

EnviWizard

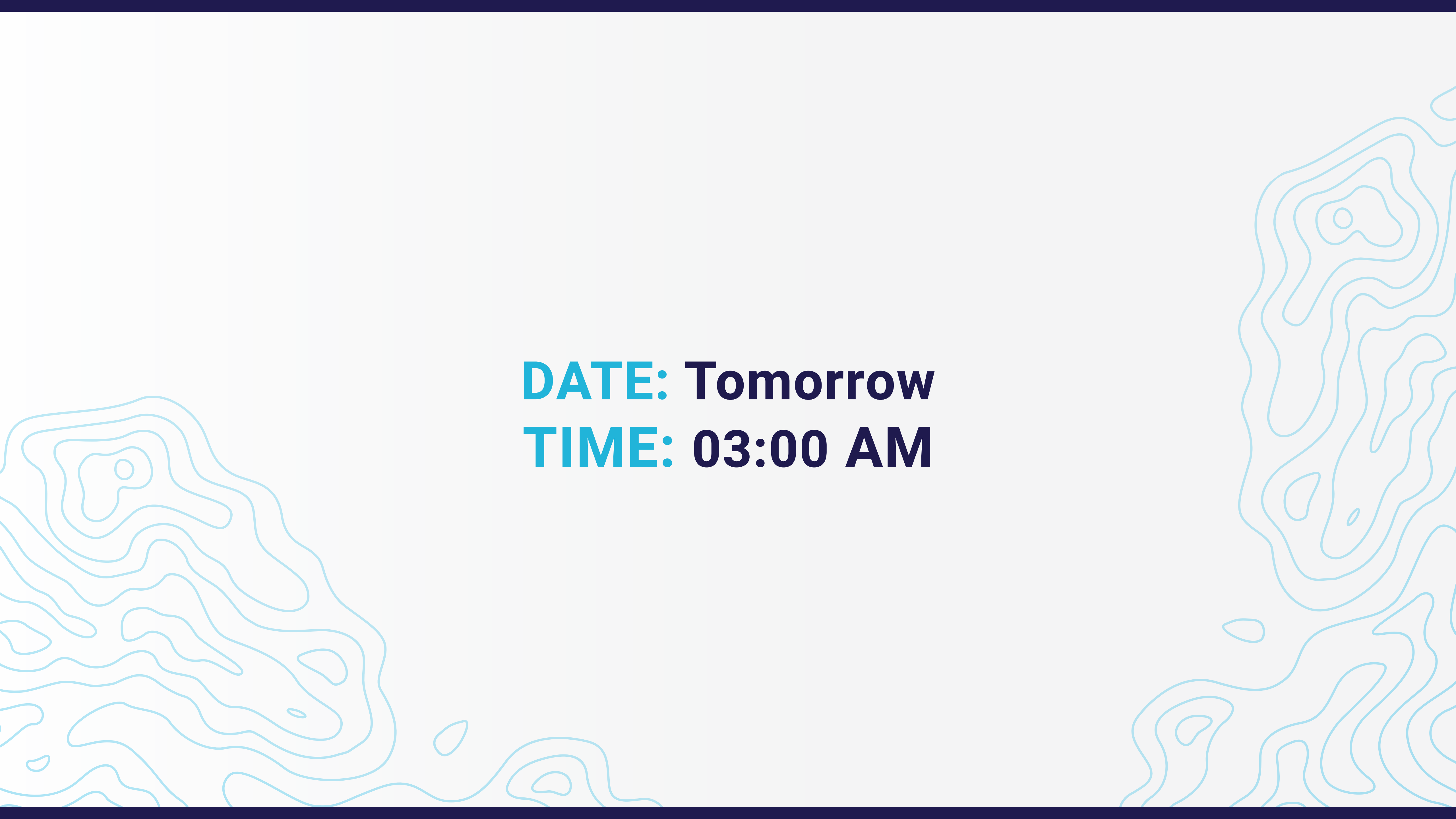
SENSING FOR LIFE

Unique system for real time determination of HAZMAT emission danger zones



The background of the slide is a light blue topographic map with contour lines. The map is centered around a white rectangular area containing text. The text is written in a bold, sans-serif font. The words "It can happen to" are in white, and the word "you!" is in a darker blue color. The text is set against a dark blue brushstroke background.

It can happen to you!

The background of the slide features a light blue topographic map with contour lines, positioned on the left and right sides. The central area is a plain white background.

DATE: Tomorrow
TIME: 03:00 AM



INCIDENT:

A monitoring station in the area detects an high concentration (above a preset threshold) of a hazardous material in the air.

The background of the slide features a light blue topographic map with contour lines, positioned on the left and right sides, framing the central text. The map shows various elevation contours and shapes, typical of a geographical map.

**The reason and source are yet unknown
but the hazardous material
is already airborne and flows toward populated areas!**

The background features a light blue topographic map with contour lines. A thick, horizontal blue brushstroke is centered across the middle of the image, containing the text.

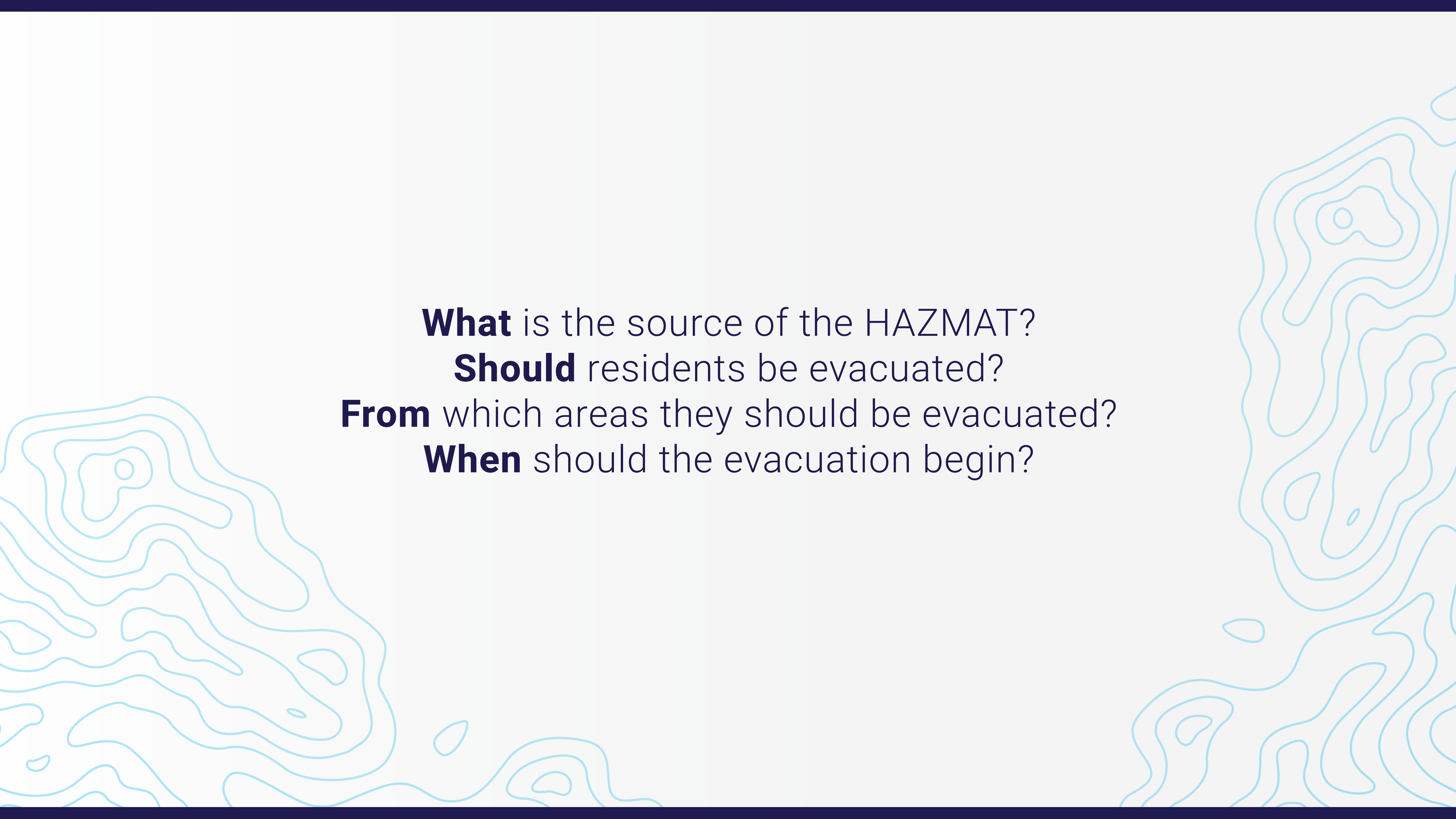
THE RESIDENTS ARE IN DANGER!



PREVENTING DISASTER

requires important
and quick decisions:



The background of the slide features a light blue topographic map with contour lines, positioned on the left and right sides, framing the central text.

What is the source of the HAZMAT?
Should residents be evacuated?
From which areas they should be evacuated?
When should the evacuation begin?

Every decision is crucial and can make the
difference between

Success or Catastrophe!

Having all of the details is essential for: **Making correct and quick decisions**
Issuing warnings and instructions to the residents
and notifying the **army/home front command/rescue forces**

ALL DETAILS ARE ESSENTIAL:



What is the emission **source**?

What is the emission **rate**?

What is the HAZMAT **concentration**?

What is the **rate and direction of the HAZMAT propagation in the air**?

ALL OF THESE INFORMATION MUST BE COMPILED

IN REAL TIME!

RAPIDLY; AND

ACCURATELY



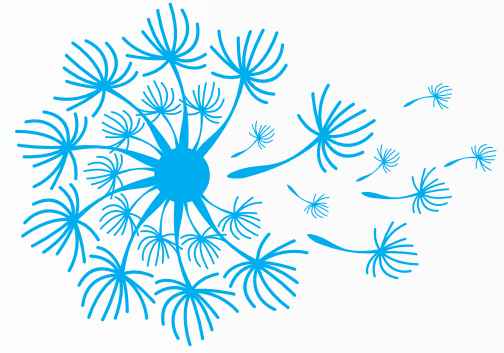
**“The greater the knowledge,
the smaller the risk”**

(Steven Harper)



“Knowledge is Power”

(Francis Bacon)

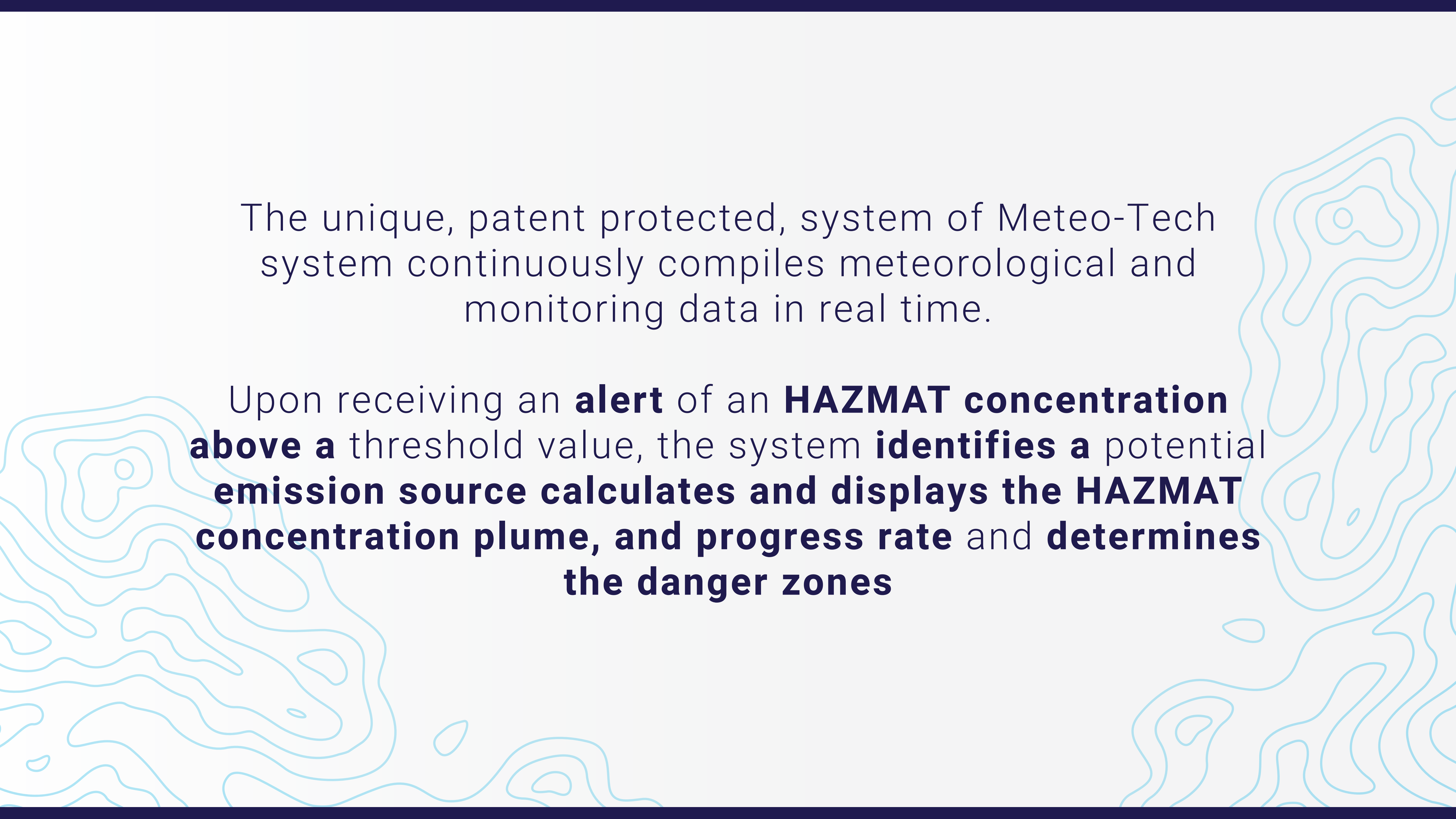


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METEO-TECH INTRODUCES:

Unique system for real time estimation
of HAZMAT emission danger zones during an HAZMAT
emission event



The unique, patent protected, system of Meteo-Tech system continuously compiles meteorological and monitoring data in real time.

Upon receiving an **alert** of an **HAZMAT concentration above a** threshold value, the system **identifies a** potential **emission source calculates and displays the HAZMAT concentration plume, and progress rate** and **determines the danger zones**



WHAT ARE THE STAGES OF THE PROCESS?

STAGE 1:



A sensor on in an area sends an alert as the measured concentration measured exceeds a threshold predetermined value.

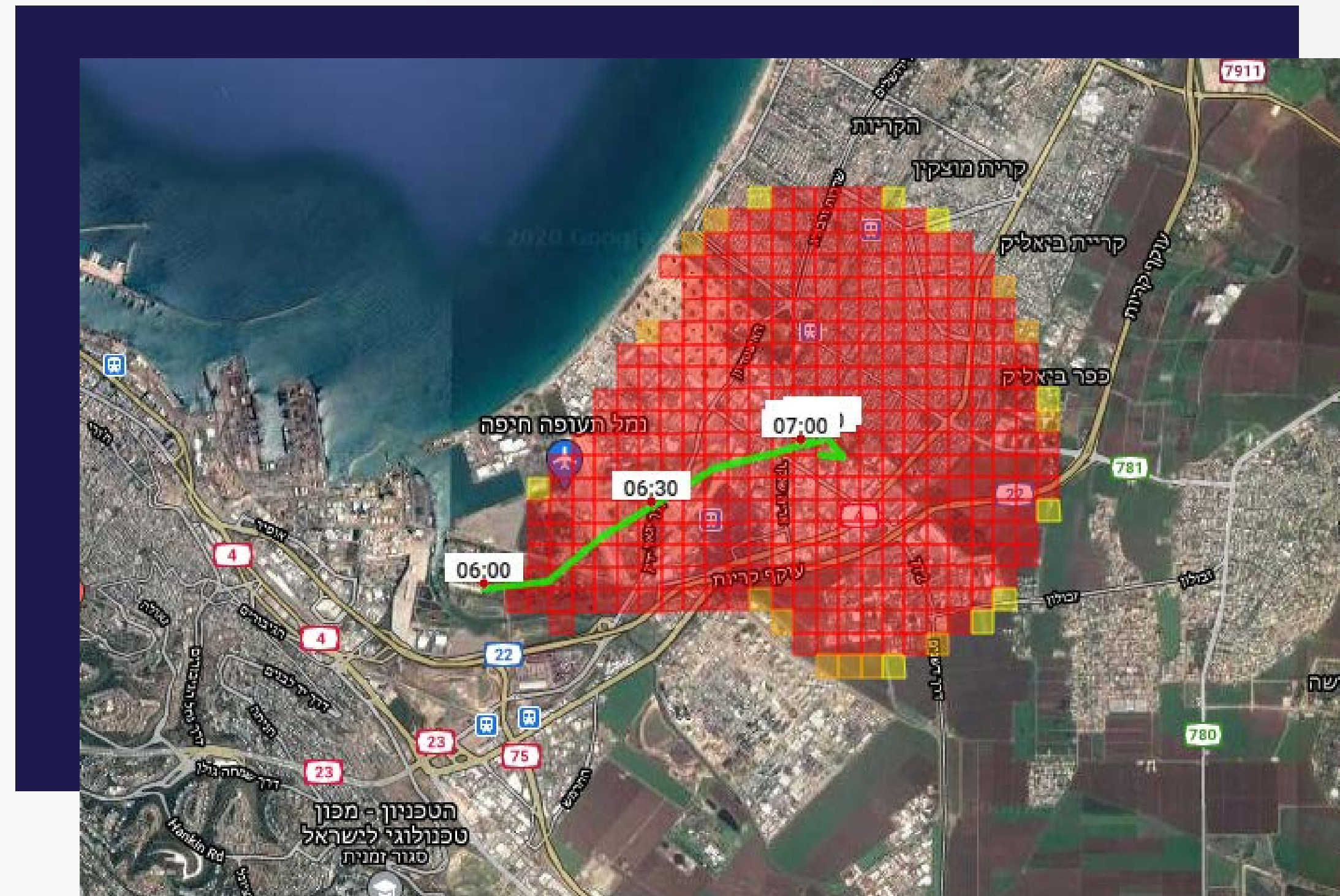
The measured Concentration measured is reported to the control center **online.**

STAGE 2:

The system identifies a potential source causing the high reading.

STAGE 3:

The system calculates the central line of the HAZMAT propagation from the potential emission source



(This is an image from the system under development, it will be replaced with a nicer plume)

STAGE 4:

The system calculates and displays the **spatial concentrations distribution** of the HAZMAT around the central line and the ensuing **danger zones** according to **real time** PAC values!

Now one can evacuate the residents **only** from the **indicated dangerous specific areas** and thus there is no need for a comprehensive 180° downwind evacuation.

Such evacuation:

Saves time

Prevents waste of resources

Enables more effective evacuation

Saves lives!



HOW DOES THE SYSTEM DO IT?

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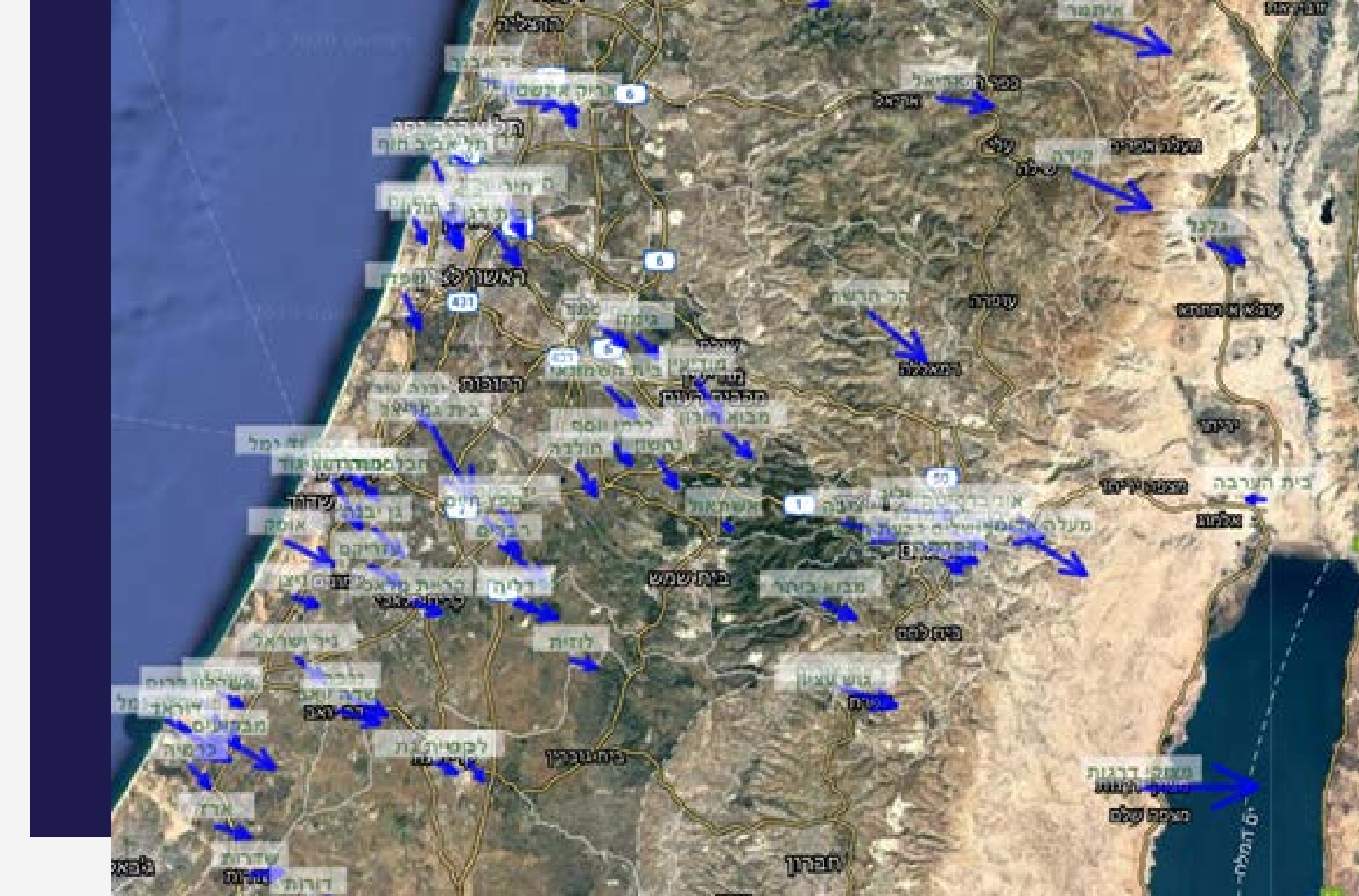
“KNOW FROM WHERE YOU COME, AND WHERE YOU ARE GOING”

(Mishna, Pirkei Avot 3a)



The system consists of three modules:

Meteorological and HAZMAT detection network
HAZMAT source determination algorithm
spatial distribution of HAZMAT concentration algorithm



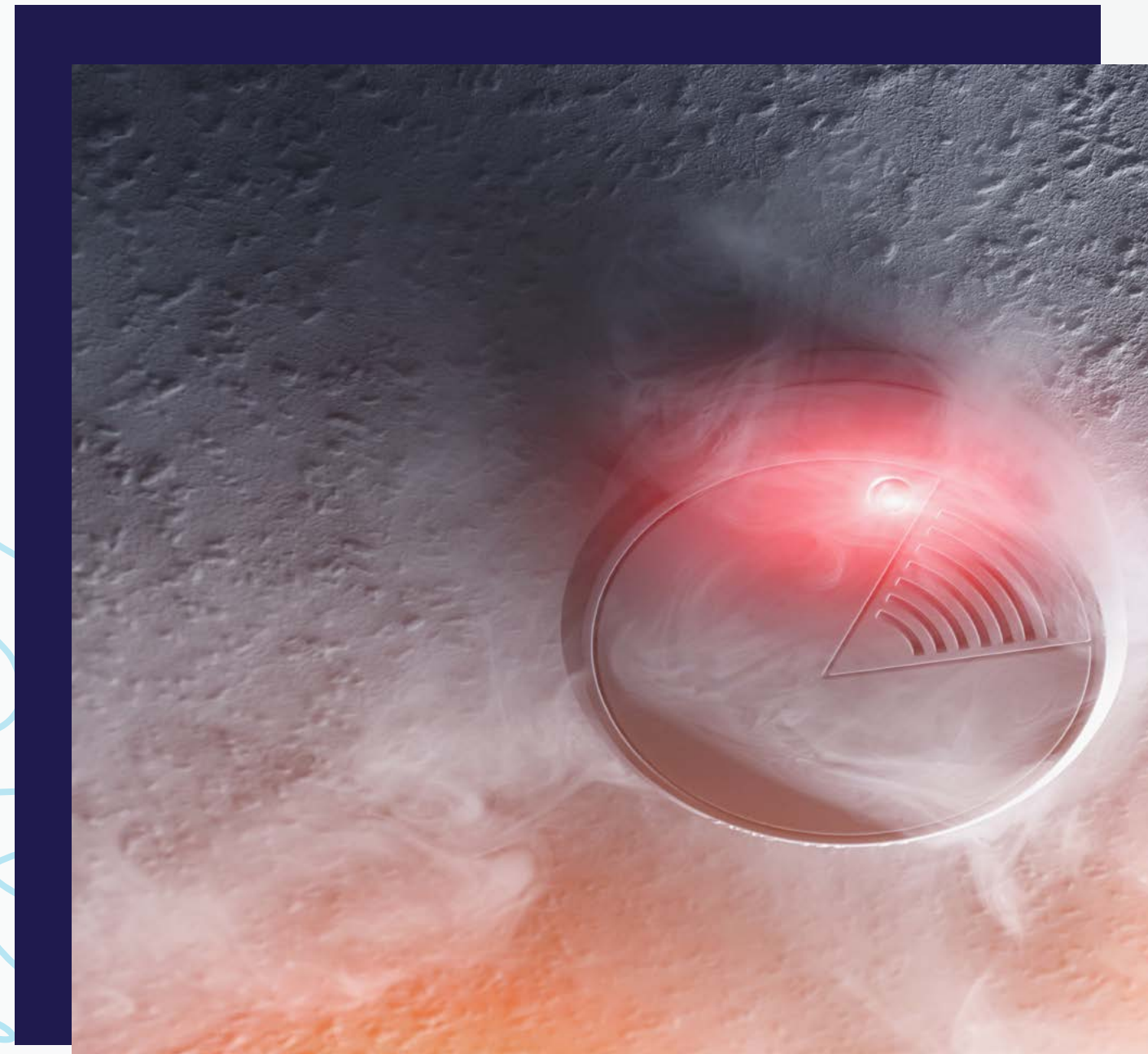
The system operates continuously and is connected to **meteorological stations**, 24/7, compiling wind data (direction and speed).

In Israel, the system is connected to ~200 meteorological stations.



Once one of the HAZMAT sensors reports excess values of HAZMAT concentration above the permitted threshold, the system activates the module that uses the meteorological data relevant to the incident time and place in order to determine the potential pollution source.

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STAGE 1:

The system calculates a **backward trajectory** and of the airflow from the alerting sensor, using the following formulas:

$$\begin{aligned} X(t+dt) &= X(t) + V_x(k,t)dt \\ Y(t+dt) &= Y(t) + V_y(k,t)dt \end{aligned}$$

STAGE 2:



The system identifies the closest source to the calculated trajectory as the incident generator- S1.

STAGE 3:



Based on the measured wind data, the system calculates the **forward trajectory** of the HAZMAT flow from the determined source, in order to estimate the HAZMAT arrival time to the protected area and the spatial concentration.

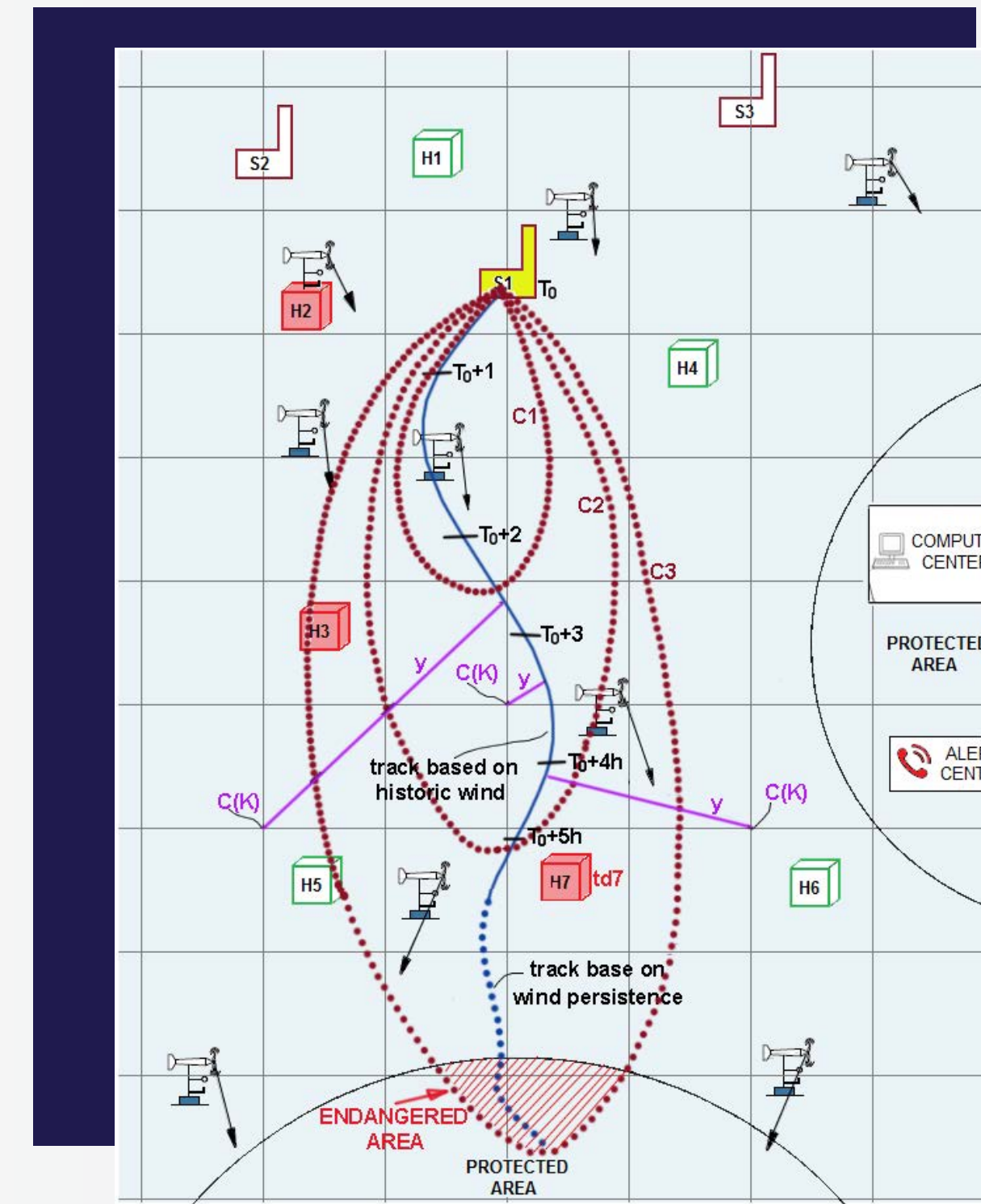
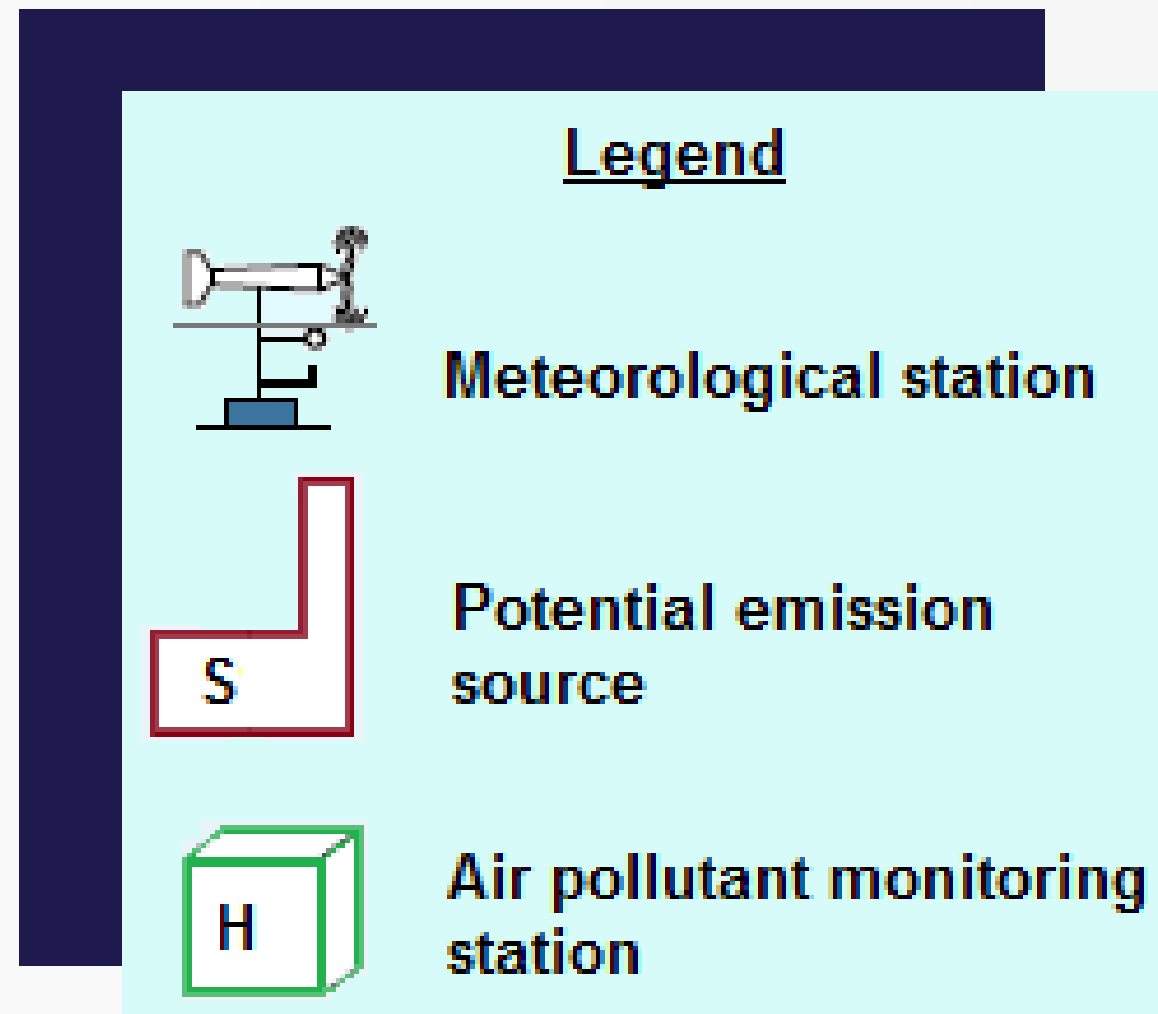
STAGE 4:

The system calculates the **emission** rate based on the concentration reported by the alerting sensor in order to evaluate the pollutant's **arrival time** to the populated area based on a forward looking calculation and its **concentration** in space using Pasquill equations:

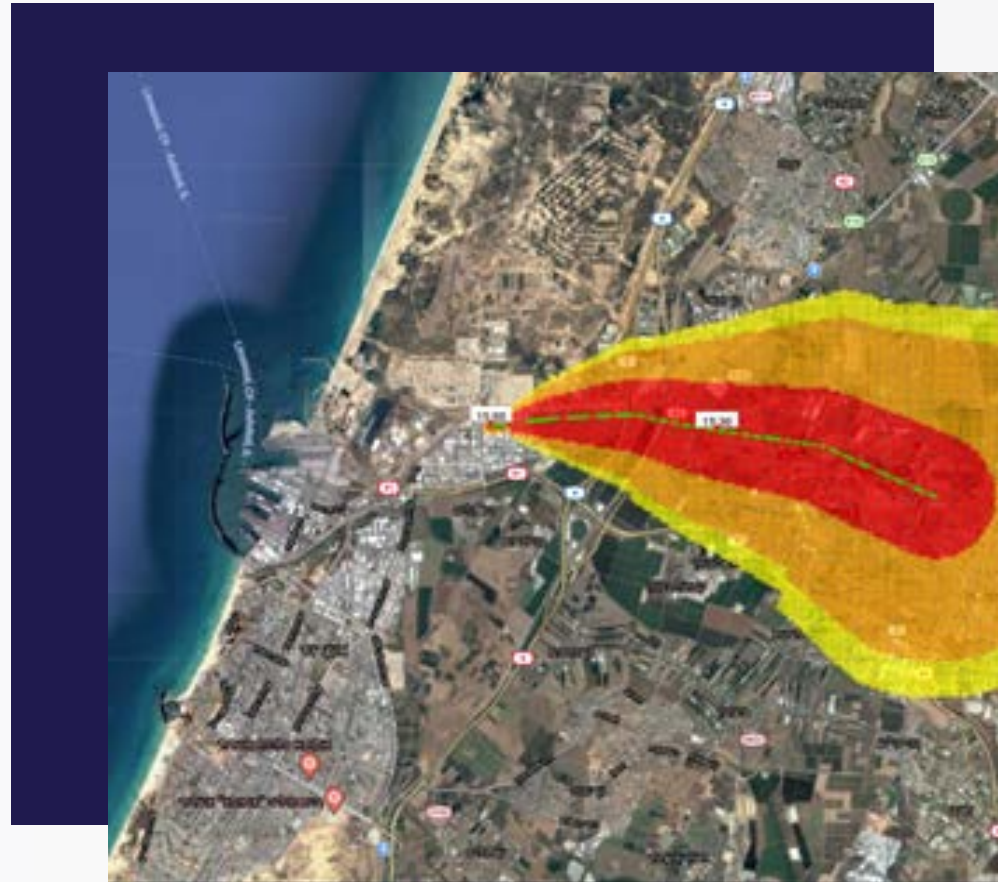
Q – Pollutant emission rate
U – Wind intensity
C(x,y) – Concentration in alerting sensor
Y – Distance between alerting sensor and plume axis
 σ_y – Turner

Where:
C(x,y) – Concentration in alerting sensor
Y – Distance from the plume axis
 σ_y – Turner

STAGE 5:



The system displays the potential **concentration distribution** in space and estimates its **arrival time** to the populated area



The real time plume calculation enables **Responsible and Informed Decisions** regarding population evacuation.

Summary:

The system operates **quickly and in real time** for case of explosions/unusual HAZMAT emissions and enables:

- **Identification** of the HAZMAT **emission source**
- **Estimation** of the HAZMAT **plume progress axis and spatial concentration levels in real time**
 - identifying the **populated** endangered **areas**
 - Estimation **of the time** at which HAZMAT excessive concentration will reach the populated areas.

ENVIWIZARD 3 ADVANTAGE OVER ALOHA:

The ENVIWIZARD 3 modules demonstrates a significant and very important advantage compared to the ALOHA:

- **Aloha** defines the air trajectory based on wind data compiled **from just one meteorological station**
- The **ENVIWIZARD 3** bases its calculation on an interpolation of wind data concurrently measured **at all meteorological stations in the analyzed zone.**

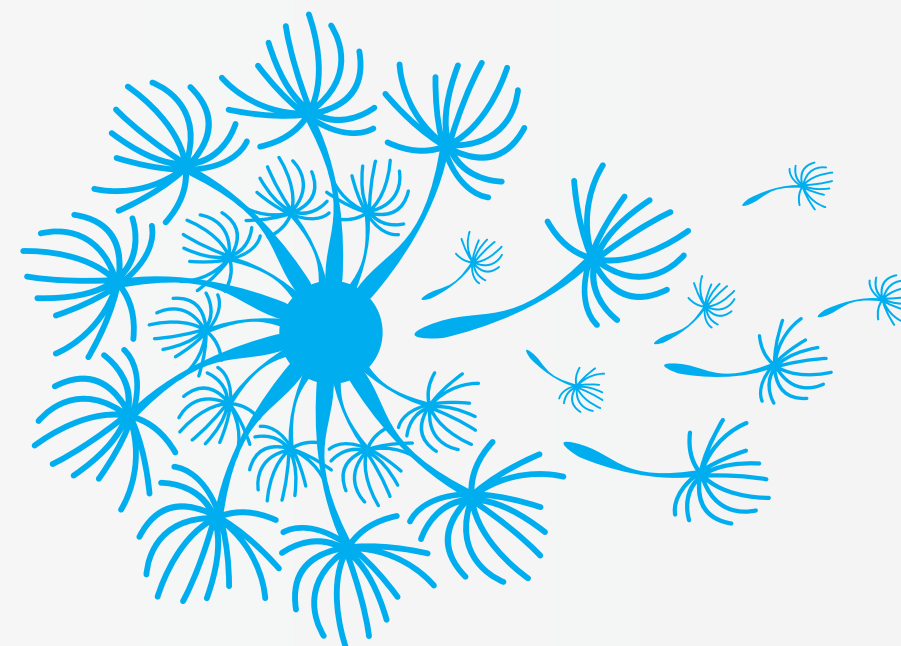
As a result, the ENVIWIZARD 3 provides a accurate and real time assessment of the situation of the HAZMAT flow and concentration.

SIMPLE. CONVENIENT. QUICK. ACCURATE!

The system operates online on the internet IN REAL TIME and can be easily and simply operated by any subscriber in the field or at the office:

- On a Google Maps map
- Using Google Chrome and Microsoft Edge
- From any PC or laptop, smartphone or tablet with internet access.





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