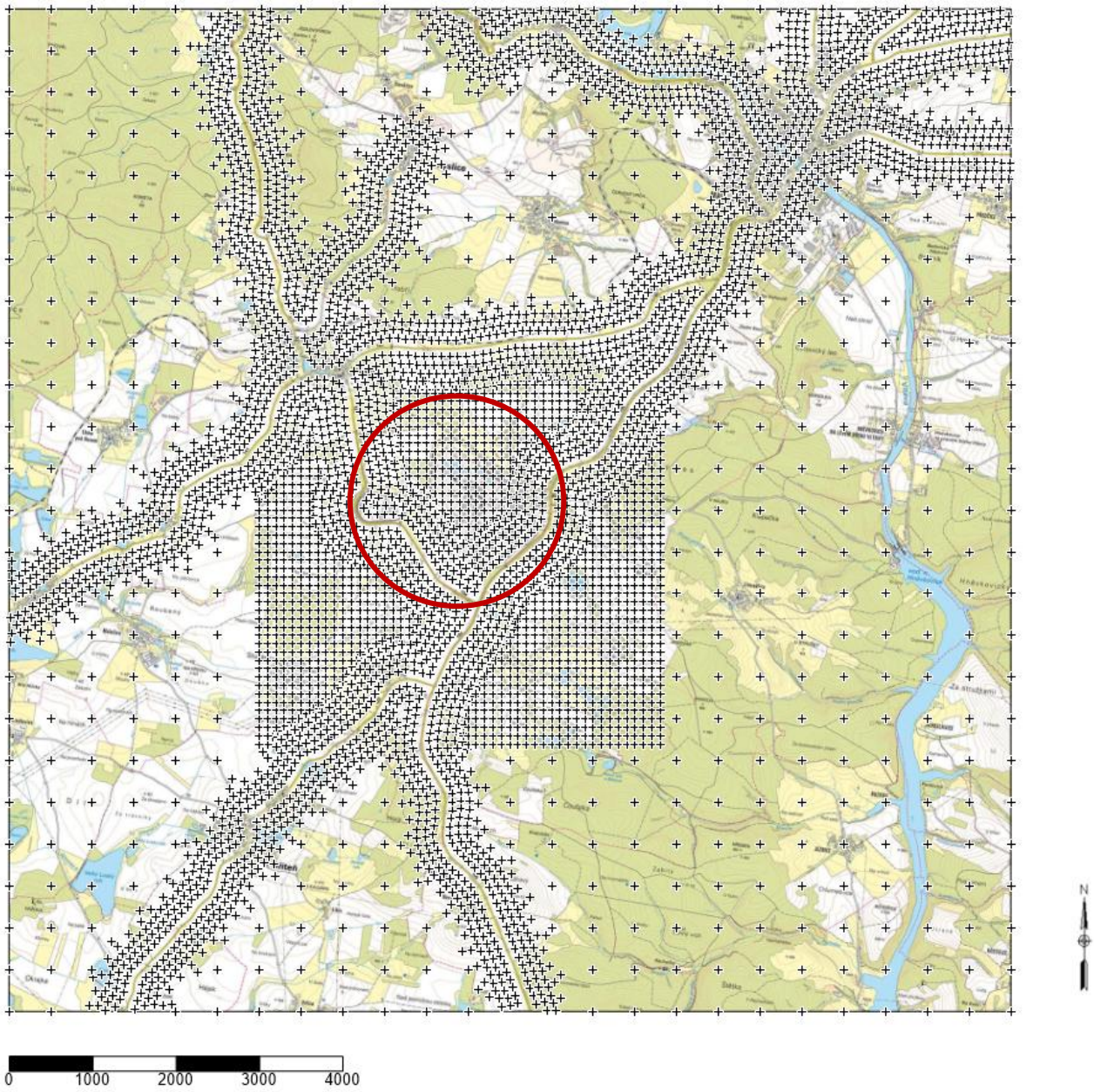


Fig. 4 Calculation grid in the affected area for calculating the effect of stationary sources and the effect of construction activities

Additional points were selected for the nearest development in the direction of pollutant dispersion from the SMR ETE site (numbered 1–6 and shown graphically in Fig. 5). For the residential development locations most affected by the passage of road traffic through individual municipalities, additional points were identified representing development along the most affected roads (collectively designated by letters).

A description of the assessed points of the most affected residential development is provided in Tab. 2.

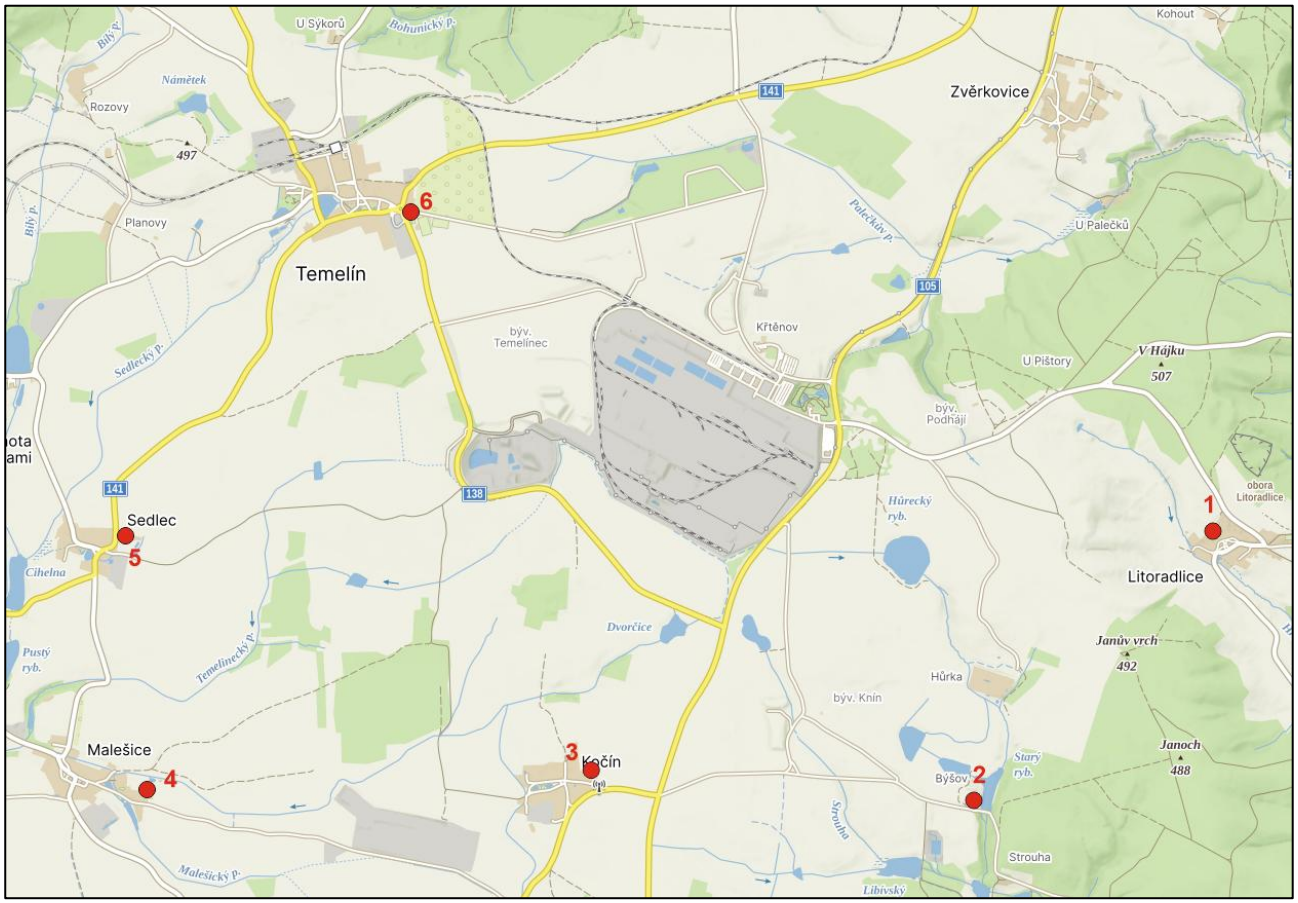


Fig. 5 Identification of the nearest development locations

Tab. 2 Description of the assessed locations of the most affected residential development

Calculation point	Location
Tem	Buildings along the road in the municipality of Temelín
Koc	Buildings along the road in the municipality of Kočín
Dri	Buildings along the road in the municipality of Dříteň
Zve	Buildings along the road in the municipality of Zvěrkovice
TnV	Buildings along the road in the municipality of Týn nad Vltavou
1	Edge of the municipality of Litoradlice
2	Farmstead behind the former municipality of Knín
3	Edge of the municipality of Kočín
4	Edge of the municipality of Malešice
5	Edge of the municipality of Sedlec
6	Edge of the municipality of Temelín

3.4 Characteristics of Air Pollution Sources

3.4.1 Road Traffic on the Public Road Network

The input data for calculating the effect of traffic on air quality were based on the "SMR ETE Traffic Study, DOPRAVOPROJEKT Ostrava, a.s., 08/2025 [5] (hereinafter the "Traffic Study"), which describes the traffic load that will accompany the implementation of SMR ETE on the affected road network.

In terms of the effect on air quality, a conservative scenario is assessed, in which rail transport is not taken into account, although it will also be used during the construction of the new nuclear power plants at the Temelín site. Any use of rail transport will always be more acceptable overall, due to lower primary emissions from fuel combustion or lower emissions from the resuspension of dust particles along access routes. Other secondary emissions (material handling, transshipment, etc.) may be considered similar in both scenarios.

According to the anticipated schedule (taking into account possible interaction with the construction or operation of New NPP ETE), the following reference time horizons are considered:

- Baseline condition
  - Existing condition = year 2025 – recalculation of the baseline traffic volumes from the 2020 census.
- Effect of construction of SMR ETE
  - The highest possible cumulation of effects in the event of a possible concurrence of construction of New NPP ETE and SMR ETE.
    - Zero option 1 = year 2034 + initial preparation phase of New NPP ETE.
    - Active option 1 = year 2034 + initial preparation phase of New NPP ETE + construction phase of SMR ETE.
- Effect of operation of SMR ETE
  - Transitional condition of possible concurrence of operation of SMR ETE with the most traffic-intensive stage of construction of New NPP ETE
    - Zero option 2 = year 2040 + main phase of construction of New NPP ETE.
    - Active option 2 = year 2040 + main phase of construction of New NPP ETE + operation of SMR ETE.
  - Cumulation of operation of New NPP ETE and SMR ETE
    - Zero option 3 = year 2042 + operation of New NPP ETE.
    - Active option 3 = year 2042 + operation of New NPP ETE + operation of SMR ETE.

Any other different scenarios not including the effect of construction or operation of New NPP ETE are more favourable from the perspective of the effect on air quality and are therefore also covered by the conservative scenarios above.

The existing ETE1,2, including generated related traffic, will continue to be operated also in the selected future scenarios, i.e., in concurrence with the operation of the assessed Project. In the cumulation of operations after 2042, New NPP ETE and SMR ETE are taken into account, but no account is taken of any change in traffic loading caused by the possible decommissioning of the Temelín Nuclear Power Plant (ETE1,2) after the end of its design lifetime or after its extension.

The affected road network is clearly shown schematically in Fig. 6 and described in Tab. 3. Some sections have alternative designations corresponding to the conservatively selected scenario in which, during the construction of SMR ETE, Road II/138 would be closed to public traffic in the section between Roads II/141 and II/105 (in the area of the SMR ETE construction site), with traffic diverted to detour routes (the routes affected by the closure are highlighted in yellow in Fig. 6). The closed section would remain accessible only for traffic related to the construction of SMR ETE. Any closure applies only to the construction period of SMR ETE; therefore, the alternative traffic management applies only to the selected scenario including the

construction period of SMR ETE (designated as Active option 1 = year 2034 + initial preparation phase of New NPP ETE + construction phase of SMR ETE).

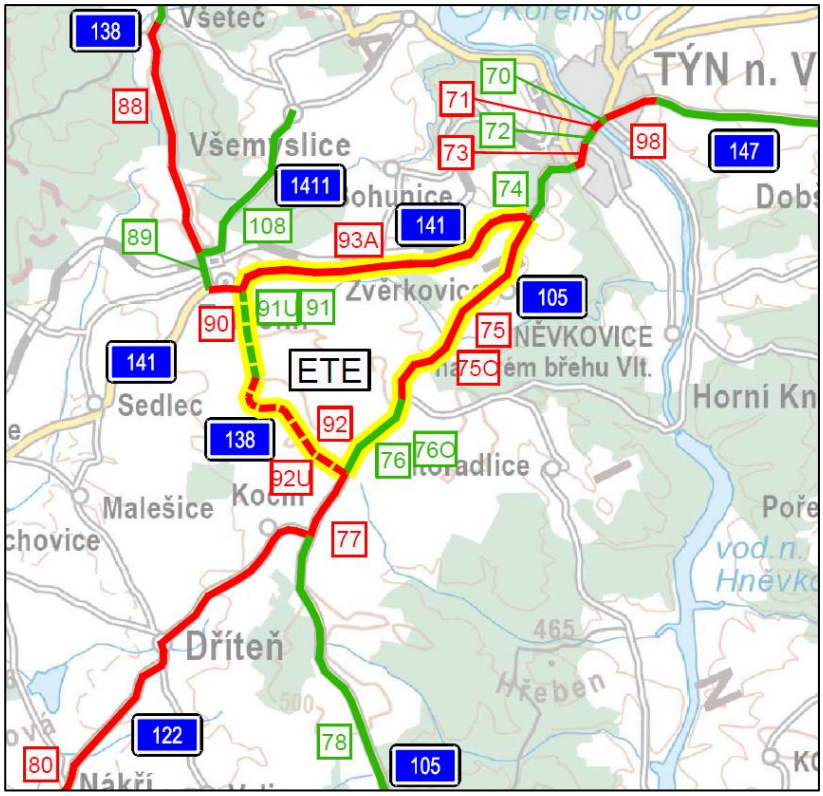


Fig. 6 Schematic of the affected road network

Tab. 3 Identification of the affected road network

Section	Road No.	Traffic count section	Section beginning	Section end
70	105	2-1216	junction with 147	junction with 1472
71	105	2-1223	junction with 1472	intersection with Žižkova local road
72	105	2-0631	intersection with Žižkova local road	junction with 0235
73	105	2-0636	junction with 0235	junction with 159
74	105	2-0640	junction with 159	junction with 141
75/75O	105	2-0656	junction with 141	junction with 12221
76/76O	105	2-0657	junction with 12221	junction with 138
77	105	2-0650	junction with 138	junction with 122
78	105	2-0660	junction with 122	junction with 10579
80	122	2-2050	junction with 105	junction with 12227
88	138	2-4200	Všeteč, end of built-up area	connection to 1411
89	138	2-4200	connection to 1411	junction with 141
90	138	2-4687	junction with 141	junction with 141
91/91U	138	2-4680	junction with 141	ETE
92/92U	138	2-4680	ETE	junction with 105
93A	141	2-2020	junction with 105	junction with 138 – Temelín

98	147	2-2381	junction with 105 in Týn	Týn n. Vltavou, end of built-up area
108	1411	2-6220	junction with 138	junction with 1412

Explanations: x – intersection

The total traffic volumes generated by the construction and operation of SMR ETE (number of arrivals and departures) were specified by the customer:

- construction of SMR ETE
  - light vehicles 600 vehicles/24 h
  - heavy vehicles 300 vehicles/24 h
- operation of SMR ETE
  - light vehicles 300 vehicles/24 h
  - heavy vehicles 70 vehicles/24 h

The traffic volumes for the individual scenarios according to the Traffic Study[5] are then summarised in Tab. 4, Tab. 5 and Tab. 6.

Tab. 4 Traffic volumes – existing condition

Section	2025		
	O	L	T
70	10,519	659	725
71	12,376	770	648
72	11,160	755	746
73	8,903	615	686
74	7,207	671	585
75/75O	5,229	484	478
76/76O	5,697	454	452
77	5,697	454	452
78	6,765	630	717
80	1,626	112	230
88	527	65	85
89	527	65	85
90	1,354	194	381
91/91U	820	86	235
92/92U	820	86	235
93A	1,366	228	259
98	1,492	185	267
108	277	27	122

*O – passenger cars, motorcycles
L – light trucks
T – heavy trucks + buses

Tab. 5 Traffic volumes – zero options

Section	Zero option 1			Zero option 2			Zero option 3		
	O	L	T	O	L	T	O	L	T
70	11,592	769	998	12,317	804	1,251	11,236	832	806
71	13,514	898	917	14,242	939	1,169	13,155	968	723
72	12,255	881	1,020	12,981	921	1,274	11,898	949	828
73	9,919	718	956	10,641	750	1,209	9,567	778	763
74	8,165	783	850	8,884	818	1,101	7,816	846	654
75/75O	6,117	565	738	6,833	590	986	5,772	616	538
76/76O	6,602	529	711	7,318	553	958	6,255	579	510
77	6,108	529	579	6,330	553	695	6,439	590	521
78	7,263	723	846	7,500	756	963	7,605	794	815
80	1,694	128	254	1,700	134	273	1,694	135	252
88	616	75	178	688	79	269	585	81	94
89	616	75	190	688	79	293	585	81	94
90	1,471	226	501	1,544	236	611	1,438	240	415
91/91U	919	100	347	991	105	453	887	108	256
92/92U	1,767	100	587	2,686	105	933	1,771	159	307
93A	1,413	266	272	1,416	278	278	1,411	280	280
98	1,544	216	461	1,546	226	648	1,615	231	293
108	287	31	139	287	33	155	286	33	132

Tab. 6 Traffic volumes – active options

Section	Active option 1			Active option 2			Active option 3		
	O	L	T	O	L	T	O	L	T
70	12,020	769	1,158	12,432	817	1,265	11,352	845	819
71	13,942	898	1,077	14,357	952	1,182	13,270	981	736
72	12,683	881	1,180	13,096	934	1,287	12,013	963	842
73	10,348	718	1,117	10,757	763	1,222	9,682	791	776
74	8,593	783	1,011	8,999	832	1,114	7,931	860	667
75/75O	7,394	665	1,145	6,948	603	999	5,887	630	552
76/76O	7,879	630	1,118	7,433	567	971	6,370	593	523
77	6,236	529	650	6503	574	715	6,612	611	541
78	7,391	723	910	7,672	776	984	7,777	815	835
80	1,694	128	261	1,700	134	273	1,694	135	252
88	659	75	238	700	80	270	597	83	95
89	659	75	258	700	80	294	597	83	95
90	1,514	226	569	1,557	237	612	1,451	241	416
91/91U	113	0	169	1,004	106	455	900	109	257
92/92U	1,475	0	572	2,974	139	967	2,059	193	341
93A	2,262	366	518	1,413	266	272	1,411	280	280
98	1,544	216	584	1,570	228	650	1,638	234	295
108	287	31	147	287	33	155	286	33	132

3.4.1.1 Emission factors used

For the calculation of primary emissions of selected pollutants produced by vehicle engines, emission factors obtained using the MEFA 13 software recommended by the Ministry of the Environment were used. The calculation of emission characteristics is based on a combination of the static and dynamic components of the traffic flow. The calculation takes into account both the static and dynamic aspects of the composition of the vehicle fleet, for both passenger vehicles and trucks, with different mileages of the individual vehicle groups. Specific emissions depend on the speed and smoothness of the traffic flow, the gradient of the given road section, and the vehicle category.

The calculation of primary emissions of selected pollutants produced by vehicle engines does not take into account the National Clean Mobility Action Plan, which was approved by the Government of the Czech Republic in 2024. This plan sets specific milestones for 2025, 2030, and 2035 in the introduction of locally zero-emission transport. This fact is not taken into account in the calculation; the calculations are carried out conservatively, on the safe side, because when any proportion of zero-emission transport is considered, the primary emissions item is eliminated, which, with secondary emissions remaining unchanged, always results in lower total emissions.

The software also takes cold starts of vehicles into account in the calculation. For a specific year, the composition of the vehicle fleet according to compliance with the EURO standard is implemented in the software. A comparison of emission factors from fuel combustion in selected calculation years is provided for the vehicle types considered in the following Tab. 7–Tab. 9.

Tab. 7 Emission factors for passenger cars (OA), light trucks (LN), and heavy trucks (TN) for the calculation year 2025

	Speed	NO_X	PM_{10}	$PM_{2.5}$	Benzene	BaP
	[km·h^{-1}]	**[g·km^{-1}·veh^{-1}]**				**[µg·km^{-1}·veh^{-1}]**
OA	**10**	0.546	0.035	0.023	0.043	4.832
	30	0.257	0.029	0.018	0.022	4.632
	50	0.222	0.027	0.016	0.016	4.436
	70	0.224	0.022	0.015	0.012	4.341
	90	0.269	0.016	0.012	0.011	4.419
	130	0.482	0.022	0.018	0.016	5.527
LN	**10**	0.940	0.108	0.083	0.041	11.165
	30	0.673	0.078	0.057	0.029	10.625
	50	0.543	0.069	0.051	0.020	10.123
	70	0.500	0.060	0.046	0.015	10.273
	90	0.520	0.058	0.047	0.011	11.268
	130	0.683	0.106	0.087	0.013	14.077
TN	**5**	3.693	0.601	0.475	0.019	20.193
	10	3.505	0.563	0.444	0.018	20.088
	30	2.534	0.403	0.309	0.012	19.373
	50	1.641	0.286	0.213	0.009	18.457
	80	1.237	0.214	0.163	0.007	18.803
	100	1.219	0.194	0.152	0.006	20.224

Tab. 8 Emission factors for passenger cars (OA), light trucks (LN), and heavy trucks (TN) for the calculation year 2034

	Speed	NO_X	PM_{10}	$PM_{2.5}$	Benzene	BaP
	[km·h^{-1}]	**[g·km^{-1}·veh^{-1}]**				**[µg·km^{-1}·veh^{-1}]**
OA	**10**	0.575	0.032	0.020	0.040	4.831
	30	0.216	0.028	0.016	0.021	4.630
	50	0.187	0.024	0.015	0.014	4.434
	70	0.187	0.020	0.013	0.011	4.339
	90	0.226	0.015	0.010	0.010	4.418
	130	0.402	0.019	0.015	0.014	5.524
LN	**10**	0.574	0.078	0.055	0.033	11.128
	30	0.424	0.060	0.041	0.023	10.588
	50	0.348	0.054	0.037	0.016	10.090
	70	0.321	0.044	0.031	0.011	10.244
	90	0.330	0.039	0.030	0.009	11.239
	130	0.429	0.070	0.057	0.010	14.041
TN	**5**	3.173	0.527	0.414	0.013	20.011
	10	3.004	0.493	0.385	0.012	19.907
	30	2.115	0.356	0.270	0.009	19.197
	50	1.311	0.258	0.190	0.006	18.288
	80	0.969	0.194	0.146	0.004	18.643
	100	0.960	0.175	0.135	0.004	20.058

Tab. 9 Emission factors for passenger cars (OA), light trucks (LN), and heavy trucks (TN) for the calculation year 2040 and higher

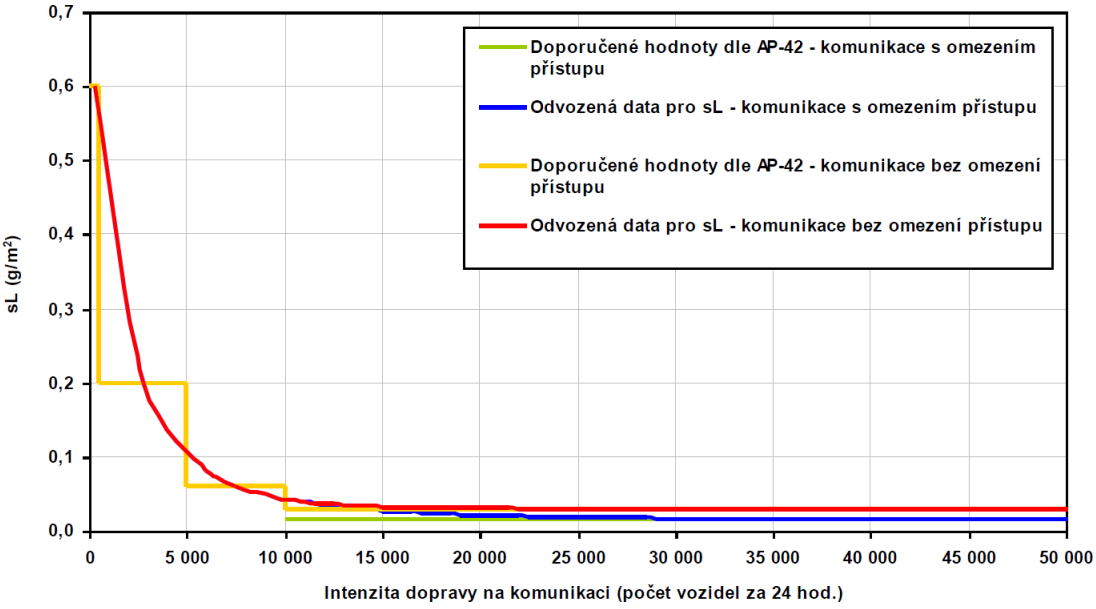
	Speed	NO_X	PM_{10}	$PM_{2.5}$	Benzene	BaP
	[km·h^{-1}]	**[g·km^{-1}·veh^{-1}]**				**[µg·km^{-1}·veh^{-1}]**
OA	**10**	0.578	0.031	0.020	0.040	4.831
	30	0.213	0.027	0.016	0.021	4.629
	50	0.185	0.024	0.015	0.014	4.433
	70	0.184	0.020	0.013	0.011	4.338
	90	0.223	0.015	0.010	0.010	4.417
	130	0.394	0.019	0.015	0.014	5.524
LN	**10**	0.524	0.073	0.052	0.032	11.098
	30	0.391	0.058	0.039	0.022	10.560
	50	0.321	0.052	0.035	0.016	10.062
	70	0.295	0.041	0.029	0.011	10.217
	90	0.303	0.036	0.028	0.009	11.209
	130	0.392	0.066	0.053	0.010	14.004
TN	**5**	3.113	0.517	0.405	0.013	19.987
	10	2.945	0.484	0.378	0.012	19.882
	30	2.065	0.349	0.264	0.009	19.174
	50	1.272	0.255	0.187	0.006	18.266
	80	0.936	0.191	0.143	0.004	18.623
	100	0.928	0.171	0.133	0.004	20.037

The calculation of secondary dust emissions from road surfaces is based on the predictive formulas of the methodology of the U.S. Environmental Protection Agency (EPA), more specifically the document Emission Factor Documentation for AP-42, Section 13.2.1. [6]. The resulting emission factor is strongly dependent on the method used to determine the value of sL (silt load – amount of dust on the road surface). The AP-42 methodology contains tabulated recommended values that vary according to road traffic volume intervals. However, their disadvantage is the step change at the boundaries of these intervals. In order for the sL values not to decrease abruptly depending on traffic volume (as proposed by the AP-42 methodology), but rather gradually, the use of a modified procedure is recommended, in which the specified values were fitted with regression curves.

The calculation of secondary emissions, or resuspension of dust particles (i.e., emissions of dust particles deposited on the road surface and resuspended into the air due to turbulent flow induced by a passing vehicle), was performed on the basis of a methodology for calculating emissions of particles originating from resuspension from road traffic[7]. This methodology is based on the above methodology, modifying and refining its calculation procedure so that the outputs better correspond to the real situation on the road network in the Czech Republic. The modifications to the original methodology consist mainly in:

- a different method of determining the sL value (i.e., the amount of dust particles smaller than 75 µm deposited on the road surface) – this depends both on traffic volume and on the type and condition of the road surface,
- a different derivation of the multiplier for the winter period,
- inclusion of the effect of traffic flow speed.

The modification consists mainly in the smooth fitting of the recommended values of the amount of dust on the road surface so that emissions do not change abruptly between traffic volume intervals. The regression curves recommended for use in the calculation take the values of individual sL depending on traffic volume and are shown in Fig. 7.



Doporučené hodnoty dle AP-42 - komunikace s omezením přístupu	Recommended values according to AP-42 – roads with limited access
Odvozená data pro sL - komunikace s omezením přístupu	Derived data for sL – roads with limited access
Doporučené hodnoty dle AP-42 - komunikace bez omezení přístupu	Recommended values according to AP-42 – roads without limited access
Odvozená data pro sL - komunikace bez omezení přístupu	Derived data for sL – roads without limited access
Intenzita dopravy na komunikaci (počet vozidel za 24 hod.)	Traffic volume on the road (number of vehicles per 24 h)

Fig. 7 Relationship between road surface dust loading and traffic volume

The calculation of the average annual value of emission factor E is performed on the basis of the weighted average of emission factors for the summer and winter periods. The equation for calculating the average value of emission factor E is then as follows:

$$E = (sL^{0.91} \times L + sL^{0.91} \times Z \times m)/12 \times k \times (W \times 1.1)^{1.02} \times (1 - P/4N)$$

where:

E average emission factor [g·km^{-1} travelled by a vehicle],
sL amount of dust particles smaller than 75 μm deposited on the road surface in the summer period [g·m^{-2}],
Z number of months with solid precipitation,
L corresponds to 12 − Z,
m multiplier for the winter period,
k coefficient for the given particle size fraction [g·km^{-1} travelled by a vehicle],
W average vehicle weight [t],
P number of days with measurable precipitation,
N total number of days.

The values of the multiplier "k" are 0.15 for the $PM_{2.5}$ fraction and 0.62 for the PM_{10} fraction.

The Climate Atlas of the Czech Republic[8] was used to determine the number of winter months with solid precipitation for the given area (a value of 5 winter months was used). Data on climatic characteristics according to the E. Quitt classification[9] were used to estimate the number of days with measurable precipitation.

Under the new methodology[7], emissions from the resuspension of benzo(a)pyrene were also calculated, consisting in determining the content of benzo(a)pyrene in emissions from the resuspension of PM10 particulate matter.

3.4.1.2 Emissions quantification

The basic parameters for the emissions calculation, which subsequently enter the model calculation in the Symos 97´ software, are as follows:

- vehicle speed
  - public roads 30–90 km·h^{-1}
- traffic flow smoothness
  - all roads 2–3
- vehicle fleet composition recommended composition corresponding to 2025/2034/2040

Primary emissions from fuel combustion depend on traffic flow speed and vehicle category. They can be quantified exactly for traffic generated by the Project; however, emissions arising from the resuspension of dust particles from the road surface have a significant effect. These emissions depend fundamentally on the existing traffic load on the roads on which the traffic generated by the Project will travel; therefore, the total emissions generated by the Project cannot be quantified simply. Given the considerable extent of input emissions data across the entire calculation grid and the number of calculation scenarios, the complete emission characteristics of the individual partial sections are held by the author of the Air Dispersion Study. The summary emission balances for the individual scenarios for the entire calculation area (including only the relevant sections of the affected roads) are presented in Tab. 10.

Tab. 10 Emission balance of road traffic in the affected area for individual calculation scenarios

Calculation scenario	NOx	PM_{10}	$PM_{2.5}$	Benzene	BaP
	kg.day^{-1}				
Existing condition	63.0	308.0	77.9	2.05	0.0012
Zero option 1	58.9	358.5	90.3	2.01	0.0015
Active option 1	65.1	391.7	98.8	2.14	0.0017
Zero option 2	65.0	402.2	101.3	2.13	0.0017
Active option 2	65.6	400.3	100.9	2.15	0.0017

Zero option 3	56.4	326.6	82.3	2.01	0.0014
Active option 3	57.2	328.0	82.7	2.03	0.0014

3.4.2 Stationary sources

3.4.2.1 Existing condition

The operation of nuclear facilities must meet certain criteria arising from nuclear safety requirements. The standard equipment currently consists of backup diesel generator sets (DG) and an auxiliary boiler plant. These nuclear facilities will continue to be operated also in selected future scenarios, i.e., in concurrence with the operation of the assessed Project. Given that emissions from these existing combustion sources are already reflected in the background concentrations for the existing condition and that there will be no change in their operation in the future calculation years, these sources will not be included in the calculations.

3.4.2.2 Future condition – SMR ETE

In connection with the implementation of SMR ETE, new stationary air pollution sources will be created. These will be backup diesel generators burning diesel fuel.

It is conservatively assumed that emergency power supply will be provided by the following equipment:

- diesel generator 2 × 4 MW_e (2 × 8 MWt) – High Voltage Essential,
- diesel generator 2 × 1.5 MW_e (2 × 3 MWt) – Low Voltage Alternate,
- diesel generator 2 × 0.4 MW_e (2 × 2 MWt) – Low Voltage Essential.

Emission factors based on European standards for non-road engines were used for these new diesel engines. On 25 September, 2014, the European Commission proposed emission regulations for Stage V[10], which also covers engines above 560 kW used for generator sets. The emission factors used are clearly summarised in Tab. 11. For the other pollutants, we used data from the EPA AP-42 methodology, Section 3.4 Large Stationary Diesel and All Stationary Dual-fuel Engines[11]. The resulting emission characteristics of the sources considered are then presented in Tab. 12.

Tab. 11 Proposed emission standards applicable to generator engines from 2019

Pollutant		CO	NO_x	TZL
Emission factor	[g·kWh^{-1}]	3.5	0.67	0.035

Tab. 12 Emission characteristics of diesel generators during operation of SMR ETE

		DG – 4 MW_e	DG – 1.5 MW_e	DG – 0.4 MW_e
Thermal output	[MW_t]	8	3	2
Fuel	[-]	diesel fuel	diesel fuel	diesel fuel
Consumption	[kg·h^{-1}]	800	300	80
Flue gas volume	[m^3·s^{-1}]	7.3	2.8	0.7
Flue gas	[°C]	340	340	340
Stack height	[m]	11	11	11
Operating hours	[h·year^{-1}]	48	48	48
CO emissions	[g·s^{-1}]	3.9	1.5	0.4
NO_x emissions	[g·s^{-1}]	0.74	0.28	0.07
TZL emissions	[g·s^{-1}]	0.039	0.015	0.004
Benzene	[g·s^{-1}]	0.003	0.001	0.000 6
BaP emissions	[mg·s^{-1}]	0.009	0.003	0.002

The detailed location of the above-mentioned diesel generators is clearly shown in Fig. 8. Testing is assumed to be carried out one unit after another; they will not operate concurrently during regular tests.

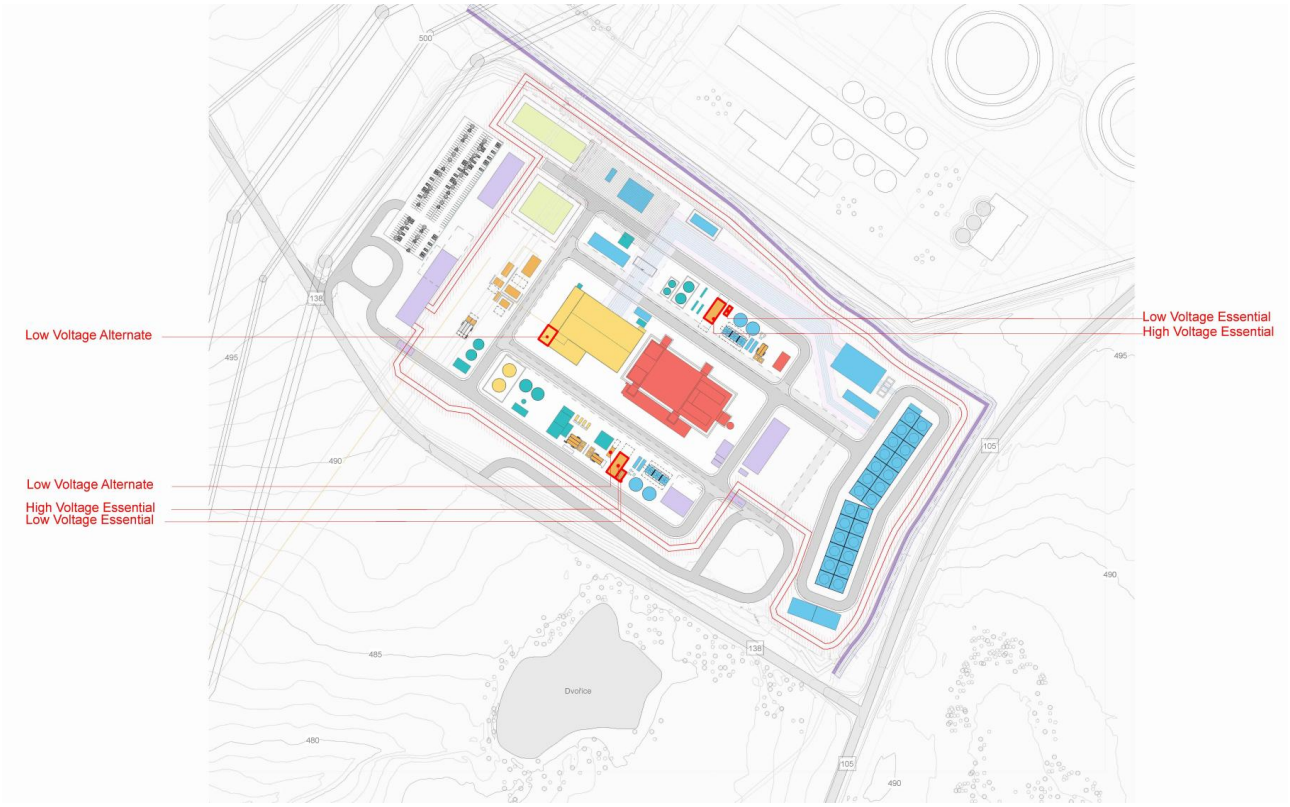


Fig. 8 Location of new stationary sources (DG) in the area of SMR ETE

We further assume the operation of an auxiliary boiler plant for the production of auxiliary steam within the SMR ETE site, with 3 electric steam boilers considered, each with an input of 5 MW_e; this is therefore not an emission source.

3.4.2.3 Future condition – other sources

In future years, long-term concurrent operation of the existing nuclear units ETE1,2 and the New NPP ETE and SMR ETE projects is assumed. In connection with the operation of New NPP ETE, the location of pollutant sources is assumed, depending on the New NPP ETE option. The option addressing backup electrical power supply by means of diesel generator stations was assessed conservatively:

- Diesel generator stations 6.3 MW_e – emergency power supply for safety systems, 4 pcs per unit, i.e., a total of 8 pcs for 2 units.
- Diesel generator stations 6.3 MW_e – emergency power supply for other consumers, 1 pc per unit, i.e., a total of 2 pcs for 2 units.

The technological equipment also includes an auxiliary backup boiler plant, which will be in operation only during the construction of New NPP ETE.

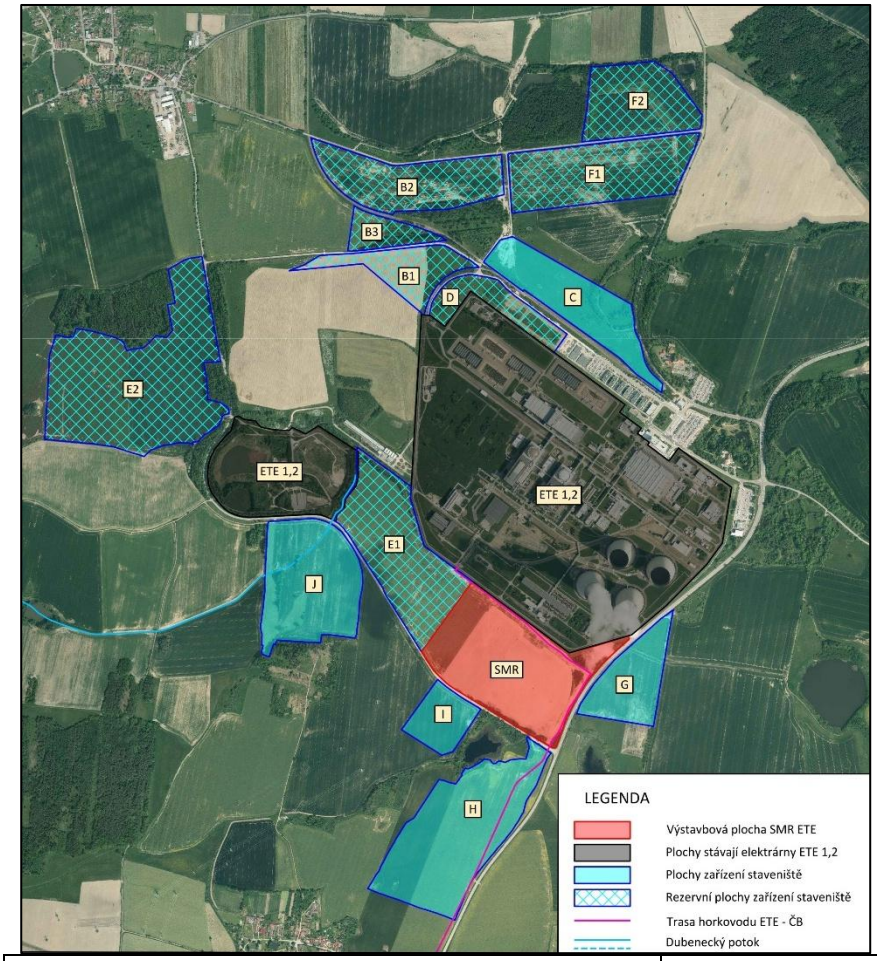
The emission characteristics of these sources, including their effects on air quality, are described in more detail in the New NPP ETE EIA Documentation, and their contribution will be cumulatively assessed together with the contribution of the assessed SMR ETE Project.

3.4.3 Construction activities

The source documents for the assessment of construction activities are based on the document Technical Assistance – Preparation of the Indicative Bulk Earthworks Design for SMR ETE[14].

3.4.3.1 Construction site division

The areas required for implementation of the Project are divided into the construction area, construction site facilities areas, and reserve areas. The detailed layout of the area division is shown in Fig. 9.



LEGENDA	LEGEND
Výstavbová plocha SMR ETE	SMR ETE construction area
Plochy stávají elektrárny ETE 1,2	Areas of the existing ETE1,2 power plant
Plochy zařízení staveniště	Construction site facilities areas
Rezervní plochy zařízení staveniště	Reserve construction site facilities areas
Trasa horkovodu ETE - ČB	ETE – České Budějovice hot-water pipeline route
Dubenecký potok	Dubenecký stream

Fig. 9 Division of areas for the construction of SMR ETE

- Construction area (SMR ETE)
  - All works related to the construction of SMR ETE will be carried out in the SMR ETE area. The area will be divided into areas for the construction of structures, as well as areas for material storage and pre-assembly of equipment before its incorporation into the structures. A network of construction site roads will also be created for the movement of construction machinery and pedestrians. An assembly hall (Site Factory) will also be built here. Construction cranes will also be positioned within the construction area.
- Construction site facilities areas

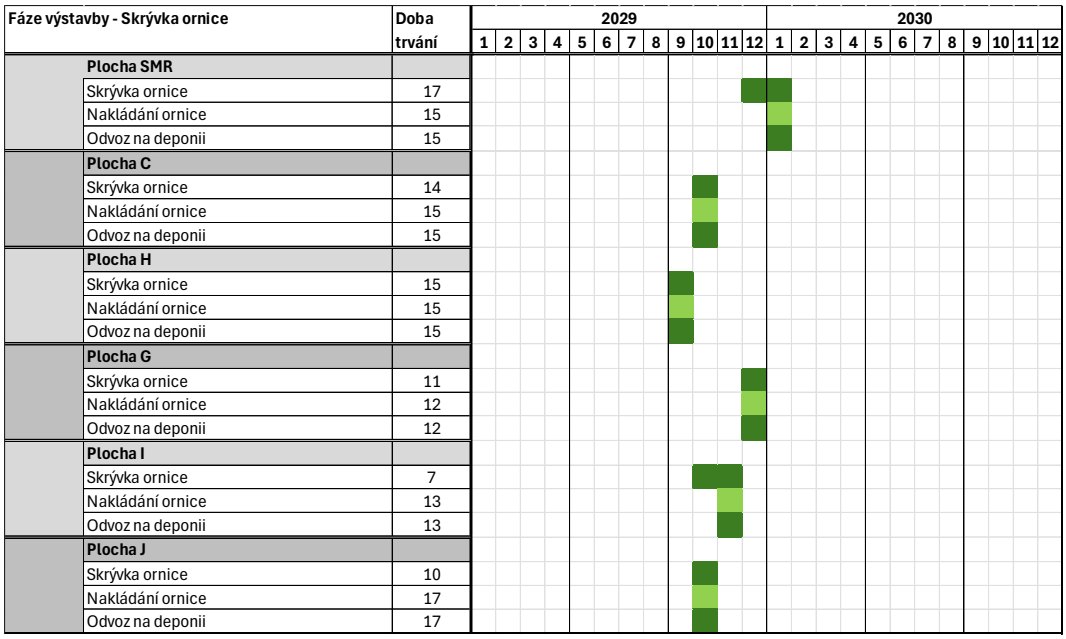
- Area C – will serve for the transshipment and short-term storage of materials. For these purposes, a transshipment facility will be built there, consisting of temporary building structures, paved areas for the storage and handling of materials, and a truck car park.
- Area H – will serve primarily for operational and storage purposes; operations related to construction (administration, workshops, warehouses, recycling line, and parking areas) will be located there, including areas allocated for stockpiles of topsoil, subsoil, and soils from excavation works.
- Area G – location of a car park. This will be a central car park for construction workers and other persons involved.
- Area I – will serve the needs of the investor. It is assumed that administrative facilities for the investor' staff will be built there. A "Security Plaza" will also be located there, providing customs, physical, and dimensional inspection of imported technology and materials.
- Area J – the construction of the main construction site facilities is considered there, where operations related to construction will be located (administration, workshops, warehouses, parking areas, and concrete batching plant).

- Reserve areas – Areas B1, B2, B3, D, E1, E2, F1, and F2 – the use of these areas is not considered in the assessment.

3.4.3.2 Specification of activities

In terms of the effect on air quality, construction activities can be divided into 2 significant stages:

- Preparatory works – activities significant in terms of dust burden from the construction site during earthworks and excavation works taking place over one calendar year, with the following assumptions:
  - Preparatory works consist of preparing the area before the start of the actual construction works. Topsoil and subsoil stripping will be carried out in the allocated areas (SMR, C, H, G, I, and J).
  - High-performance dozers will be used for topsoil stripping. The dozers will work in strips and push the topsoil into piles. The topsoil will be loaded by loading excavators with large-capacity buckets onto trucks, which will transport it to the soil stockpile in Area H.
  - The sequence of activities associated with topsoil stripping is graphically shown in the model schedule (Fig. 10).



Fáze výstavby-Skrývka ornice	Construction phase – Topsoil stripping
Doba trvání	Duration
Plocha SMR	SMR area
Skrývka ornice	Topsoil stripping
Nakládání ornice	Loading of topsoil
Odvoz na deponii	Landfill disposal

Plocha C	Area C
Plocha H	Area H
Plocha G	Area G
Plocha I	Area I
Plocha J	Area J

Fig. 10 Model schedule for the topsoil stripping phase

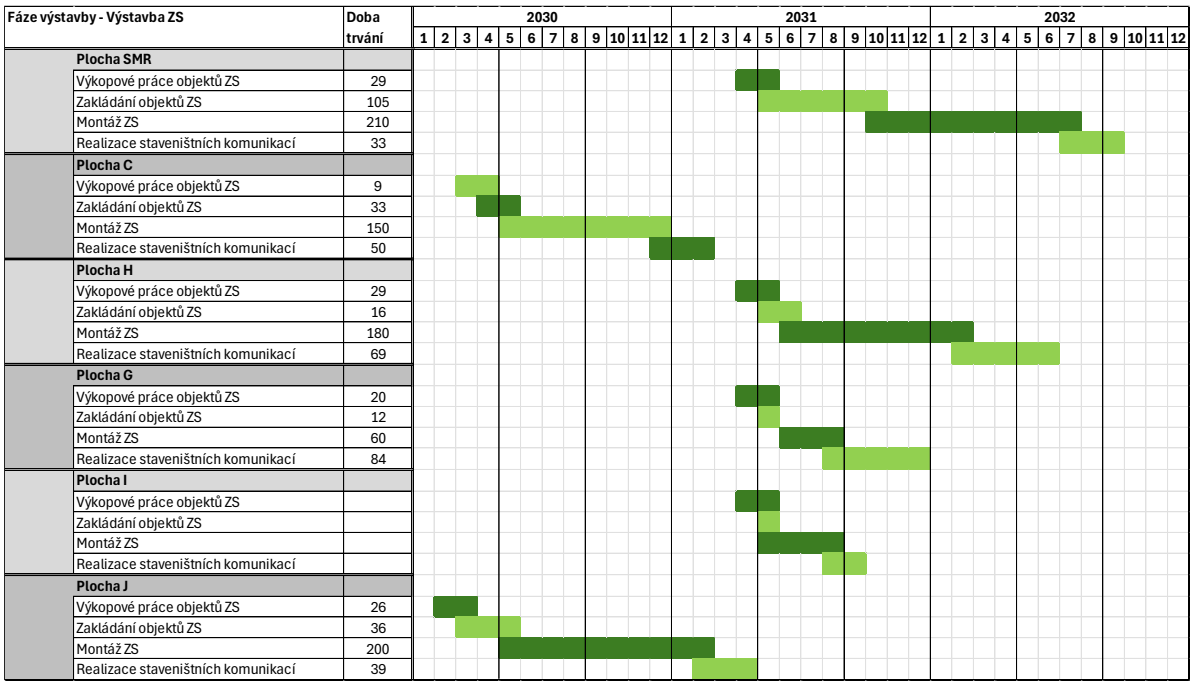
- Extensive earthworks will then be carried out, consisting of excavations and fills in order to level the selected areas to a working plane. The excavation works will be carried out using high-performance excavators fitted with buckets of appropriate capacity. At this stage, the excavated soil within the affected area will be used for fills. There are significant soil deficits in Area J. Trucks will continuously transport soil from Areas C, H, G, and I to Area J in order to achieve the required levels.
- During the excavations, it is assumed that approximately 10% of the total volume of excavated soil will be produced as soil unsuitable for the construction of fills. These soils will be transported to Area H, where, for the purposes of this study, the recycling line is assumed to be located. In the recycling line, this material will then be sorted, with maximum effort made to reuse the excavated material.
- The sequence of activities associated with bulk earthworks is graphically shown in the model schedule (Fig. 11).

Fáze výstavby - HTÚ		Doba trvání	2030											2031										
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
	Plocha SMR																									
	Odtěžení a naložení zeminy	32																								
	Přesun v rámci plochy	32																								
	Odvoz na deponii nevyužité zeminy	32																								
	Plocha C																									
	Odtěžení a naložení zeminy	24																								
	Přesun v rámci plochy	24																								
	Odvoz na deponii nevyužité zeminy	24																								
	Plocha H																									
	Odtěžení a naložení zeminy	57																								
	Přesun v rámci plochy	57																								
	Odvoz na deponii nevyužité zeminy	57																								
	Plocha G																									
	Odtěžení a naložení zeminy	42																								
	Přesun v rámci plochy	42																								
	Odvoz na deponii nevyužité zeminy	42																								
	Plocha I																									
	Odtěžení a naložení zeminy	39																								
	Přesun v rámci plochy	39																								
	Odvoz na deponii nevyužité zeminy	39																								
	Plocha J																									
	Odtěžení a naložení zeminy	20																								
	Přesun v rámci plochy	20																								
	Odvoz na deponii nevyužité zeminy	20																								

Fáze výstavby - HTÚ	Construction phase – Bulk earthworks
Doba trvání	Duration
Plocha SMR	SMR area
Odtěžení a naložení zeminy	Soil excavation and loading
Přesun v rámci plochy	Movement within the area
Odvoz na deponii nevyužité zeminy	Transport of unused soil to stockpile
Plocha C	Area C
Plocha H	Area H
Plocha G	Area G
Plocha I	Area I
Plocha J	Area J

Fig. 11 Model schedule for the bulk earthworks phase

- Construction works will then be carried out in the construction site facilities areas. Social and office buildings will be constructed from container assemblies, which will be erected on strip and spread foundations. Mobile cranes are considered for their assembly. Utility networks and basic technical infrastructure structures are expected to be constructed using excavators, trucks, and mobile cranes.
- The sequence of activities associated with the construction of construction site facilities (ZS) is graphically shown in the model schedule (Fig. 12).



Fáze výstavby - Výstavba ZS	Construction phase – Construction of construction site facilities
Doba trvání	Duration
Plocha SMR	SMR area
Výkopové práce objektů ZS	Excavation works for construction site facilities structures
Zakládání objektů ZS	Foundation works for construction site facilities structures
Montáž ZS	Assembly of construction site facilities
Realizace staveništních komunikací	Construction of construction site roads
Plocha C	Area C
Plocha H	Area H
Plocha G	Area G
Plocha I	Area I
Plocha J	Area J

Fig. 12 Model schedule for the construction of construction site facilities phase

- The deployment of machinery assumes 12-hour shifts. Taking into account work breaks, the net working time will be 11 hours.
- The list of machinery used for the individual stages is summarised in Tab. 13–Tab. 17.

Tab. 13 Estimated quantity of machinery used and its mileage during topsoil stripping

Area	Quantity of topsoil	Machine	Number of machines deployed	Distance travelled per shift	Duration of works	Total distance travelled
	[m^3]		[pcs]	[km·machine^{-1}]	[days]	(km)
SMR	88,500	Dozer	2	6.8	17	231.2
C	21,000	Dozer	1	8.4	14	117.6
H	89,250	Dozer	2	6.4	15	192.0
G	33,250	Dozer	1	6.4	11	70.4
I	19,250	Dozer	1	6.4	7	44.8
S	47,500	Dozer	2	7.1	10	142.0

Tab. 14 Estimated quantity of machinery and its mileage during transport of stripped topsoil to the stockpile

Area	Quantity of topsoil	Machine	Number of machines deployed	Transport distance to stockpile	Distance travelled per shift	Duration of works	Total distance travelled
	[m^3]		[pcs]	[m]	[km·machine^{-1}]	[days]	(km)
SMR	88,500	Truck	17	1,100	114.4	15	29,172.0
		Excavator-loader	4	-	-	15	-
C	21,000	Truck	8	4,750	266.0	15	31,920.0
		Excavator-loader	1	-	-	15	-
H	89,250	Truck	17	500	52.0	15	13,260.0
		Excavator-loader	4	-	-	15	-
G	33,250	Truck	9	1,050	109.2	12	11,793.6
		Excavator-loader	2	-	-	12	-
I	19,250	Truck	5	1,100	101.2	13	6,578.0
		Excavator-loader	1	-	-	13	-
S	47,500	Truck	10	2,000	176.0	17	29,920.0
		Excavator-loader	2	-	-	17	-

Tab. 15 Estimated quantity of machinery and its mileage during bulk earthworks

Area	Quantity of soil	Machine	Number of machines deployed	Distance travelled per shift	Duration of works	Total distance travelled
	[m^3]		[pcs]	[km·machine^{-1}]	[days]	(km)
SMR	193,230	Truck	14	34.6	32	15,500.8
		Excavator	5	-	32	-
C	29,070	Truck	6	214.5	24	30,888.0
		Excavator	1	-	24	-
H	346,410	Truck	19	120.0	57	129,960.0
		Excavator	5	-	57	-
G	154,350	Truck	11	182.0	42	84,084.0
		Excavator	3	-	42	-
I	96,840	Truck	6	117.3	39	27,448.2
		Excavator	2	-	39	-
S	47,070	Truck	6	30.5	20	3,660.0
		Excavator	2	-	20	-

Tab. 16 Estimated quantity of machinery and its mileage during transport of unusable soil from excavations

Area	Quantity of soil	Machine	Number of machines deployed	Transport distance to stockpile	Distance travelled per shift	Duration of works	Total distance travelled
	[m^3]		[pcs]	[m]	[km·machine^{-1}]	[days]	(km)
SMR (Bulk earthworks excavations)	21,470	Truck	4	750	72.0	18	5,184.0
		Excavator-loader	1	-	-	18	-
SMR (Structure excavations)	40,050	Truck	4	750	72.0	33	9,504.0
		Excavator-loader	1	-	-	33	-
C	3,230	Truck	6	4,250	256.0	3	4,608.0
		Excavator-loader	1	-	-	3	-
H	38,490	Truck	4	250	23.0	32	2,944.0
		Excavator-loader	1	-	-	32	-
G	17,150	Truck	4	650	67.6	14	3,785.6
		Excavator-loader	1	-	-	14	-
I	10,760	Truck	4	450	49.5	9	1,782.0
		Excavator-loader	1	-	-	9	-
S	5,230	Truck	4	550	55.0	5	1,100.0
		Excavator-loader	1	-	-	5	-

Tab. 17 Estimated quantity of machinery and its mileage during construction of construction site facilities

Area	Activity	Machine	Number of machines	Distance travelled per shift	Duration of works	Total distance travelled	Presence*
			[pcs]	[km·machine^{-1}]	[days]	(km)	
SMR	Excavation works for construction site facilities structures	Truck	3	74.8	29	6507.6	-
		Excavator	1	-	29	-	0.8
	Transport of materials for concrete production	Truck	2	325	90	58,500.0	-
		Excavator-loader	1	-	90	-	0.8
	Foundation works for construction site facilities structures	Truck	2	33.0	75	4950.0	-
		Truck mixer	2	95.7	90	17,226.0	-
		Concrete pump	1	-	90	-	0.5

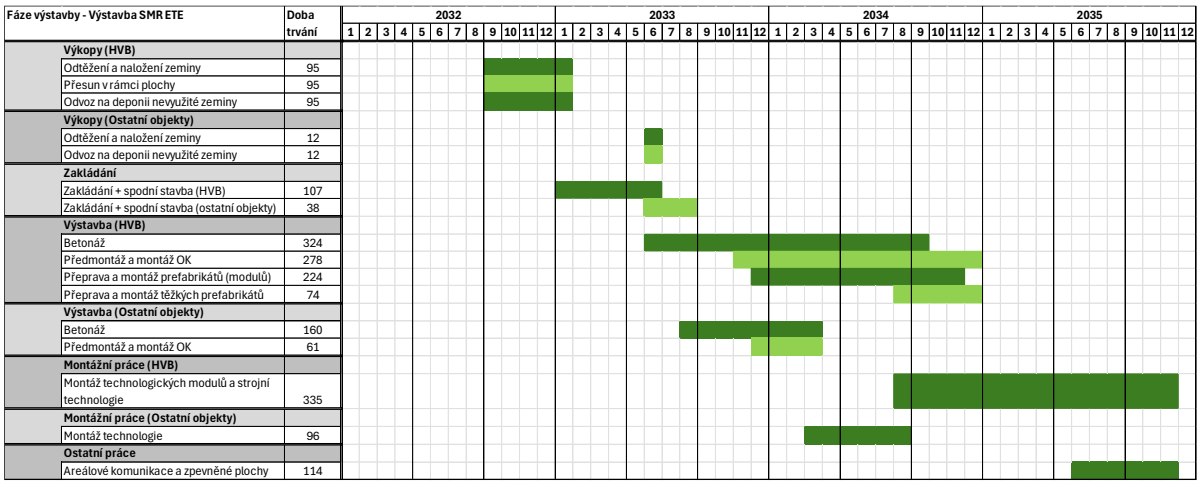
Area	Activity	Machine	Number of machines	Distance travelled per shift	Duration of works	Total distance travelled	Presence*
			[pcs]	[km·machine^{-1}]	[days]	(km)	
	(concreting, incl. installation of reinforcements)	Mobile crane	1	-	75	-	0.5
	Assembly of construction site facilities	Truck	2	22.0	210	9240.0	-
		Mobile crane	1	-	210	-	0.5
	Construction of construction site roads	Excavator	1	-	33	-	0.8
		Truck	4	39.0	33	5148.0	-
		Vibrating roller	1	6.0	8	48.0	-
		Mobile crane	1	-	33	-	0.5
C	Excavation works for construction site facilities structures	Truck	4	225.6	9	8121.6	-
		Excavator	1	-	9	-	0.8
	Transport of materials for concrete production	Truck	2	33.0	28	1,848.0	-
		Excavator-loader	1	-	28	-	0.8
	Foundation works for construction site facilities structures (concreting, incl. installation of reinforcements)	Truck	2	33.0	23	1518.0	-
		Truck mixer	2	33.0	28	1,848.0	-
		Concrete pump	1	-	28	-	0.5
		Mobile crane	1	-	23	-	0.5
	Assembly of construction site facilities	Truck	2	3.0	150	900.0	-
		Mobile crane	1	-	150	-	0.5
	Construction of construction site roads	Excavator	1	-	50	-	0.8
		Truck	4	19.6	50	3,920.0	-
		Vibrating roller	1	1.8	8	14.4	-
		Mobile crane	1	-	50	-	0.5
H	Excavation works for construction site facilities structures	Truck	2	19.5	29	1,131.0	-
		Excavator	1	-	29	-	0.8
	Transport of materials for concrete production	Truck	2	325.0	10	6,500.0	-
		Excavator-loader	1	-	10	-	0.8
	Foundation works for construction site facilities structures (concreting, incl. installation of reinforcements)	Truck	2	33.0	6	396.0	-
		Truck mixer	2	115.5	10	2,310.0	-
		Concrete pump	1	-	10	-	0.5
		Mobile crane	1	-	6	-	0.5
	Assembly of construction site	Truck	3	6.0	180	3,240.0	-
		Mobile crane	1	-	180	-	0.5

Area	Activity	Machine	Number of machines	Distance travelled per shift	Duration of works	Total distance travelled	Presence*
			[pcs]	[km·machine^{-1}]	[days]	(km)	
	facilities						
	Construction of construction site roads (including paved storage areas)	Excavator	1	-	69	-	0.8
		Truck	4	27.4	69	7,562.4	-
		Vibrating roller	2	8.6	15	258.0	-
		Mobile crane	1	-	69	-	0.5
G	Excavation works for construction site facilities structures	Truck	5	89.1	20	8,910.0	-
		Excavator	2	-	20	-	0.8
	Transport of materials for concrete production	Truck	2	325.0	8	5,200.0	-
		Excavator-loader	1	-	8	-	0.8
	Foundation works for construction site facilities structures (concreting, incl. installation of reinforcements)	Truck	2	26.4	4	211.2	-
		Truck mixer	2	135.3	8	2,164.8	-
		Concrete pump	1	-	8	-	0.5
		Mobile crane	1	-	4	-	0.5
	Assembly of construction site facilities	Truck	2	3.6	60	432.0	-
		Mobile crane	1	-	60	-	0.5
	Construction of construction site roads (including paved storage areas)	Excavator	2	-	84	-	0.8
		Truck	6	23.4	84	11,793.6	-
		Vibrating roller	2	17.0	30	1,020.0	-
		Mobile crane	1	-	84	-	0.5
I	Excavation works for construction site facilities structures	Truck	2	79.2	12	1,900.8	-
		Excavator	1	-	12	-	0.8
	Transport of materials for concrete production	Truck	2	325.0	12	7,800.0	-
		Excavator-loader	1	-	12	-	0.8
	Foundation works for construction site facilities structures (concreting, incl. installation of reinforcements)	Truck	2	26.4	6	316.8	-
		Truck mixer	2	69.3	12	1,663.2	-
		Concrete pump	1	-	12	-	0.5
		Mobile crane	1	-	6	-	0.5
	Assembly of construction site facilities	Truck	2	1.8	54	194.4	-
		Mobile crane	1	-	54	-	0.5
	Construction of construction site roads (including paved storage	Excavator	1	-	36	-	0.8
		Truck	4	11.7	36	1,684.8	-
		Vibrating roller	1	2.9	10	29.0	-

Area	Activity	Machine	Number of machines	Distance travelled per shift	Duration of works	Total distance travelled	Presence*
			[pcs]	[km·machine^{-1}]	[days]	(km)	
	areas)	Mobile crane	1	-	36	-	0.5
S	Excavation works for construction site facilities structures	Truck	8	88.0	26	18,304.0	-
		Excavator	2	-	26	-	0.8
	Transport of materials for concrete production	Truck	3	33.0	32	3,168.0	-
		Excavator-loader	1	-	32	-	0.8
	Foundation works for construction site facilities structures (concreting, incl. installation of reinforcements)	Truck	4	33.0	17	2,244.0	-
		Truck mixer	4	33.0	32	4,224.0	-
		Concrete pump	2	-	32	-	0.5
		Mobile crane	2	-	17	-	0.5
	Assembly of construction site facilities	Truck	4	3.0	200	2,400.0	-
		Mobile crane	2	-	200	-	0.5
	Construction of construction site roads (including paved storage areas)	Excavator	2	-	39	-	0.8
		Truck	8	15.6	39	4,867.2	-
		Vibrating roller	2	5.4	27	291.6	-
		Mobile crane	4	-	39	-	0.5

* The simultaneity coefficient of use expresses the proportion of machinery operating concurrently.

- Main construction works – the highest load from both on-site and off-site road traffic, as well as the potential concurrence of construction of SMR ETE and New NPP ETE.
  - Construction activities related to the construction of SMR ETE will be carried out in the SMR ETE area.
  - Intensive concreting will take place (approximately 193,700 m^3 of concrete is assumed, to be produced in the concrete batching plant in the construction site facilities areas – Area J), which will be associated with intensive construction-site traffic.
  - All materials for the production of concrete and prefabricated modules will be supplied from Area C to Area J. Reinforcements will also be supplied and assembled there. Concrete will be transported from Area J, and prefabricated modules will be transported to the SMR construction area. Materials or structures for which transport by rail siding is not assumed will be delivered to and stored in Area J. The estimate of kilometres travelled is based on the route from Area J to the SMR construction area.
  - A car park for construction workers and other persons involved will be located in the construction site areas (Area G).
  - The deployment of machinery assumes 12-hour shifts. Taking into account work breaks, the net working time will be 11 hours.
  - The sequence of activities associated with the construction of SMR ETE is graphically shown in the model schedule (Fig. 13).
  - The list of machinery used for this stage is summarised in Tab. 18.



Fáze výstavby-Výstavba SMR ETE	Construction phase - Construction of SMR ETE
Doba trvání	Duration
Výkopy (HVB)	Excavations (MTB)
Odtěžení a naložení zeminy	Soil excavation and loading
Přesun v rámci plochy	Movement within the area
Odvoz na deponii nevyužité zeminy	Transport of unused soil to stockpile
Výkopy (Ostatní objekty)	Excavations (other structures)
Zakládání	Foundation
Zakládání + spodní stavba (HVB)	Foundation works + substructure (MTB)
Zakládání + spodní stavba (ostatní objekty)	Foundation works + substructure (other structures)
Výstavba (HVB)	Construction (MTB)
Betonáž	Concreting
Předmontáž a montáž OK	Pre-assembly and erection of steel structures
Přeprava a montáž prefabrikátů (modulů)	Transport and installation of prefabricated elements (modules)
Přeprava a montáž těžkých prefabrikátů	Transport and installation of heavy prefabricated elements
Výstavba (Ostatní objekty)	Construction (other structures)
Montážní práce (HVB)	Installation works (MTB)
Montáž technologických modulů a strojní technologie	Installation of technological modules and mechanical equipment
Montážní práce (Ostatní objekty)	Installation works (other structures)
Montáž technologie	Technology installation
Ostatní práce	Other works
Areálové komunikace a zpevněné plochy	On-site roads and paved areas

Fig. 13 Model schedule for the SMR ETE construction phase

Tab. 18 Estimated quantity of machinery and its mileage during construction of SMR ETE

Construction phase	Activity	Machine	Number of machines	Distance travelled per shift	Duration of works	Total distance travelled	Presence*
			[pcs]	[km·machine^{-1}]	[days]	(km)	
Excavation works	Excavations (MTB)	Truck	9	32.0	95	27,360.0	-
		Excavator	3	-	95	-	0.8
	Excavations (other structures)	Truck	6	314.6	12	22,651.2	-
		Excavator	2	-	12	-	0.8
Foundation works + substructure (MTB)	Transport and installation of reinforcements	Truck	8	280.5	54	121,176.0	-
		Stationary/gantry cranes	4	-	54	-	0.5
	Transport of materials for concrete production	Truck	5	325.0	77	125,125.0	-
		Excavator-loader	1	-	77	-	0.8

Construction phase	Activity	Machine	Number of machines	Distance travelled per shift	Duration of works	Total distance travelled	Presence*
			[pcs]	[km·machine^{-1}]	[days]	(km)	
	Concreting	Truck mixer	6	108.9	77	50,311.8	-
		Concrete pump	3	-	77	-	0.5
		Stationary/gantry cranes	3	-	77	-	0.5
Foundation works + substructure (other structures)	Transport and installation of reinforcements	Truck	2	280.5	15	8,415.0	-
		Stationary cranes	4	-	15	-	0.5
	Transport of materials for concrete production	Truck	2	325.0	23	14,950.0	-
		Excavator-loader	1	-	23	-	0.8
	Concreting	Truck mixer	2	108.9	23	5,009.4	-
		Concrete pump	1	-	23	-	0.5
Construction (MTB)	Transport and installation of reinforcements	Truck	8	280.5	180	403,920.0	-
		Stationary/gantry cranes	4	-	180	-	0.5
	Transport of materials for concrete production	Truck	5	325.0	264	429,000.0	-
		Excavator-loader	1	-	264	-	0.8
	Concreting	Truck mixer	6	108.9	264	172,497.6	-
		Concrete pump	3	-	264	-	0.5
		Stationary/gantry cranes	3	-	264	-	0.5
	Pre-assembly and erection of steel structures	Truck	4	12.6	278	14,011.2	-
		Stationary/gantry cranes	2	-	278	-	0.5
	Transport of materials for the production of prefabricated elements (modules)	Truck	4	325.0	224	291,200.0	-
		Excavator-loader	1	-	224	-	0.8
	Transport and installation of prefabricated elements (modules)	Tractor with low loader	3	35.2	224	23,654.4	-
		Stationary/gantry cranes	3	-	224	-	0.5
	Transport and installation of heavy prefabricated elements (modules)	Tractor with low loader	1	3.2	74	236.8	-
		Mobile crane with superlifts / gantry cranes	1	-	74	-	0.5
Construction (other structures)	Transport and installation of reinforcements	Truck	2	280.5	59	33,099.0	-
		Stationary cranes	4	-	59	-	0.5
	Transport of	Truck	2	325.0	90	58,500.0	-

Construction phase	Activity	Machine	Number of machines	Distance travelled per shift	Duration of works	Total distance travelled	Presence*
			[pcs]	[km·machine^{-1}]	[days]	(km)	
	materials for concrete production	Excavator-loader	1	-	90	-	0.8
	Concreting	Truck mixer	2	108.9	90	19,602.0	-
		Concrete pump	1	-	90	-	0.5
		Stationary cranes	4	-	90	-	0.5
	Pre-assembly and erection of steel structures	Truck	2	8.4	61	1,024.8	-
		Mobile cranes	1	-	61	-	0.5
Installation works (MTB)	Transport and installation of oversized technological components	Oversized cargo kit	-**	-	-	-	-
		Mobile crane with superlifts / gantry cranes	1	-	-	-	1.0
	Installation of technological modules and mechanical equipment	Tractor with low loader	2	35.2	335	23,584.0	-
		Stationary/gantry cranes	2	-	335	-	0.5
Installation works (other structures)	Installation of technological equipment	Tractor with low loader	2	35.2	96	6,758.4	-
		Tower/mobile cranes	2	-	96	-	0.5
Other works	On-site roads and paved areas	Vibrating roller	1	6.0	114	684.0	-
		Truck	8	132.0	114	120,384.0	-
		Finisher	2	3.4	114	775.2	-

* The simultaneity coefficient of use expresses the proportion of machinery operating concurrently.

3.4.3.3 Emission characteristics

The quantification of emissions from the described construction activities was carried out using emission factors developed within the project “Methodology for determination of pollutant emission production from construction activities”[15]. Their overview is as follows:

For dozer activities, the calculation is based on the following formula:

$$E_{PM_{10}} = 0.75 \times \frac{0.45 \times s^{1.5}}{M^{1.4}},$$

where:

E_{PM10} average PM_{10} emission factor [kg·h^{-1}],
s silt content [%],
M material moisture content [%].

The percentage share of fine particles in the surface material again depends on the type of material. To determine it, the US EPA AP-42[16] methodology may be used, which gives a value of up to 15% for stripping (exposed soil). Given the fact that the uppermost cover will remain permanently exposed during stripping, the typical moisture value given by the methodology, 7.9%, was conservatively used (this is a value that takes into account both undisturbed and partially exposed terrain). The share of the $PM_{2.5}$ fraction is then considered by the methodology to be 15%.

For loading and unloading activities, including material relocation and wind erosion from stockpiles, the calculations were performed according to the following formula:

$$E_{PM_{10}} = 0.35 \times 0.0016 \times \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}},$$

where:

E_{PM10} average PM_{10} emission factor [kg·t^{-1} of material handled],
U average wind speed [m·s^{-1}],
M material moisture content [%].

The average wind speed was determined on the basis of meteorological data. The moisture content of the topsoil was selected as for the dozer activity. The share of the $PM_{2.5}$ fraction is again considered by the methodology to be 15%.

For excavations of fine-grained soils, the methodology gives an emission factor of 0.04 g PM_{10} per tonne of transferred material for material with moisture content higher than 12%. The share of the $PM_{2.5}$ fraction is then considered by the methodology to be 15%.

A significant factor affecting air quality during construction will be dust entrainment caused by the movement of heavy trucks over the construction areas and construction site facilities areas.

The amount of resuspension emissions caused by the movement of machinery and trucks over paved areas is determined according to the following formula:

$$E_{PM_{10}} = 0.68 \times sL^{0.91} \times W^{1.02},$$

where:

E_{PM10} average PM_{10} emission factor [g·km^{-1} travelled by a vehicle],
sL silt loading on the road surface [g·m^{-2}],
W average vehicle weight [t].

For the amount of particles deposited on the road surface, the methodology gives characteristic sL values for various types of industrial operations, of which the closest in character to construction sites – depending on the type of construction works – may be, for example, landfills (7.4 g·m^{-2}), quarries (8.2 g·m^{-2}), concrete batching plants (12 g·m^{-2}), and, in extreme cases, sand pits and gravel pits (70 g·m^{-2}). For sections near selected construction site areas, a value of 12 g·m^{-2} was used (a value typical for concrete batching plants and also the mean value for sections near construction site exits), or 6 g·m^{-2} for existing roads through the former Temelínec. The share of the $PM_{2.5}$ fraction is then considered by the methodology to be 24.2%.

For resuspension emissions caused by the movement of machinery and trucks over unpaved areas and roads, the calculation according to the following relationship is normally used:

$$E_{PM_{10}} = 1.5 \times k \times (s/12)^{0.9} \times (W \times 1.1023/3)^{0.45} \times (N/30) \times 0.2819\ ,$$

where:

E_{PM10} average PM_{10} emission factor [g·km^{-1} travelled by a vehicle],
s silt content [%],
W average vehicle weight [t],
S average vehicle speed [km·h^{-1}].

The mean value for silt content was used according to the US EPA AP-42[16] methodology, which gives a value of 8.5% for unpaved roads in construction areas. The average speed was selected as up to 15 km·h^{-1}, and the vehicle weight was considered to be up to 25 t (taking into account that half of the trips are made by an empty vehicle). The share of the $PM_{2.5}$ fraction is then considered by the methodology to be 10%. Dust entrainment from the surface itself can be assumed only during periods when the soil surface is dry. Data on climatic characteristics according to the E. Quitt classification[9] were used to estimate the number of days with measurable precipitation (i.e., periods when emissions are considered to be zero).

For the values used for the characteristics of the handled materials, the secondary dust emission factors for the assessed activities are as follows:

Tab. 19 Deployment of construction machinery for MTB construction

Activity	PM_{10} emission factor	$PM_{2.5}$ emission factor	Unit
dozer activity	1,086	163	$g \cdot h^{-1}$
soil excavation	0.04	0.006	$g \cdot t^{-1}$
loading and unloading of topsoil/soil	0.122	0.018	$g \cdot t^{-1}$
dust entrainment by movement on unpaved roads	420	42.0	$g \cdot km^{-1}$
dust entrainment by movement on paved roads (concrete panels)	239	58	$g \cdot km^{-1}$
dust entrainment by movement on paved roads (existing road – through the former Temelínec)	93	23	$g \cdot km^{-1}$

For concrete batching activities and the recycling line, the specific emission factors set out in the Communication of the Air Protection Department establishing emission factors pursuant to Section 12(1)(b) of Decree No. 415/2012 Coll., on the permissible level of pollution and its determination and on the implementation of certain other provisions of the Air Protection Act[17], were used. The overall emission factor for industrial concrete production (at average moisture content and raw-material dosing) is given as 8.565 $g \cdot t^{-1}$ of concrete produced, while production of up to 193,700 m^3 of concrete (450 $m^3 \cdot h^{-1}$) is considered. For construction-material recycling lines with a considered sprinkling system, an emission factor of up to 200 $g \cdot t^{-1}$ of processed waste is considered, while processing of up to 133,150 m^3 of aggregate in 2030 is considered, with 222 operating hours per year (8 h per day), or 6,060 t of construction waste in the period 2030–2035, with approximately 2 hours of operation per day, approximately once a week.

Emissions of particulate matter from other activities are insignificant in terms of their effect on air quality.

Emission factors for calculating emissions from the operation of construction machinery (arising from fuel combustion) were calculated on the basis of data provided in the EMEP/EEA air pollutant emission inventory guidebook 2023[12], which summarises emission factors for “1.A.4 Non-road mobile machinery” sources in the form of specific emissions per fuel consumption. The sources were selected in emission class Stage IV, which will already have been in force for 20 years at the time of construction; the calculation is therefore prepared conservatively, as in reality partial deployment of more modern construction machinery, and therefore correspondingly lower emissions, is assumed.

3.4.3.4 Calculation scenario

Based on the machinery deployment schedule for the individual activities, including the estimate of distances travelled by construction machinery, it was quantified that the most emission-intensive period will be the construction phase, during which a very significant part of the transport will take place (in particular, transport of material for the production of concrete and prefabricated modules from Area C to Area J, followed by transport from Area J to the SMR area). In terms of emissions of the monitored pollutants, this stage will exceed even the period of bulk earthworks, in particular due to the substantial mileage travelled between the considered distant areas.

In the period of the main phases of construction of SMR ETE, potential concurrence with the initial preparation phase of New NPP ETE is also considered; the selection of this time concurrence will therefore represent the worst possible situation that may occur in the monitored area from the perspective of ambient air pollution burden.

4 Air Pollution Calculation Method

4.1 Model Characteristics

The calculation of the Project's contribution to the ambient air pollution burden is performed according to the Methodological Guideline of the Air Protection Department of the Ministry of the Environment for the preparation of air dispersion studies pursuant to Section 32(1)(e) of Act No. 201/2012 Coll., on Air Protection, as amended[2]. The reference method for calculating air pollution from point, line, and area sources, "SYMOS 97", version 2013[18], is used for the calculation, taking into account current legislation (e.g., updated air quality limits) and new findings in the field of air quality protection.

The methodology used is based on the assumption of a Gaussian concentration profile across the plume cross-section (statistical theory of turbulent diffusion) and enables the calculation of air pollution by gaseous substances and dust from point, area, and line sources, as well as the calculation of pollution from a larger number of sources.

When calculating concentrations of pollutants spreading from a line source, the line source is divided into a sufficient number of length elements and, for the given reference point, the concentration contributions of the substance from each of them are calculated. The same applies similarly when calculating concentrations from area sources.

The methodology includes corrections for vertical terrain division, reckons with wind shifting and speed increase depending on height, and while calculating average concentrations and duration of exceeding the boundary concentrations, it takes into account frequency distribution of wind direction, wind speed, and thermal turbulence intensity, on which speed of dispersion of pollutants into atmosphere is dependent. Since the intensity of thermal turbulence directly depends on the thermal stability of the atmosphere, the most important climatic input is a wind rose differentiated by wind speed and atmospheric thermal stability. The wind rose contains relative frequencies of wind direction from 8 basic directions for various types of dispersion conditions.

The calculations are performed for 5 atmospheric stability classes (i.e., 5 classes of the atmosphere's ability to disperse admixtures) and 3 wind speed classes (light wind 1.7 $m \cdot s^{-1}$, moderate wind 5 $m \cdot s^{-1}$, and strong wind 11 $m \cdot s^{-1}$). The characteristics of the stability classes are as follows:

- superstable – strong inversions, very poor dispersion conditions,
- stable – common inversions, poor dispersion conditions,
- isothermal – weak inversions, isothermy, or a small positive temperature gradient, frequently occurring moderately worsened dispersion conditions,
- normal – indifferent temperature stratification, common case of good dispersion conditions,
- unstable – unstable temperature stratification, rapid dispersion of pollutants.

In practice, 11 combinations of stability classes and wind speed classes may occur. The wind rose that serves as an input for the air pollution calculation contains relative frequencies of wind direction from 8 basic directions for these 11 different types of dispersion conditions and, in addition, the frequency of calm conditions for each atmospheric stability class.

The methodology further includes a procedure for calculating the number of days exceeding the 24-hour limit (VoL) for suspended PM_{10} particles:

$$VoL = a + b \times \left(1 - exp\left(-\left(IHr - d \times \ln\left(1 - {}^{\sqrt{2}}/_{2}\right) - c\right)/d\right)\right)^{2},$$

where IHr is the average annual ambient concentration of suspended PM_{10} particles [$\mu g \cdot m^{-3}$], and constants a, b, c, and d have the values a = 0.515 5; b = 348.809 7; c = 63.886 3; d = 41.130 9.

The uncertainty of the calculation is determined primarily by the uncertainty of the input data (including the quality of measurements of meteorological elements and concentrations), as well as by the uncertainty of the modelling itself.

The basis of the methodology is a mathematical model, which by its very nature represents a simplification and cannot describe all atmospheric processes that affect the dispersion of pollutants. The purpose of the Air Dispersion Study is to estimate the expected impact of the assessed Project on air quality in the area under

assessment, with the aim of obtaining information on the degree of probability that, after implementation of the proposed Project, the relevant air quality limit will not be exceeded.

The input data entered that describe the assessed emission sources (emission parameters of stationary sources, data on the traffic volume and composition of the traffic flow, etc.) have the character of maximum possible values. Although uncertainties in emission factors, future traffic composition, meteorology, and the model itself may still be expected, given that their effect is limited by the conservative calculation settings, the results obtained from the calculation model specified in this way represent an upper estimate of the expected situation.

4.2 Determination of Relevant Pollutants

The calculations are prepared for nitrogen dioxide, particulate matter fractions PM_{10} and $PM_{2.5}$, benzene, and benzo(a)pyrene, which, with regard to the amount of emissions produced by the assessed sources and generated road traffic and the level of the existing ambient air pollution burden, are the decisive pollutants for which the air quality limit may be reached or exceeded first.

For the pollutants sulphur dioxide and carbon monoxide, ambient concentrations in the affected area are currently expected to be at levels far below the limits. The main sources of emissions of these pollutants include the energy sector, household heating, and, to a lesser extent, industrial sources. Given the nature of the assessed sources (road traffic and backup power sources), these pollutants were not assessed; their contributions can be expected to be at very low levels, and the change in the ambient air pollution situation in the affected area itself will be negligible in the future scenarios. The overall ambient air pollution situation for these pollutants can therefore continue to be described as below the limits in the future years together with the implementation of SMR ETE, with a substantial ambient concentration reserve.

4.3 Air Quality Limits Used

The results of the model calculations are evaluated in relation to the air quality limits that determine the permissible level of air pollution. Their values for the individual pollutants are set out in Annex No. 1 to Act No. 201/2012 Coll., on Air Protection, as amended (see Tab. 20).

Tab. 20 Legislative air quality limits for selected pollutants

Pollutant	Averaging period	Air quality limit	Permissible frequency of exceeded limits per calendar year
Nitrogen dioxide	1 hour	200 $\mu g \cdot m^{-3}$	18
Nitrogen dioxide	1 calendar year	40 $\mu g \cdot m^{-3}$	-
Particulate matter fraction PM_{10}	24 hours	50 $\mu g \cdot m^{-3}$	35
Particulate matter fraction PM_{10}	1 calendar year	40 $\mu g \cdot m^{-3}$	-
Particulate matter fraction $PM_{2.5}$	1 calendar year	20 $\mu g \cdot m^{-3}$	-
Benzene	1 calendar year	5 $\mu g \cdot m^{-3}$	-
Benzo(a)pyrene	1 calendar year	1 $ng \cdot m^{-3}$	-

4.4 Calculated Air Pollution Characteristics

When modelling changes in ambient concentrations in the area of interest, maximum hourly, maximum daily, and average annual ambient concentrations were calculated, always in relation of the pollutants addressed to the relevant air quality limits (see Chapter 4.3).

5 Analysis and Assessment of the Ambient Concentration Situation

To describe the background level of the ambient air pollution burden, data from pollution maps constructed in a 1 × 1 km grid were used; these represent five-year moving averages of pollutant concentrations based on actual data for the years 2020–2024 (CHMI Prague). In the case of maximum short-term NO_2 concentrations, for which pollution maps are not prepared, data from ambient air quality monitoring (CHMI) are used.

Detailed modelling is performed, pursuant to the Methodological Guideline for the preparation of air dispersion studies under Section 32(1)(e) of Act No. 201/2012 Coll., as amended[2], for selected relevant substances that may be emitted into the air and may affect air quality in the affected area and for which air quality limits have been set.

With regard to the level of the existing ambient air pollution burden and the amount of emissions produced by the Project, nitrogen dioxide NO_2, particulate matter fractions PM_{10} and $PM_{2.5}$, benzene, and benzo(a)pyrene are the decisive pollutants for which the air quality limit may be reached or exceeded first. Model calculations of the contribution of the assessed sources to the background ambient air pollution burden in the affected area are also prepared for these pollutants.

The result of the calculation is both the development of the ambient background (the effect of the natural increase in traffic, including potential cumulation with New NPP ETE) and the difference in the ambient contribution of the individual pollutants due to the implementation of the Project (the difference between the zero option and the active option), in the individual time horizons of the selected scenarios.

The following chapters present the graphic outputs of the calculation models and the ambient contributions of the assessed sources. Given the extent of the output data across the entire calculation grid, the complete results are stored with the author of the Air Dispersion Study.

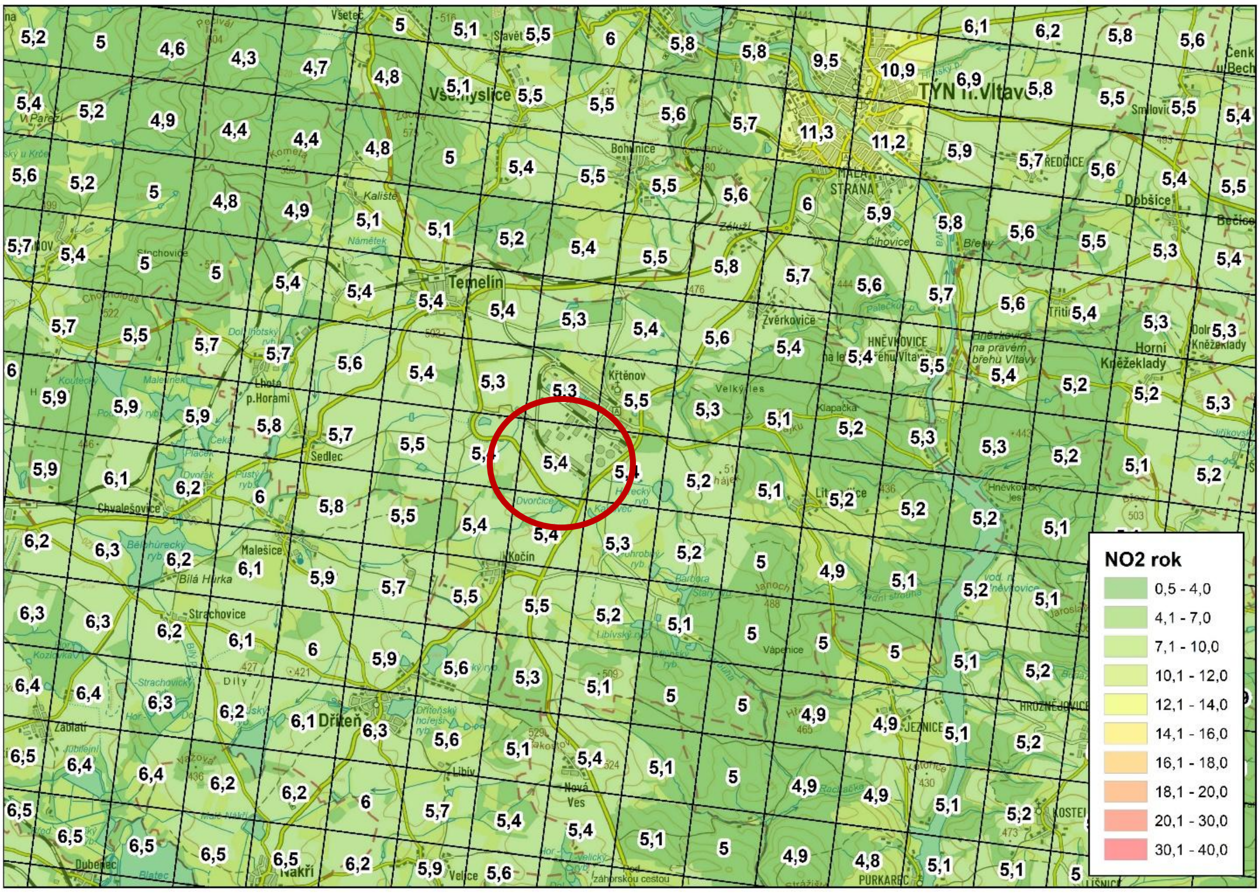
The results are presented in the form of cartographic visualisation of concentration isolines on a map base, and the future levels of air pollution and the expected compliance with the air quality limits are assessed in a brief commentary (see the following chapters). The results for selected calculation points in the built-up parts of the surrounding municipalities are supplemented in tabular form.

5.1 Existing Condition

5.1.1 Ambient air pollution burden from nitrogen dioxide

Annual average concentrations

According to the five-year moving averages, average annual concentration values of up to 5.5 µg·m^{-3} can be expected near the Project, i.e., up to 14% of the air quality limit (40 µg·m^{-3}). A detailed illustration of the average annual concentrations in the area is shown in Fig. 14. A partial link between ambient concentrations and transport corridors is apparent here, while emissions from heating near residential development play a less significant role in the area.



NO2 rok	NO2 year

Fig. 14 Average annual NO_2 concentrations [µg·m^{-3}] – existing condition

According to the emission balance of stationary and mobile sources (Air Quality Improvement Programme – South-West Zone – Z03), the largest contributor to total NO_x emissions is the REZZO4 source group (mobile sources). However, a clear downward trend has been evident over the last several years.

Maximum short-term (hourly) concentrations

Five-year moving averages of maximum hourly concentrations are not prepared for nitrogen dioxide. According to measurements at locations of similar character in the South Bohemian Region (Tab. 21), maximum short-term NO_2 concentrations can be expected at levels of approximately 60–90 µg·m^{-3}, i.e., up to 45% of the air quality limit (200 µg·m^{-3}).

Tab. 21 Ambient air quality monitoring results in 2024

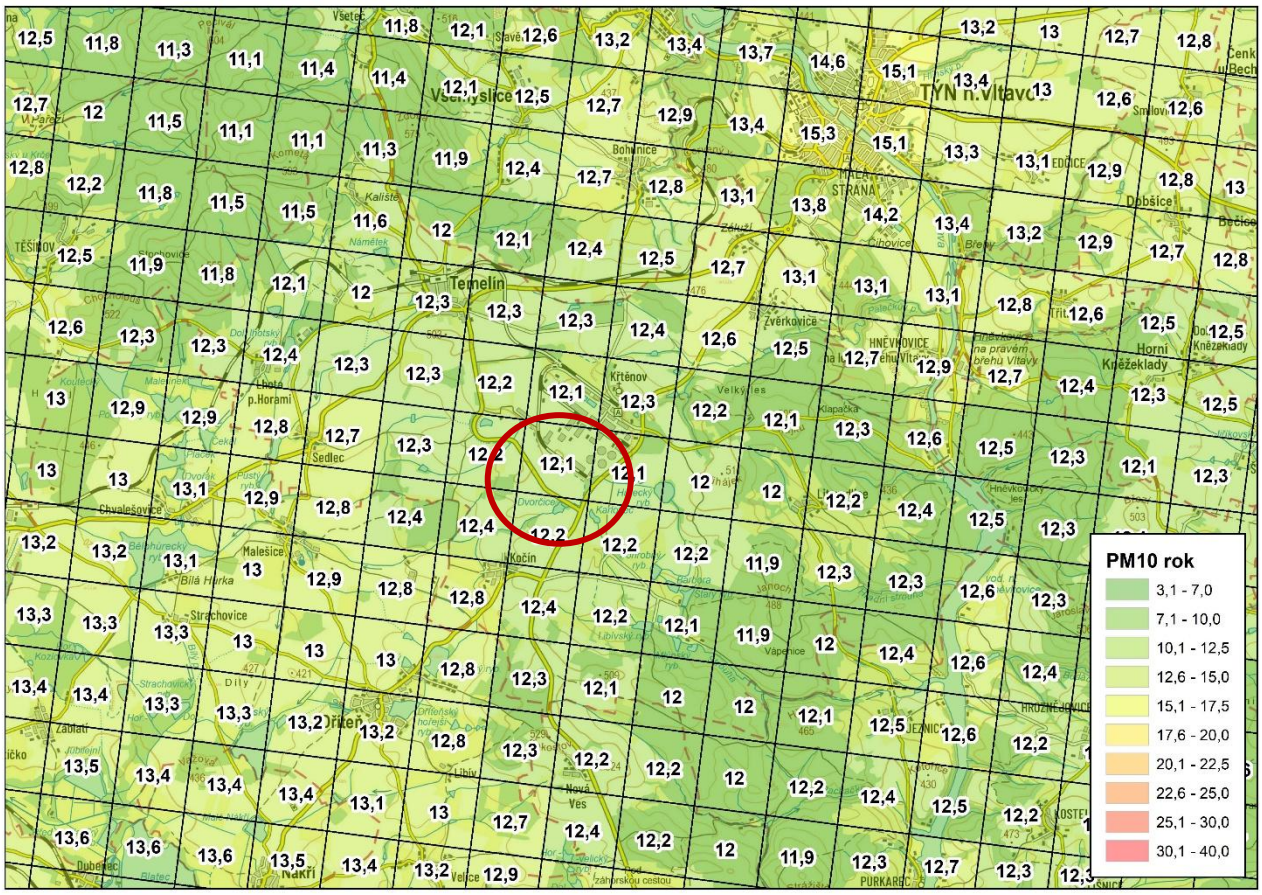
Organizace	Typ měřicího programu	Hodinové hodnoty				Denní hodnoty				Čtvrtletní hodnoty				Roční hodnoty		
Identifikace ISKO		Max.	19 MV	Vol.	50% Kv	Max.		95% Kv	50% Kv	X1q.	X2q.	X3q.	X4q.	X	S	N
Lokalita	Metoda	Datum	Datum	VoM	98% Kv	Datum			98% Kv	C1q.	C2q.	C3q.	C4q.	XG	SG	dv
ČHMÚ (1104) České Budějovice	Automatizovaný měřicí program CHLM	65,8	53,8	0	7,1	43,7	~	21,4	8,4	13,7	6,8	7,3	11,6	9,8	5,72	361
		06.09.	11.01.	0	36,9	11.01.	~	~	25,0	90	90	91	90	8,5	1,70	2
ČHMÚ (1225) Prachatice	Automatizovaný měřicí program CHLM	67,5	53,6	0	5,2	39,8	~	18,4	6,4	10,2	5,3	5,5	10,7	7,9	5,43	365
		17.01.	05.12.	0	34,6	10.01.	~	~	25,3	91	91	92	91	6,6	1,82	1
ČHMÚ (2594) Tábor	Automatizovaný měřicí program CHLM	92,6	70,4	0	13,4	47,8	~	31,3	15,5	19,1	13,3	14,6	19,3	16,6	8,13	364
		10.01.	18.01.	0	52,2	19.12.	~	~	36,4	91	91	92	90	14,5	1,74	1

Organizace	Organization
Typ měřicího programu	Type of measurement programme
Identifikace ISKO	ISKO identification
Lokalita	Location
Metoda	Method
Hodinové hodnoty	Hourly values
Datum	Date
Denní hodnoty	Daily values
Čtvrtletní hodnoty	Quarterly values
Roční hodnoty	Annual values
ČHMÚ (1104) České Budějovice	CHMI (1104) České Budějovice
ČHMÚ (1225) Prachatice	CHMI (1225) Prachatice
ČHMÚ (2594) Tábor	CHMI (2594) Tábor
Automatizovaný měřicí program CHLM	Automated CHLM measurement programme

5.1.2 Ambient air pollution burden from particulate matter

Annual average concentrations – particulate matter fraction PM_{10}

According to the five-year moving averages, average annual concentration values of up to approximately 12.5 $\mu g \cdot m^{-3}$ can be expected near the Project, i.e., approximately 31% of the air quality limit (40 $\mu g \cdot m^{-3}$). A detailed illustration of the average annual concentrations in the area is shown in Fig. 15. The figure shows that higher concentrations can be expected in built-up areas, which is related mainly to the operation of seasonal heat sources and, to a lesser extent, to road traffic.



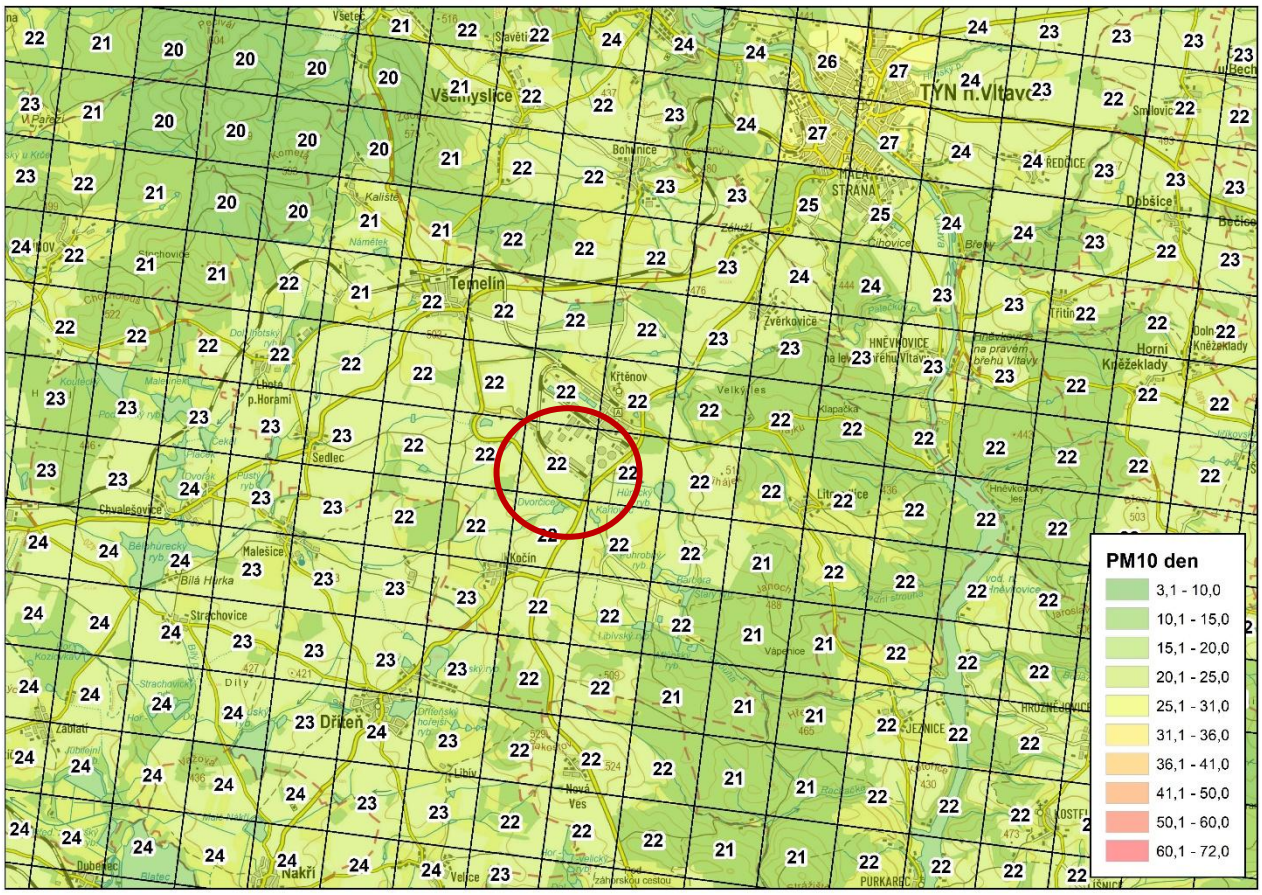
PM10 rok	PM10 year

Fig. 15 Average annual PM_{10} concentrations [$\mu g \cdot m^{-3}$] – existing condition

According to the emission balance of stationary and mobile sources (Air Quality Improvement Programme – South-West Zone – Z03), it follows that the effect of listed stationary sources is ceasing to be dominant, while the importance of sources such as household heating and traffic (primarily the resuspension caused by traffic) is increasing. At the area-wide level, the effect of secondary aerosols, which are formed by chemical transformation from gaseous pollutants (precursors), may also be described as significant. Given the duration of the chemical reactions, secondary aerosols are characterised by very long transport pathways and a weak or non-existent spatial link between the location where precursors are emitted and the location where the aerosols ultimately manifest as a contribution to suspended particulate matter concentrations.

Maximum short-term (24-hour) concentrations – particulate matter fraction PM_{10}

According to the five-year moving averages, values of the 36th highest maximum short-term PM_{10} concentration of approximately 22 $\mu g \cdot m^{-3}$ can be expected near the Project. The relevant air quality limit (LV = 50 $\mu g \cdot m^{-3}$, TE = 35 cases per year) may probably be exceeded locally, but with a below-limit frequency. A detailed illustration of the maximum daily burden in the area is shown in Fig. 16. The figure again shows a link between ambient concentrations and the built-up area, where the effect of local furnaces during the cold part of the year is expected in particular. However, so-called secondary aerosols also have a significant effect (see above).

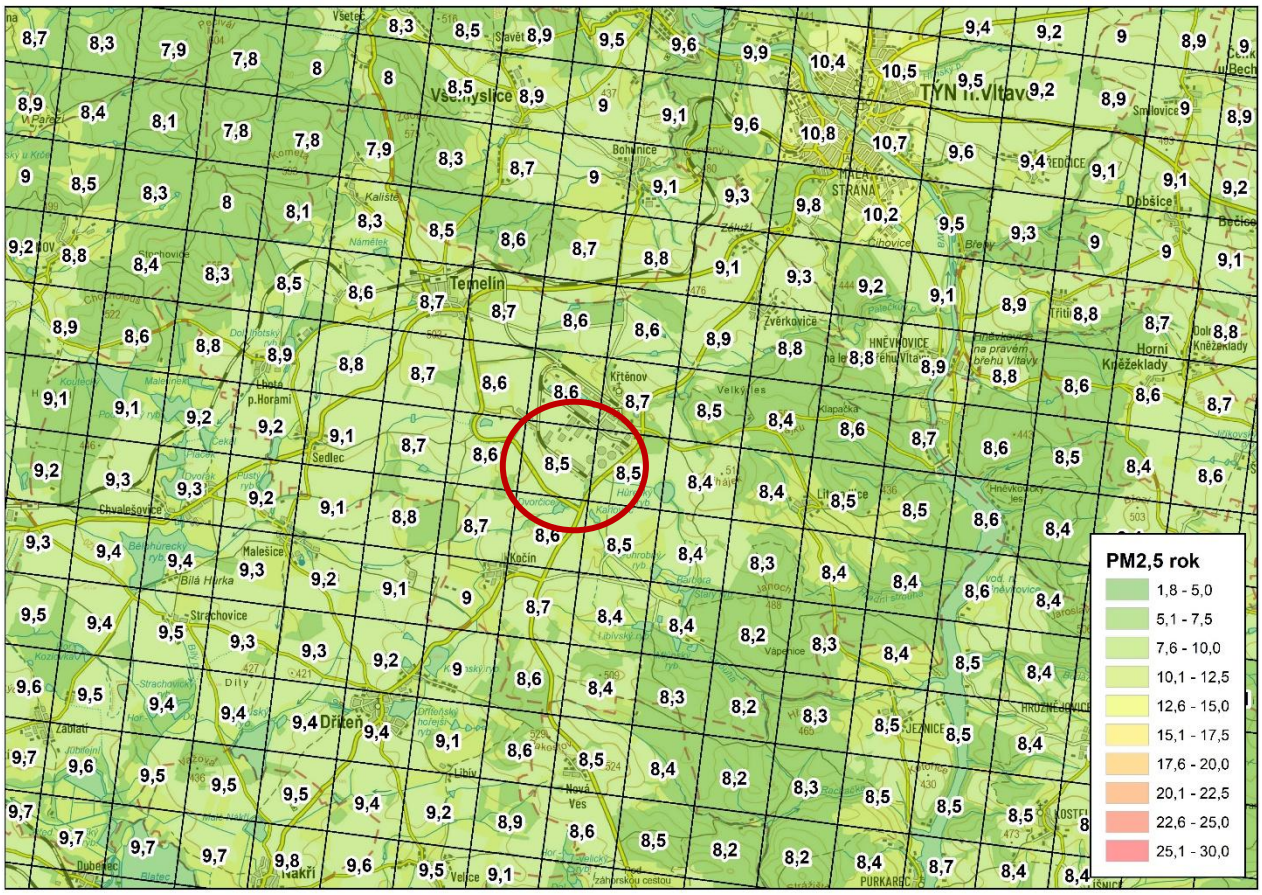


PM10 den	PM10 day

Fig. 16 36th highest daily PM_{10} concentration [$\mu g \cdot m^{-3}$] – existing condition

Annual average concentrations – particulate matter fraction $PM_{2.5}$

According to the five-year moving averages, average annual concentration values of up to 9 $\mu g \cdot m^{-3}$ can be expected near the Project, i.e., up to 45% of the air quality limit (20 $\mu g \cdot m^{-3}$). A detailed illustration of the average annual concentrations in the area is shown in Fig. 17. The figure again shows a link between ambient concentrations and areas of local furnaces



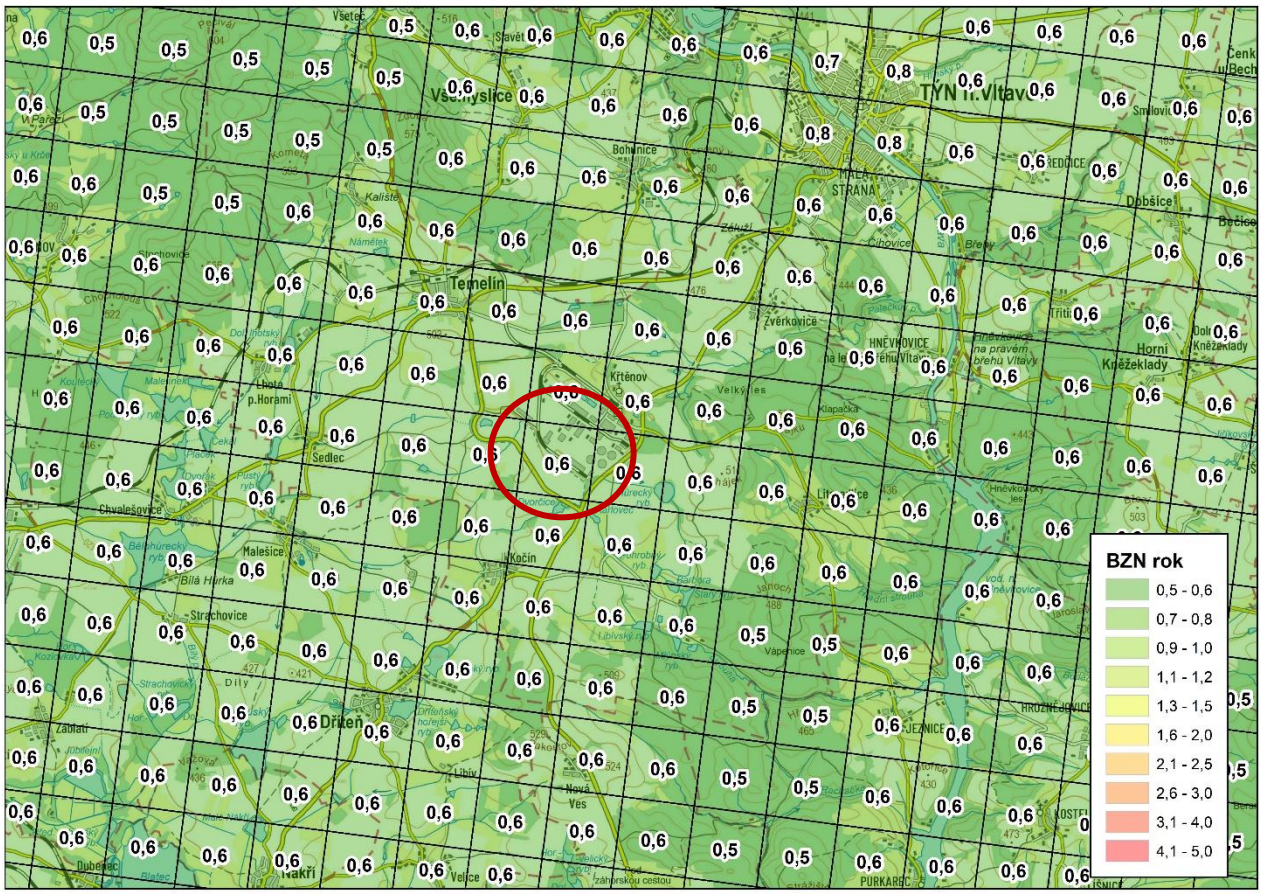
PM2,5 rok	PM2.5 year

Fig. 17 Average annual $PM_{2.5}$ concentrations [$\mu g \cdot m^{-3}$] – existing condition

5.1.3 Ambient air pollution burden from benzene

Annual average concentrations

According to the five-year moving averages, average annual concentration values of approximately 0.6 $\mu g \cdot m^{-3}$ can be expected near the Project, i.e., 12% of the air quality limit (LV = 5 $\mu g \cdot m^{-3}$). A detailed illustration of the average annual concentrations in the area is shown in Fig. 18.



BZN rok	BZN year

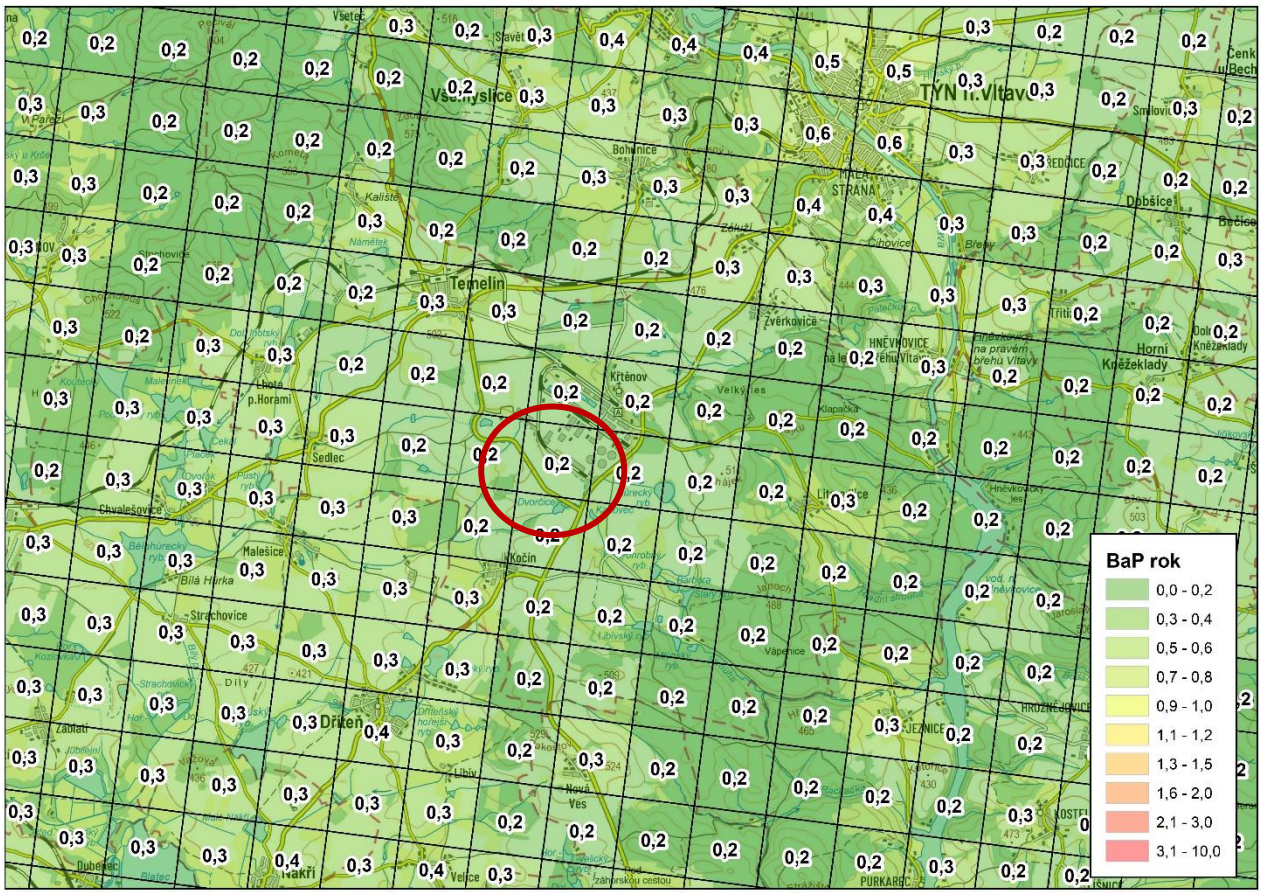
Fig. 18 Average annual benzene concentrations [µg·m^{-3}] – existing condition

According to the emission balance of stationary and mobile sources (Air Quality Improvement Programme – South-West Zone – Z03), benzene emissions are contributed to mainly by REZZO3 sources (use of solvents, or household heating), with a significant effect from REZZO4 mobile sources.

5.1.4 Ambient air pollution burden from benzo(a)pyrene

Annual average concentrations

According to the five-year moving averages, average annual concentration values of approximately 0.2 ng·m^{-3} can be expected near the Project, i.e., 20% of the air quality limit (1 ng·m^{-3}). A detailed illustration of the average annual concentrations in the area is shown in Fig. 19. The figure shows a link between ambient concentrations mainly in areas of local furnaces.



BaP rok	BaP year

Fig. 19 Average annual benzo(a)pyrene concentrations [ng·m^{-3}] – existing condition

According to the emission balance of stationary and mobile sources (Air Quality Improvement Programme – South-West Zone – Z03), the largest contributor to total benzo(a)pyrene emissions is household heating (combustion of solid fuels in domestic furnaces). The model assessment calculated the share of household heating at up to 97% of the total ambient concentration burden.

5.2 Construction period – year 2034

For this period, the so-called zero option without the effect of implementation of SMR ETE was modelled, corresponding to the change in ambient concentrations due both to the natural increase in traffic volumes by 2034 and to the effect of traffic associated with the initial phase of construction of New NPP ETE. The potential maximum effect of construction itself in the area designated for New NPP ETE was cumulatively added to these values.

The second modelling scenario then represents only the contribution generated by the construction of the SMR ETE Project, including generated traffic.

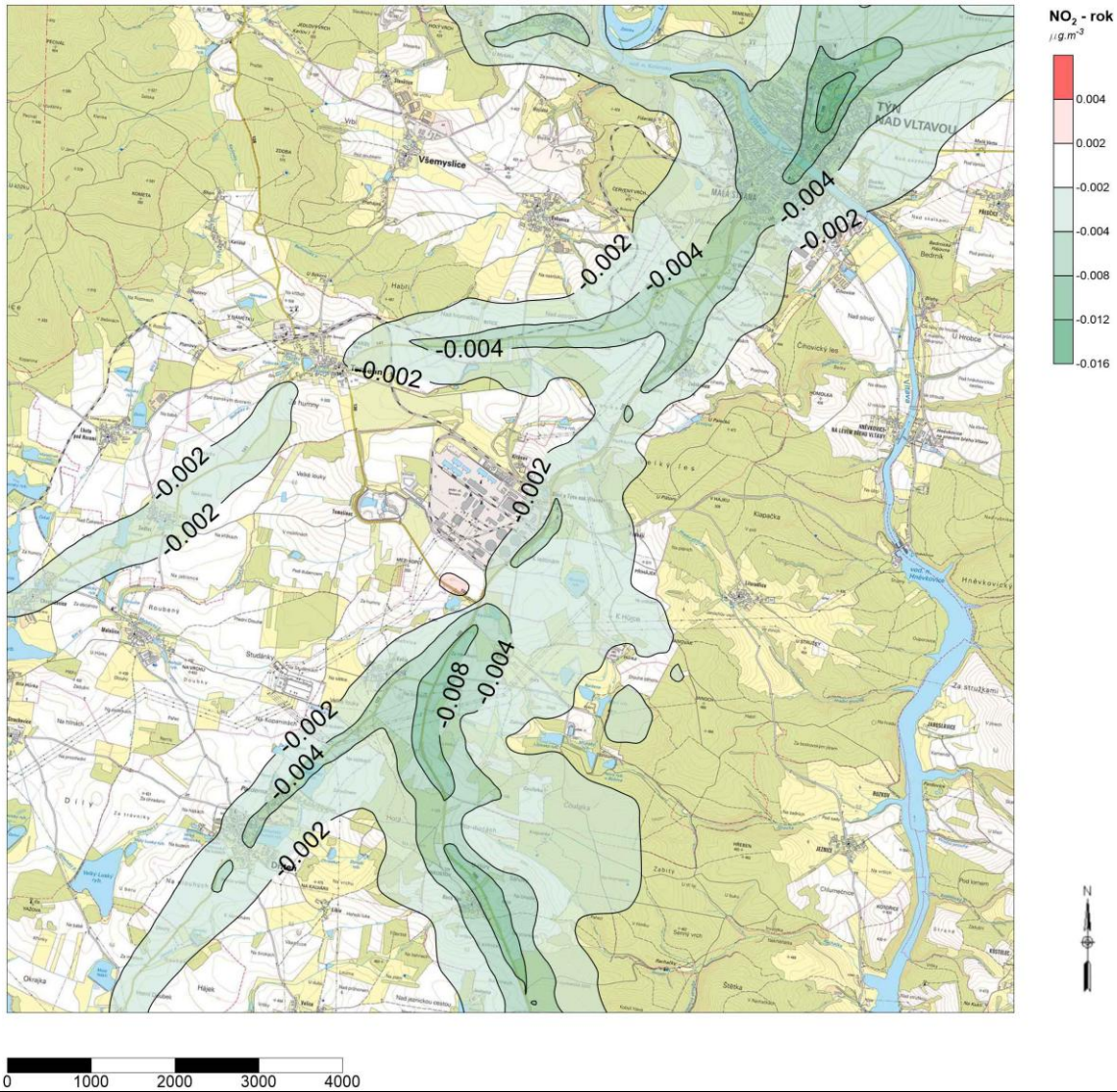
5.2.1 Ambient air pollution burden from nitrogen dioxide

5.2.1.1 Annual average concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the initial phase of construction of New NPP ETE, virtually no increase in average annual NO_2 concentrations is expected. Despite the increase in traffic volumes, a decrease in ambient concentrations can be observed

near transport routes at the site (see Fig. 20). This decrease is caused by a reduction in primary emissions from fuel combustion as a result of renewal of the vehicle fleet (improvement in vehicle emission standards), which compensates for the effect of the increase in traffic volumes in the area.



NO_2 - rok	NO_2 – year

Fig. 20 Change in average annual NO_2 concentration [µg·m^{-3}] due to traffic – period 2034 without the Project

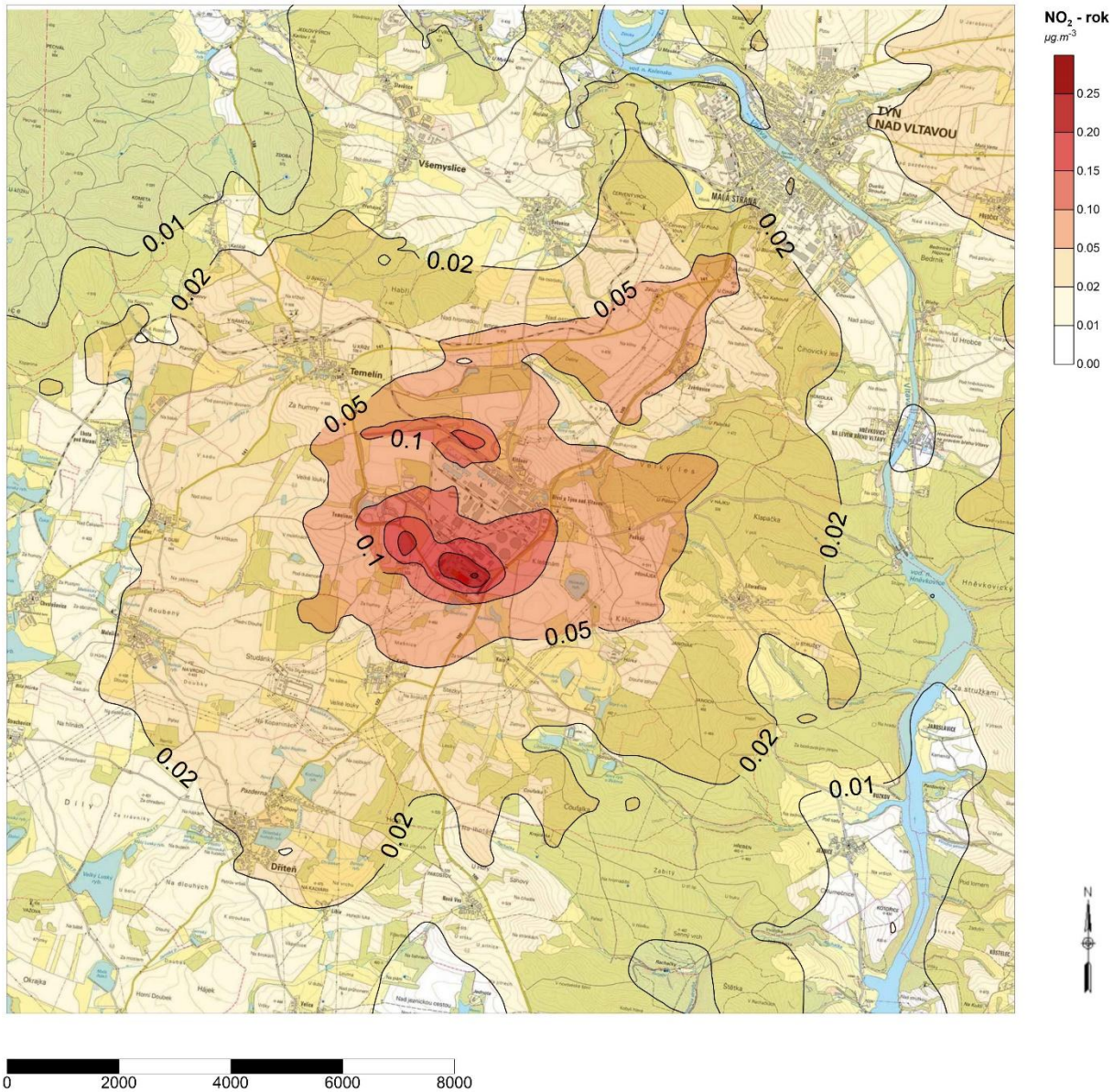
The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes. The contribution values for these activities were taken from the Air Dispersion Study "New NPP at the ETE site – Air Dispersion Study of the operation of construction machinery on the main construction site and construction site facilities areas"[19]. In this study, the contribution attributable to the most intensive operation of machinery during the considered construction period of approximately 6 years was calculated. The cumulative assessment of the concurrence of these activities is therefore carried out conservatively, resulting in the worst possible condition that may occur at the site.

The compiled maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (hundredths of µg·m^{-3}); at the nearest residential development, it represents a completely insignificant contribution to background concentrations.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition, with a large reserve.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient NO_2 concentration due to construction reaches a level of up to approximately 0.25 $\mu g \cdot m^{-3}$, i.e., approximately 0.6% of the air quality limit (40 $\mu g \cdot m^{-3}$). The field of contribution distribution is apparent from Fig. 21.



NO_2 - rok	NO_2 – year

Fig. 21 Contribution of SMR ETE to the average annual NO_2 concentration [$\mu g \cdot m^{-3}$] – period 2034 – construction of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of construction of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 22. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

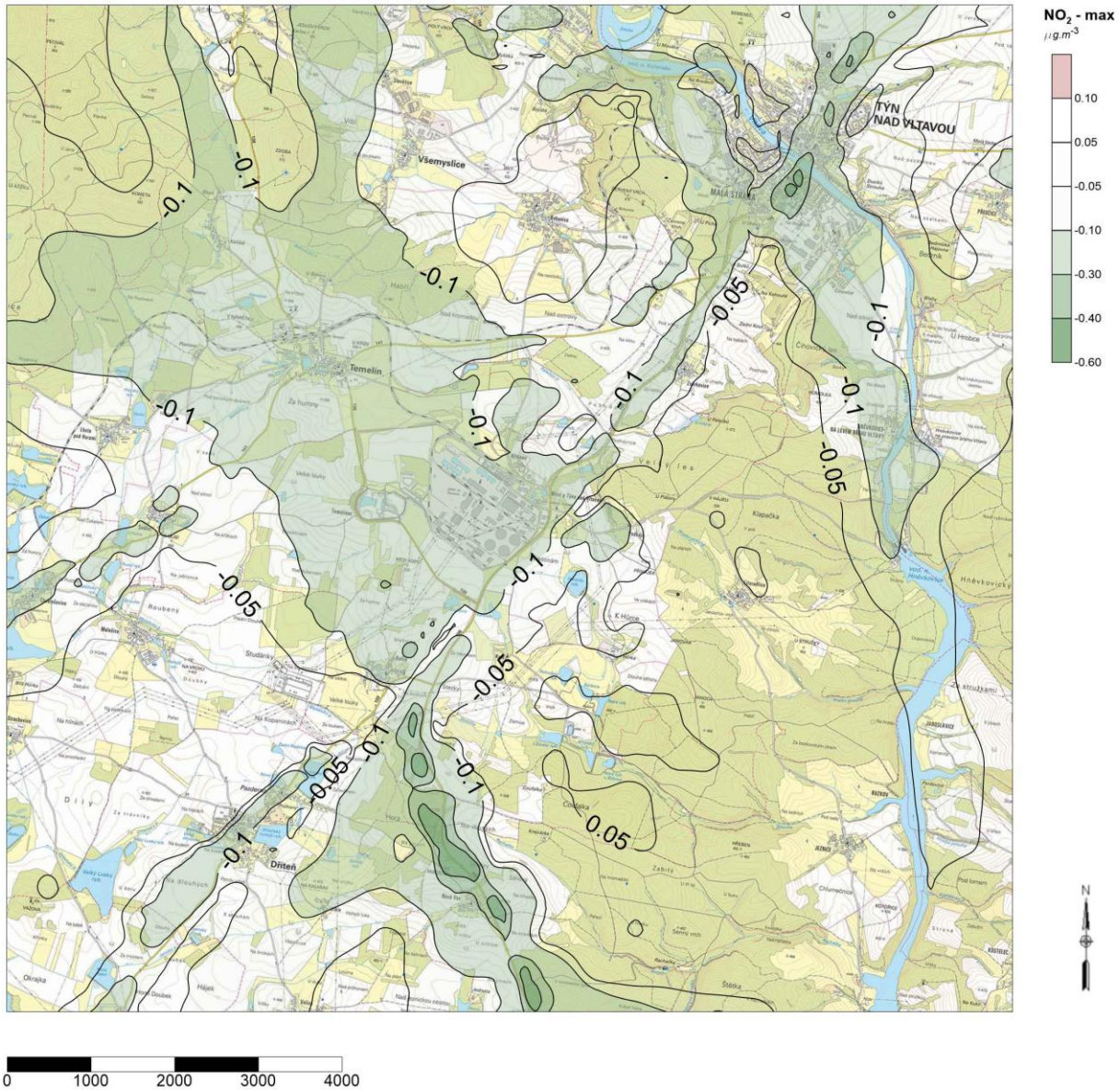
Tab. 22 Results of the assessment for selected locations – average annual NO_2 concentrations – year 2034

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of construction of SMR ETE
	[µg.m^{-3}]			
Tem	5.4	0.000	<0.005	+0.041
Koc	5.5	-0.004	<0.005	+0.046
Dri	6.3	-0.003	<0.005	+0.025
Zve	5.8	-0.004	<0.005	+0.064
TnV	11.3	-0.005	<0.005	+0.034
1	5.1	-0.001	<0.005	+0.024
2	5.1	-0.002	<0.005	+0.023
3	5.5	-0.002	<0.005	+0.046
4	5.9	-0.001	<0.005	+0.023
5	5.7	-0.003	<0.005	+0.024
6	5.4	-0.001	<0.005	+0.040

5.2.1.2 Maximum short-term (hourly) concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the initial phase of construction of New NPP ETE, no significant change in maximum hourly NO_2 concentrations is expected. Despite the increase in traffic volumes, a decrease in ambient concentrations can be observed near transport routes at the site (see Fig. 22). This decrease is caused by a reduction in primary emissions from fuel combustion as a result of renewal of the vehicle fleet (improvement in vehicle emission standards), which fully compensates for the effect of the increase in traffic volumes in the area.



NO_2 - max	NO_2 – max

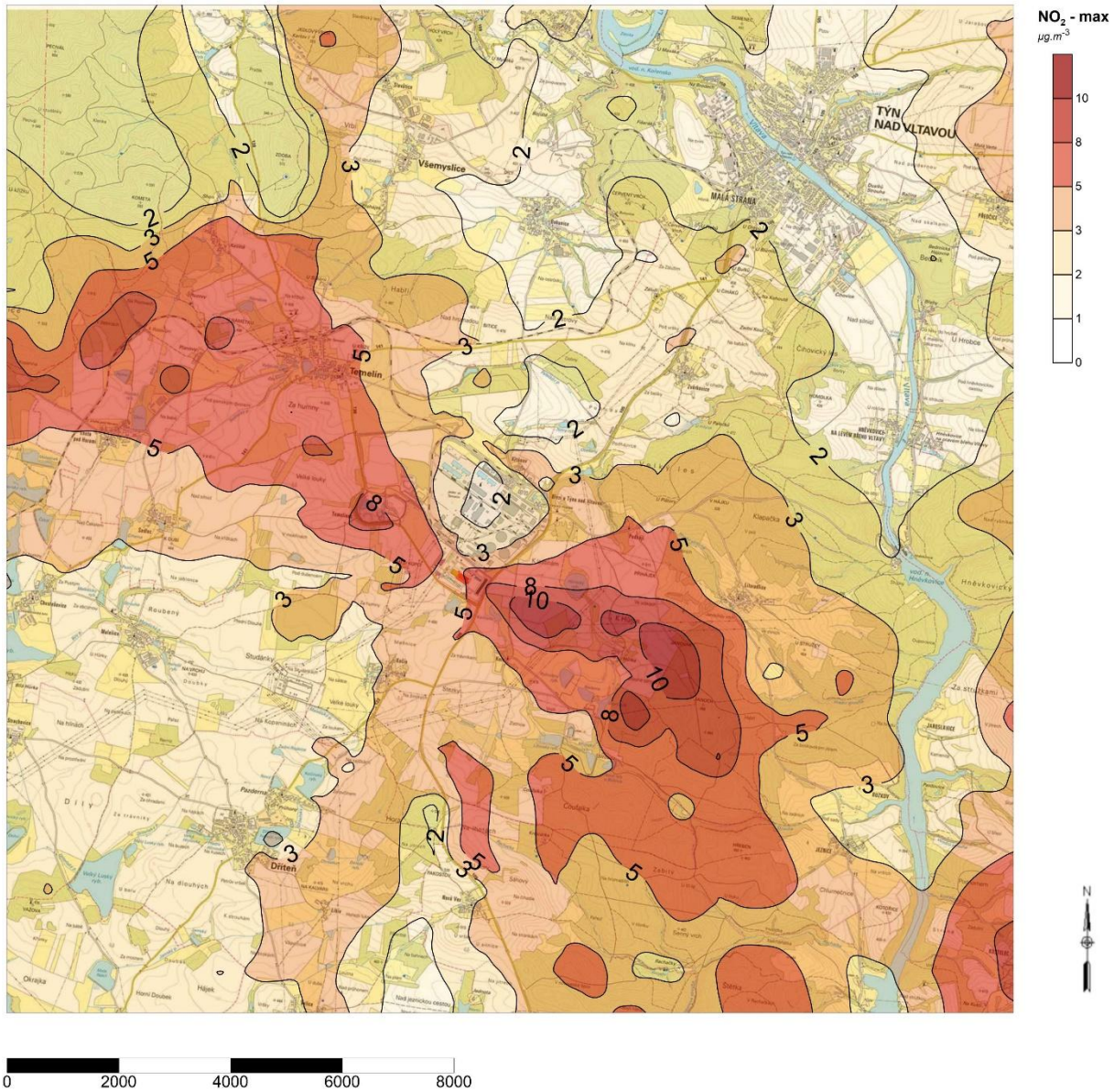
Fig. 22 Change in maximum hourly NO_2 concentration [µg·m^{-3}] due to traffic – period 2034 without the Project

The effect of operation of construction machinery due to construction of New NPP ETE must again be added to these changes[19]. The constructed maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (approximately 12 µg·m^{-3} at the construction site boundary), and up to approximately 7 µg·m^{-3} at the nearest residential development.

When considering the background ambient air pollution burden in this area at a level corresponding to the expected background maximum concentrations, the maximum NO_2 concentration in the affected area in the condition without implementation of SMR ETE is expected to remain reliably below the limit.

Effect of SMR ETE

In the calculation of maximum hourly concentrations during construction, concurrence of the most demanding works was taken into account. The most demanding scheme was assessed by calculation; under other, less demanding organisational schemes, the contributions will be lower. The highest calculated contribution to the maximum hourly ambient NO_2 concentration due to construction reaches approximately 10 µg·m^{-3}, i.e., approximately 5% of the air quality limit (200 µg·m^{-3}). The field of contribution distribution is apparent from Fig. 23.



NO_2 - max	NO_2 – max

Fig. 23 Contribution of SMR ETE to the maximum hourly NO_2 concentration [µg·m^{-3}] – period 2034 – construction of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of construction of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 23. At the most affected residential development, maximum hourly concentrations can be expected to remain below the limits, with a large reserve.

Tab. 23 Results of the assessment for selected locations – maximum hourly NO_2 concentrations – year 2034

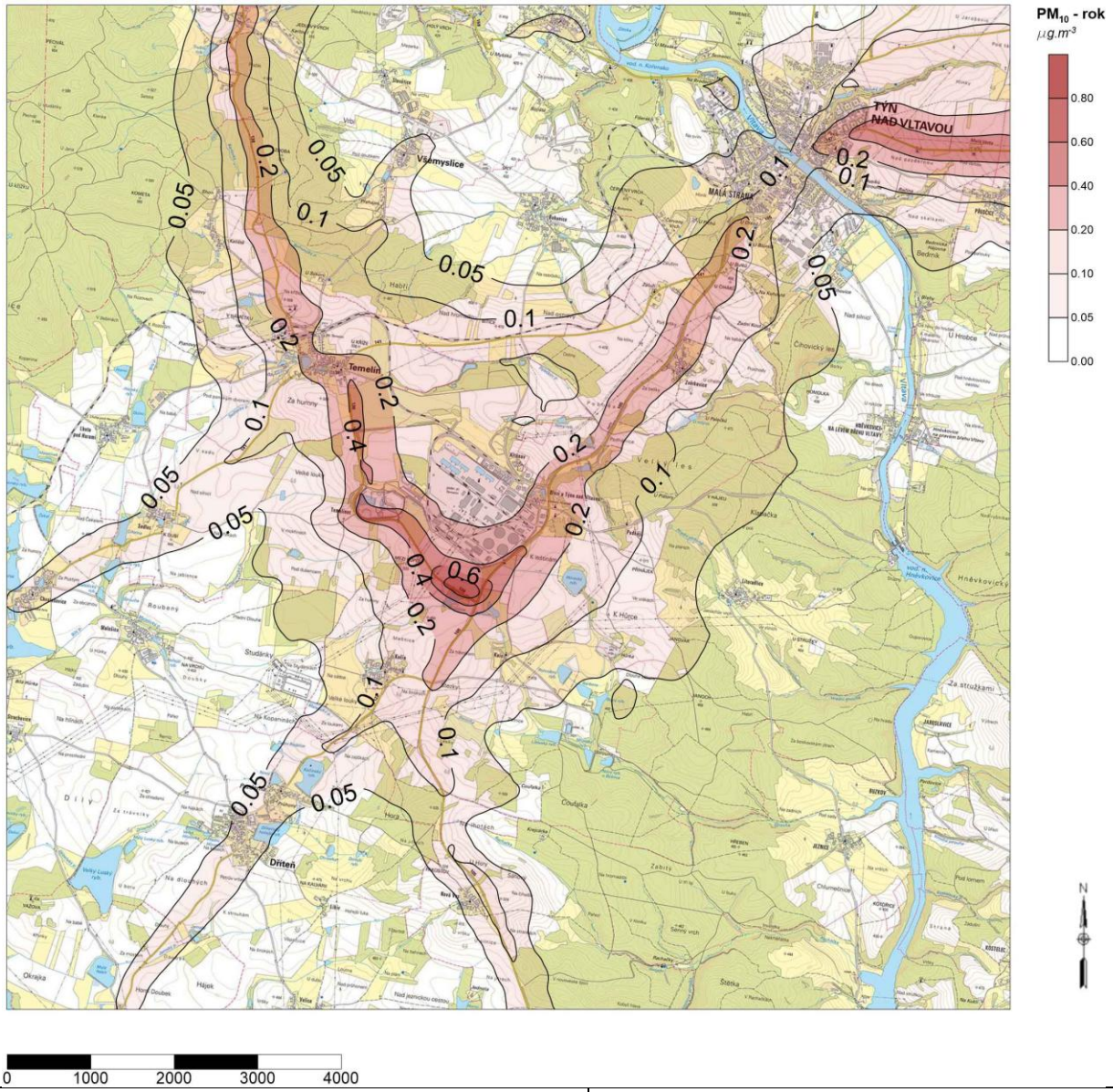
Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of construction of SMR ETE
	[µg·m^{-3}]			
Tem	60–90	-0.19	<7	+6.72
Koc	60–90	-0.04	<5	+3.98
Dri	60–90	-0.06	<3	+2.85
Zve	60–90	-0.10	<4	+3.06
TnV	60–90	-0.04	<2	+2.14
1	60–90	-0.04	<4	+3.11
2	60–90	0.06	<4	+5.07
3	60–90	0.01	<5	+3.36
4	60–90	-0.02	<3	+2.65
5	60–90	-0.08	<4	+3.89
6	60–90	-0.19	<7	+5.71

5.2.2 Ambient air pollution burden from particulate matter

5.2.2.1 Annual average concentrations – particulate matter fraction PM_{10}

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the initial phase of construction of New NPP ETE, an increase in average annual concentrations of particulate matter fraction PM_{10} of up to 0.8 µg·m^{-3} is expected, i.e., up to 2% of the air quality limit value (40 µg·m^{-3}). This maximum is reached near the access route to the construction site and is due mainly to the increase in resuspension of dust particles from the road surface as a result of the increased traffic load caused predominantly by the construction of New NPP ETE (see Fig. 24). Conversely, in locations where traffic volume is already higher and vehicle speed lower in the existing condition (e.g. Týn nad Vltavou), such a significant increase is not observed despite the increased traffic demands associated with the construction of New NPP ETE, due to the lower effect of resuspension from the road surface. This is because the production of emissions of particles released into the air as a result of so-called particle resuspension, i.e., emissions of dust particles deposited on the road surface, depends on the number of passing vehicles. As background traffic volume increases, the amount of dust deposited on the road surface decreases, which ultimately causes a reduction in the specific emissions of dust particles emitted by the passage of a vehicle.



PM10 - rok	PM10 – year

Fig. 24 Change in average annual PM_{10} concentration [µg·m^{-3}] due to traffic – period 2034 without the Project

The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes. The contribution values for these activities were taken from the Air Dispersion Study "New NPP at the ETE site – Air Dispersion Study of the operation of construction machinery on the main construction site and construction site facilities areas"[19] and "New NPP at the ETE site – Air Dispersion Study of dust generated by construction activity on the main construction site and on construction site facilities areas"[20].

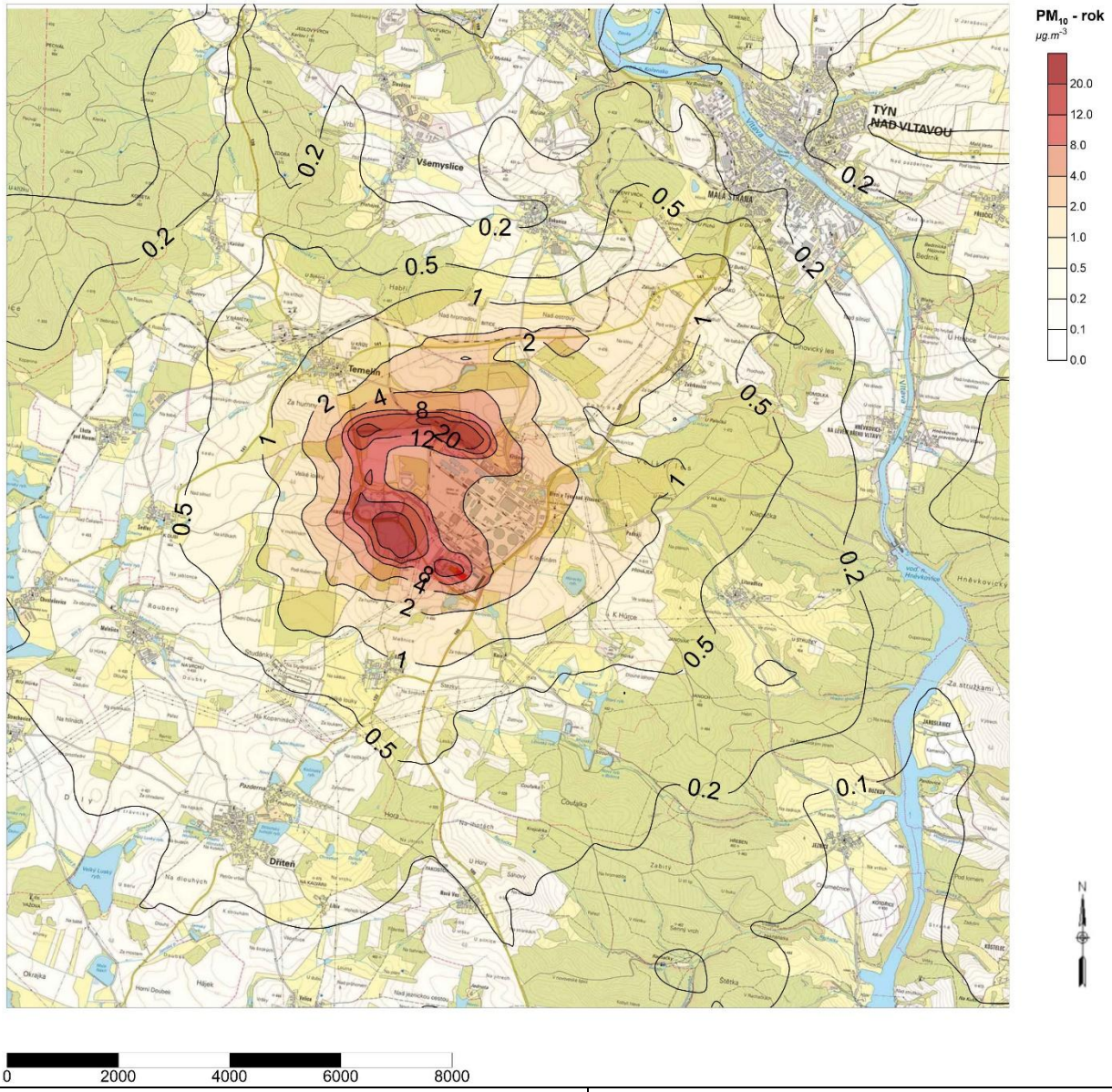
The constructed maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (lower tens of µg·m^{-3}), and at the nearest residential development the contribution may be up to 5 µg·m^{-3}.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area outside the construction site areas themselves are therefore expected to remain below the limits in the future condition.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient PM_{10} concentration due to construction reaches approximately 20 $\mu g \cdot m^{-3}$, i.e., approximately 50% of the air quality limit (40 $\mu g \cdot m^{-3}$). However, these maximum values are only limited to the construction site areas themselves; at the nearest residential development, a contribution of up to approximately 2 $\mu g \cdot m^{-3}$ is expected, i.e., up to 5% of the air quality limit. The field of contribution distribution is apparent from Fig. 25.

These maximum values are caused exclusively by the activities of construction machinery and generated secondary dust emissions, with intensive transport from Area C to Area J (materials for the production of concrete and prefabricated modules) and subsequently from this area to the SMR construction area itself playing a significant role among them.



PM10 - rok	PM10 – year

Fig. 25 Contribution of SMR ETE to the average annual PM_{10} concentration [$\mu g \cdot m^{-3}$] – period 2034 – construction of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and

the effect of construction of SMR ETE itself, a minor change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 24. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 24 Results of the assessment for selected locations – average annual PM_{10} concentrations – year 2034

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE*	Effect of construction of SMR ETE
	[µg·m^{-3}]			
Tem	12.3	+0.32	<<5	+1.74
Koc	12.8	+0.15	<<5	+0.89
Dri	13.2	+0.08	<<5	+0.34
Zve	13.1	+0.36	<<5	+1.37
TnV	15.3	+0.31	<<5	+0.59
1	12.0	+0.03	<<5	+0.35
2	12.1	+0.04	<<5	+0.37
3	12.8	+0.13	<<5	+0.89
4	12.9	+0.03	<<5	+0.38
5	12.7	+0.09	<<5	+0.48
6	12.3	+0.30	<<5	+1.55

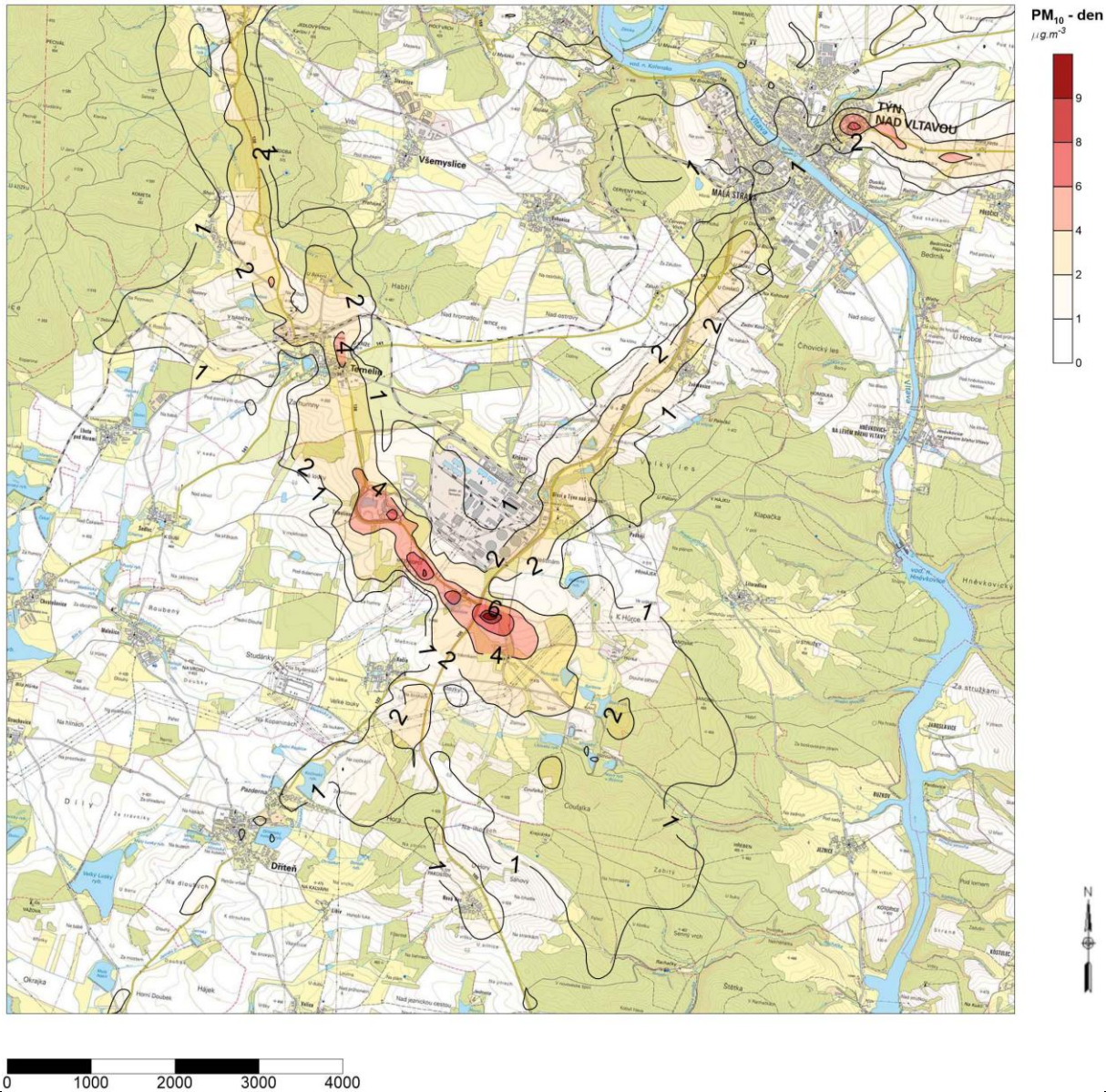
* Calculation points outside the legend range (estimate significantly less than 5 µg m^{-3}).

5.2.2.2 Maximum short-term (24-hour) concentrations – particulate matter fraction PM_{10}

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the initial phase of construction of New NPP ETE, an increase in maximum daily concentrations of particulate matter fraction PM_{10} of up to 8 µg·m^{-3} is expected, i.e., 16% of the air quality limit value (50 µg·m^{-3}). This maximum is reached near the access route to the construction site (see Fig. 26) and is again due mainly to the increase in resuspension of dust particles from the road surface as a result of the increased traffic load caused predominantly by the construction of New NPP ETE.

An increase in ambient concentrations may be expected mainly on roads with a lower background traffic load, where higher dust loading on the road surface, and therefore also higher emissions due to the increase in traffic, can be expected.



PM10 - den	PM10 – day

Fig. 26 Change in maximum daily PM_{10} concentration [µg·m^{-3}] due to traffic – period 2034 without the Project

The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes [19], [20].

The compiled maps of the calculation results show that the effect of earthworks during excavation works on the construction site facilities and New NPP ETE areas is manifested mainly inside the New NPP ETE construction site (exceeding 1,000 µg·m^{-3}), and at the nearest residential development the contribution may reach the lower hundreds of µg·m^{-3}.

It should be noted, however, that the maximum ambient concentration values are calculated under the least favourable dispersion conditions, the duration of which is assumed in the model calculations for the entire assessed time interval (i.e., 24 hours). Given that, under real conditions, some directional or speed fluctuation of wind always occurs, these values cannot practically be reached.

Since the short-term concentration of particulate matter fraction PM_{10} depends to a significant extent on current meteorological and dispersion conditions (frequency and duration of inversions, wind erosion, length of the precipitation-free period, ground-level fog, supra-regional nature of episodes of increased ambient air pollution burden, etc.), it is therefore appropriate to take into account primarily concentrations with an

averaging period of 1 calendar year, which are subject to much smaller fluctuations and are therefore a more stable indicator of deteriorated air quality.

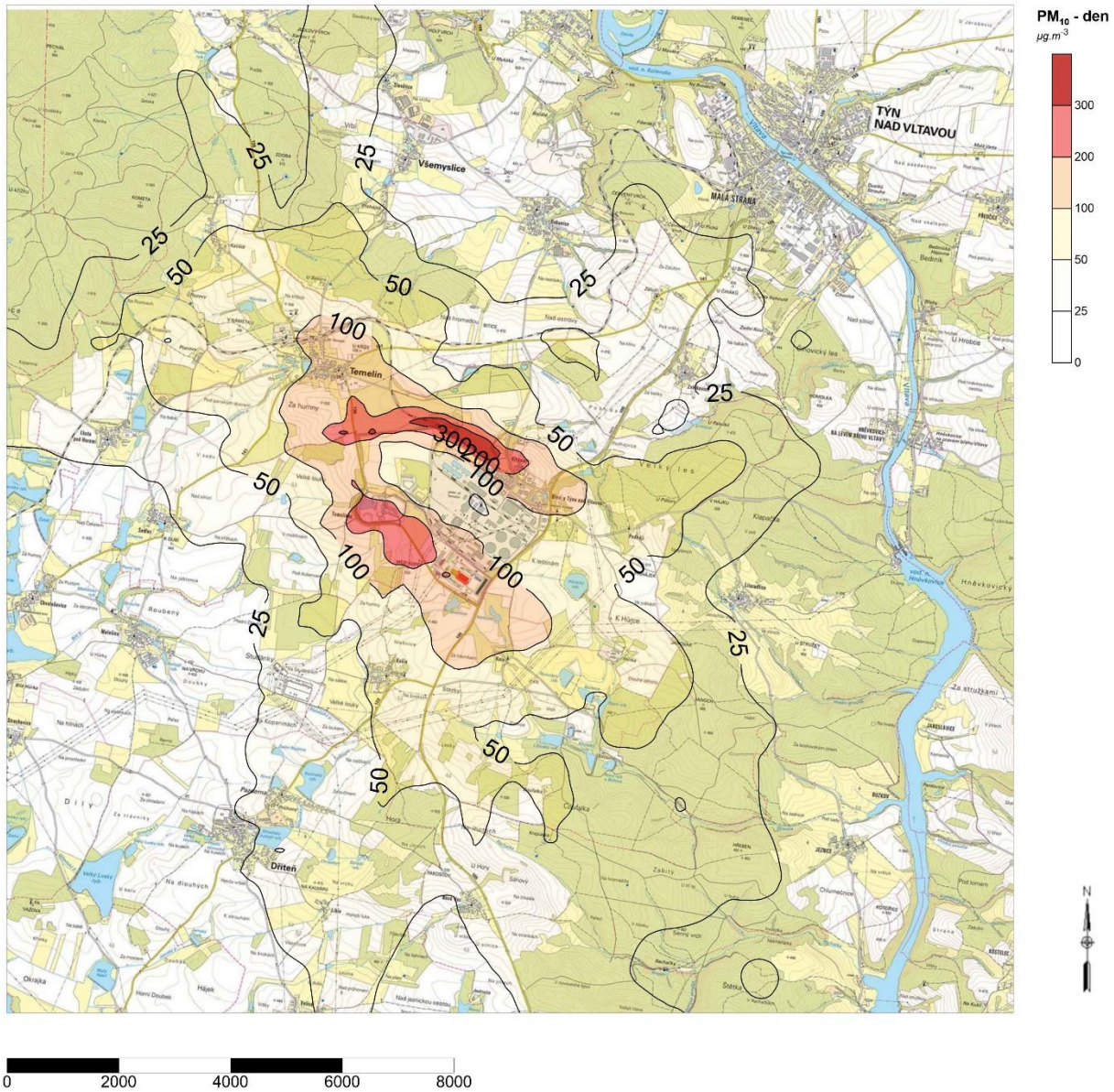
The calculation according to the methodology set out in Chapter 4.1 showed that, under the existing condition, approximately 1 day with the limit for maximum 24-hour concentrations exceeded can be expected at the nearest residential development, while in the future condition, dominantly due to the construction of New NPP ETE, the frequency of the air quality limit being exceeded may increase by a maximum of approximately 3 days. The stated increase in the number of days with the air quality limit exceeded will therefore reliably not lead to an increase in the number of cases the air quality limit is exceeded above the permitted value of 35 such cases per year.

Dust emissions during construction could be further reduced by applying appropriate measures, in particular sprinkling exposed areas, cleaning internal roads, and maintaining the optimum vehicle travel speed, which would minimise the above-mentioned effects.

Effect of SMR ETE

The highest calculated contributions to the maximum daily PM_{10} concentration during construction (specifically construction of the MTB) reach values in the lower hundreds of $\mu g \cdot m^{-3}$, i.e., above the air quality limit value (50 $\mu g \cdot m^{-3}$). The field of contribution distribution is apparent from Fig. 27.

These highest possible daily concentration values can occur on condition that a combination of the most unfavourable meteorological conditions lasts continuously all the day and even during the period when these activities are being performed. According to the wind rose data, such unfavourable conditions can be expected for a limited period of the year (predominantly the winter period, with a possible occurrence of inversions). The probability of actual occurrence of the concentrations modelled in this way is low. In reality, values half as high or even lower can be expected.



PM10 - den	PM10 – day

Fig. 27 Contribution of SMR ETE to the maximum daily PM_{10} concentration [µg·m^{-3}] – construction of SMR ETE – MTB construction period

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of construction of SMR ETE itself, significant increases in short-term ambient concentrations are expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 25.

Tab. 25 Results of the assessment for selected locations – maximum daily PM_{10} concentrations – year 2034

Point	Background (OZKO)*	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of construction of SMR ETE
	[µg·m^{-3}]			
Tem	22	+4.71	<600	+168.5
Koc	23	+1.97	<300	+70.6
Dri	24	+0.78	<150	+28.5
Zve	24	+3.65	<150	+42.1
TnV	27	+3.82	<100	+19.3
1	22	+0.27	<200	+15.2
2	22	+1.79	<200	+49.7
3	23	+0.70	<300	+69.9
4	23	+0.19	<150	+18.9
5	23	+1.01	<150	+25.1
6	22	+4.71	<600	+156.9

* 36th highest daily concentration

The short-term concentration of particulate matter fraction PM_{10} depends to a significant extent on current meteorological and dispersion conditions (frequency and duration of inversions, wind erosion, length of the precipitation-free period, ground-level fog, supra-regional nature of episodes of increased ambient air pollution burden, etc.). This short-term ambient effect fluctuates greatly in connection with the current climatic situation and therefore does not characterise the effect of sources to the same extent. It is therefore appropriate to take into account primarily concentrations with an averaging period of 1 calendar year, which are subject to much smaller fluctuations and are therefore a more stable indicator of deteriorated air quality.

Using the methodology for calculating the number of days exceeding the 24-hour limit for suspended particles set out in Chapter 4.1, there is an ambient concentration reserve in the area before the permitted number of cases with the limit exceeded of 35 per year is reached, corresponding to an increase in average annual concentrations of approximately 16 µg·m^{-3}. This contribution to the average annual concentration will not be reached in the area; therefore, the number of cases when the limit is exceeded above the limit in the area is not expected to be reached. In the surrounding municipalities, the number of cases when the limit is exceeded under the existing condition can be expected to be up to 1 day per year; in the event of possible concurrence of construction of New NPP ETE and SMR ETE, the increase in the number of days with the daily maximum exceeded may reach approximately 5 days per year, and the resulting ambient air pollution situation will therefore remain below the limit.

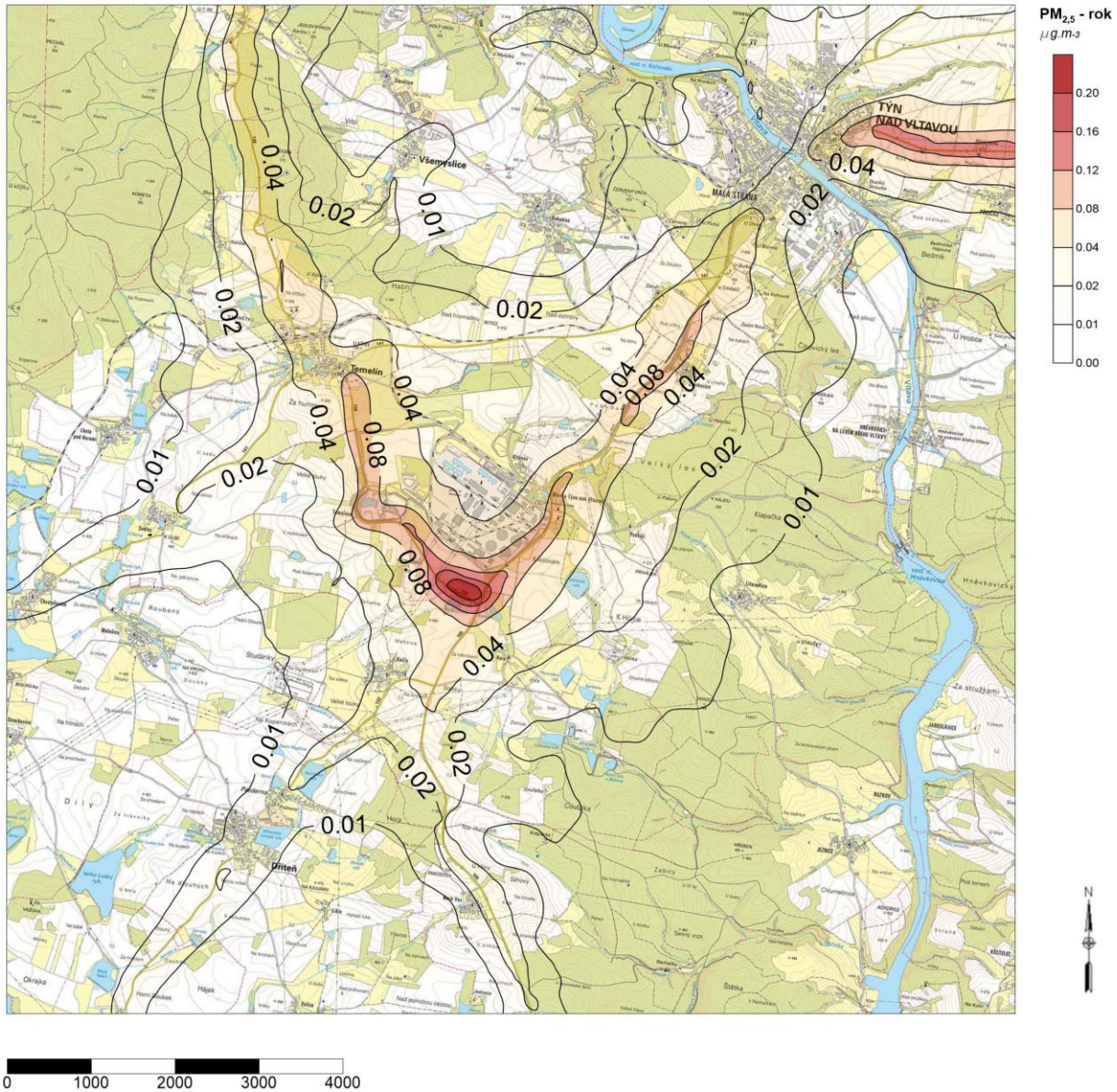
Despite the below-limit effect in the surrounding municipalities, the increase in maximum concentrations is very significant; it will therefore be appropriate to observe preventive measures to eliminate dust during the construction period. These measures are set out in Chapter 5.5.

5.2.2.3 Annual average concentrations – particulate matter fraction $PM_{2.5}$

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the initial phase of construction of New NPP ETE, an increase in average annual concentrations of particulate matter fraction $PM_{2.5}$ of up to 0.2 µg·m^{-3} is expected, i.e., up to 1% of the air quality limit value (20 µg·m^{-3}). This maximum is again reached near the access route to the construction site and is due mainly to the increase in resuspension of dust particles from the road surface as a result of the increased traffic load caused predominantly by the construction of New NPP ETE. Conversely, in locations where traffic volume is already higher and vehicle speed lower in the existing condition (e.g. Týn nad Vltavou), such a significant increase is not observed despite the increased traffic demands associated with the construction of New NPP ETE, due

to the lower effect of resuspension from the road surface. The field of distribution of changes in ambient concentrations is apparent from Fig. 28.



$PM_{2,5}$ - rok	$PM_{2.5}$ – year

Fig. 28 Change in average annual $PM_{2.5}$ concentration [µg·m^{-3}] due to traffic – period 2034 without the Project

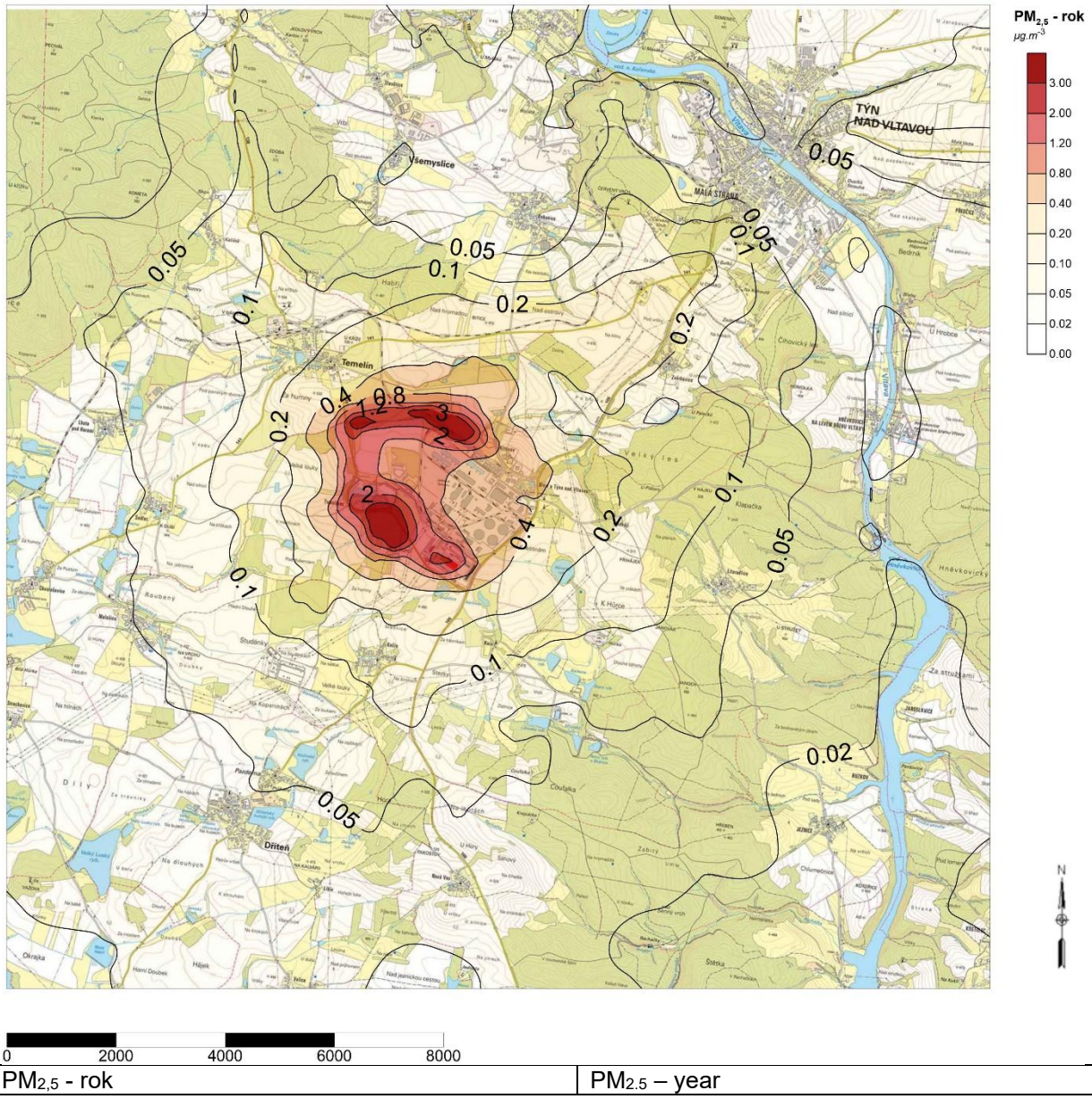
The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes. The Air Dispersion Study "New NPP at the ETE site" did not include a dust calculation for the $PM_{2.5}$ fraction; however, conservatively (based on the current calculation for SMR ETE), these contributions may be estimated at approximately 30% of the PM_{10} fraction. Under this assumption, the effect of operation of construction machinery can be estimated at the level of higher units of µg·m^{-3}, and at the nearest residential development the contribution may be up to 1 µg·m^{-3}.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area outside the construction site areas themselves are therefore expected to remain below the limits in the future condition.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient $PM_{2.5}$ concentration due to construction reaches approximately 3 $\mu g \cdot m^{-3}$, i.e., 15% of the air quality limit (20 $\mu g \cdot m^{-3}$). These maximum values are limited only to the construction site areas themselves; at the nearest residential development, values of up to 0.3 $\mu g \cdot m^{-3}$ are expected, i.e., up to 1.5% of the air quality limit. The field of contribution distribution is apparent from Fig. 29.

The calculated maximum values are caused exclusively by the activities of construction machinery and generated secondary dust emissions, with intensive transport from Area C to Area J (materials for the production of concrete and prefabricated modules) and subsequently from this area to the SMR construction area itself playing a significant role among them.



$PM_{2,5}$ - rok	$PM_{2.5}$ – year

Fig. 29 Contribution of SMR ETE to the average annual $PM_{2.5}$ concentration [$\mu g \cdot m^{-3}$] – period 2034 – construction of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of construction of SMR ETE itself, a minor change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 26. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 26 Results of the assessment for selected locations – average annual $PM_{2.5}$ concentrations – year 2034

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE*	Effect of construction of SMR ETE
	[µg·m^{-3}]			
Tem	8.7	+0.08	<<1	+0.26
Koc	9.0	+0.04	<<1	+0.14
Dri	9.4	+0.02	<<1	+0.05
Zve	9.3	+0.09	<<1	+0.26
TnV	10.8	+0.08	<<1	+0.11
1	8.4	+0.01	<<1	+0.05
2	8.4	+0.01	<<1	+0.06
3	9.0	+0.03	<<1	+0.14
4	9.2	+0.01	<<1	+0.06
5	9.1	+0.02	<<1	+0.07
6	8.7	+0.07	<<1	+0.25

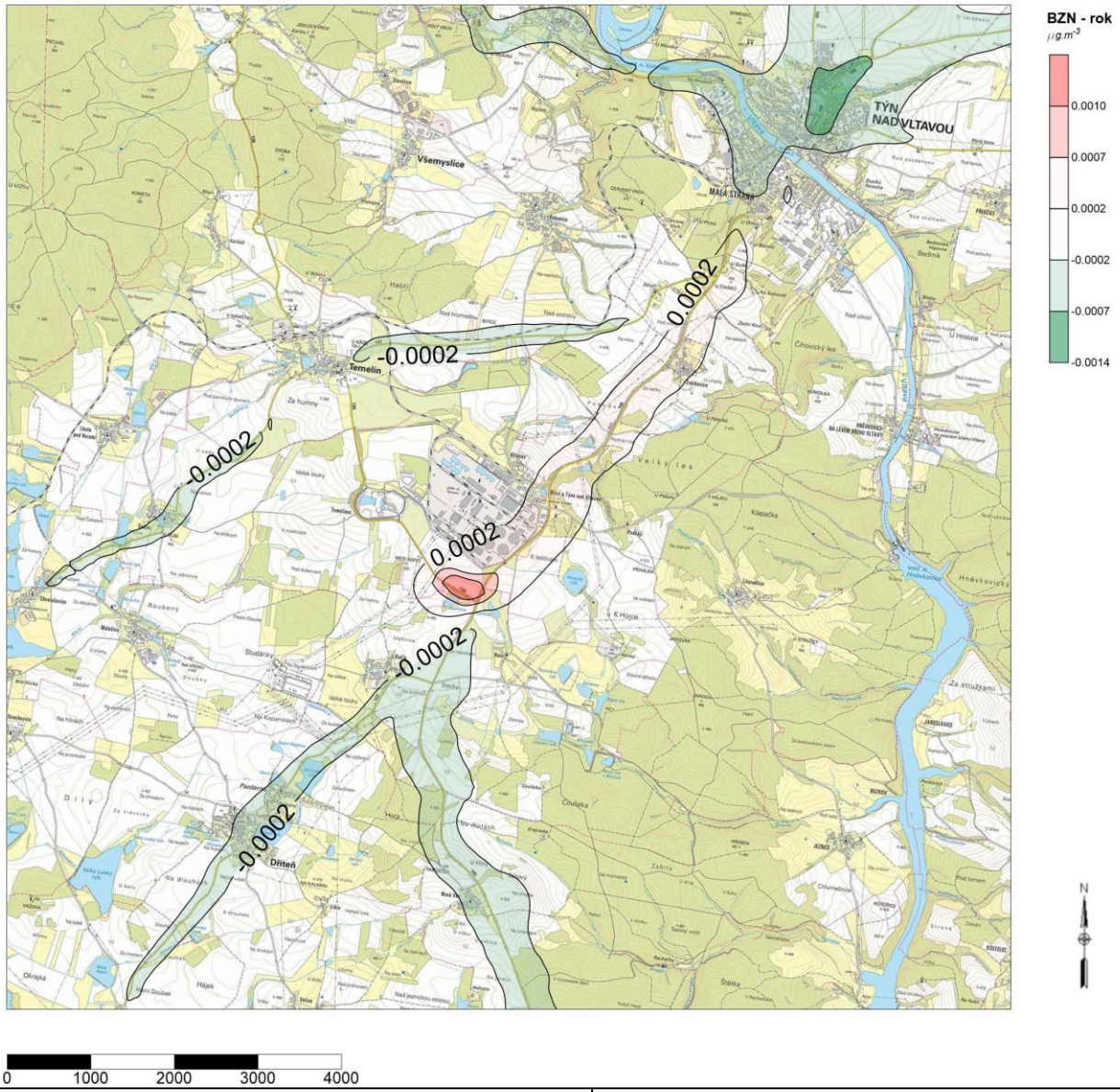
* Not addressed in the New NPP ETE Air Dispersion Study (estimated to be significantly less than1 µg m^{-3}).

5.2.3 Ambient air pollution burden from benzene

5.2.3.1 Annual average concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the initial phase of construction of New NPP ETE, no significant increase in average annual benzene concentrations is expected (see Fig. 30). Despite the increase in traffic volumes, changes at the level of hundredths of the air quality limit (5 µg·m^{-3}) can be observed near transport routes at the site. This decrease is caused by a reduction in primary emissions from fuel combustion as a result of renewal of the vehicle fleet (improvement in vehicle emission standards), which compensates for the effect of the increase in traffic volumes in the area.



$PM_{2,5}$ - rok	$PM_{2.5}$ – year

Fig. 30 Change in average annual benzene concentration [μg·m^{-3}] due to traffic – period 2034 without the Project

The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes. The contribution values for these activities were again taken from the Air Dispersion Study "New NPP at the ETE site – Air Dispersion Study of the operation of construction machinery on the main construction site and construction site facilities areas"[19].

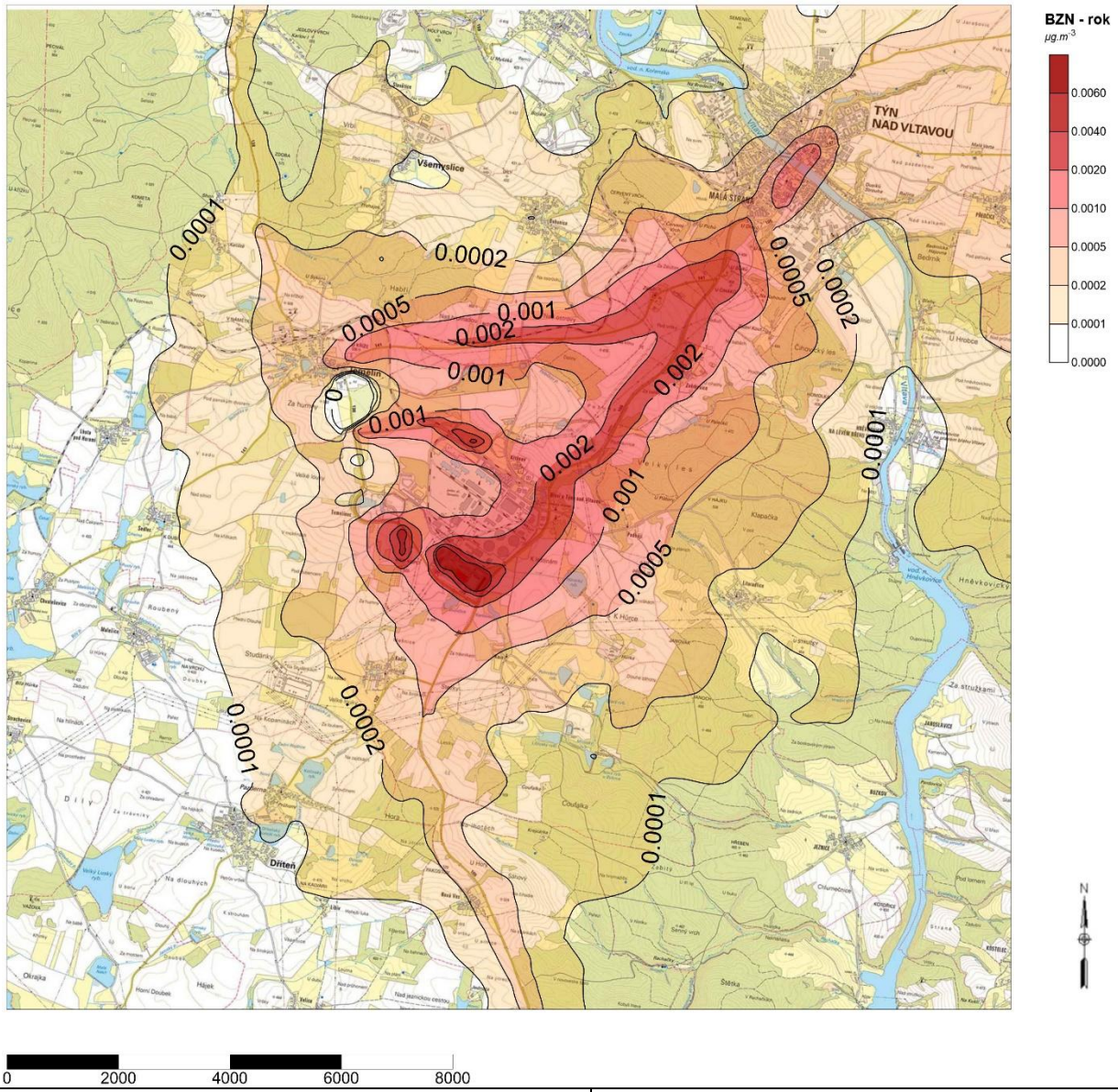
The compiled maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (approx. thousandths of μg·m^{-3}); at the nearest residential development, it represents a completely insignificant contribution to background concentrations.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition, with a large reserve.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient benzene concentration due to construction reaches approximately 0.006 μg·m^{-3}, i.e., up to 0.12% of the air quality limit (5 μg·m^{-3}). The field of contribution distribution is apparent from Fig. 31.

In the case of benzene, both the effect of generated traffic associated with construction and the diversion of existing traffic onto Road II/138 (in the section between Roads II/141 and II/105) as a result of its closure to public traffic are clearly manifested here.



BZN - rok	BZN – year

Fig. 31 Contribution of SMR ETE to the average annual benzene concentration [µg·m^{-3}] – period 2034 – construction of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of construction of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 27. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 27 Results of the assessment for selected locations – average annual benzene concentrations – year 2034

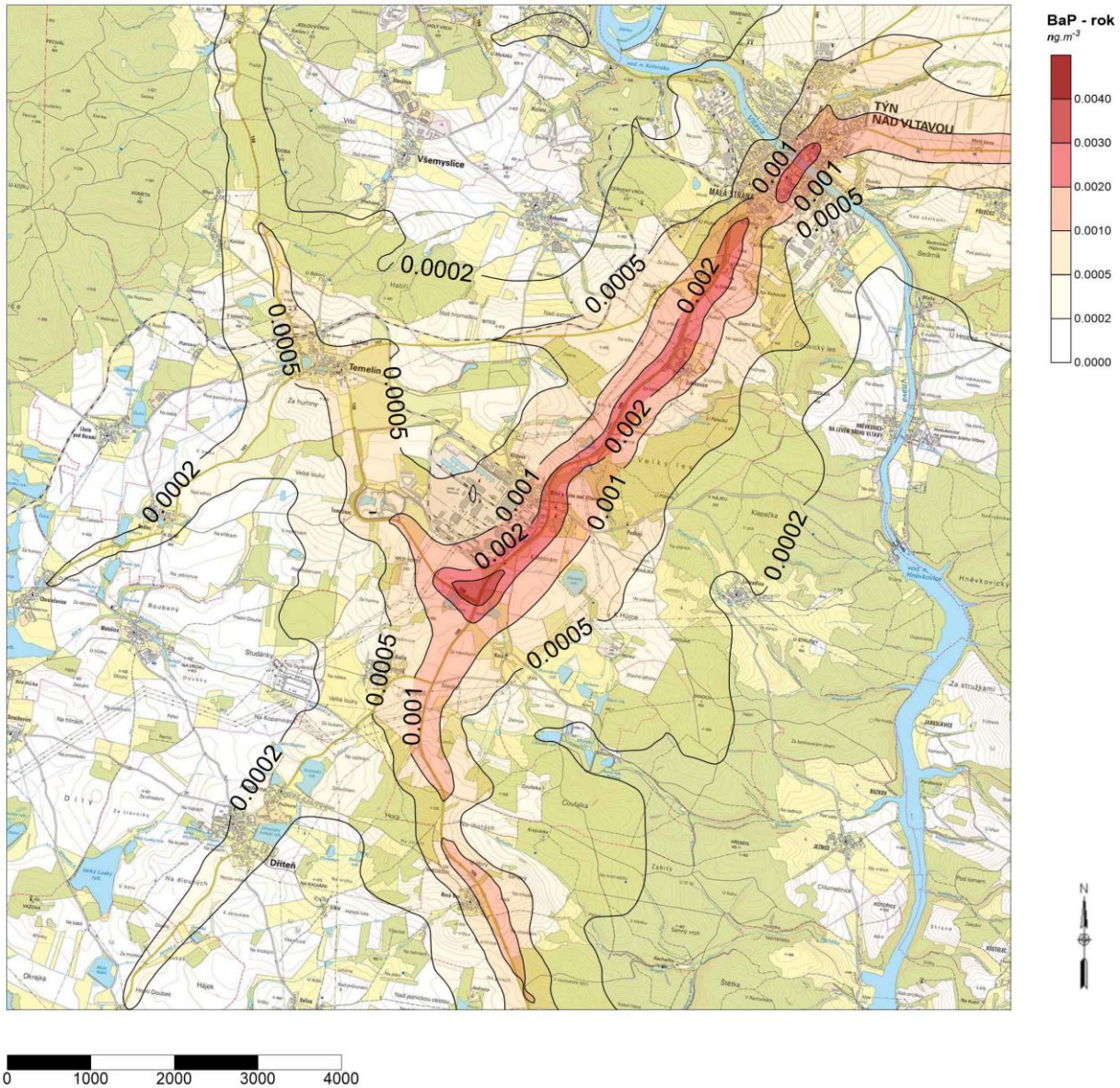
Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of construction of SMR ETE
	[µg·m^{-3}]			
Tem	0.6	+0.000 0	<0.000 2	+0.001 0
Koc	0.6	-0.000 1	<0.000 2	+0.000 4
Dri	0.6	-0.000 2	<0.000 2	+0.000 1
Zve	0.6	+0.000 5	<0.000 2	+0.003 4
TnV	0.8	+0.000 2	<0.000 2	+0.001 3
1	0.6	-0.000 0	<0.000 2	+0.000 1
2	0.6	-0.000 0	<0.000 2	+0.000 2
3	0.6	-0.000 1	<0.000 2	+0.000 4
4	0.6	-0.000 0	<0.000 2	+0.000 1
5	0.6	-0.000 2	<0.000 2	+0.000 1
6	0.6	-0.000 1	<0.000 2	+0.001 0

5.2.4 Ambient air pollution burden from benzo(a)pyrene

5.2.4.1 Annual average concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the initial phase of construction of New NPP ETE, an increase in average annual benzo(a)pyrene concentrations of up to 0.004 ng·m^{-3} is expected, i.e., up to 0.4% of the air quality limit value (1 ng·m^{-3}). This maximum is reached near the access route to the construction site (see Fig. 32), where the highest traffic volumes associated with the construction of New NPP ETE are expected.



BaP - rok	BaP – year

Fig. 32 Change in average annual benzo(a)pyrene concentration [ng·m^{-3}] due to traffic – period 2034 without the Project

The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes.

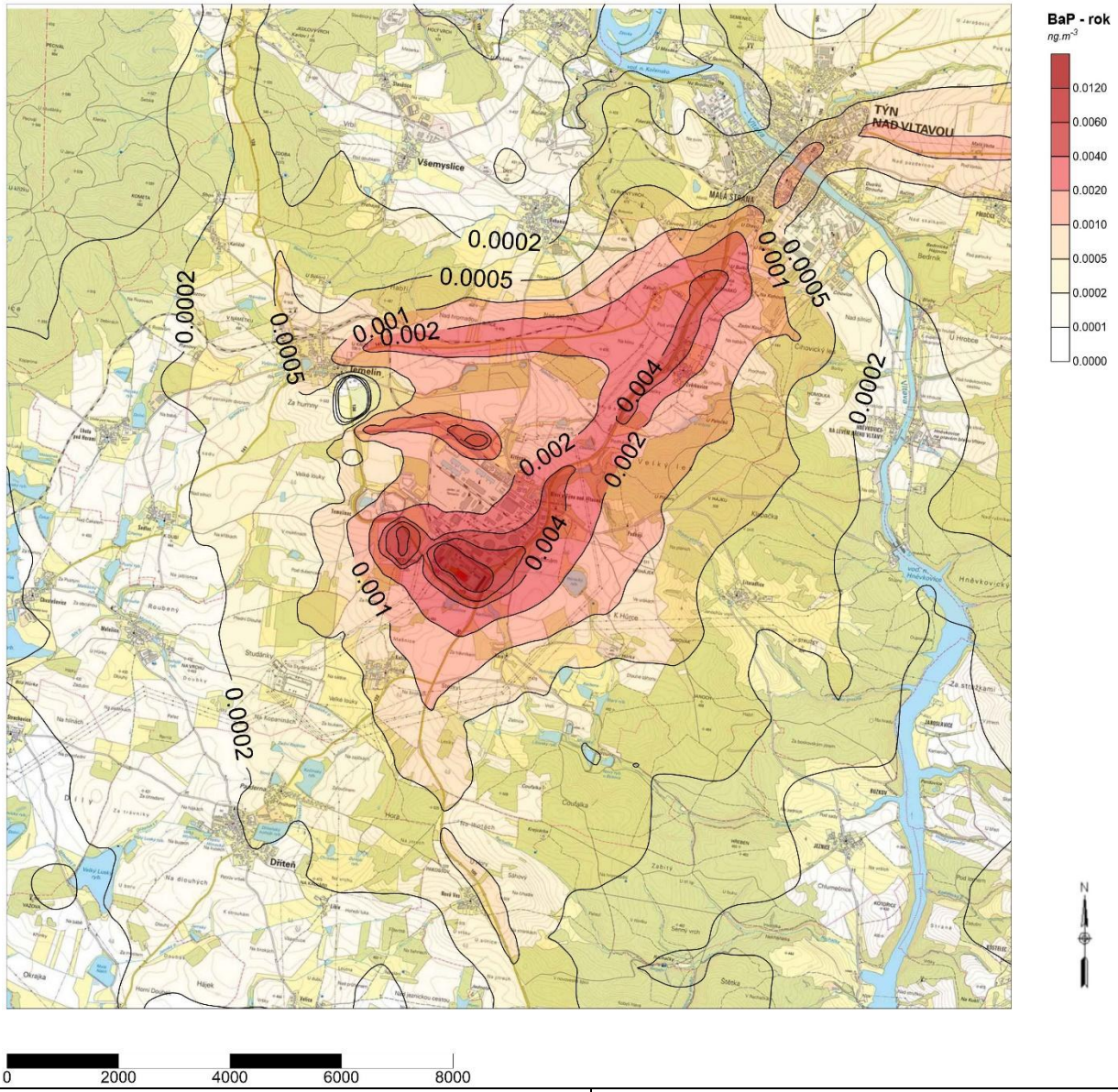
The compiled maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (approx. thousandths of ng·m^{-3}); at the nearest residential development, it represents a completely insignificant contribution to background concentrations.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition, with a large reserve.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient benzo(a)pyrene concentration due to construction reaches approximately 0.012 ng·m^{-3}, i.e., 1.2% of the air quality limit (1 ng·m^{-3}). The field of contribution distribution is apparent from Fig. 33.

The maximum values are reached in the construction site area itself, mainly due to fuel combustion by construction machinery. The effect of generated traffic associated with construction and the diversion of existing traffic onto Road II/138 (in the section between Roads II/141 and II/105) as a result of its closure to public traffic are also manifested here.



BaP - rok	BaP – year

Fig. 33 Contribution of SMR ETE to the average annual benzo(a)pyrene concentration [ng·m^{-3}] – period 2034 – construction of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of construction of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 28. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 28 Results of the assessment for selected locations – average annual benzo(a)pyrene concentrations – year 2034

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of construction of SMR ETE
	[ng·m^{-3}]			
Tem	0.3	+0.000 9	<0.001	+0.001 3
Koc	0.3	+0.000 8	<0.001	+0.000 8
Dri	0.4	+0.000 3	<0.001	+0.000 2
Zve	0.3	+0.002 8	<0.001	+0.004 9
TnV	0.6	+0.002 5	<0.001	+0.001 8
1	0.2	+0.000 2	<0.001	+0.000 3
2	0.2	+0.000 3	<0.001	+0.000 3
3	0.3	+0.000 6	<0.001	+0.000 8
4	0.3	+0.000 1	<0.001	+0.000 2
5	0.3	+0.000 3	<0.001	+0.000 2
6	0.3	+0.000 8	<0.001	+0.001 3

5.3 Operation period – year 2040

For this period, the so-called zero option without the effect of implementation of SMR ETE was modelled, corresponding to the change in ambient concentrations due both to the natural increase in traffic volumes by 2040 and to the effect of traffic associated with the main phase of construction of New NPP ETE. The potential maximum effect of construction itself in the area designated for New NPP ETE was cumulatively added to these values. Given that, in this period, construction stages of New NPP ETE that are more favourable in terms of emissions are expected, the worst possible scenario that may occur at the site during the construction of New NPP ETE and operation of SMR ETE is thus assessed.

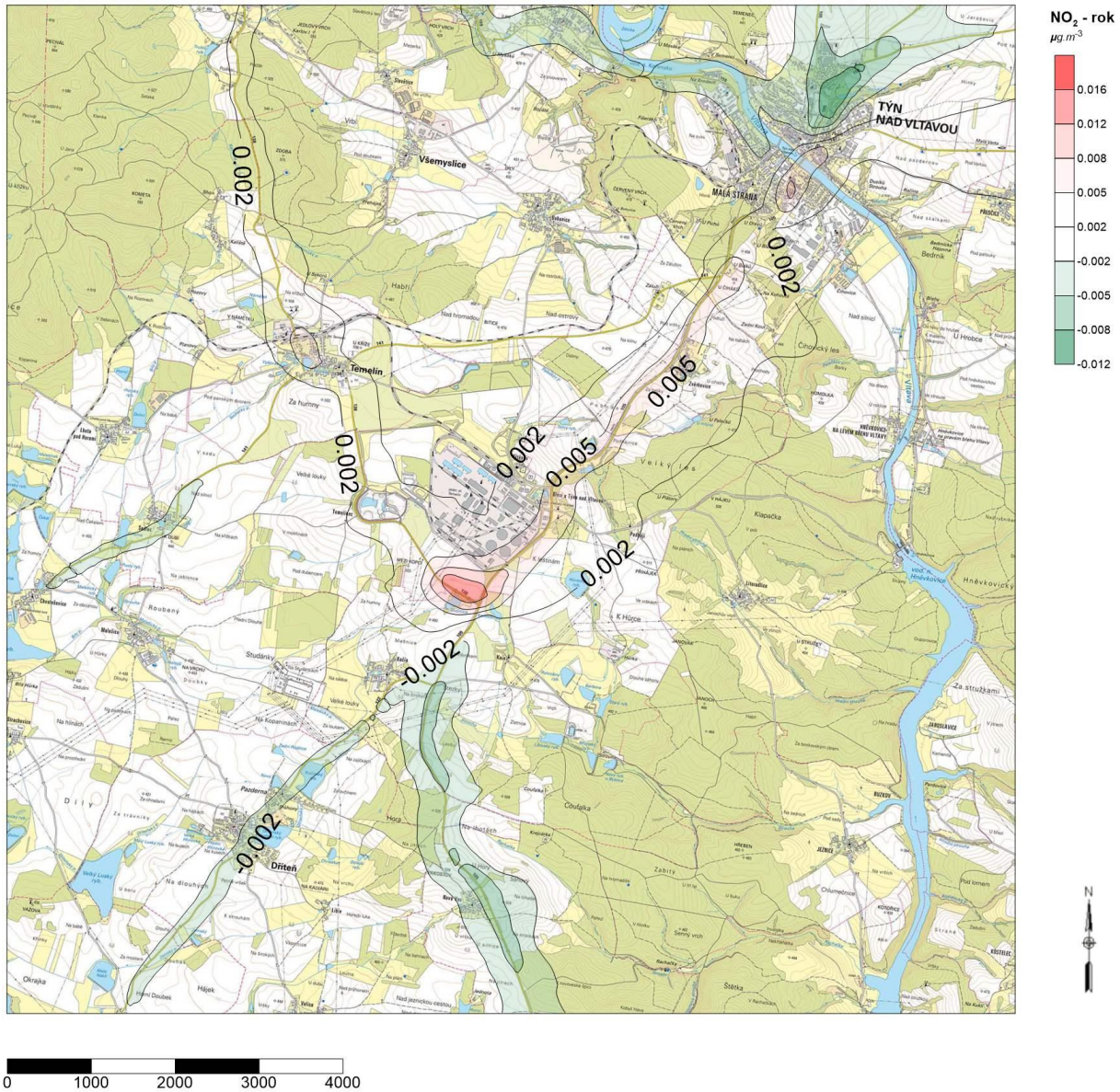
The second modelling scenario then represents only the contribution generated by the operation of the SMR ETE Project, including generated traffic.

5.3.1 Ambient air pollution burden from nitrogen dioxide

5.3.1.1 Annual average concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the main phase of construction of New NPP ETE, a minimum increase in average annual NO_2 concentrations is expected, on the main routes used for the delivery of raw materials for the construction of New NPP ETE. These are contributions of up to approximately 0.016 µg·m^{-3}, i.e., approximately 0.04% of the air quality limit (40 µg·m^{-3}). In other locations, despite the increase in traffic volumes, a decrease in ambient concentrations can be observed, caused by a reduction in primary emissions from fuel combustion as a result of renewal of the vehicle fleet (improvement in vehicle emission standards), which compensates for the effect of the natural increase in traffic volumes in the area. The field of distribution of the change in the ambient background is apparent from Fig. 34.



NO_2 - rok	NO_2 – year

Fig. 34 Change in average annual NO_2 concentration [µg·m^{-3}] due to traffic – period 2040 without the Project

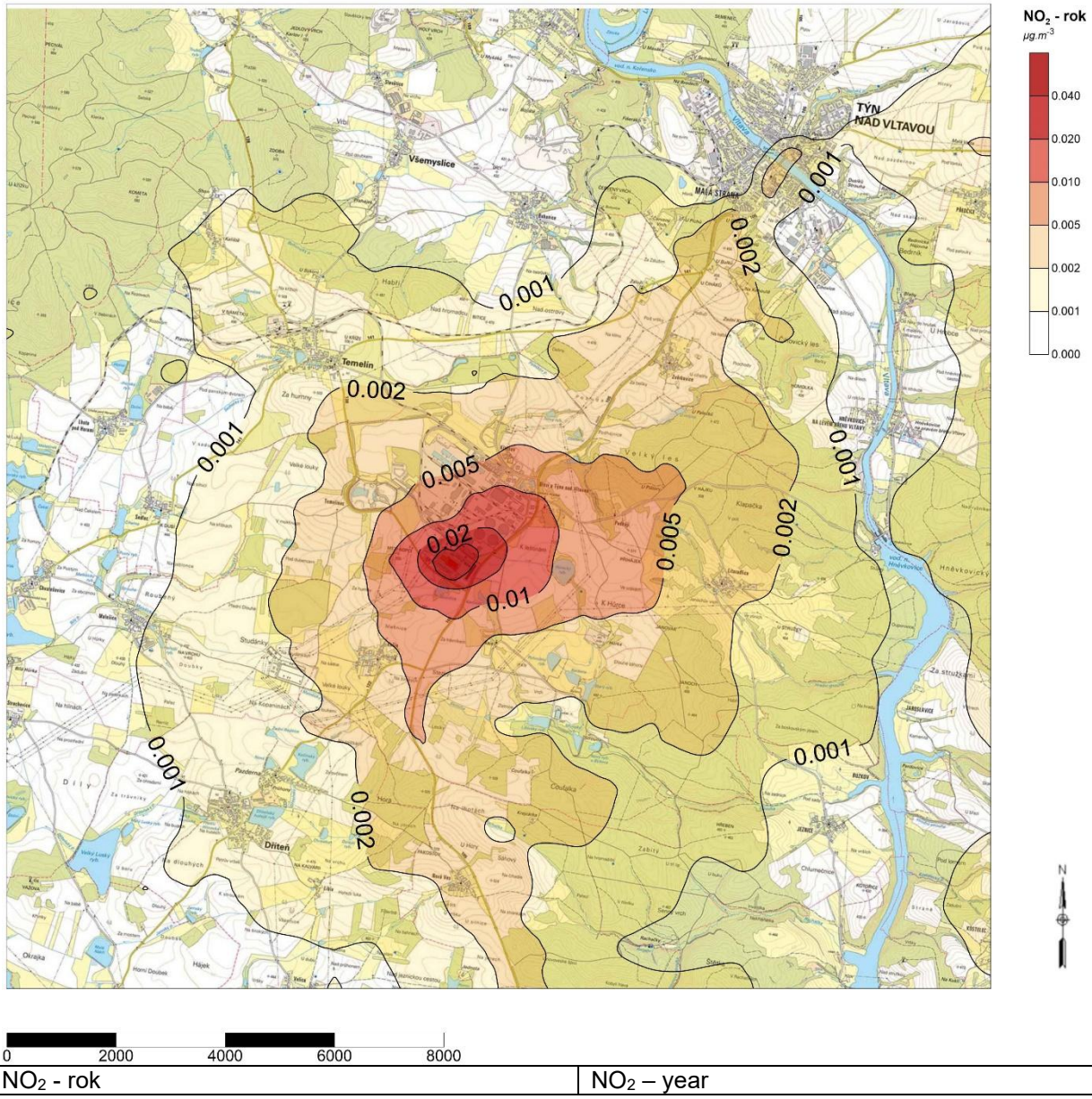
The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes. The contribution values for these activities were taken from the Air Dispersion Study "New NPP at the ETE site – Air Dispersion Study of the operation of construction machinery on the main construction site and construction site facilities areas"[19]. In this study, the contribution attributable to the most intensive operation of machinery during the considered construction period of approximately 6 years was calculated. The cumulative assessment of the concurrence of these activities is therefore carried out conservatively, resulting in the worst possible condition that may occur at the site.

The compiled maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (hundredths of µg·m^{-3}); at the nearest residential development, it represents a completely insignificant contribution to background concentrations.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition, with a large reserve.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient NO_2 concentration due to operation of SMR ETE reaches up to approximately 0.04 $\mu g \cdot m^{-3}$, i.e., approximately 0.1% of the air quality limit (40 $\mu g \cdot m^{-3}$). The field of contribution distribution is apparent from Fig. 35.



NO_2 - rok	NO_2 – year

Fig. 35 Contribution of SMR ETE to the average annual NO_2 concentration [$\mu g \cdot m^{-3}$] – period 2040 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 29. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

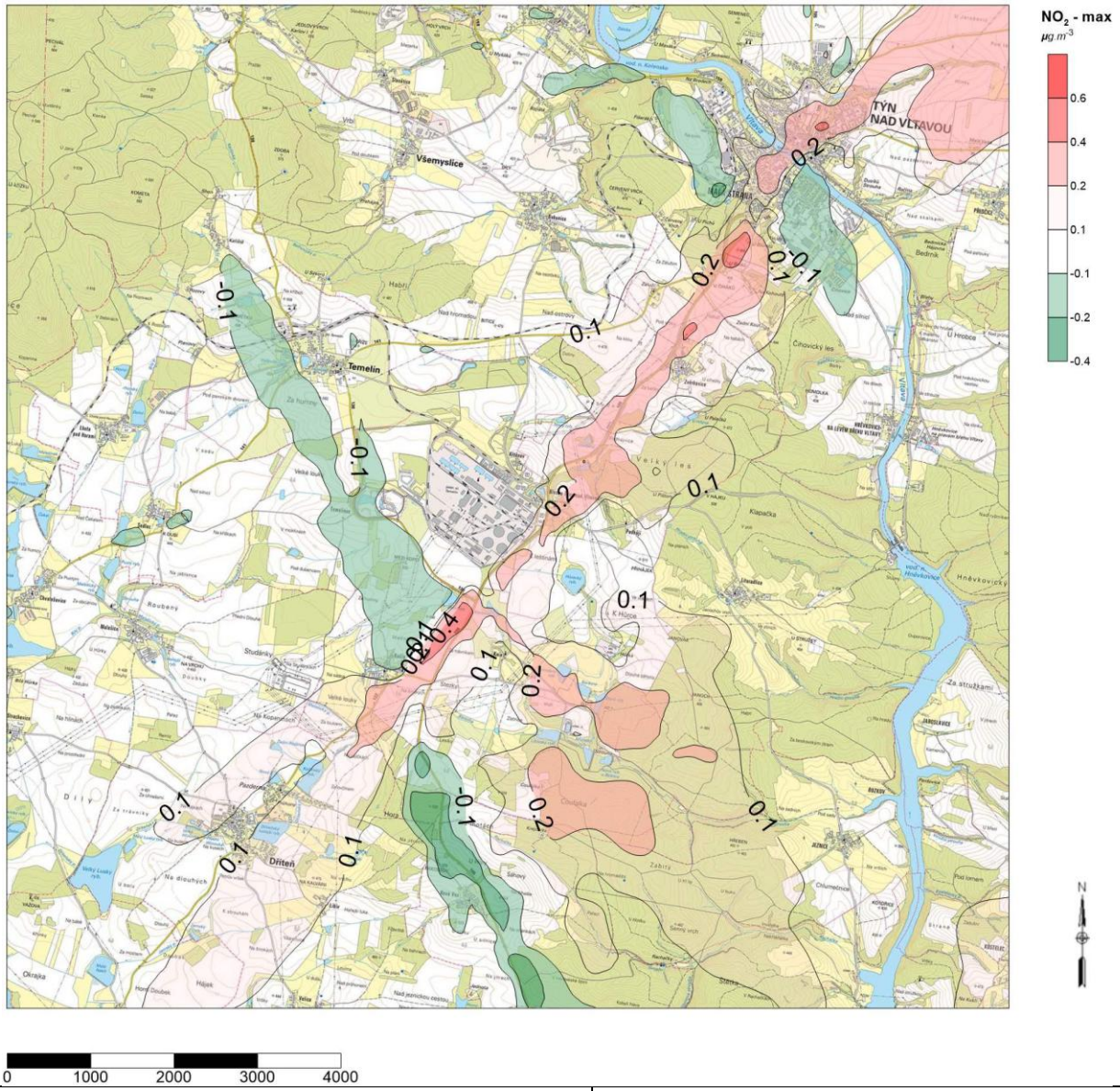
Tab. 29 Results of the assessment for selected locations – average annual NO_2 concentrations – year 2040

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of operation of SMR ETE
	[µg·m^{-3}]			
Tem	5.4	+0.005	<0.005	+0.002
Koc	5.5	-0.001	<0.005	+0.004
Dri	6.3	-0.002	<0.005	+0.001
Zve	5.8	+0.007	<0.005	+0.004
TnV	11.3	+0.008	<0.005	+0.003
1	5.1	+0.000	<0.005	+0.002
2	5.1	-0.000	<0.005	+0.002
3	5.5	+0.000	<0.005	+0.004
4	5.9	-0.000	<0.005	+0.001
5	5.7	-0.002	<0.005	+0.001
6	5.4	+0.003	<0.005	+0.002

5.3.1.2 Maximum short-term (hourly) concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the main phase of construction of New NPP ETE, a minimum increase in maximum hourly NO_2 concentrations is expected, on the main routes used for the delivery of raw materials for the construction of New NPP ETE. These are contributions of up to approximately 0.6 µg·m^{-3}, i.e., approximately 0.3% of the air quality limit (200 µg·m^{-3}). In other locations, despite the increase in traffic volumes, a stagnation or decrease in ambient concentrations can be observed, caused by a reduction in primary emissions from fuel combustion as a result of renewal of the vehicle fleet (improvement in vehicle emission standards), which compensates for the effect of the natural increase in traffic volumes in the area. The field of distribution of the change in the ambient background is apparent from Fig. 36.



NO_2 - max	NO_2 – max

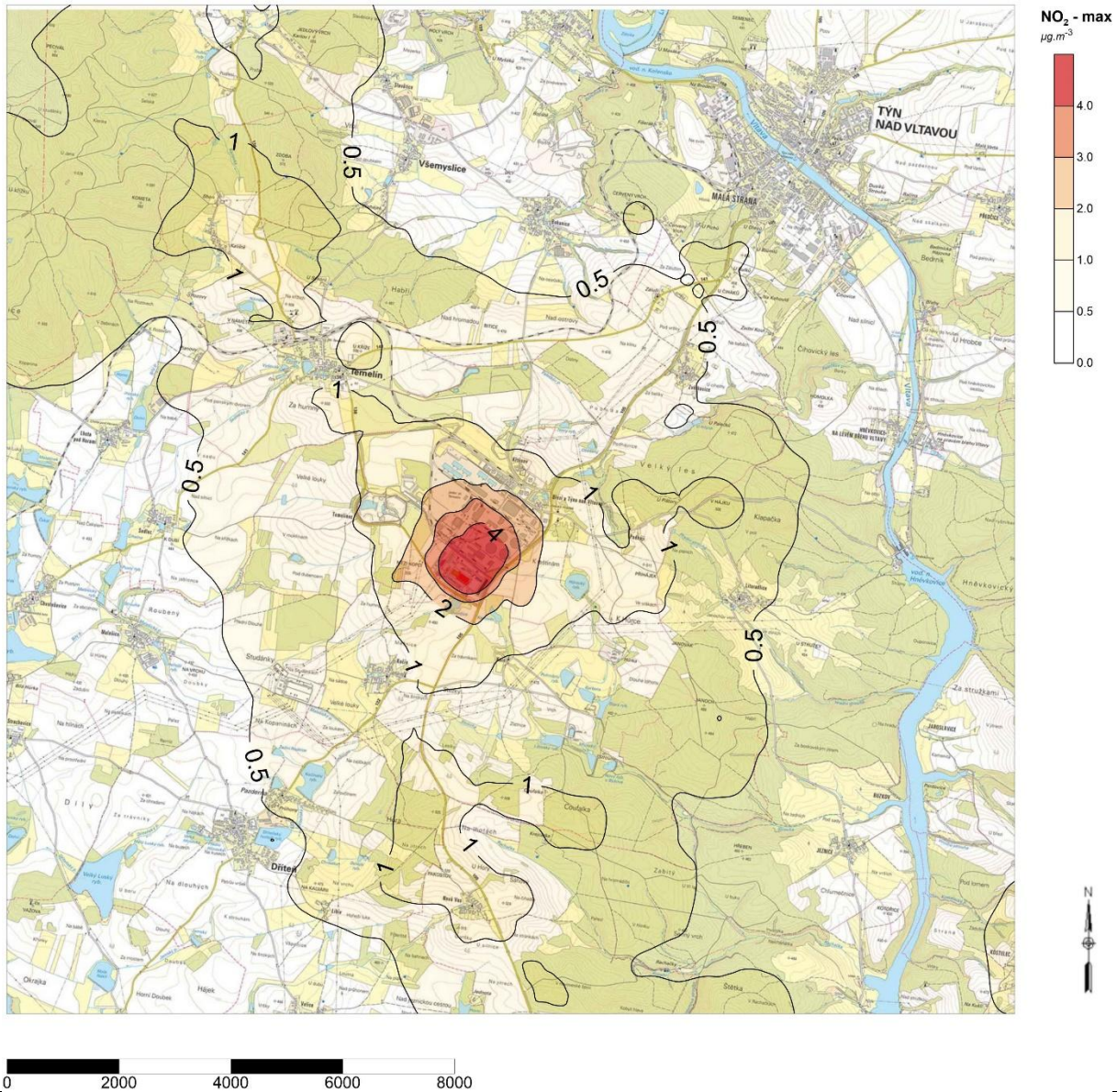
Fig. 36 Change in maximum hourly NO_2 concentration [µg·m^{-3}] due to traffic – period 2040 without the Project

The effect of operation of construction machinery due to construction of New NPP ETE must again be added to these changes. The constructed maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (approximately 12 µg·m^{-3} at the construction site boundary), and up to approximately 7 µg·m^{-3} at the nearest residential development.

When considering the background ambient air pollution burden in this area at a level corresponding to the expected background maximum concentrations, the maximum NO_2 concentration in the affected area in the condition without implementation of SMR ETE is expected to remain reliably below the limit.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient NO_2 concentration due to operation of SMR ETE reaches approximately 4 µg·m^{-3}, i.e., approximately 2% of the air quality limit (200 µg·m^{-3}). The field of contribution distribution is apparent from Fig. 37.



NO_2 - max	NO_2 – max

Fig. 37 Contribution of SMR ETE to the maximum hourly NO_2 concentration [µg·m^{-3}] – period 2040 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 30. At the most affected residential development, maximum hourly concentrations can be expected to remain below the limits, with a large reserve.

Tab. 30 Results of the assessment for selected locations – maximum hourly NO_2 concentrations – year 2040

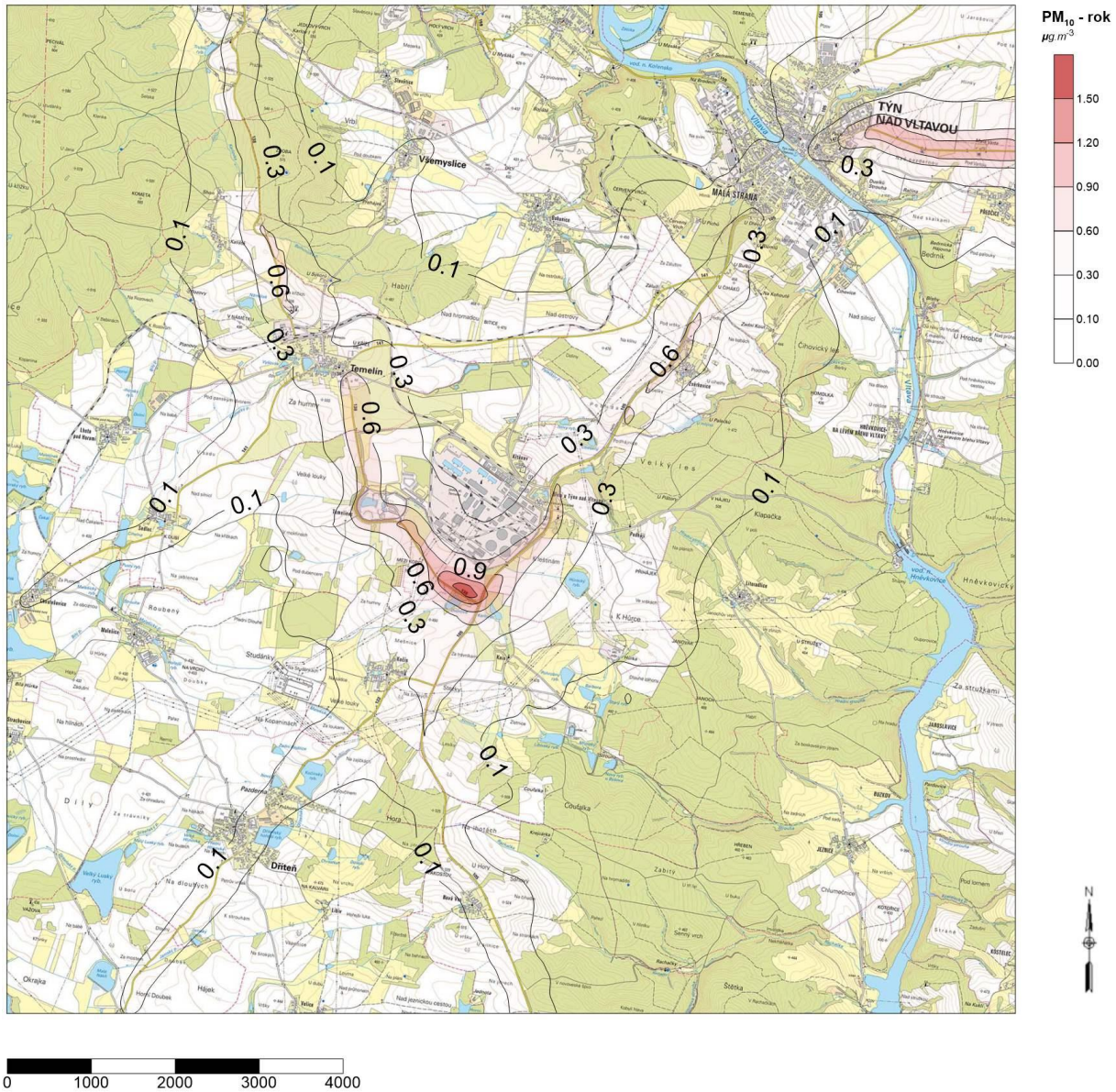
Point	Background	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of operation of SMR ETE
	[µg·m^{-3}]			
Tem	60–90	+0.07	<7	+0.99
Koc	60–90	+0.31	<5	+0.89
Dri	60–90	+0.12	<3	+0.51
Zve	60–90	+0.38	<4	+0.63
TnV	60–90	+0.41	<2	+0.41
1	60–90	-0.02	<4	+0.52
2	60–90	+0.20	<4	+0.70
3	60–90	+0.16	<5	+0.85
4	60–90	+0.03	<3	+0.45
5	60–90	-0.05	<4	+0.48
6	60–90	+0.07	<7	+0.99

5.3.2 Ambient air pollution burden from particulate matter

5.3.2.1 Annual average concentrations – particulate matter fraction PM_{10}

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the main phase of construction of New NPP ETE, an increase in average annual concentrations of particulate matter fraction PM_{10} of up to 1.5 µg·m^{-3} is expected, i.e., up to 3.8% of the air quality limit value (40 µg·m^{-3}). This maximum is reached near the access route to the construction site and is due mainly to the increase in resuspension of dust particles from the road surface as a result of the increased traffic load caused by the construction of New NPP ETE (see Fig. 38). Conversely, in locations where traffic volume is already higher and vehicle speed lower in the existing condition (e.g. Týn nad Vltavou), such a significant increase is not observed despite the increased traffic demands caused by the construction of New NPP ETE, due to the lower effect of resuspension from the road surface. This is because the production of emissions of particles released into the air as a result of so-called particle resuspension, i.e., emissions of dust particles deposited on the road surface, depends on the number of passing vehicles. As background traffic volume increases, the amount of dust deposited on the road surface decreases, which ultimately causes a reduction in the specific emissions of dust particles emitted by the passage of a vehicle.



PM10 - rok	PM10 – year

Fig. 38 Change in average annual PM_{10} concentration [µg·m^{-3}] due to traffic – period 2040 without the Project

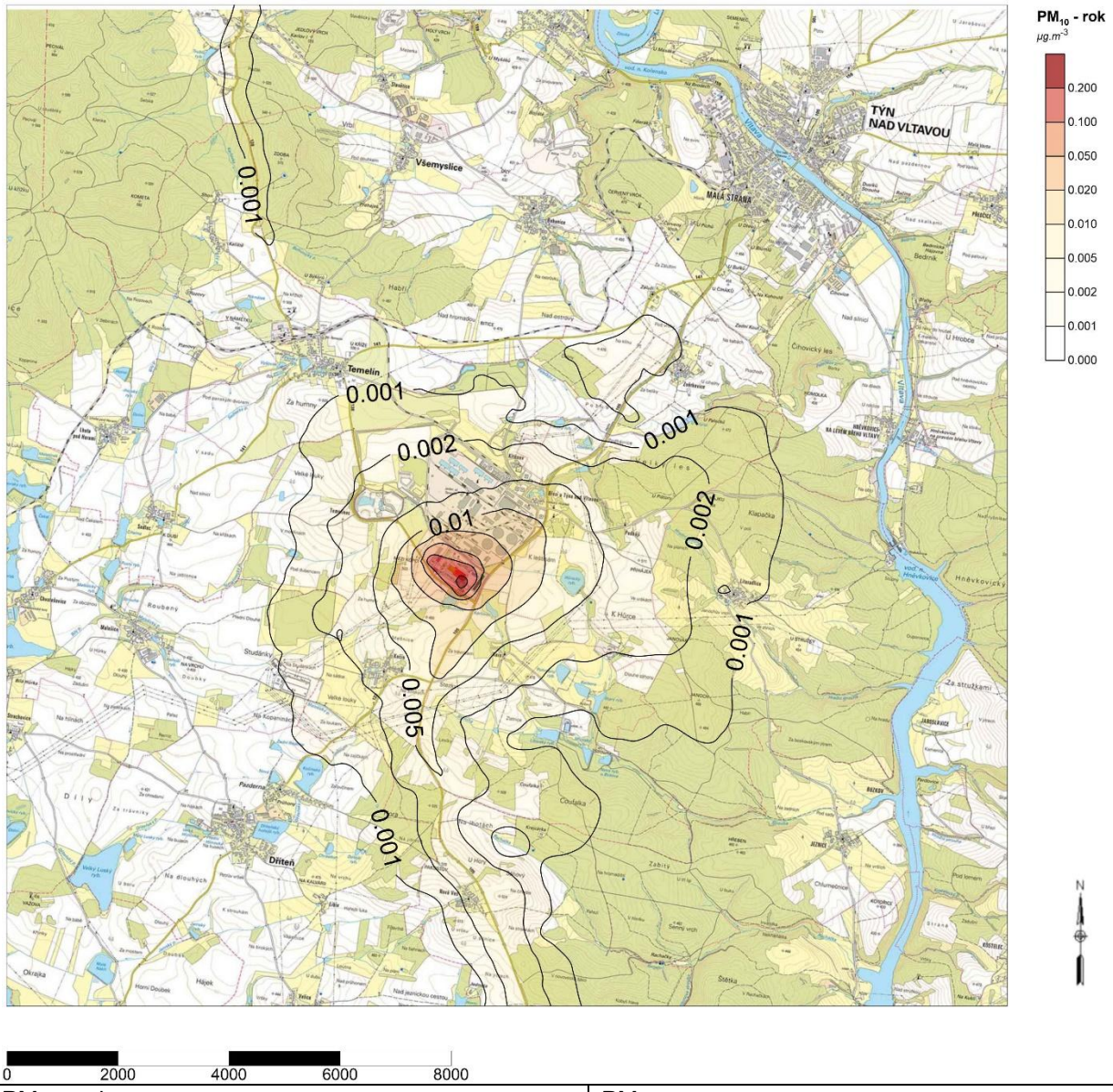
The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes. The contribution values for these activities were taken from the Air Dispersion Study "New NPP at the ETE site – Air Dispersion Study of the operation of construction machinery on the main construction site and construction site facilities areas"[19] and "New NPP at the ETE site – Air Dispersion Study of dust generated by construction activity on the main construction site and on construction site facilities areas"[20].

The constructed maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (lower tens of µg·m^{-3}), and at the nearest residential development the contribution may be up to 5 µg·m^{-3}. In addition, these are contributions for the most emission-intensive phase of construction, whereas a more favourable effect is expected in the period up to 2040, and therefore correspondingly lower contributions are also expected.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area outside the construction site areas themselves are therefore expected to remain below the limits in the future condition.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient PM_{10} concentration due to operation of SMR ETE reaches approximately 0.2 $\mu g \cdot m^{-3}$, i.e., approximately 0.5% of the air quality limit (40 $\mu g \cdot m^{-3}$). However, these maximum values are only limited to the SMR ETE site itself; at the nearest residential development, they reach negligible values. The field of contribution distribution is apparent from Fig. 39.



PM10 - rok	PM10 – year

Fig. 39 Contribution of SMR ETE to the average annual PM_{10} concentration [$\mu g \cdot m^{-3}$] – period 2040 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of operation of SMR ETE itself, a minor change in the ambient air pollution situation is expected at the most affected residential development, with the effect of the assessed SMR ETE Project being negligible in this respect. More detailed calculation results for the individual affected locations are apparent from Tab. 31. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 31 Results of the assessment for selected locations – average annual PM_{10} concentrations – year 2040

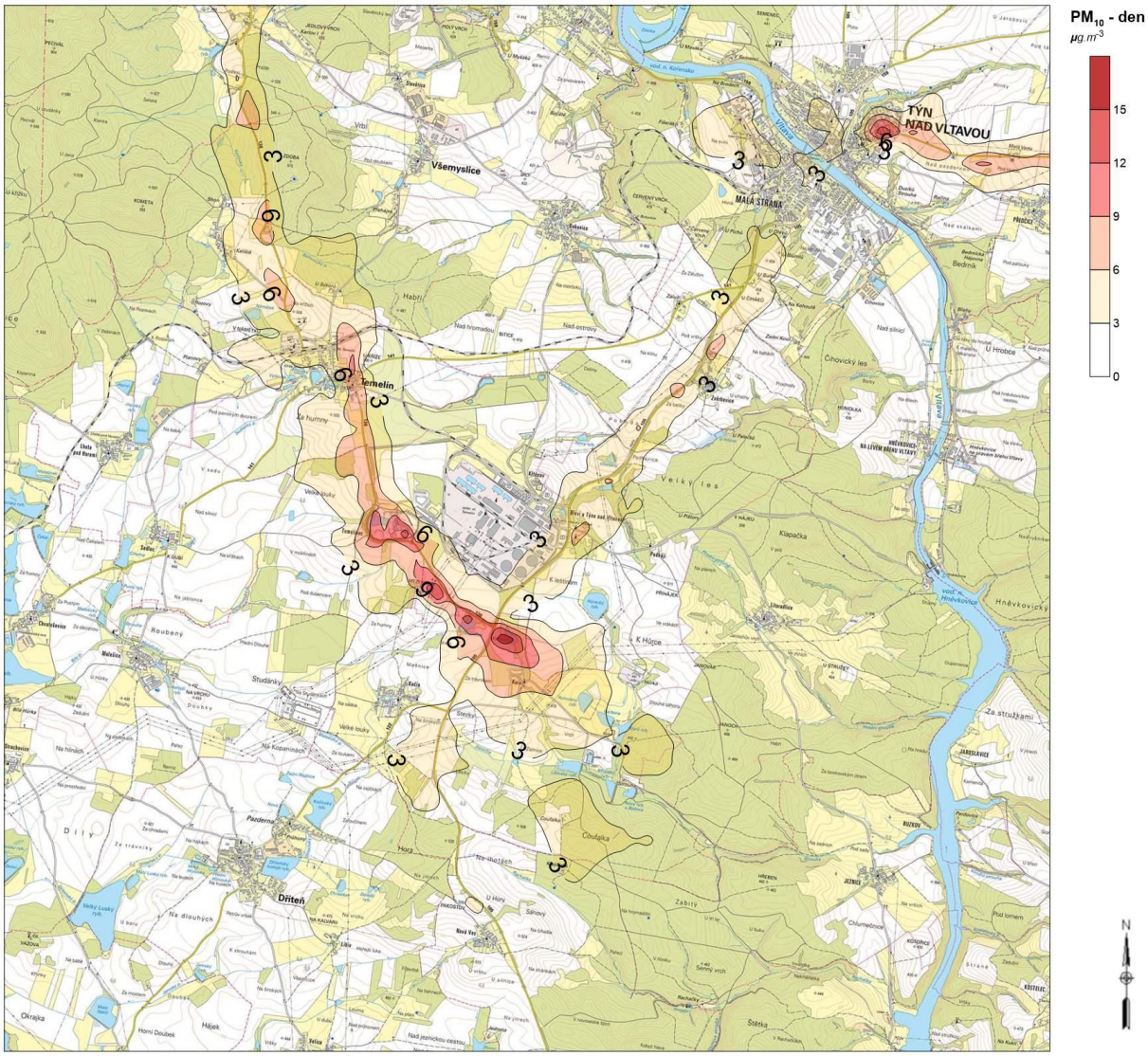
Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of operation of SMR ETE
	[µg.m^{-3}]			
Tem	12.3	+0.61	<<5	+0.001
Koc	12.8	+0.28	<<5	+0.003
Dri	13.2	+0.14	<<5	+0.001
Zve	13.1	+0.65	<<5	+0.001
TnV	15.3	+0.60	<<5	+0.000
1	12.0	+0.06	<<5	+0.001
2	12.1	+0.08	<<5	+0.001
3	12.8	+0.24	<<5	+0.003
4	12.9	+0.05	<<5	+0.000
5	12.7	+0.14	<<5	+0.000
6	12.3	+0.57	<<5	+0.001

5.3.2.2 Maximum short-term (24-hour) concentrations – particulate matter fraction PM_{10}

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the main phase of construction of New NPP ETE, an increase in maximum daily concentrations of particulate matter fraction PM_{10} of up to 15 µg·m^{-3} is expected, i.e., 30% of the air quality limit value (50 µg·m^{-3}). This maximum is reached near the access route to the construction site (see Fig. 40) and is again due mainly to the increase in resuspension of dust particles from the road surface as a result of the increased traffic load caused predominantly by the construction of New NPP ETE.

An increase in ambient concentrations may be expected mainly on roads with a lower background traffic load, where higher dust loading on the road surface, and therefore also higher emissions due to the increase in traffic, can be expected.



PM10 - den	PM10 – day

Fig. 40 Change in maximum daily PM_{10} concentration [µg·m^{-3}] due to traffic – period 2040 without the Project

The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes.

The compiled maps of the calculation results show that the effect of earthworks during excavation works on the construction site facilities and New NPP ETE areas is manifested mainly inside the New NPP ETE construction site (exceeding 1,000 µg·m^{-3}), and at the nearest residential development the contribution may reach the lower hundreds of µg·m^{-3}.

It should be noted, however, that the maximum ambient concentration values are calculated under the least favourable dispersion conditions, the duration of which is assumed in the model calculations for the entire assessed time interval (i.e., 24 hours). Given that, under real conditions, some directional or speed fluctuation of wind always occurs, these values cannot practically be reached.

Since the short-term concentration of particulate matter fraction PM_{10} depends to a significant extent on current meteorological and dispersion conditions (frequency and duration of inversions, wind erosion, length of the precipitation-free period, ground-level fog, supra-regional nature of episodes of increased ambient air pollution burden, etc.), it is therefore appropriate to take into account primarily concentrations with an

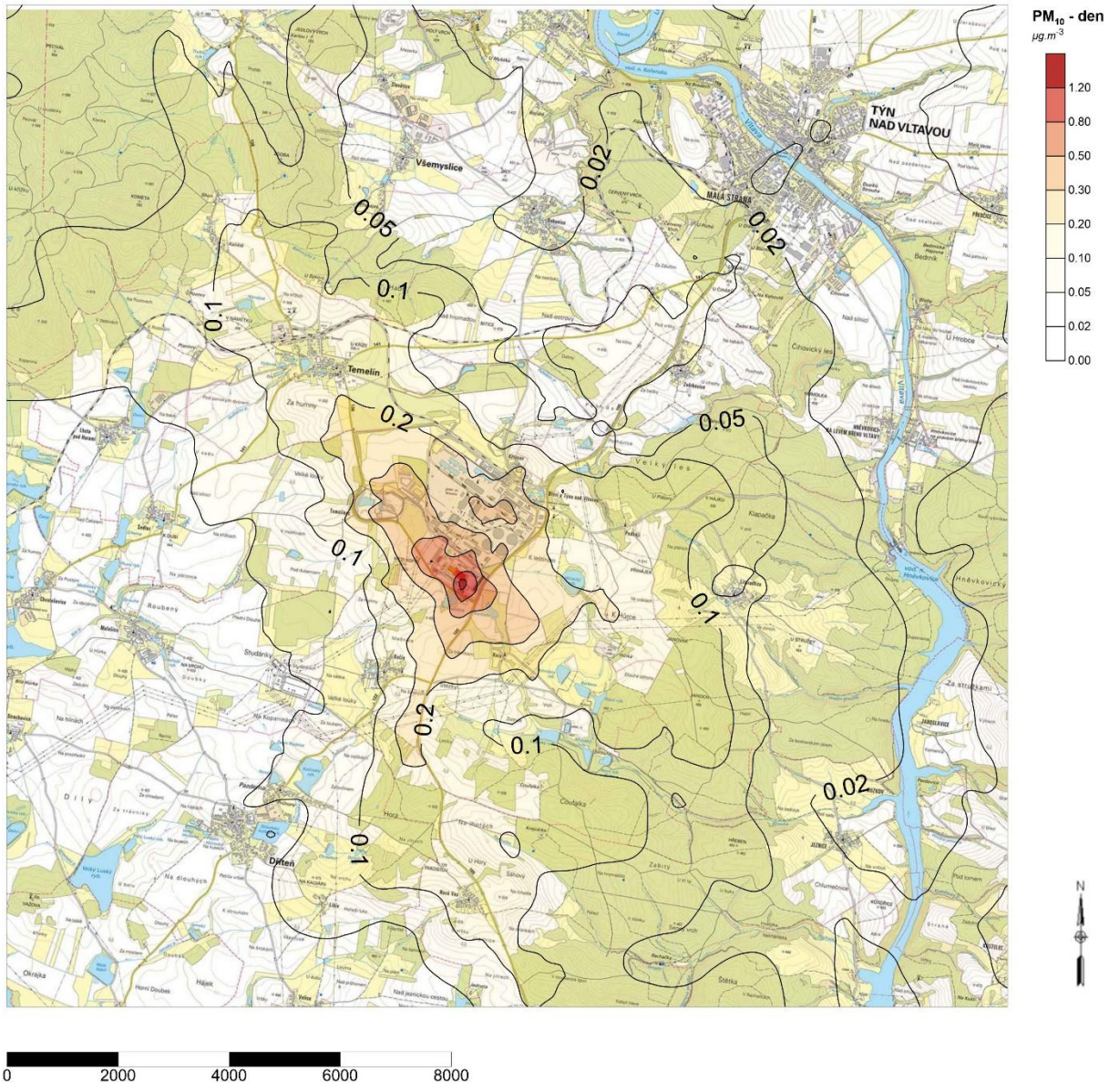
averaging period of 1 calendar year, which are subject to much smaller fluctuations and are therefore a more stable indicator of deteriorated air quality.

The calculation according to the methodology set out in Chapter 4.1 showed that, under the existing condition, approximately 1 day with the limit for maximum 24-hour concentrations exceeded can be expected at the nearest residential development, while in the future condition, dominantly due to the construction of New NPP ETE, the frequency of the air quality limit being exceeded may increase by a maximum of approximately 3 days. The stated increase in the number of days with the air quality limit exceeded will therefore reliably not lead to an increase in the number of cases the air quality limit is exceeded above the permitted value of 35 such cases per year. In addition, these are changes generated by the most emission-intensive construction phase, whereas a more favourable effect is expected in the period up to 2040, and therefore correspondingly lower effects are also expected.

Dust emissions during the construction of New NPP ETE can be further reduced by applying appropriate measures, in particular sprinkling exposed areas, cleaning internal roads, and maintaining the optimum vehicle travel speed, which would minimise the above-mentioned effects.

Effect of SMR ETE

The highest calculated contributions to the maximum daily PM_{10} concentration during operation of SMR ETE reach values of up to approximately 1.2 $\mu g \cdot m^{-3}$, i.e., approximately 2.4% of the air quality limit value (50 $\mu g \cdot m^{-3}$). This maximum is reached near the access route to the SMR ETE site (see Fig. 41); at the nearest residential development, the contribution from operation decreases to low tenths of $\mu g \cdot m^{-3}$.



PM_{10} - den	PM_{10} – day

Fig. 41 Contribution of SMR ETE to the maximum daily PM_{10} concentration [µg·m^{-3}] – period 2040 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of operation of SMR ETE itself, significant increases in short-term ambient concentrations are expected at the most affected residential development. The negligible effect of SMR ETE is completely masked here by the significant increases due to the construction of New NPP ETE. More detailed calculation results for the individual affected locations are apparent from Tab. 32.

Tab. 32 Results of the assessment for selected locations – maximum daily PM_{10} concentrations – year 2040

Point	Background (OZKO)*	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of operation of SMR ETE
	[µg·m^{-3}]			
Tem	22	+9.12	<600	+0.19
Koc	23	+3.49	<300	+0.13
Dri	24	+1.43	<150	+0.06
Zve	24	+6.52	<150	+0.09
TnV	27	+7.62	<100	+0.03
1	22	+0.51	<200	+0.04
2	22	+3.17	<200	+0.11
3	23	+1.27	<300	+0.13
4	23	+0.32	<150	+0.04
5	23	+1.55	<150	+0.04
6	22	+9.12	<600	+0.18

* 36th highest daily concentration.

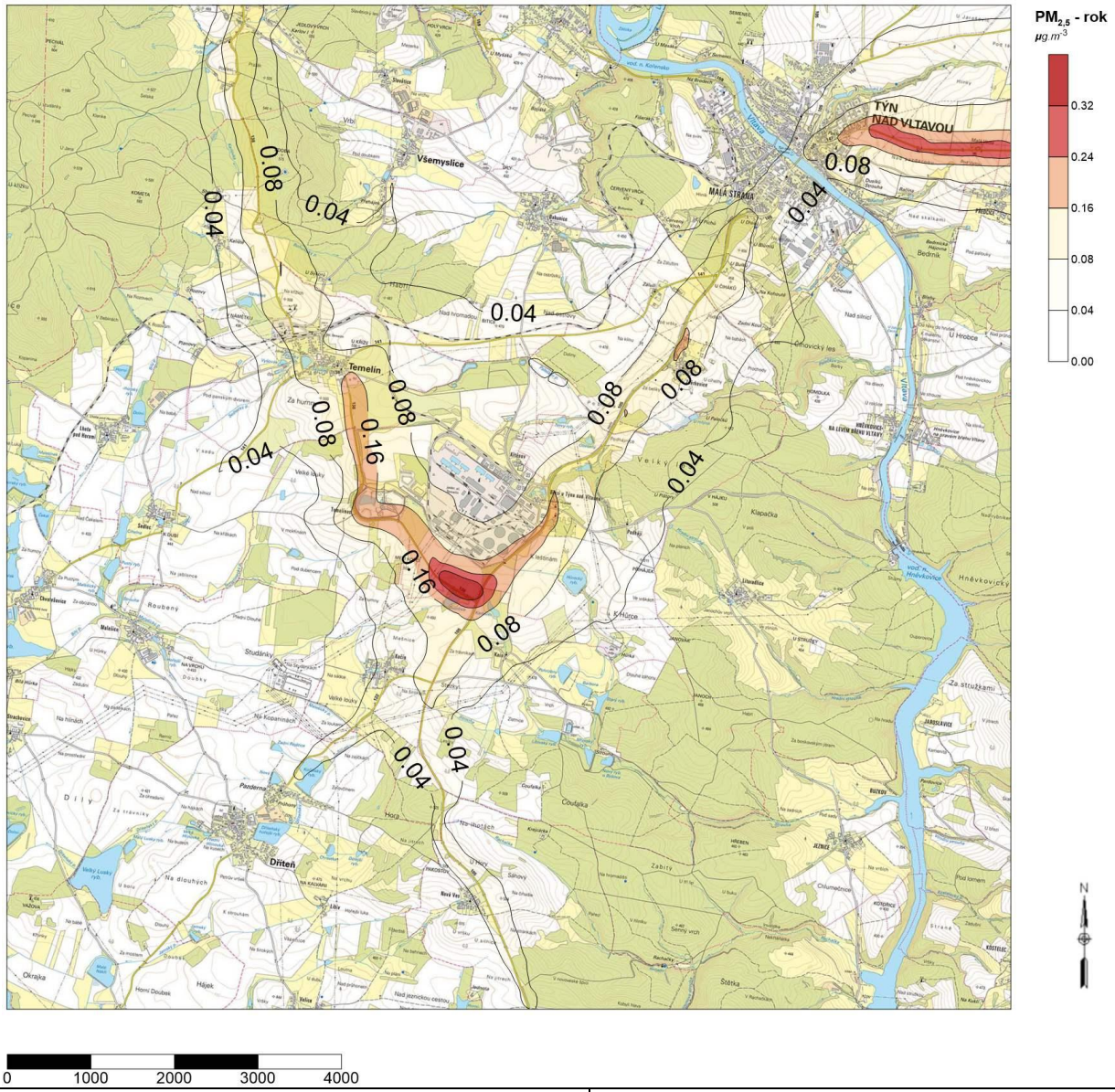
Using the methodology for calculating the number of days exceeding the 24-hour limit for suspended particles set out in Chapter 4.1, there is an ambient concentration reserve in the area before the permitted number of cases with the limit exceeded of 35 per year is reached, corresponding to an increase in average annual concentrations of approximately 16 µg·m^{-3}. This contribution to the average annual concentration will not be reached in the area; therefore, the number of cases when the limit is exceeded above the limit in the area is not expected to be reached. In the surrounding municipalities, under the existing condition, the number of cases when the limit is exceeded can be expected to be up to 1 day per year; in the event of possible concurrence of construction of New NPP ETE and operation of SMR ETE, the increase in the number of days with the daily maximum exceeded may reach approximately 3 days per year, and the resulting ambient air pollution situation will therefore remain below the limit, with the effect of SMR ETE not playing a significant role in this increase.

Despite the below-limit effect in the surrounding municipalities, the increase in maximum concentrations is very significant; it is therefore necessary to observe appropriate preventive measures to eliminate dust during the construction period of New NPP ETE.

5.3.2.3 Annual average concentrations – particulate matter fraction $PM_{2.5}$

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the main phase of construction of New NPP ETE, an increase in average annual concentrations of particulate matter fraction $PM_{2.5}$ of up to 0.32 $\mu g \cdot m^{-3}$ is expected, i.e., up to 1.6% of the air quality limit value (20 $\mu g \cdot m^{-3}$). This maximum is again reached near the access route to the construction site and is due mainly to the increase in resuspension of dust particles from the road surface as a result of the increased traffic load caused predominantly by the construction of New NPP ETE. Conversely, in locations where traffic volume is already higher and vehicle speed lower in the existing condition (e.g. Týn nad Vltavou), such a significant increase is not observed despite the increased traffic demands associated with the construction of New NPP ETE, due to the lower effect of resuspension from the road surface. The field of distribution of changes in ambient concentrations is apparent from Fig. 42.



$PM_{2,5}$ - rok	$PM_{2.5}$ – year

Fig. 42 Change in average annual $PM_{2.5}$ concentration [$\mu g \cdot m^{-3}$] due to traffic – period 2040 without the Project

The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes. The Air Dispersion Study “New NPP at the ETE site” did not include a dust calculation for

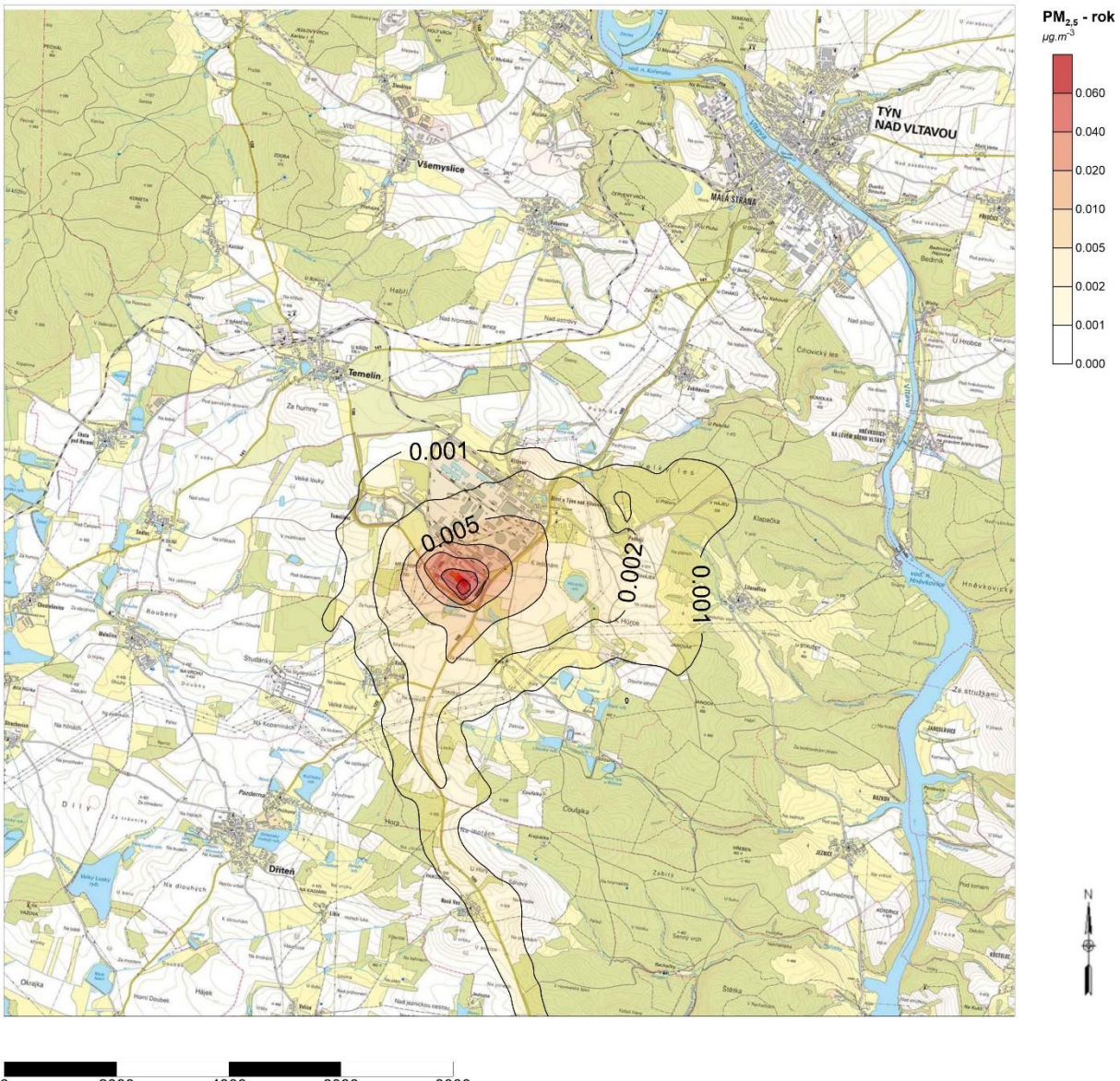
the $PM_{2.5}$ fraction; however, conservatively, these contributions may be estimated at approximately 30% of the PM_{10} fraction. On this assumption, the effect of operation of construction machinery can be estimated at the level of lower tens of $\mu g \cdot m^{-3}$, and at the nearest residential development the contribution may be up to 1 $\mu g \cdot m^{-3}$.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area outside the construction site areas themselves are therefore expected to remain below the limits in the future condition.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient $PM_{2.5}$ concentration due to operation of SMR ETE reaches up to approximately 0.06 $\mu g \cdot m^{-3}$, i.e., up to 0.3% of the air quality limit (20 $\mu g \cdot m^{-3}$). These maximum values are limited only to the SMR ETE site itself; at the nearest residential development, the contributions reach negligible values.

The field of contribution distribution is apparent from Fig. 43.



$PM_{2,5}$ - rok	$PM_{2.5}$ – year

Fig. 43 Contribution of SMR ETE to the average annual $PM_{2.5}$ concentration [$\mu g \cdot m^{-3}$] – period 2040 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of operation of SMR ETE itself, a minor change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 33. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 33 Results of the assessment for selected locations – average annual $PM_{2.5}$ concentrations – year 2040

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE*	Effect of operation of SMR ETE
	[µg·m^{-3}]			
Tem	8.7	+0.15	<<1	+0.000
Koc	9.0	+0.07	<<1	+0.002
Dri	9.4	+0.03	<<1	+0.000
Zve	9.3	+0.17	<<1	+0.001
TnV	10.8	+0.15	<<1	+0.000
1	8.4	+0.01	<<1	+0.000
2	8.4	+0.02	<<1	+0.001
3	9.0	+0.06	<<1	+0.002
4	9.2	+0.01	<<1	+0.000
5	9.1	+0.03	<<1	+0.000
6	8.7	+0.14	<<1	+0.000

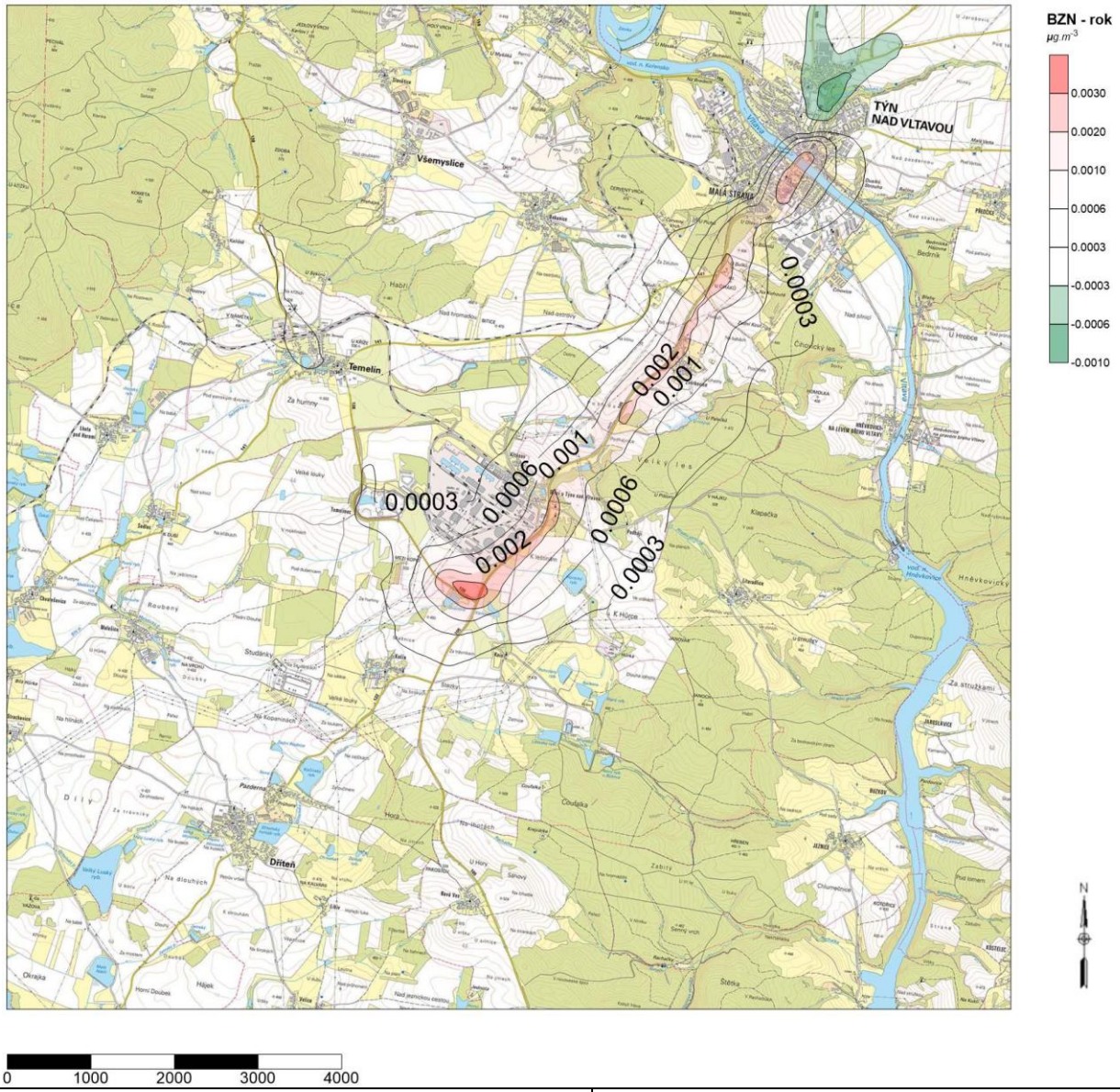
* Not addressed in the New NPP ETE Air Dispersion Study (estimated to be significantly less than1 µg m^{-3}).

5.3.3 Ambient air pollution burden from benzene

5.3.3.1 Annual average concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the main phase of construction of New NPP ETE, a minimum increase in average annual benzene concentrations is expected, on the main routes used for the delivery of raw materials for the construction of New NPP ETE. These are contributions of up to approximately 0.003 µg·m^{-3}, i.e., approximately 0.06% of the air quality limit (5 µg·m^{-3}). In other locations, despite the increase in traffic volumes, a stagnation or insignificant decrease in ambient concentrations can be observed, caused by a reduction in primary emissions from fuel combustion as a result of renewal of the vehicle fleet (improvement in vehicle emission standards), which compensates for the effect of the natural increase in traffic volumes in the area. The field of distribution of the change in the ambient background is apparent from Fig. 44.



BZN - rok	BZN – year

Fig. 44 Change in average annual benzene concentration [µg·m^{-3}] due to traffic – period 2040 without the Project

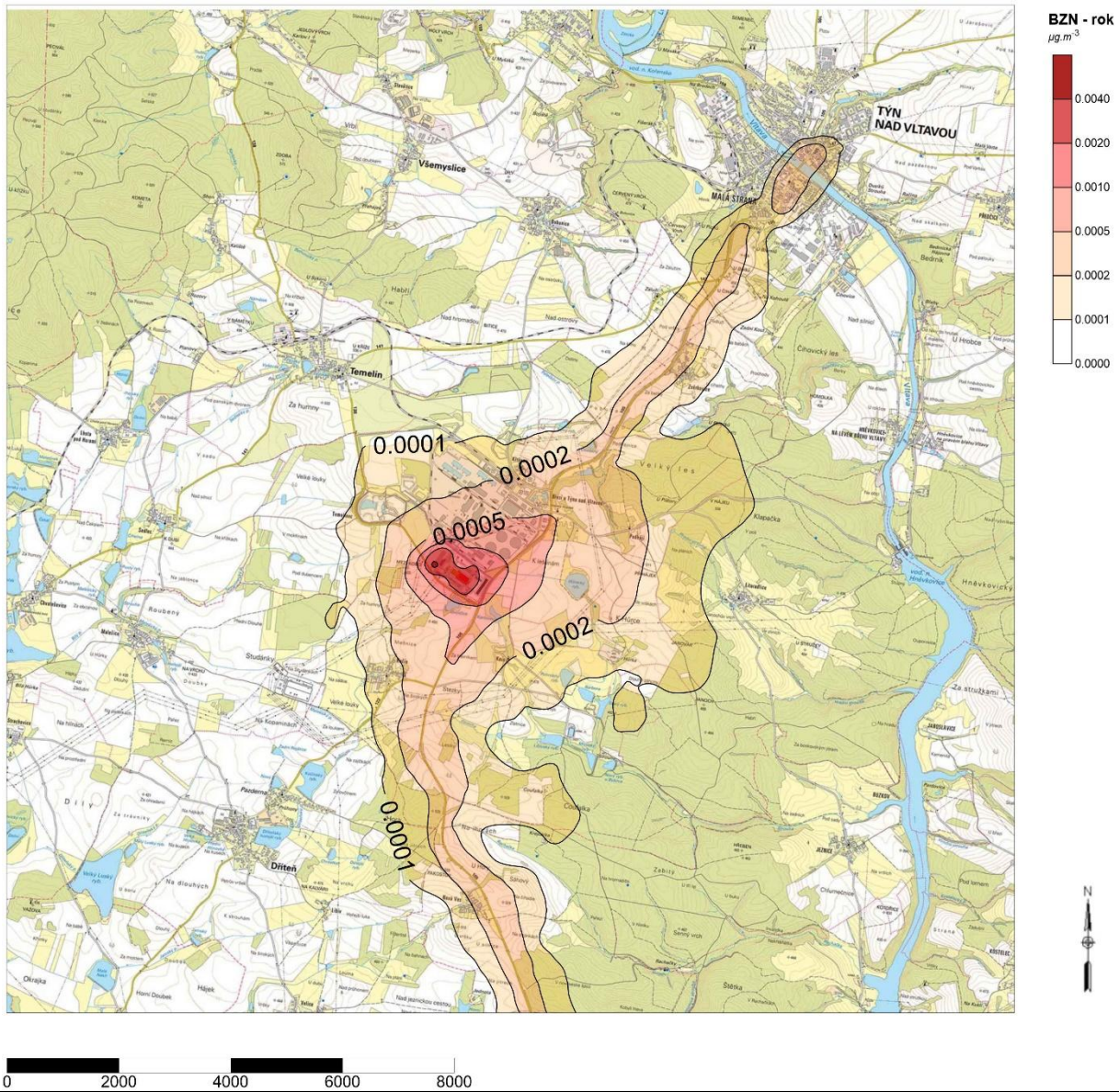
The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes. The contribution values for these activities were again taken from the Air Dispersion Study "New NPP at the ETE site – Air Dispersion Study of the operation of construction machinery on the main construction site and construction site facilities areas"[19].

The compiled maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (approx. thousandths of µg·m^{-3}); at the nearest residential development, it represents a completely insignificant contribution to background concentrations.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition, with a large reserve.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient benzene concentration due to operation of SMR ETE reaches up to approximately 0.004 µg·m^{-3}, i.e., up to 0.08% of the air quality limit (5 µg·m^{-3}). The field of contribution distribution is apparent from Fig. 45.



BZN - rok	BZN – year

Fig. 45 Contribution of SMR ETE to the average annual benzene concentration [µg·m^{-3}] – period 2040 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 34. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 34 Results of the assessment for selected locations – average annual benzene concentrations – year 2040

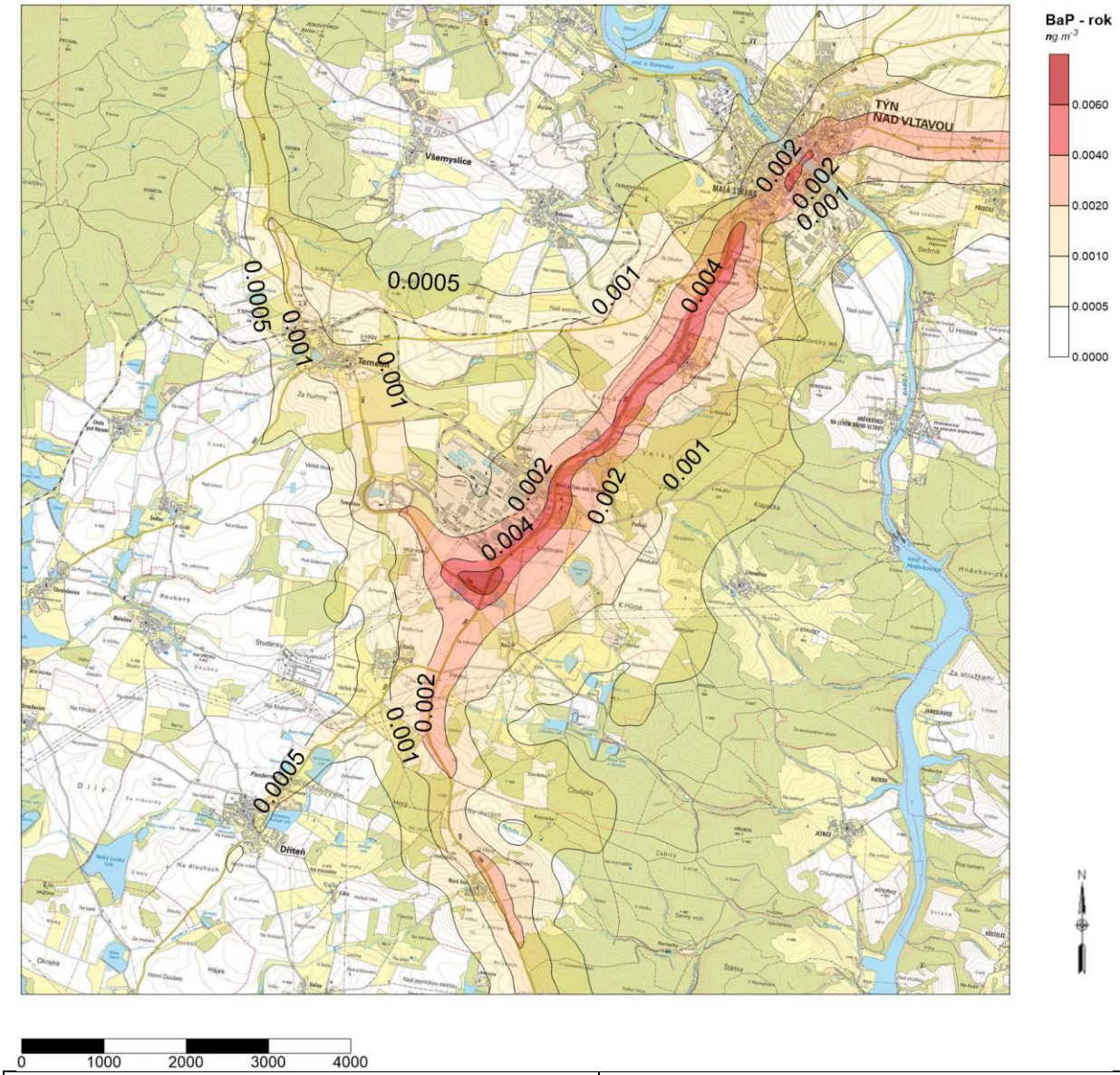
Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of operation of SMR ETE
	[µg·m^{-3}]			
Tem	0.6	+0.000 3	<0.000 2	+0.000 1
Koc	0.6	+0.000 1	<0.000 2	+0.000 2
Dri	0.6	-0.000 1	<0.000 2	+0.000 0
Zve	0.6	+0.002 2	<0.000 2	+0.000 3
TnV	0.8	+0.002 2	<0.000 2	+0.000 3
1	0.6	+0.000 1	<0.000 2	+0.000 1
2	0.6	+0.000 1	<0.000 2	+0.000 1
3	0.6	+0.000 1	<0.000 2	+0.000 2
4	0.6	+0.000 0	<0.000 2	+0.000 0
5	0.6	-0.000 1	<0.000 2	+0.000 0
6	0.6	+0.000 2	<0.000 2	+0.000 1

5.3.4 Ambient air pollution burden from benzo(a)pyrene

5.3.4.1 Annual average concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the main phase of construction of New NPP ETE, an increase in average annual benzo(a)pyrene concentrations of up to 0.006 ng·m^{-3} is expected, i.e., up to 0.6% of the air quality limit value (1 ng·m^{-3}). This maximum is reached near the access route to the construction site (see Fig. 46), where the highest traffic volumes associated with the construction of New NPP ETE are expected.



BaP - rok	BaP – year

Fig. 46 Change in average annual benzo(a)pyrene concentration [ng·m^{-3}] due to traffic – period 2040 without the Project

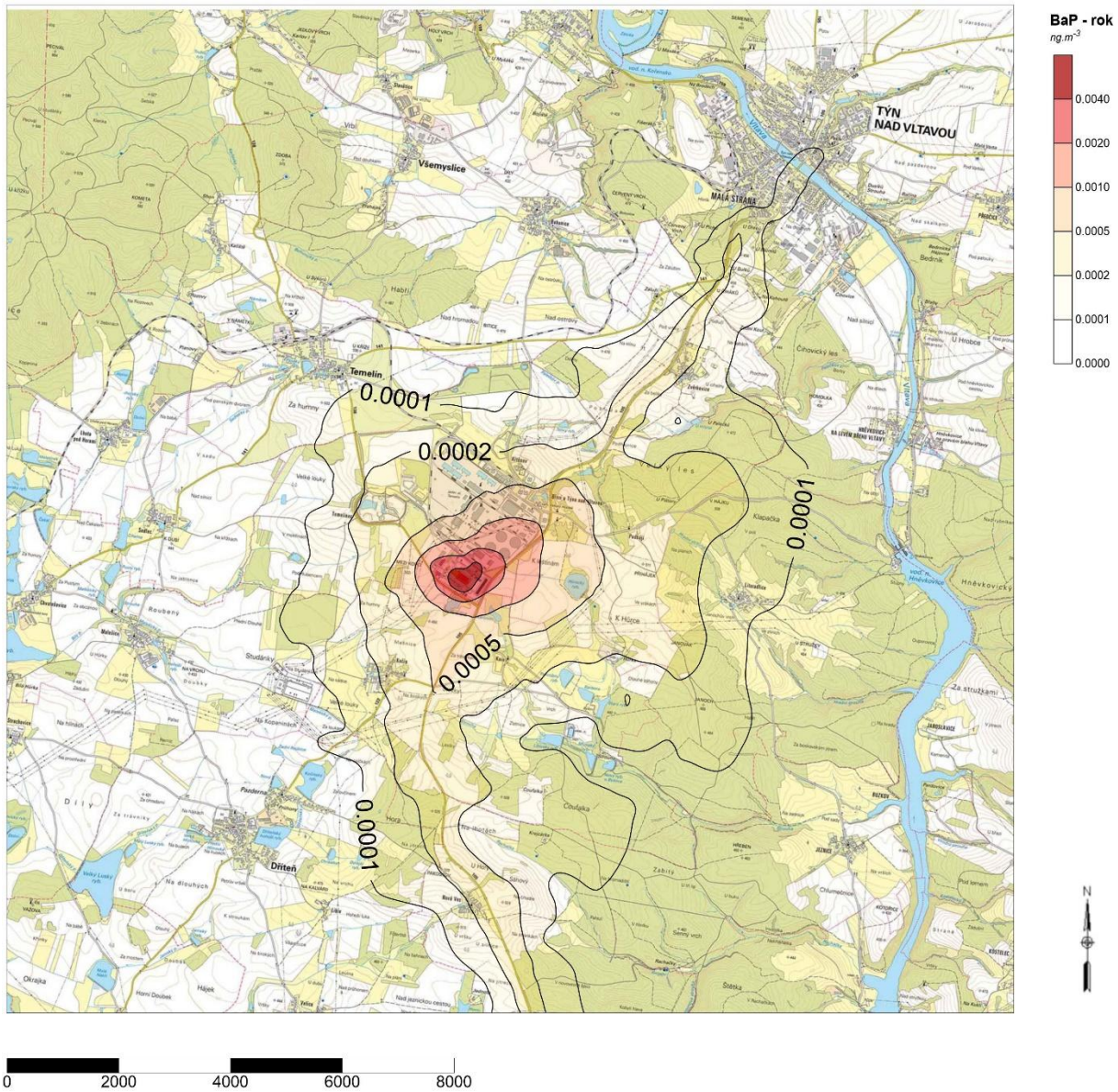
The effect of operation of construction machinery due to construction of New NPP ETE must also be added to these changes.

The compiled maps of the calculation results show that the effect of construction machinery operation is manifested mainly inside the New NPP ETE construction site (approx. thousandths of ng·m^{-3}); at the nearest residential development, it represents a completely insignificant contribution to background concentrations.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition, with a large reserve.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient benzo(a)pyrene concentration due to operation of SMR ETE reaches up to approximately 0.004 ng·m^{-3}, i.e., up to 0.4% of the air quality limit (1 ng·m^{-3}). The field of contribution distribution is apparent from Fig. 47.



BaP - rok	BaP – year

Fig. 47 Contribution of SMR ETE to the average annual benzo(a)pyrene concentration [ng·m^{-3}] – period 2040 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 35. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 35 Results of the assessment for selected locations – average annual benzo(a)pyrene concentrations – year 2040

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of construction of New NPP ETE	Effect of operation of SMR ETE
	[ng·m^{-3}]			
Tem	0.3	+0.001 7	<0.001	+0.000 1
Koc	0.3	+0.001 3	<0.001	+0.000 3
Dri	0.4	+0.000 5	<0.001	+0.000 1
Zve	0.3	+0.005 3	<0.001	+0.000 3
TnV	0.6	+0.004 5	<0.001	+0.000 2
1	0.2	+0.000 3	<0.001	+0.000 1
2	0.2	+0.000 5	<0.001	+0.000 1
3	0.3	+0.001 2	<0.001	+0.000 3
4	0.3	+0.000 2	<0.001	+0.000 0
5	0.3	+0.000 4	<0.001	+0.000 0
6	0.3	+0.001 6	<0.001	+0.000 1

5.4 Operation period – year 2042

For this period, the so-called zero option without the effect of implementation of SMR ETE was modelled, corresponding to the change in ambient concentrations due both to the natural increase in traffic volumes by 2042 and to the effect of traffic associated with the operation of New NPP ETE. The potential maximum effect of the stationary sources associated with New NPP ETE was cumulatively added to these values.

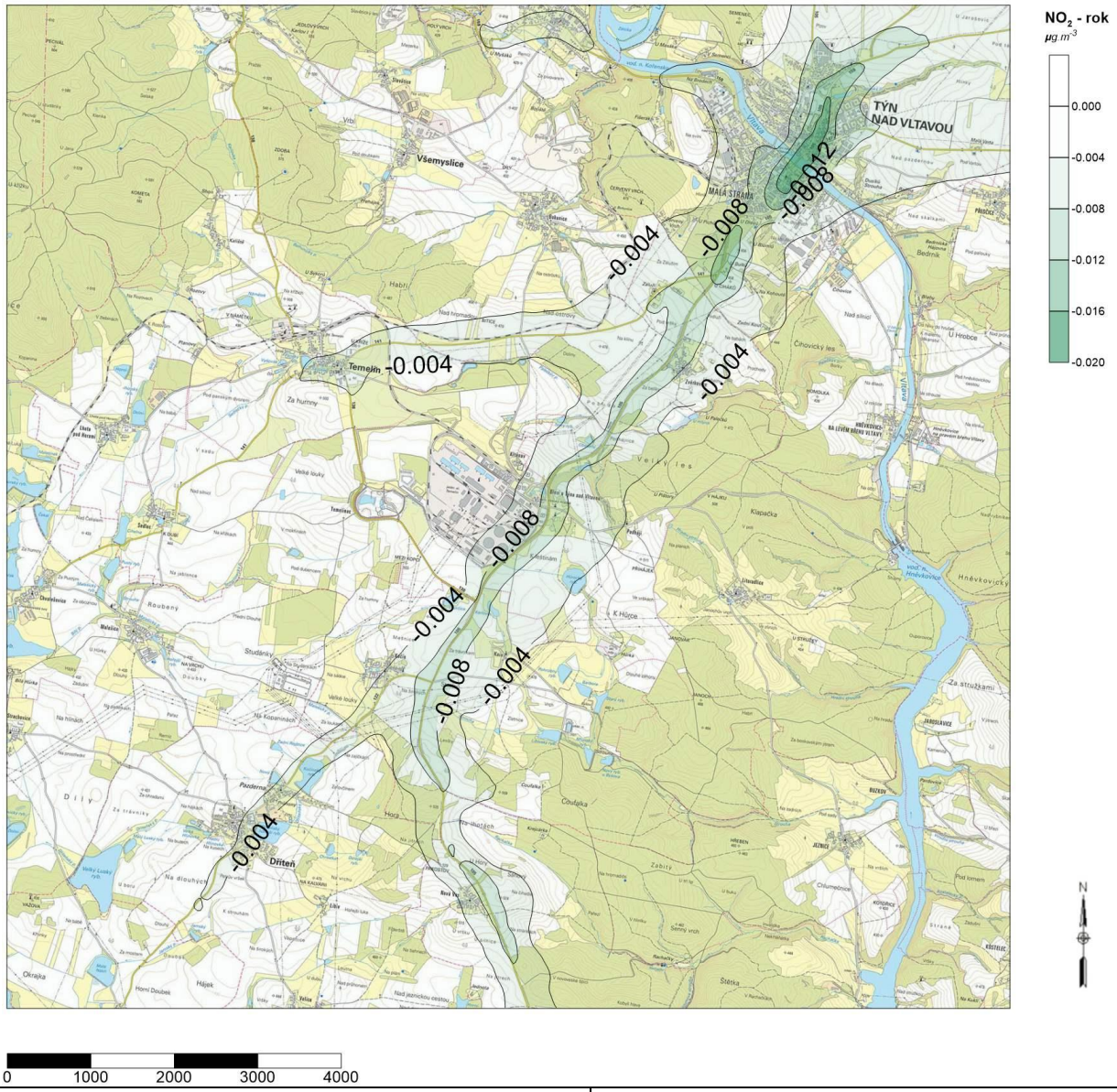
The second modelling scenario then represents only the contribution generated by the operation of the SMR ETE Project, including generated traffic.

5.4.1 Ambient air pollution burden from nitrogen dioxide

5.4.1.1 Annual average concentrations

Development of the ambient background

Despite the natural increase in road traffic, including the effect of road traffic associated with the operation of New NPP ETE, a slight decrease in average annual NO_2 concentrations is expected in the future condition, caused by a reduction in primary emissions from fuel combustion as a result of renewal of the vehicle fleet (improvement in vehicle emission standards), which fully compensates for the effect of the expected increase in traffic volumes in the area. The field of distribution of the change in the ambient background is apparent from Fig. 48.



NO_2 - rok	NO_2 – year

Fig. 48 Change in average annual NO_2 concentration [µg·m^{-3}] due to traffic – period 2042 without the Project

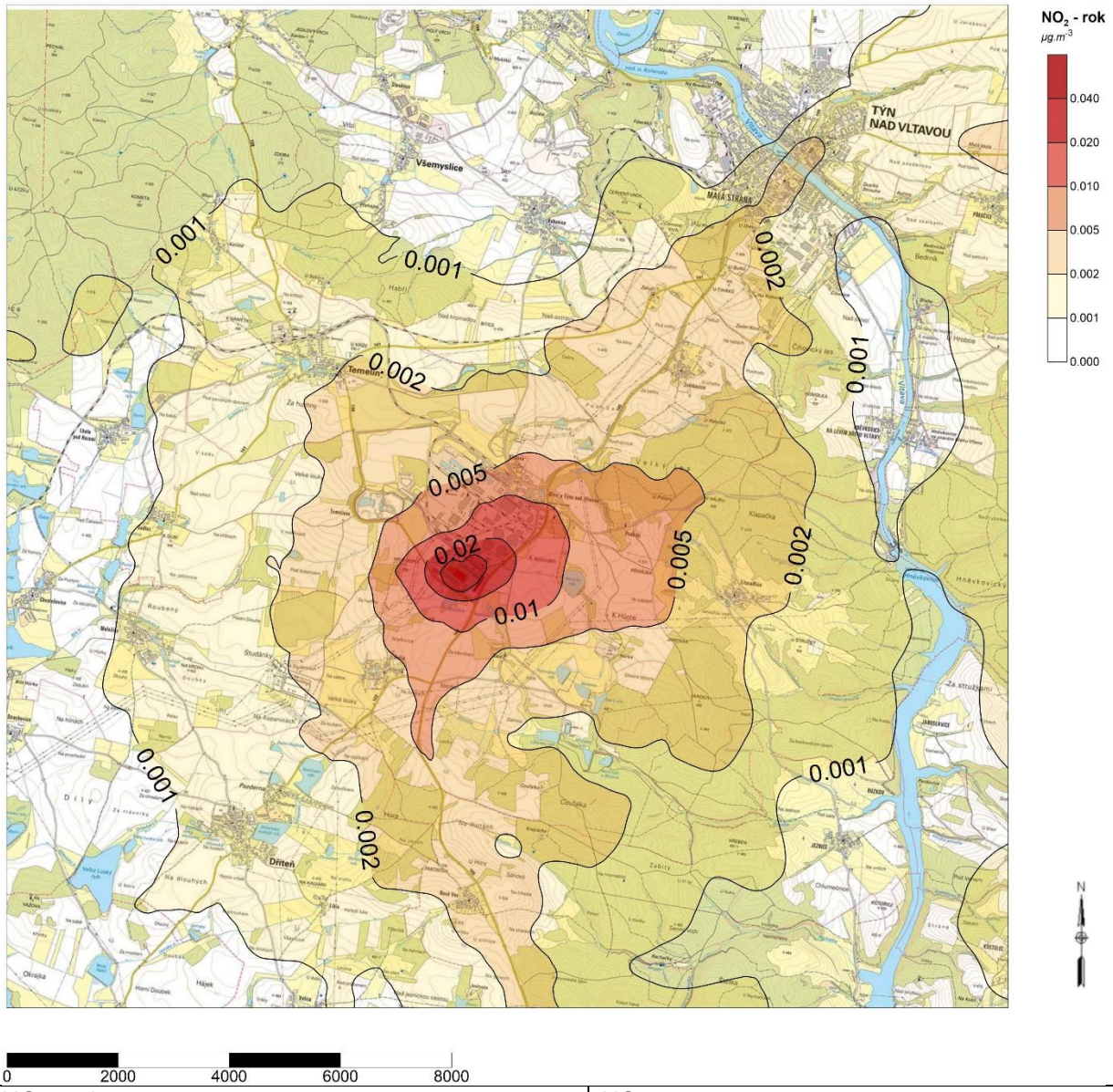
The effect of operation of New NPP ETE must also be added to these changes. The contribution values for these activities were taken from the Air Dispersion Study "New NPP at the ETE site – Air Dispersion Study of the operation of New NPP point air pollution sources"[21].

The compiled maps of the calculation results show that the effect of operation of New NPP ETE is manifested mainly inside the site (hundredths of µg·m^{-3}); at the nearest residential development, it represents a completely insignificant contribution to background concentrations.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition, with a large reserve.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient NO_2 concentration due to operation of SMR ETE reaches up to approximately 0.04 µg·m^{-3}, i.e., approximately 0.1% of the air quality limit (40 µg·m^{-3}). The field of contribution distribution is apparent from Fig. 49.



NO_2 - rok	NO_2 – year

Fig. 49 Contribution of SMR ETE to the average annual NO_2 concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and stationary air pollution sources in connection with the operation of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 36. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

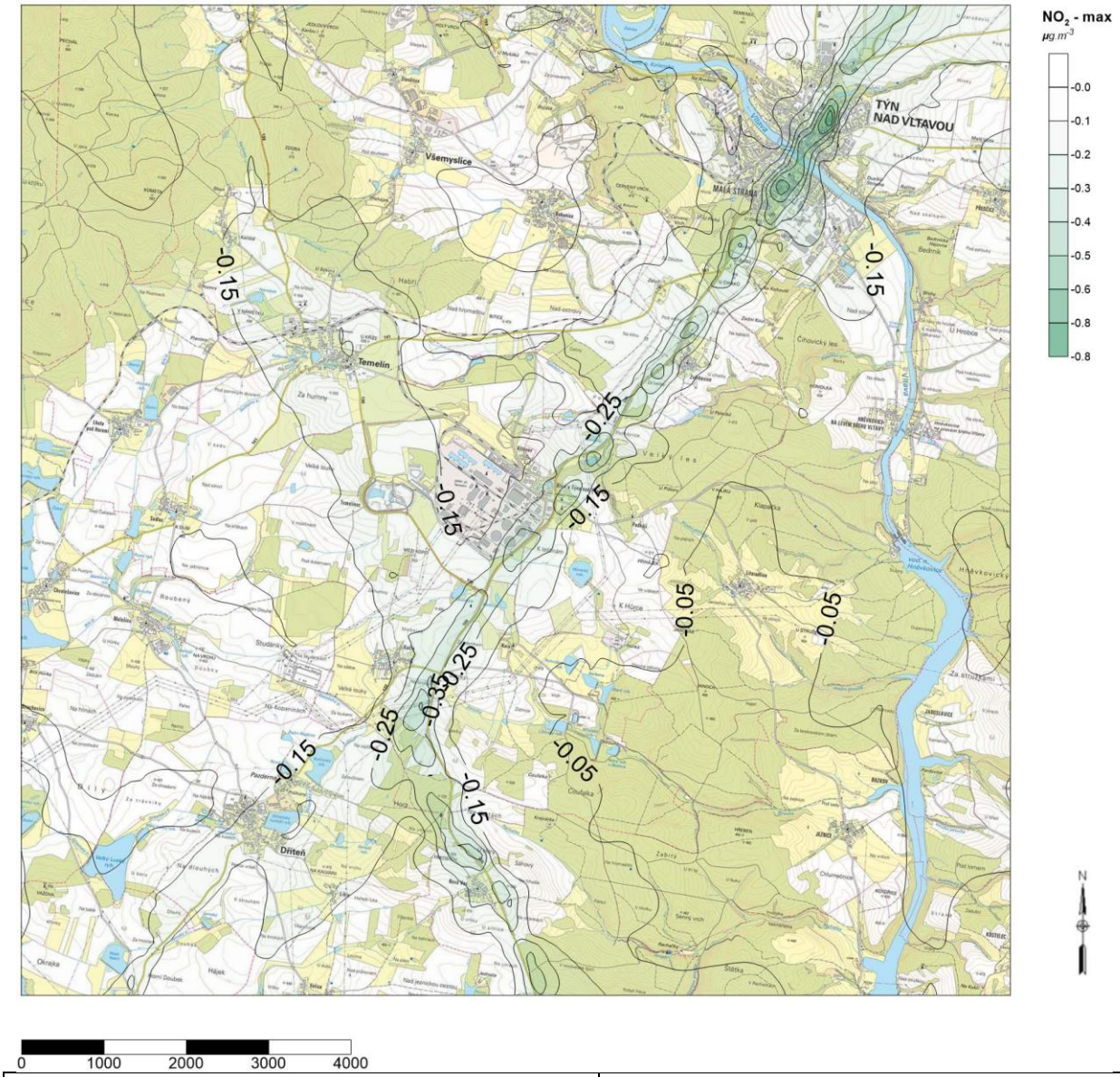
Tab. 36 Results of the assessment for selected locations – average annual NO_2 concentrations – year 2042

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of operation of New NPP ETE	Effect of operation of SMR ETE
	[µg·m^{-3}]			
Tem	5.4	-0.003	<0.005	+0.002
Koc	5.5	-0.004	<0.005	+0.004
Dri	6.3	-0.004	<0.005	+0.002
Zve	5.8	-0.010	<0.005	+0.004
TnV	11.3	-0.010	<0.005	+0.003
1	5.1	-0.001	<0.005	+0.002
2	5.1	-0.002	<0.005	+0.002
3	5.5	-0.002	<0.005	+0.004
4	5.9	-0.001	<0.005	+0.001
5	5.7	-0.003	<0.005	+0.001
6	5.4	-0.004	<0.005	+0.002

5.4.1.2 Maximum short-term (hourly) concentrations

Development of the ambient background

Despite the natural increase in road traffic, including the effect of road traffic associated with the operation of New NPP ETE, a slight decrease in maximum hourly NO_2 concentrations is expected in the future condition, caused by a reduction in primary emissions from fuel combustion as a result of renewal of the vehicle fleet (improvement in vehicle emission standards), which compensates for the effect of the natural increase in traffic volumes in the area. The field of distribution of the change in the ambient background is apparent from Fig. 50.



NO_2 - max	NO_2 – max

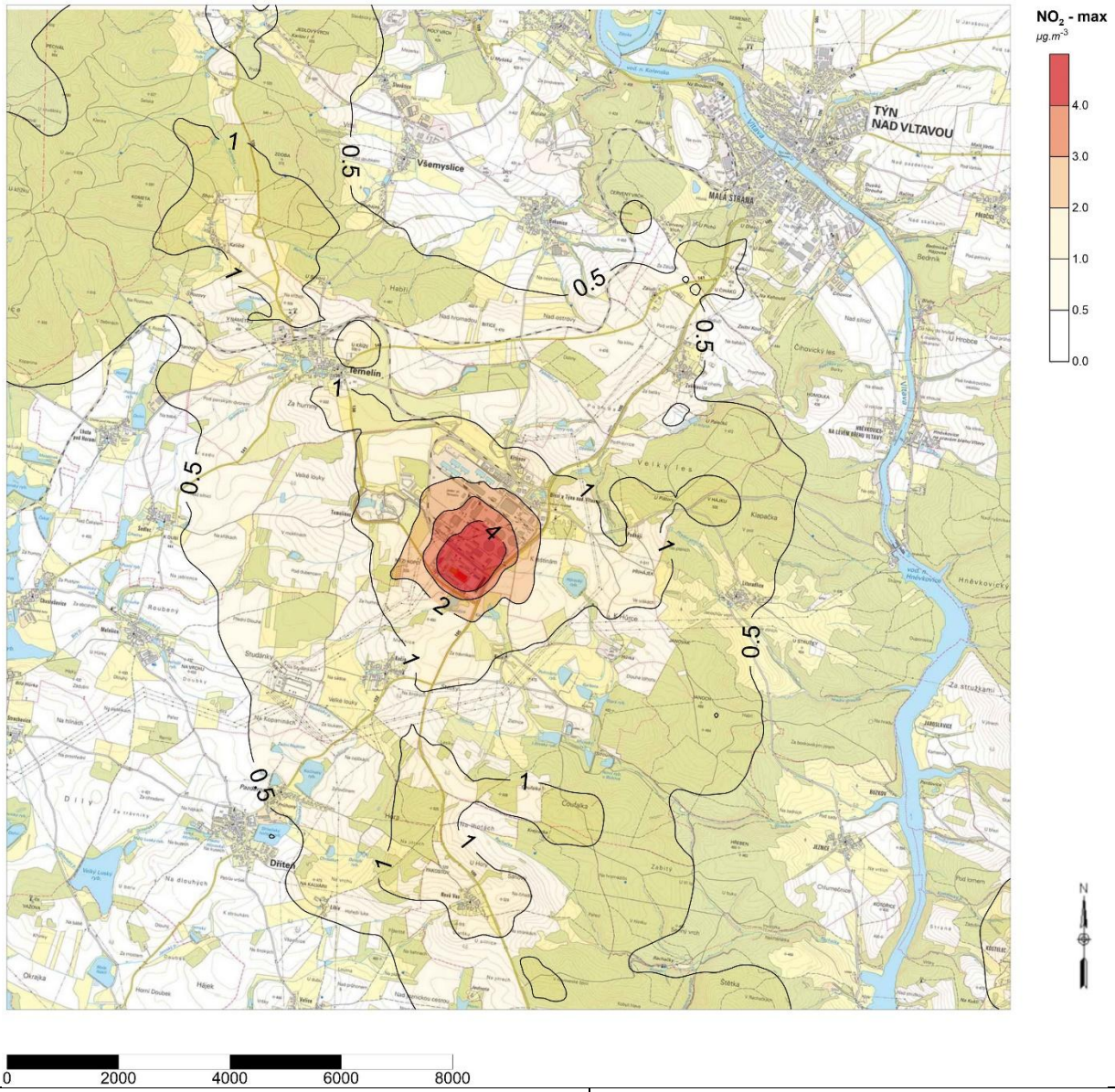
Fig. 50 Change in maximum hourly NO_2 concentration [µg·m^{-3}] due to traffic – period 2042 without the Project

The effect of operation of construction machinery due to operation of New NPP ETE must again be added to these changes. The compiled maps of the calculation results show that the effect of operation of New NPP ETE is manifested mainly inside the New NPP site (tens of µg·m^{-3}), and up to approximately 15 µg·m^{-3} at the nearest residential development.

When considering the background ambient air pollution burden in this area at a level corresponding to the expected background maximum concentrations, the maximum NO_2 concentration in the affected area in the condition without implementation of SMR ETE is expected to remain reliably below the limit.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient NO_2 concentration due to operation of SMR ETE reaches approximately 4 µg·m^{-3}, i.e., approximately 2% of the air quality limit (200 µg·m^{-3}). The field of contribution distribution is apparent from Fig. 51.



NO_2 - max	NO_2 – max

Fig. 51 Contribution of SMR ETE to the maximum hourly NO_2 concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and stationary air pollution sources in connection with the operation of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 37. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 37 Results of the assessment for selected locations – maximum hourly NO_2 concentrations – year 2042

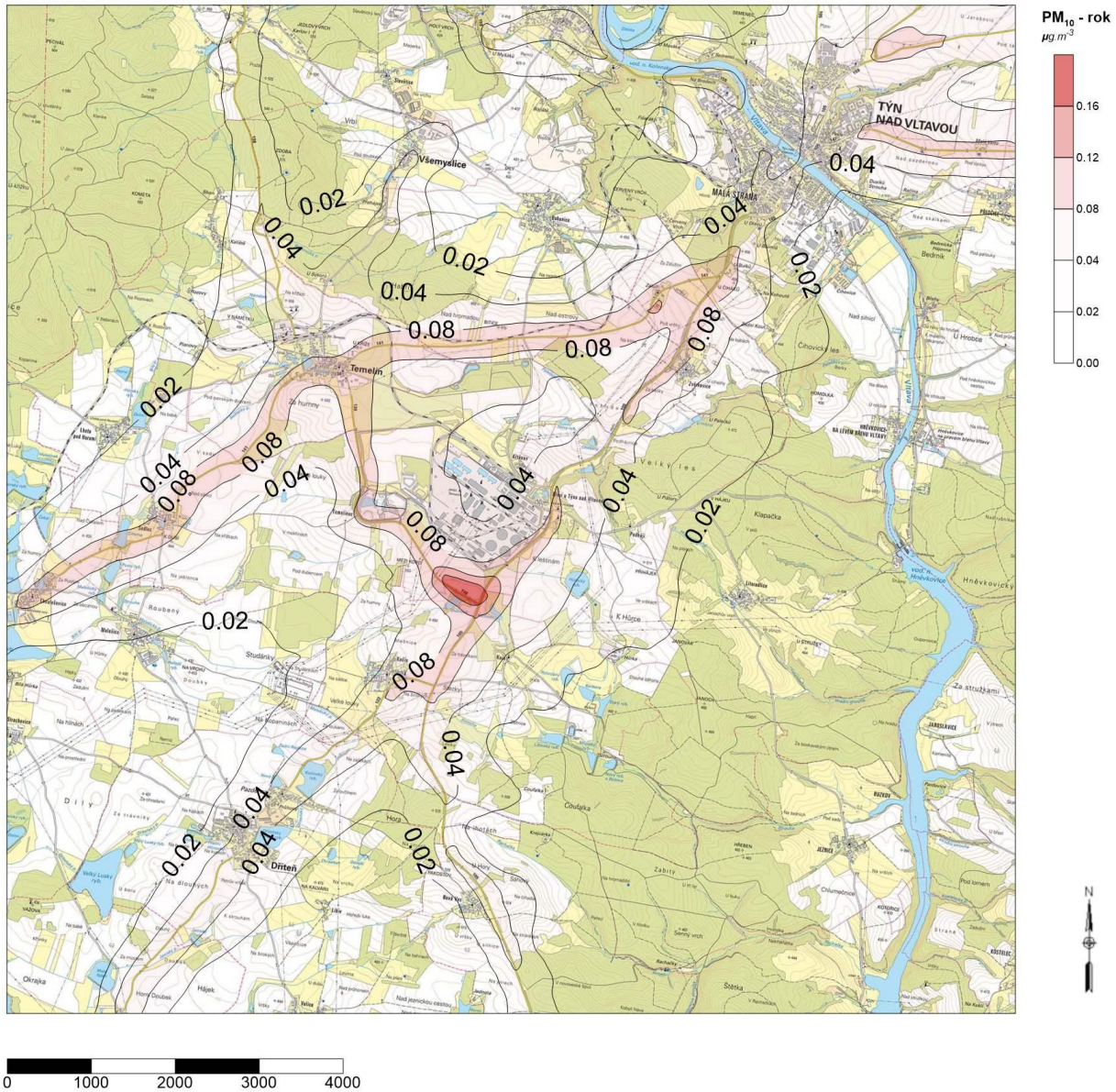
Point	Background	NUL		ACT
		Effect of traffic	Effect of operation of New NPP ETE	Effect of SMR ETE
	[µg·m^{-3}]			
Tem	60–90	-0.18	<16	+0.99
Koc	60–90	-0.19	<12	+0.89
Dri	60–90	-0.16	<10	+0.51
Zve	60–90	-0.25	<11	+0.64
TnV	60–90	-0.19	<8	+0.41
1	60–90	-0.03	<11	+0.52
2	60–90	-0.01	<12	+0.70
3	60–90	-0.07	<12	+0.85
4	60–90	-0.05	<9	+0.46
5	60–90	-0.06	<10	+0.48
6	60–90	-0.21	<16	+0.99

5.4.2 Ambient air pollution burden from particulate matter

5.4.2.1 Annual average concentrations – particulate matter fraction PM_{10}

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the operation of New NPP ETE, an increase in average annual concentrations of particulate matter fraction PM_{10} of up to 0.16 µg·m^{-3} is expected, i.e., up to 0.4% of the air quality limit value (40 µg·m^{-3}). This maximum is reached near the access route to the southern part of the ETE1,2 site (see Fig. 52). Conversely, in locations where traffic volume is already higher and vehicle speed lower in the existing condition (e.g., Týn nad Vltavou), no significant effect is observed despite the increase in traffic, mainly due to the lower effect of resuspension from the road surface.



PM10 - rok	PM10 – year

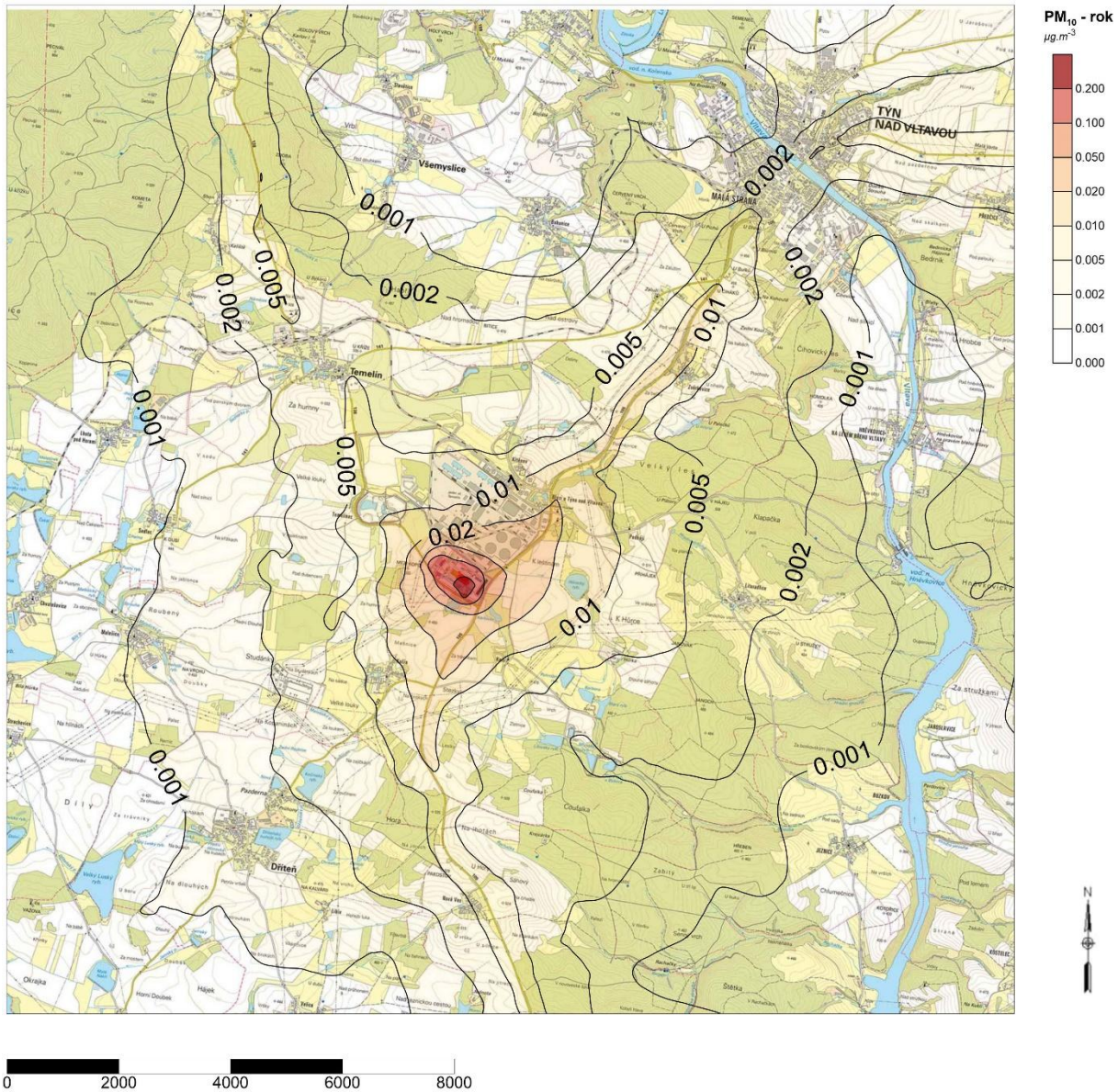
Fig. 52 Change in average annual PM_{10} concentration [µg·m^{-3}] due to traffic – period 2042 without the Project

The effect of operation of New NPP ETE must also be added to these changes. The compiled maps of the calculation results show that the effect of operation of New NPP ETE is manifested mainly inside the site (hundredths of µg·m^{-3}); at the nearest residential development, the contribution may be up to 0.005 µg·m^{-3}.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient PM_{10} concentration due to operation of SMR ETE reaches approximately 0.2 µg·m^{-3}, i.e., approximately 0.5% of the air quality limit (40 µg·m^{-3}). The field of contribution distribution is apparent from Fig. 53.



PM10 - rok	PM10 – year

Fig. 53 Contribution of SMR ETE to the average annual PM_{10} concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and stationary air pollution sources in connection with the operation of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 38. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

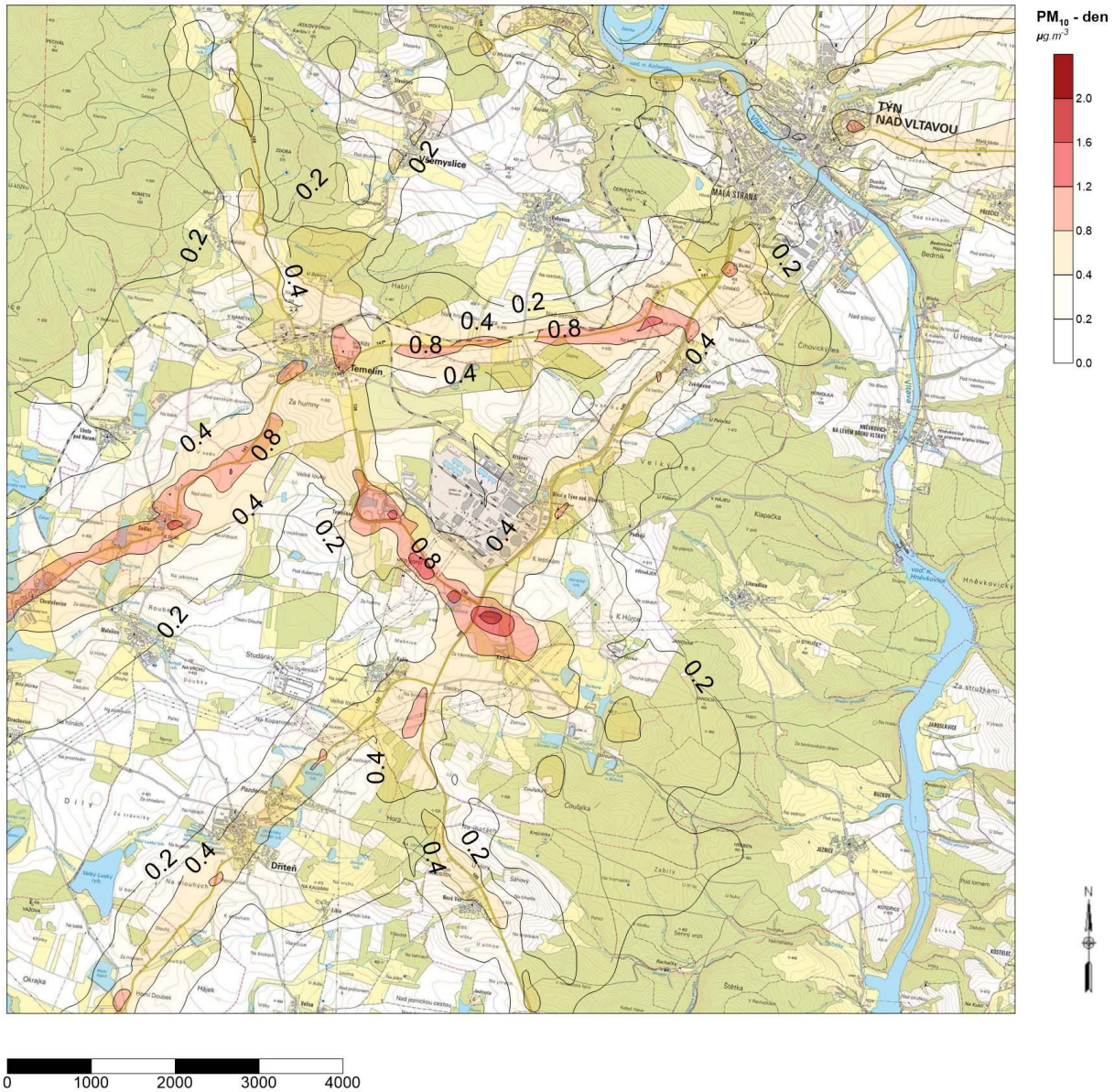
Tab. 38 Results of the assessment for selected locations – average annual PM_{10} concentrations – year 2042

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of operation of New NPP ETE	Effect of SMR ETE
	[µg·m^{-3}]			
Tem	12.3	+0.11	<0.005	+0.005
Koc	12.8	+0.09	<0.005	+0.009
Dri	13.2	+0.06	<0.005	+0.002
Zve	13.1	+0.10	<0.005	+0.014
TnV	15.3	+0.07	<0.005	+0.008
1	12.0	+0.01	<0.005	+0.002
2	12.1	+0.02	<0.005	+0.003
3	12.8	+0.07	<0.005	+0.009
4	12.9	+0.02	<0.005	+0.001
5	12.7	+0.11	<0.005	+0.001
6	12.3	+0.10	<0.005	+0.004

5.4.2.2 Maximum short-term (24-hour) concentrations – particulate matter fraction PM_{10}

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the operation of New NPP ETE, an increase in maximum daily concentrations of particulate matter fraction PM_{10} of up to 2 µg·m^{-3} is expected, i.e., 4% of the air quality limit value (50 µg·m^{-3}). This maximum is reached near the access route to the southern part of the ETE1,2 site (see Fig. 54) and is again due mainly to the increase in resuspension of dust particles from the road surface as a result of the increased traffic load on less heavily trafficked roads. The reason is that an increase in ambient concentrations may be expected mainly on roads with a lower background traffic load, where higher dust loading on the road surface, and therefore also higher emissions due to the increase in traffic, can be expected.



PM10 - den	PM10 – day

Fig. 54 Change in maximum daily PM_{10} concentration [µg·m^{-3}] due to traffic – period 2042 without the Project

The effect of operation of New NPP ETE must also be added to these changes. The compiled maps of the calculation results show that the effect of operation of New NPP ETE is mainly manifested inside the New NPP ETE site (tens of µg·m^{-3}); at the nearest residential development, the contribution may be up to 25 µg·m^{-3}.

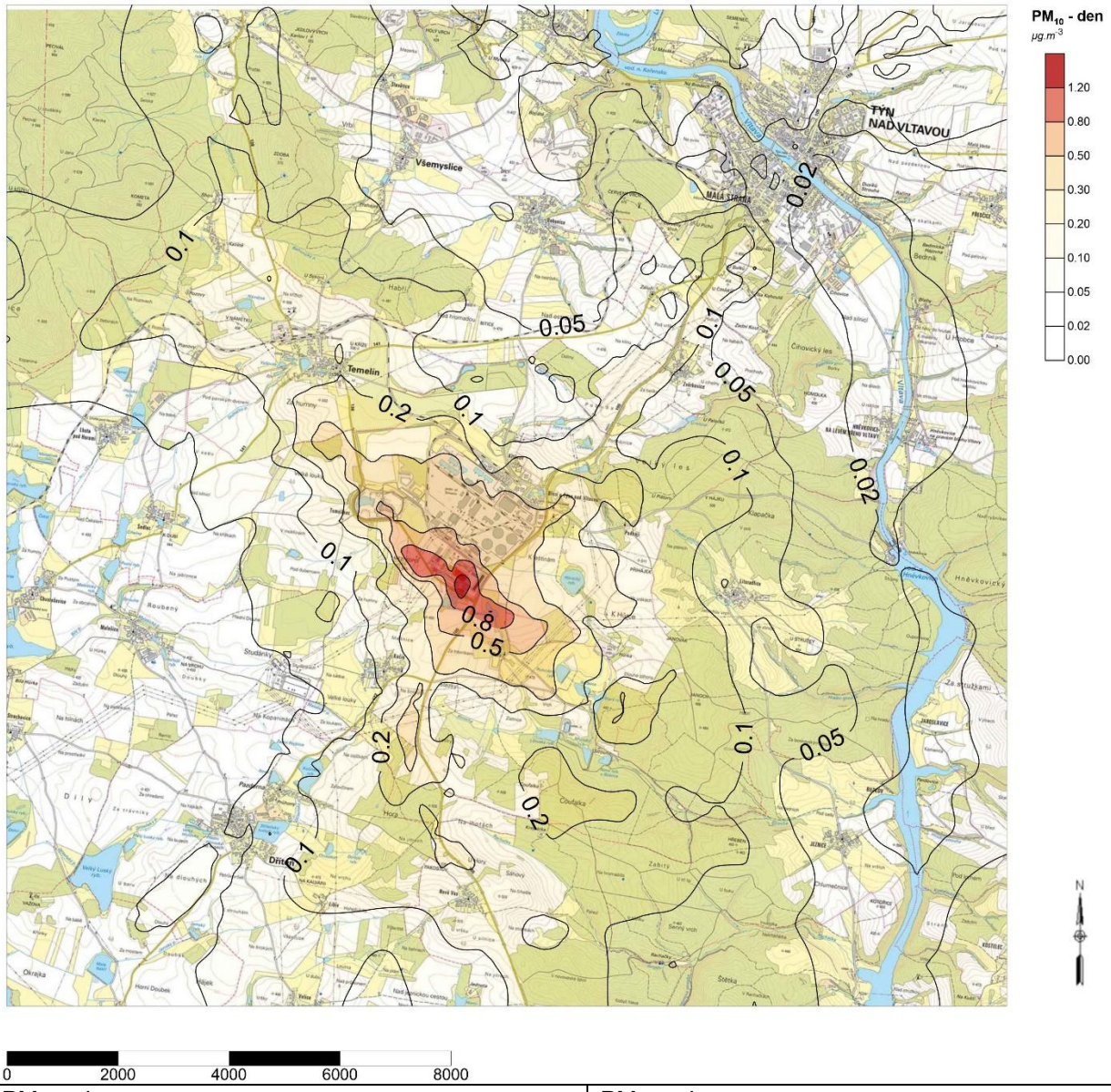
It should be noted, however, that the maximum ambient concentration values are calculated under the least favourable dispersion conditions, the duration of which is assumed in the model calculations for the entire assessed time interval (i.e., 24 hours). Given that, under real conditions, some directional or speed fluctuation of wind always occurs, these values cannot practically be reached.

Since the short-term concentration of particulate matter fraction PM_{10} depends to a significant extent on current meteorological and dispersion conditions (frequency and duration of inversions, wind erosion, length of the precipitation-free period, ground-level fog, supra-regional nature of episodes of increased ambient air pollution burden, etc.), it is therefore appropriate to take into account primarily concentrations with an averaging period of 1 calendar year, which are subject to much smaller fluctuations and are therefore a more stable indicator of deteriorated air quality.

The calculation according to the methodology set out in Chapter 4.1 showed that, under the existing condition, approximately 1 day with the limit for maximum 24-hour concentrations exceeded can be expected at the nearest residential development, whereas in the future condition, no increase in the frequency of the air quality limit being exceeded even by 1 day is expected due to the operation of New NPP ETE.

Effect of SMR ETE

The highest calculated contributions to the maximum daily PM_{10} concentration during operation of SMR ETE reach values of up to approximately 1.2 $\mu g \cdot m^{-3}$, i.e., approximately 2.4% of the air quality limit value (40 $\mu g \cdot m^{-3}$). This maximum is reached near the access route to the SMR ETE site (see Fig. 55); at the nearest residential development, the contribution from operation decreases to low tenths of $\mu g \cdot m^{-3}$.



PM_{10} - den	PM_{10} – day

Fig. 55 Contribution of SMR ETE to the maximum daily PM_{10} concentration [$\mu g \cdot m^{-3}$] – period 2042 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and stationary air pollution sources in connection with the operation of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 39. At the most affected residential development, maximum concentrations can be expected to remain below the limits, with a large reserve.

Tab. 39 Results of the assessment for selected locations – maximum daily PM_{10} concentrations – year 2042

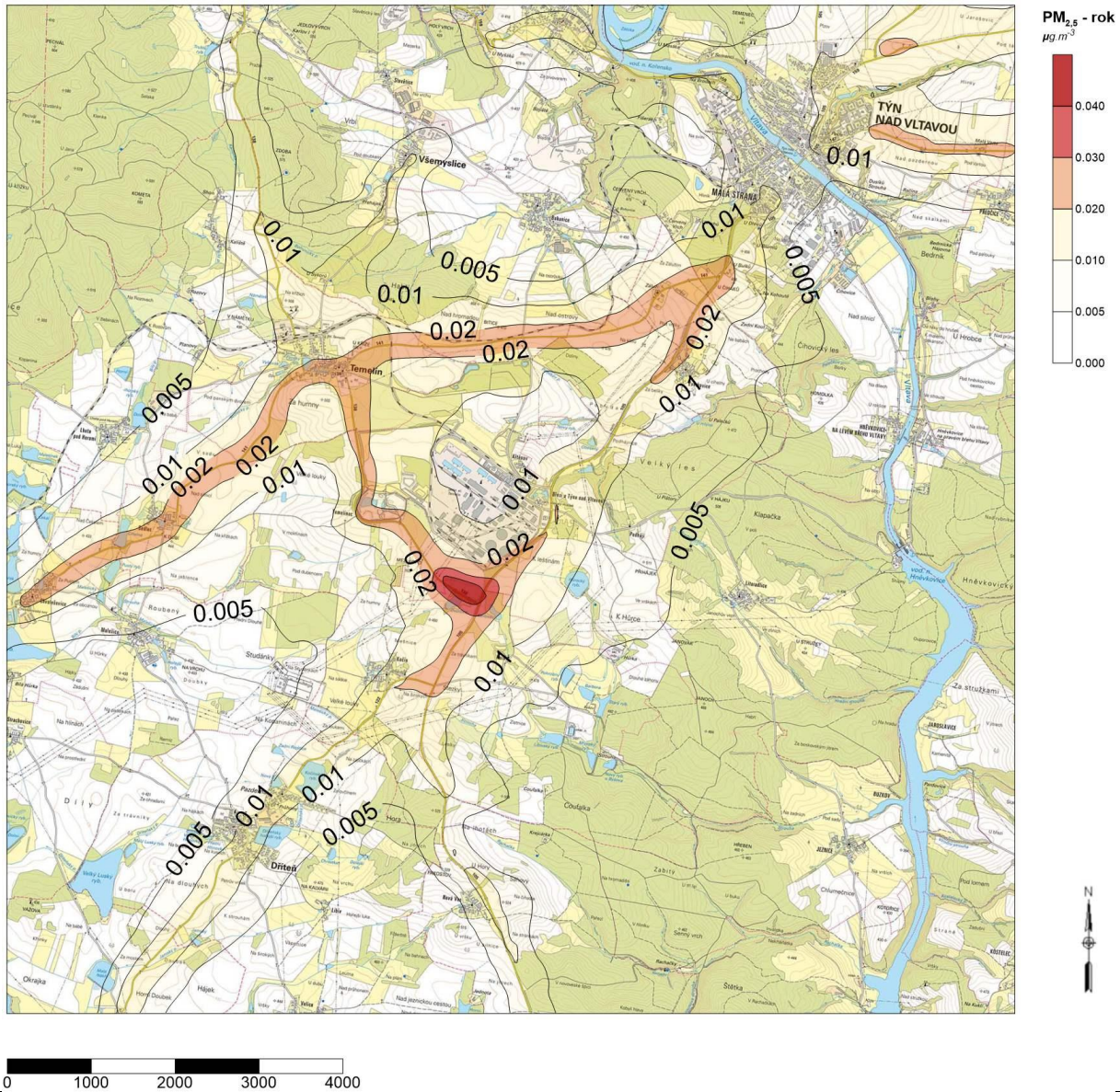
Point	Background (OZKO)*	NUL		ACT
		Effect of traffic	Effect of operation of New NPP ETE	Effect of SMR ETE
	[µg·m^{-3}]			
Tem	22	+1.02	<20	+0.23
Koc	23	+0.67	<15	+0.22
Dri	24	+0.68	<10	+0.06
Zve	24	+0.77	<10	+0.19
TnV	27	+0.55	<5	+0.08
1	22	+0.07	<13	+0.04
2	22	+0.38	<15	+0.21
3	23	+0.67	<15	+0.14
4	23	+0.19	<5	+0.04
5	23	+1.71	<10	+0.04
6	22	+1.02	<20	+0.21

* 36th highest daily concentration.

5.4.2.3 Annual average concentrations – particulate matter fraction $PM_{2.5}$

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the operation of New NPP ETE, an increase in average annual concentrations of particulate matter fraction $PM_{2.5}$ of up to 0.04 µg·m^{-3} is expected, i.e., up to 0.2% of the air quality limit value (20 µg·m^{-3}). This maximum is again reached near the access route to the southern part of the ETE1,2 site and is due mainly to the increase in resuspension of dust particles from the road surface. Conversely, in locations where traffic volume is already higher and vehicle speed lower in the existing condition (e.g. Týn nad Vltavou), a significant increase is not observed despite the increased traffic demands associated with the construction of New NPP ETE, due to the lower effect of resuspension from the road surface. The field of distribution of changes in ambient concentrations is apparent from Fig. 56.



$PM_{2,5}$ - rok	$PM_{2.5}$ – year

Fig. 56 Change in average annual $PM_{2.5}$ concentration [µg·m^{-3}] due to traffic – period 2042 without the Project

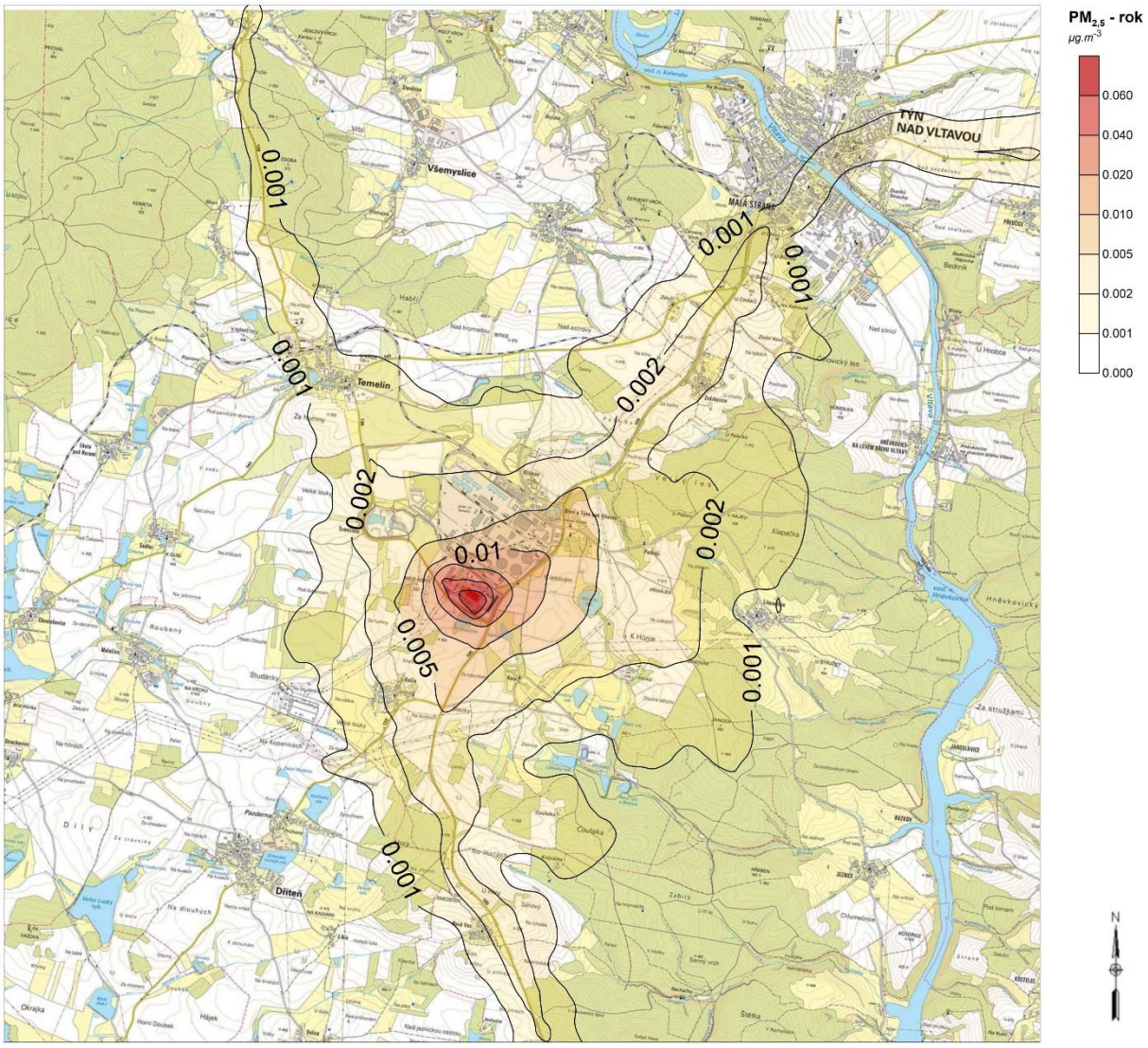
The effect of operation of New NPP ETE must also be added to these changes. Given that calculations were not performed for the $PM_{2.5}$ fraction, it may be estimated that the effect of operation of New NPP ETE is likewise completely insignificant, as is the case for the PM_{10} fraction.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient $PM_{2.5}$ concentration due to operation of SMR ETE reaches up to approximately 0.06 µg·m^{-3}, i.e., up to 0.3% of the air quality limit (20 µg·m^{-3}). These maximum values are limited only to the SMR ETE site itself; at the nearest residential development, the contributions reach negligible values.

The field of contribution distribution is apparent from Fig. 57.



$PM_{2,5}$ - rok	$PM_{2.5}$ – year

Fig. 57 Contribution of SMR ETE to the average annual $PM_{2.5}$ concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and stationary air pollution sources in connection with the operation of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 40. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 40 Results of the assessment for selected locations – average annual $PM_{2.5}$ concentrations – year 2042

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of operation of New NPP ETE*	Effect of SMR ETE
	[µg·m^{-3}]			
Tem	8.7	+0.03	<<0.005	+0.001
Koc	9.0	+0.02	<<0.005	+0.003
Dri	9.4	+0.01	<<0.005	+0.001
Zve	9.3	+0.02	<<0.005	+0.004
TnV	10.8	+0.02	<<0.005	+0.002
1	8.4	+0.00	<<0.005	+0.001
2	8.4	+0.00	<<0.005	+0.001
3	9.0	+0.02	<<0.005	+0.003
4	9.2	+0.00	<<0.005	+0.000
5	9.1	+0.03	<<0.005	+0.000
6	8.7	+0.02	<<0.005	+0.001

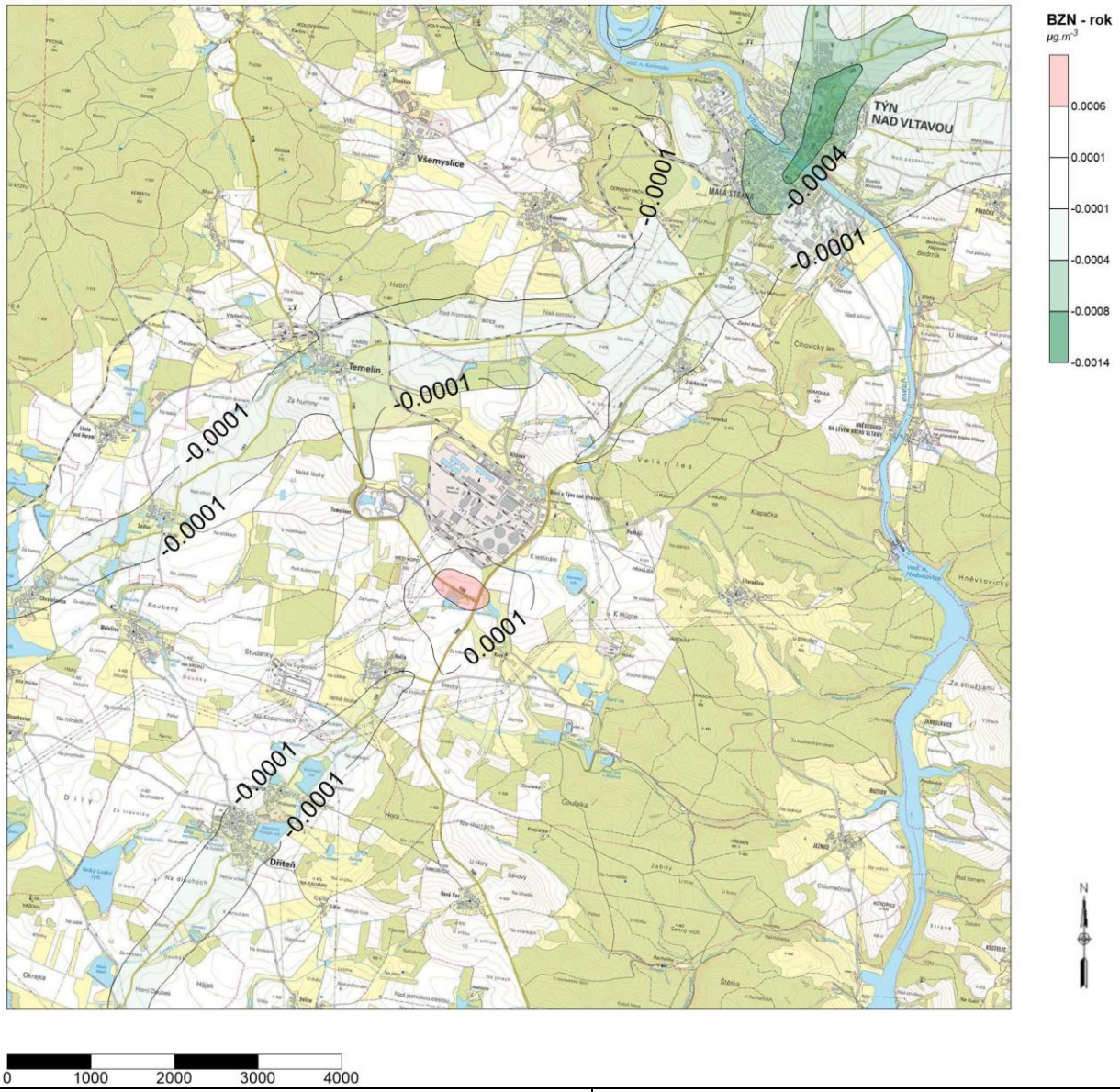
* Not addressed in the New NPP ETE Air Dispersion Study (estimated to be significantly less than 0.005 µg m^{-3}).

5.4.3 Ambient air pollution burden from benzene

5.4.3.1 Annual average concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the operation of New NPP ETE, a minimum increase in average annual benzene concentrations is expected near the access route to the southern part of the ETE1,2 site. These are contributions of up to approximately 0.000 6 µg·m^{-3}, i.e., approximately 0.01% of the air quality limit (5 µg·m^{-3}). In other locations, despite the increase in traffic volumes, a stagnation or insignificant decrease in ambient concentrations can be observed, caused by a reduction in primary emissions from fuel combustion as a result of renewal of the vehicle fleet (improvement in vehicle emission standards), which compensates for the effect of the natural increase in traffic volumes in the area. The field of distribution of the change in the ambient background is apparent from Fig. 58.



BZN - rok	BZN – year

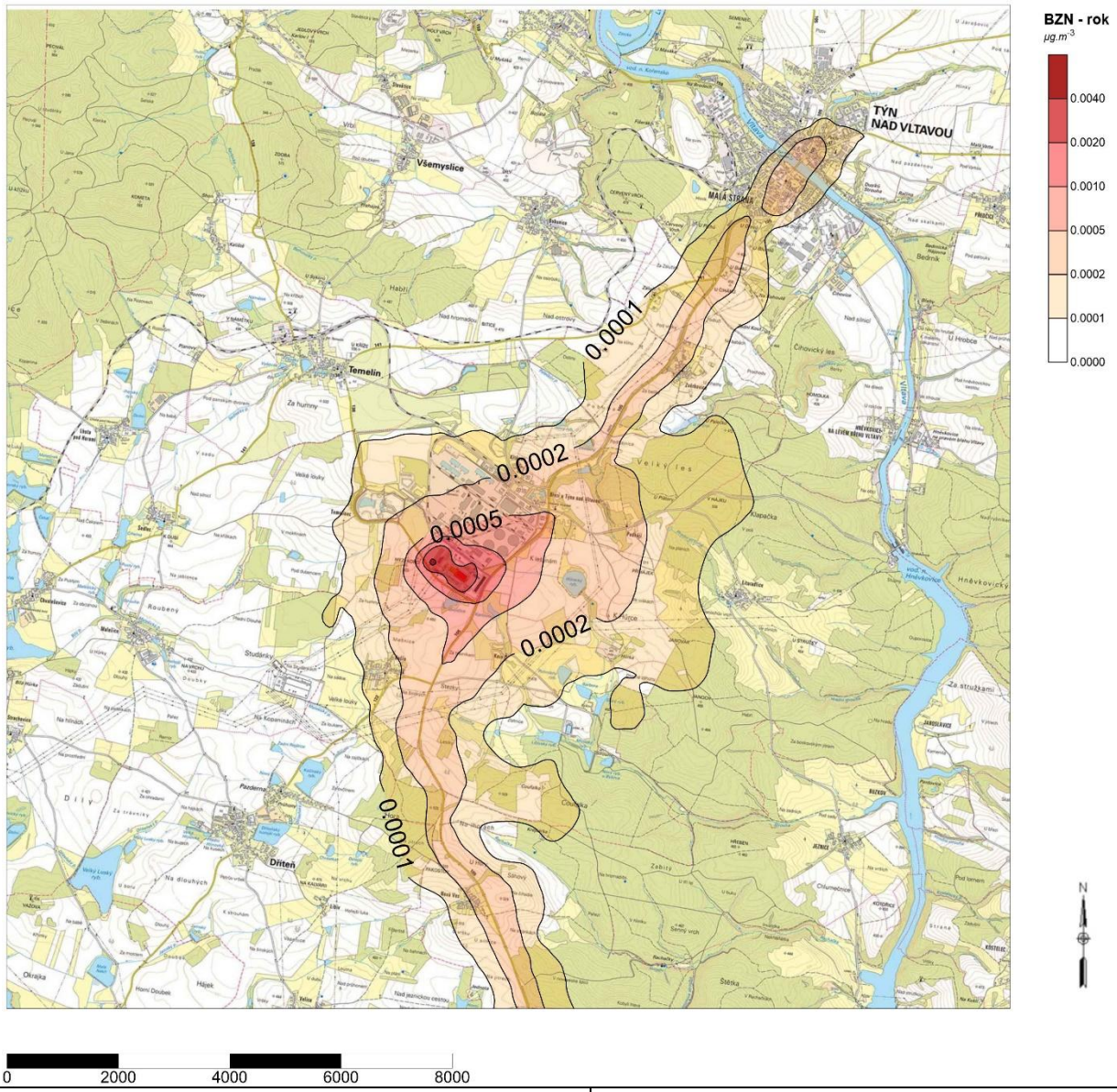
Fig. 58 Change in average annual benzene concentration [µg·m^{-3}] due to traffic – period 2042 without the Project

The effect of operation of New NPP ETE must also be added to these changes. Given that calculations were not performed for benzene, it may be estimated, based on the character of similar sources, that the effect of operation of New NPP ETE is manifested entirely at levels of no more than thousandths of µg·m^{-3}.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient benzene concentration due to operation of SMR ETE reaches up to approximately 0.004 µg·m^{-3}, i.e., up to 0.08% of the air quality limit (5 µg·m^{-3}). The field of contribution distribution is apparent from Fig. 59.



BZN - rok	BZN – year

Fig. 59 Contribution of SMR ETE to the average annual benzene concentration [µg·m^{-3}] – period 2042 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and stationary air pollution sources in connection with the operation of New NPP ETE, and the effect of operation of SMR ETE itself, a completely insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 41. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 41 Results of the assessment for selected locations – average annual benzene concentrations – year 2042

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of operation of New NPP ETE*	Effect of operation of SMR ETE
	[µg·m^{-3}]			
Tem	0.6	-0.000 1	<0.001	+0.000 1
Koc	0.6	-0.000 1	<0.001	+0.000 2
Dri	0.6	-0.000 2	<0.001	+0.000 0
Zve	0.6	-0.000 2	<0.001	+0.000 3
TnV	0.8	-0.000 4	<0.001	+0.000 4
1	0.6	-0.000 0	<0.001	+0.000 1
2	0.6	+0.000 0	<0.001	+0.000 1
3	0.6	-0.000 0	<0.001	+0.000 2
4	0.6	-0.000 0	<0.001	+0.000 0
5	0.6	-0.000 2	<0.001	+0.000 0
6	0.6	-0.000 2	<0.001	+0.000 1

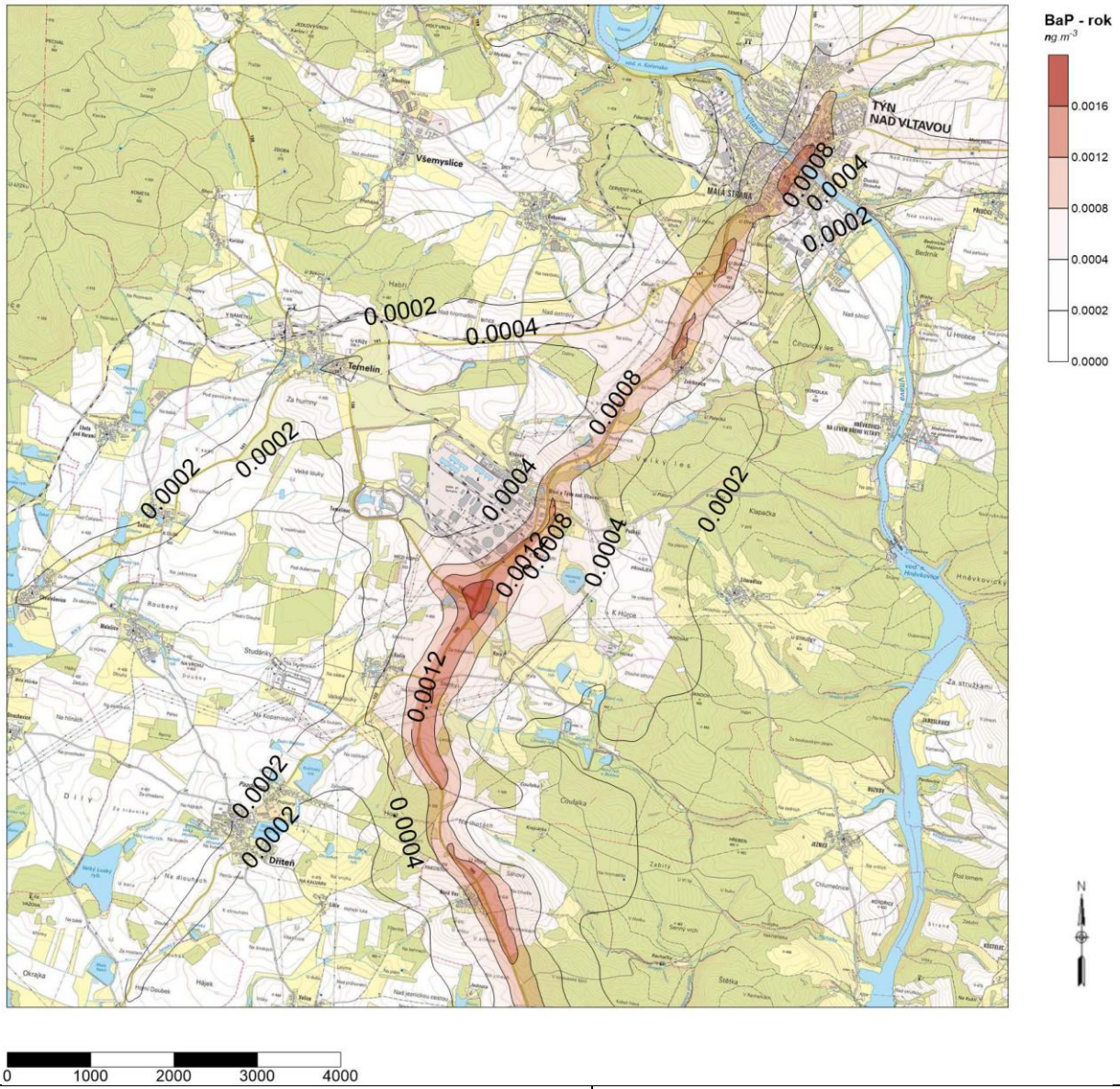
* Not addressed in the New NPP ETE Air Dispersion Study (estimated to be less than 0.001 µg m^{-3}).

5.4.4 Ambient air pollution burden from benzo(a)pyrene

5.4.4.1 Annual average concentrations

Development of the ambient background

As a result of the natural increase in road traffic, including the effect of road traffic associated with the operation of New NPP ETE, an increase in average annual benzo(a)pyrene concentrations of up to 0.001 6 ng·m^{-3} is expected, i.e., up to 0.16% of the air quality limit value (1 ng·m^{-3}). This maximum is reached near the main access routes (see Fig. 60), where the highest increases in traffic volumes are expected.



BaP - rok	BaP – year

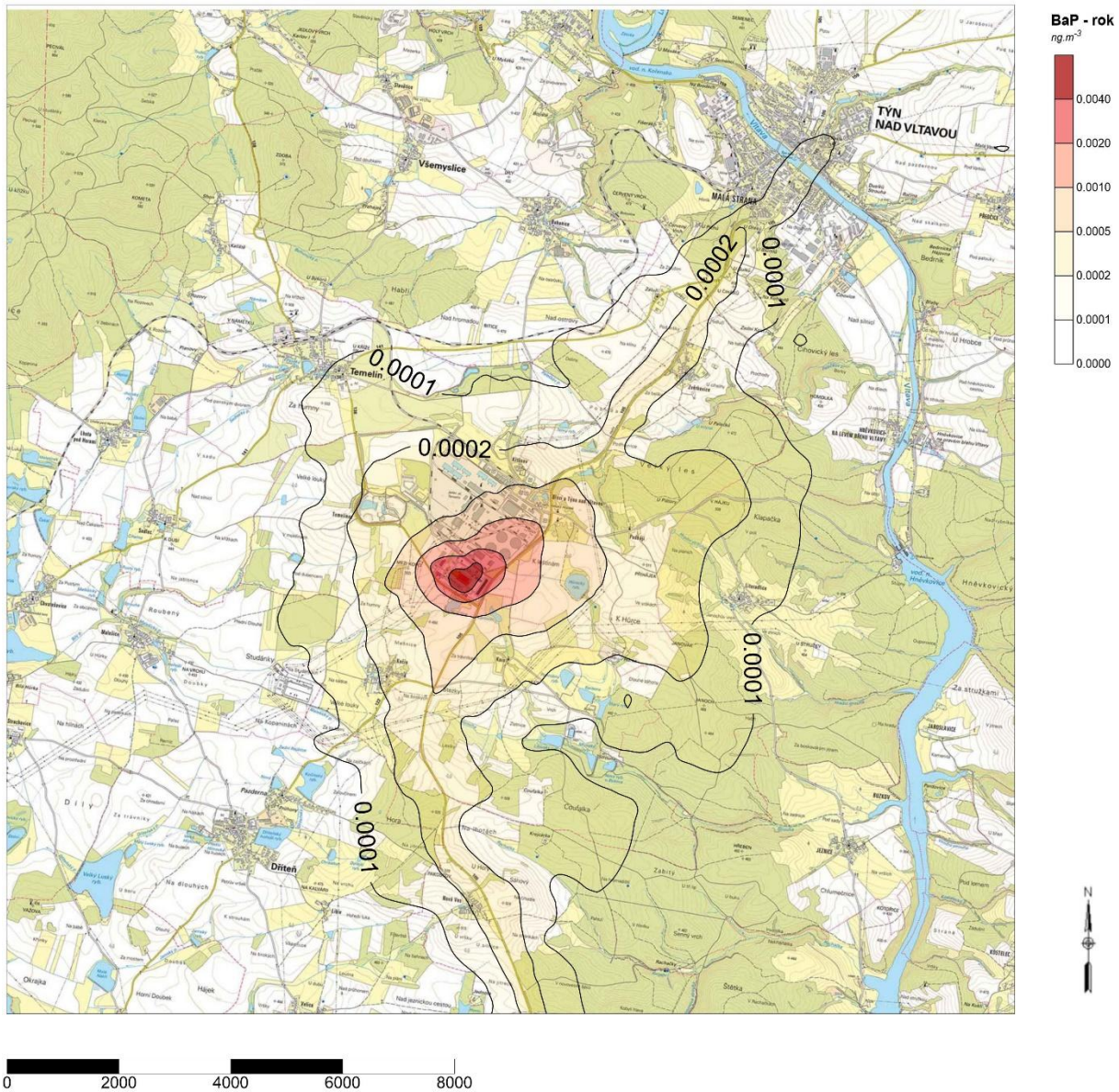
Fig. 60 Change in average annual benzo(a)pyrene concentration [ng·m^{-3}] due to traffic – period 2042 without the Project

The effect of operation of New NPP ETE must also be added to these changes. Given that calculations were not performed for benzo(a)pyrene, it may nevertheless be professionally estimated, based on the calculation results considered in the SMR ETE assessment, whose pollution sources have a similar emission character, that the effect of operation of New NPP ETE is completely insignificant, at levels of no more than thousandths of ng·m^{-3}.

When considering the background ambient air pollution burden in this area at a level corresponding to the above five-year averages, average annual concentrations in the affected area are therefore expected to remain below the limits in the future condition.

Effect of SMR ETE

The highest calculated contribution to the average annual ambient benzo(a)pyrene concentration due to operation of SMR ETE reaches up to approximately 0.004 ng·m^{-3}, i.e., up to 0.4% of the air quality limit (1 ng·m^{-3}). The field of contribution distribution is apparent from Fig. 61.



BaP - rok	BaP – year

Fig. 61 Contribution of SMR ETE to the average annual benzo(a)pyrene concentration [ng·m^{-3}] – period 2042 – operation of SMR ETE

Assessment of cumulative effects

With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and stationary air pollution sources in connection with the operation of New NPP ETE, and the effect of operation of SMR ETE itself, an insignificant change in the ambient air pollution situation is expected at the most affected residential development. More detailed calculation results for the individual affected locations are apparent from Tab. 42. At the most affected residential development, average annual concentrations can be expected to remain below the limits, with a large reserve.

Tab. 42 Results of the assessment for selected locations – average annual benzo(a)pyrene concentrations – year 2042

Point	Background (OZKO)	NUL		ACT
		Effect of traffic	Effect of operation of New NPP ETE*	Effect of operation of SMR ETE
	[ng·m^{-3}]			
Tem	0.3	+0.000 5	<0.001	+0.000 1
Koc	0.3	+0.000 7	<0.001	+0.000 3
Dri	0.4	+0.000 3	<0.001	+0.000 1
Zve	0.3	+0.001 3	<0.001	+0.000 3
TnV	0.6	+0.001 3	<0.001	+0.000 2
1	0.2	+0.000 1	<0.001	+0.000 1
2	0.2	+0.000 2	<0.001	+0.000 1
3	0.3	+0.000 5	<0.001	+0.000 3
4	0.3	+0.000 1	<0.001	+0.000 0
5	0.3	+0.000 3	<0.001	+0.000 0
6	0.3	+0.000 4	<0.001	+0.000 1

* Not addressed in the New NPP ETE Air Dispersion Study (estimated to be less than 0.001 ng m^{-3})

5.5 Compensatory Measures

The obligation to impose compensatory measures follows from Section 11(4) of Act No. 201/2012 Coll., on Air Protection, as amended:

"If, through the operation of a stationary source indicated in column B in Annex No. 2 to the Act, or due to the siting of a road or car park pursuant to paragraph 2(d), any of the air quality limits with an averaging period of 1 calendar year specified in points 1 and 3 of Annex No. 1 to the Act would be exceeded in the area of their effect on the level of pollution, or if its value is already exceeded in this area, a favourable binding opinion pursuant to paragraph 2(b) or (d) may only be issued with the simultaneous application of measures ensuring at least the preservation of the existing level of pollution for the given pollutant (hereinafter "Compensatory Measures"). In justified cases, a favourable binding opinion pursuant to paragraph 2(b) or (d) may also be issued without the application of Compensatory Measures if it is apparent that the operation of the stationary source, road, or car park would have only a negligible effect on the level of pollution for the given pollutant."

Given that the Project does not cause any of the air quality limits with an averaging period of 1 calendar year to be exceeded, the obligation to apply Compensatory Measures is not imposed for this Project.

Nevertheless, the following preventive measures to eliminate dust due to operation of the Project will be observed:

- regular cleaning of roads,
- after the end of the winter period, cleaning of roads to remove gritting material.

The application of this measure can achieve a reduction in emissions and the associated corresponding reduction in the contribution of particulate matter, or benzo(a)pyrene, to background concentrations.

In view of the potentially adverse effect of dust generated during construction of the assessed Project, it is appropriate to apply preventive measures to eliminate it.

These include both generally applicable measures to prevent and reduce dust (see Annex No. 10 to Act No. 201/2012 Coll., on Air Protection, as amended) and the measures set out in the Supporting Measures of the Air Quality Improvement Programme under code PZKO_2020_P_21 "Reduction of dust from construction activity"[22], or in the Methodology for setting conditions to reduce emissions from construction machinery

and other construction activities[23]. In the individual construction stages, emphasis will be placed on selecting the combination of measures that will be most appropriate at the given time.

Construction works should be designed already at the construction preparation stage with a view to minimising the production of dust emissions; in the case of the Project under assessment, the following may be considered, for example:

- minimising the length of transport routes across the construction site (selection of the location of the construction site exit, storage areas, bulk material stockpiles, and vehicle parking),
- minimising travel over unpaved areas (or temporarily paving construction site routes using concrete panels or gravel),
- minimising drop heights when loading and unloading construction materials,
- selecting appropriate construction technology and equipment that will, to the maximum extent possible, prevent dust generation and limit its generation and dispersion into the surroundings, particularly with regard to local conditions,
- continuously monitoring dust levels on the SMR ETE construction site so that action can be taken in the event of more serious problems using effective techniques (sprinkling, wetting at various intervals, mist walls, etc.).

During the implementation phase of the Project construction, the following measures will be applied:

- checking the technical condition of machinery and conditions on the construction site before the start of the individual stages of construction works (weather conditions, availability of anti-dust measures),
- an area for final mechanical cleaning of vehicles will be located before the exit from the construction site, where vehicles will be thoroughly cleaned before leaving the construction site,
- principles of proper loader handling will be observed, and machinery will be operated by trained personnel,
- idling of trucks and machinery will be reduced to a minimum,
- continuous maintenance and cleaning of roads affected by the construction will be ensured throughout the construction period. If roads are soiled by construction vehicles, the soiling must be removed immediately and without delay, in accordance with Section 28(1) of Act No. 13/1997 Coll., on Roads, as amended, and the road must be restored to its original condition at the builder's expense,
- free stockpiling of fine-grained material (cement, lime) will be minimised or completely excluded,
- exposed dry and loose areas and stockpiles will be sprinkled (wetted), particularly in windy weather (e.g., when wind speed exceeds 5 m/s).

The air protection authorities will continue to require strict compliance with these measures as a condition for implementation of the construction through binding opinions pursuant to Section 11 of Act No. 201/2012 Coll., on Air Protection, as amended.

6 Conclusion

The subject of the assessed Project is the construction of the New SMR Power Plant at the Temelín site (SMR ETE), including all related building structures and operational units (technological equipment) serving the generation and evacuation of electrical energy and ensuring the safe operation of the nuclear facility. The model addressed the effect of all non-radioactive stationary, line, and area sources from both the operation of SMR ETE and the construction of the Project itself. In terms of the effect on air quality, the least favourable condition for the implementation of SMR ETE was assessed, including the cumulative effects of the planned New Nuclear Power Plant at the Temelín site (New NPP ETE). The calculations assessed the potential change in the ambient air pollution burden for all pollutants for which the described technological equipment and activities (including traffic) are a relevant source. These are nitrogen dioxide, particulate matter fractions PM_{10} and $PM_{2.5}$, benzene, and benzo(a)pyrene.

The description of the existing condition was based on pollution maps compiled in a 1 × 1 km grid, representing five-year moving averages of pollutant concentrations, or on data from ambient air quality monitoring. On the basis of these data, it can be stated that, under the existing condition, no cases of legislative limits being exceeded are observed in the affected area for any monitored pollutant; in the case of annual averages, concentrations are even achieved with a significant ambient concentration reserve.

In the future condition for the period of operation of SMR ETE, only an insignificant change in the ambient air pollution situation in the area can be expected. The maximum values are reached near the access route to the SMR ETE site (Road II/138), particularly as a result of traffic generated both by the assessed SMR ETE Project and by the planned New NPP ETE project. In terms of average annual concentrations of the individual pollutants, these maximum values reach tenths of a percent of the relevant air quality limits. Completely insignificant contributions can be expected at the most affected residential development (in particular the municipality of Kočín). Taking into account the existing ambient air pollution burden, the natural increase in traffic in the area, and the operation of the assessed sources, it can be clearly confirmed that, for all assessed pollutants, concentrations in the affected area can be expected to remain below the limits, with a large reserve.

The effect on air quality was also assessed for the most emission-intensive period of the SMR ETE construction phase. In the period of the main phases of construction of SMR ETE, potential concurrence with the initial preparation phase of New NPP ETE is also considered; the selection of this time concurrence thus represents the worst possible situation that may occur in the monitored area from the perspective of ambient air pollution burden.

For the pollutants nitrogen dioxide, benzene, and benzo(a)pyrene, the effect for the period of concurrent construction of SMR ETE and New NPP ETE is caused by the considerable intensity of generated traffic due to the transport of persons and materials, including the transport of materials between the individual construction areas. Higher SMR ETE contributions can be expected predominantly in the main construction site area, where changes in average annual concentrations of up to 1% of the air quality limits will be reached. In the case of short-term nitrogen dioxide concentrations, a short-term effect at the level of approximately 4% of the legislative limit can be expected. This situation will be time-limited and may only occur under the worst dispersion conditions. In view of the substantial ambient concentration reserve, the ambient air pollution situation for these pollutants during construction can be considered to remain below the limits.

By contrast, for particulate matter, the effect of secondary emissions of dust particles from the activities being carried out and vehicle movement across the construction areas will be entirely dominant. As regards average annual concentrations, increases in concentrations in the tens of percent of the air quality limit values can be expected at the boundary of the SMR ETE construction site; at the nearest residential development, a contribution of up to units of percent of the air quality limit values is expected. With the concurrent effect of the change in background concentration due to the natural increase in traffic, the increase in traffic and construction activities in connection with the construction of New NPP ETE, and the effect of construction of SMR ETE itself, a minor change in the ambient air pollution situation is therefore expected at the most affected residential development. Average annual concentrations are expected to remain below the limits there.

For maximum daily concentrations, the contributions of the most demanding stage (construction of the MTB) reach far above the air quality limit even at considerable distances from the SMR ETE construction site at the nearest residential development. These highest possible daily concentration values can occur on condition that a combination of the most unfavourable meteorological conditions lasts continuously all the day and

even during the period when these activities are being performed. According to the wind rose data, such unfavourable conditions can be expected for a limited period of the year (predominantly the winter period, with a possible occurrence of inversions), while activities associated with topsoil stripping may be expected rather outside the cold part of the year. The probability of actual occurrence of the concentrations modelled in this way is therefore low. In reality, values half as high or even lower can be expected. Using the methodology for calculating the number of days exceeding the 24-hour limit, there is a sufficient ambient concentration reserve in the area before the permitted number of cases when the limit is exceeded of 35 per year is reached. At the nearest municipalities, the number of cases when the limit is exceeded under the existing condition can be expected to be up to 1 day per year; in the event of possible concurrence of construction of New NPP ETE and SMR ETE, the increase in the number of days with the daily maximum exceeded may reach approximately 5 days per year, and the resulting ambient air pollution situation will therefore remain below the limits.

In view of the above effects on the particulate-matter air pollution burden, preventive measures to eliminate dust during construction of the assessed Project are therefore proposed. By applying an appropriate combination of measures that make it possible to significantly reduce dust during construction, a significant reduction in the effect on the ambient air pollution burden in the affected area can be achieved, and possible adverse conditions can be eliminated.

In conclusion, it can therefore be stated that no significant change in the ambient air pollution burden of the site is expected as a result of the implementation of the Project during operation of SMR ETE. During construction, appropriate measures are proposed to eliminate the adverse effect, and even in these phases, which are unfavourable in terms of air quality, the specified air quality limits are not expected to be exceeded in the affected area.

In Brno, on 28 April, 2026

Prepared by:

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RNDr. Tomáš Bartoš, Ph.D.

holder of authorisation to prepare air dispersion studies
pursuant to Act No. 201/2012 Coll.
Ministry of the Environment, Ref. No. 1703/780/10/KS

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