HAMS-GPS : Dispersion Module

[Licensed to : HAMSAGARS]

Date : Thursday, February 14, 2019

Data Entered

Reference No. : H2S gas from cow waste

Name of Chemical : Hydrogen sulphide

Scenario : H2S gas dispersion from cow waste (A stability class)

Height of release (m) : 6.3

Height of simulation (m): 1

Percent Humidity (%) : 10.00

Atmospheric stability class : A

Wind velocity : 2.69 m/s

Terrain : Rural

Quantity of Released (g) : 2978670

Results

Max Isopleth conc (ppm) : 103317.00

Max. Isopleth Conc. Distance from source/release (m) : 50.00

MGC (ppm) : 52594.04

MGC Distance (m) : 49.00

Explosion mass (lbm) : Mass = 0

Time for stabilization concentration zones of dispersion (Mins) 9.39

*MGC : Maximum Ground Concentration in ppm

	Concentration (ppm):	Begin point	End point	Time (Sec)	Isopleth length	Isopleth (Y- Axis) [m]	Distance of Max. ISOP from source [m]	Isopleth angle (deg.)	Isopleth Area (Ha)
Unconsciousness 🔴	500	25.00	414.44	153.94	389.44	146.73	246.00	16.60	4.488
Dizziness 🟣	200	24.00	539.95	200.56	515.95	189.92	294.00	17.90	7.696
Vomiting, nausea 🔵	100	23.50	658.06	244.44	634.56	223.73	357.00	17.40	11.150
Irritation to throat 🔵	20	22.50	1034.61	384.31	1012.11	324.86	560.00	16.17	25.823
Eye irritation 🟢	10	22.00	1253.73	465.70	1231.73	380.48	678.00	15.67	36.808
Safe for human 🟢	5	21.50	1516.84	563.43	1495.34	444.99	820.00	15.18	52.261

NOTE: According to latest Emergency Planning, one has to use TEEL (Temporary Emergency Exposure Limits-15 min exposures) and ERPG (Emergency Response Planning Guidelines-1-hr. exposure) Limits are to be used

Probit Equations :

Scenario : H2S gas dispersion from cow waste (A stability class)

Fatality Probit (y) -11.5   +1(Ln(Conc$^{1.9}$ x Time)

Injury Probit (y) : -4.49   +1(Ln(Conc$^{1.5}$ x Time)

Wind orientation selected :1

Probit Table and Absolute Fatality/Injury at ht. of simulation 1 m

Distance(m)	% Fatality	% Injury	Time (Sec)	Area (Ha)	Conc.(ppm) along X-axis	Dose (mg)	Absolute	
							Fatality No.	Injury No.
25.1	0	2.05	9.32	<0.001	699.59	5.4605	0	0
50.1	0	100	18.61	0.191	107651.42	840.2574	0.000	9.550
75.1	0	100	27.90	0.306	55173.79	430.6509	0.000	15.300
100.1	0	100	37.18	0.386	27057.51	211.1934	0.000	19.300
125.1	0	100	46.47	0.455	15441.64	120.5274	0.000	22.750
150.1	0	100	55.75	0.518	9646.9	75.2975	0.000	25.900
175.1	0	100	65.04	0.576	6444.52	50.3017	0.000	28.800
200.1	0	100	74.33	0.629	4530.38	35.3612	0.000	31.450
225.1	0	100	83.61	0.679	3314.28	25.8691	0.000	33.950
250.1	0	100	92.90	0.726	2503.26	19.5388	0.000	36.300
275.1	0	76.85	102.19	0.770	1940.69	15.1478	0.000	29.587
300.1	0	51.75	111.47	0.811	1500.67	11.7132	0.000	20.985
325.1	0	28.78	120.76	0.847	1145.36	8.94	0.000	12.188
350.1	0	12.02	130.04	0.879	890.62	6.9516	0.000	5.283
375.1	0	2.2	139.33	0.909	703.88	5.494	0.000	1.000
400.1	0	0	148.62	0.937	564.29	4.4045	0.000	0.000
425.1	0	0	157.90	0.963	458.14	3.576	0.000	0.000
450.1	0	0	167.19	0.988	376.18	2.9362	0.000	0.000
475.1	0	0	176.48	1.010	312.01	2.4354	0.000	0.000
0	0	0	0.00	0	0	0	0.000	0.000

HAMS-GPS : Dispersion Model

Date : Thursday, February 14, 2019

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Scenario: H2S gas dispersion from cow waste (A stability class)

Concentration profile (ISOELEVET)
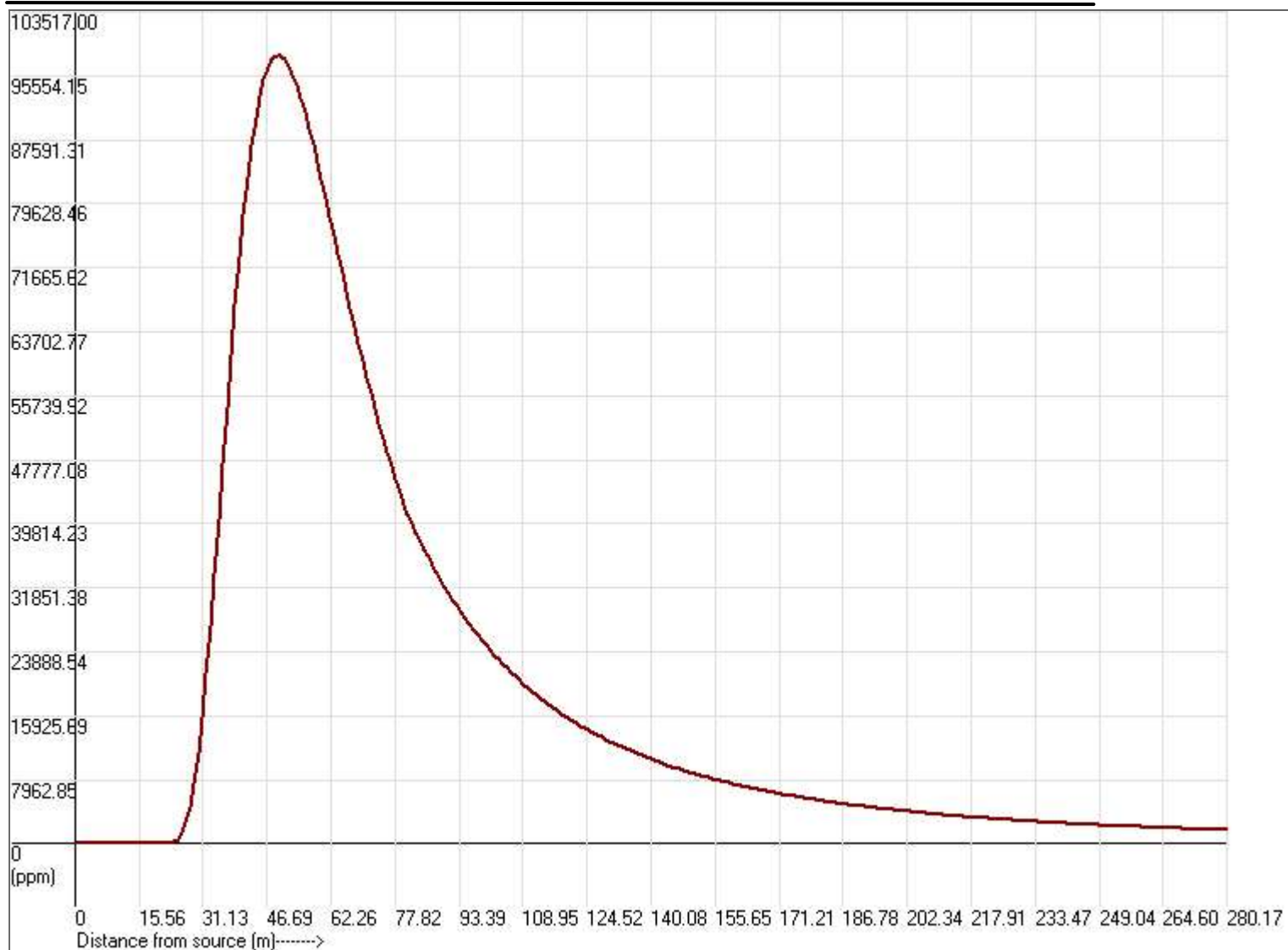
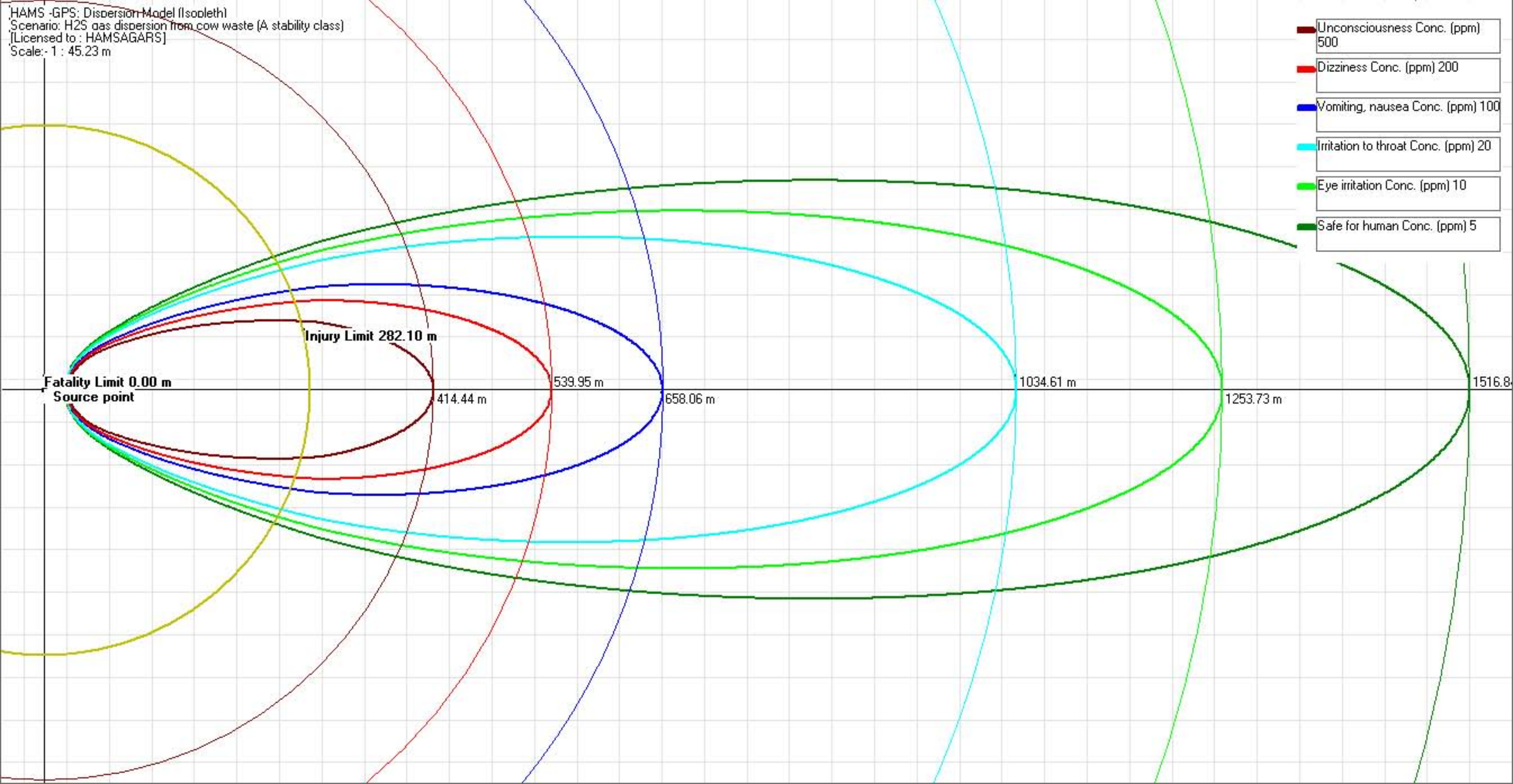Concentration 492.6 ppm
At Distance 24.723 m

Concentration 98039.22 ppm
At Distance 48.609 m

Concentration 19243.46 ppm
At Distance 109.970 m

Concentration 1756.7 ppm
At Distance 277.581 m

HAMS -GPS: Dispersion Model (Isopleth)
Scenario: H2S gas dispersion from cow waste (A stability class)
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Scale:- 1 : 45.23 m

Legend:
- Unconsciousness Conc. (ppm) 500
- Dizziness Conc. (ppm) 200
- Vomiting, nausea Conc. (ppm) 100
- Irritation to throat Conc. (ppm) 20
- Eye irritation Conc. (ppm) 10
- Safe for human Conc. (ppm) 5

Injury Limit 282.10 m

Fatality Limit 0.00 m
Source point

414.44 m
539.95 m
658.06 m
1034.61 m
1253.73 m
1516.8

Elucidation

HAMS-GPS : Dispersion Model (Isopleth) [Licensed to : HAMSAGARS]

Unconsciousness 500 ppm

Distance of Max. Isopleth
from source [m]: 246.00

Concentration
Contour for
Unconsciousness
500 ppm

Isopleth (Y- Axis) [m]: 146.73

Begin Point [m]: 25.00

End Point [m]: 414.44

Source point

Isopleth angle (deg.): 16.60

Isopleth Area (Ha): 4.488

Isopleth length (m): 389.44

NOT TO SCALE

Isopleth concentration is horizontal cross-section of the
plume dispersion at height of average breathing height
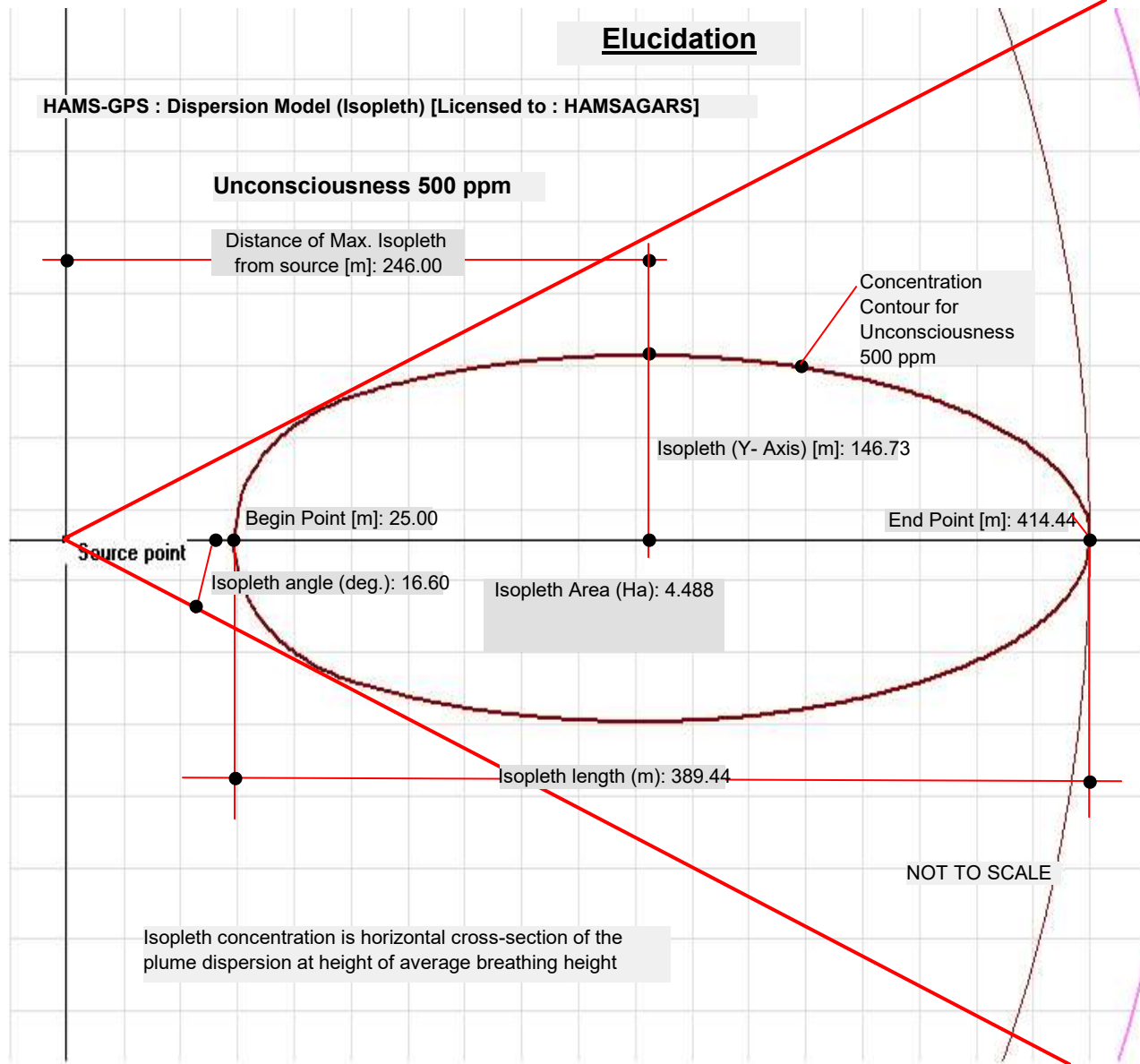
HAMS -GPS: Dispersion Model (Isoelevate)
Scenario: H2S gas dispersion from cow waste (A stability class)
[Licensed to : HAMSAGARS]
Scale:- 1 : 45.23 m

Legend:
- Unconsciousness Conc. (ppm) 500
- Dizziness Conc. (ppm) 200
- Vomiting, nausea Conc. (ppm) 100
- Irritation to throat Conc. (ppm) 20
- Eye irritation Conc. (ppm) 10
- Safe for human Conc. (ppm) 5

Gr.Lvl.
Source point at : 6.3 m

414.44 m
539.95 m
658.06 m
1034.61 m
1253.73 m
1516.8

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Palla Bakhtawarpur Rd

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Dharmveer Singh ji
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Mandir Trust
श्री सिद्ध शनि
मंदिर ट्रस्ट

Mairaa Farms
मायरा फार्म्स

Source point int

Shri Ram Janki
Hanuman Mandir
श्री राम जानकी
हनुमान मंदिर

Unconsciousness - 414.44 m

Dizziness - 539.95 m

Vomiting, nausea - 658.06 m

FATEHPUR JAT
फतेहपुर
जाट

Palla Bakhtawarpur Rd
पल्ला बख्तावरपुर मार्ग

Irritation to throat - 1034.61 m

MOHAMMAD PUR
मोहम्मद
पुर

Eye irritation - 1253.73 m

Map

Google

Legend	
Unconsciousness Conc. (ppm) 500	
Dizziness Conc. (ppm) 200	
Vomiting, nausea Conc. (ppm) 100	
Irritation to throat Conc. (ppm) 20	
Eye irritation Conc. (ppm) 10	
Safe for human Conc. (ppm) 5	

3D

WIND
N
W E
S

288.66 m