# Nanogate North America

**CONFINED SPACE HAZARD ANALYSIS.**

(Name of Plant) _____

Name of Confined Space: _____

Space Location/Description: _____

Persons completing analysis: _____

Date and time of analysis: _____

A. IS IT A CONFINED SPACE?

1. The area was NOT designed for continuous human occupancy.

    - Yes, it was NOT designed for continuous human occupancy
    - No, it was designed for continuous human occupancy

Description:

2. The area can be bodily entered and assigned work can be performed inside

    - Yes
    - No

Description:

3. The area has a limited or restricted means of entry and exit (tanks, pits, vessels, silos, storage bins, hoppers, vaults, and pits).

- Yes
- No

Description:

**If you answered YES to ALL of the three questions above, then the space is considered to be a confined space. Please answer the questions in Part B to determine if a permit is required.**

A. IS IT A PERMIT-REQUIRED CONFINED SPACE?

- Is the space shaped so that a person could be entrapped or asphyxiated by converging walls or floors that slope downward and taper to a smaller cross-section?

    - Yes
    - No

Description:

- Does it contain materials that have the potential to engulf the entrant?

- Yes
  - Water/waste/chemicals/paint _____
  - Sand/gravel/loose rock/soil _____
  - Oil
  - Plastic pellets or other loose materials _____
  - Powder
  - Other _____

  - No

- Does the space have the potential for a hazardous atmosphere?

  - Yes

    - Oxygen deficiency
    - Oxygen enriched
    - Explosive Gas/Vapor _____
    - Explosive Dust
    - Carbon Monoxide
    - Hydrogen Sulfide
    - Chlorine
    - Other _____

    - No

- Is there a potential for any other safety or health hazard?

  - Yes
    - Electrical _____
    - Moving Parts _____
    - Slips and trips _____
    - Falling more than five feet _____
    - Heat
    - Cold
    - Skin or Eye Irritants _____
    - Noise _____
    - Chemicals _____
  - Other _____

    - No other potential safety or health hazards

- Is ventilation needed in the space?

  - Yes
    - Natural
    - Forced Positive
    - Forced Negative

    - No

- How is the space entered?
    - Fixed ladder

- Stairs
- Portable Ladder
- Lowering winch (not using rescue equipment)

**If you answered "No" to <u>all</u> five of the above questions, then the confined space is considered a <u>non-permit required confined space</u>.**

**If you answered "Yes" to <u>any</u> of the above questions, then the confined space is considered a <u>permit-required confined space</u>.**

**For both space classifications, (permit-required <u>or</u> non-permit required confined space), complete the following hazard assessment checklist to determine if other hazards are present in the space:**

B. <u>SAFETY HAZARDS</u>

- Animals or insects (stinging, biting, snakes, skunks)
- Low ceilings (ergonomics, sharp objects, visual obstructions)
- Sharp objects
- Electrical hazards (live circuits, metal rope around electrical devices)
- Adverse temperatures (steam lines, coolant lines)
- Slippery ladder rungs
- Rusty surfaces (cuts, hides chemicals, poor footing)
- Chemical coated walls/surfaces
- Biological residue/slime (exposure, slippery surfaces, sewage)
- Loud ambient noise - traffic, etc. (annoyance, communications interference)
- Vibration (discomfort, noise)
- Poor lighting (can't read meters, can't perform critical tasks)
- Radiation
- Other extreme ergonomic conditions including those that may occur because of PPE limitations: respirators, fall protection harnesses, connection to retrieval equipment
- Liquids on floor/walking surface (standing water)
- Hazards external to the hole that could affect operations--combustion exhaust, possible precipitation, vehicle traffic, overhead electrical wires, chemical/hazardous materials lines nearby
- Others:

D. <u>HEALTH HAZARDS</u>

Chemical Hazards (list) _____

Asphyxiation Potential: _____

E. <u>GETTING TO THE CONFINED SPACE</u>

- How is the space entered?
  - Fixed ladder
  - Stairs
  - Portable Ladder
  - Scaffold
  - Lowering winch/tripod

- Other _____

- Is the entrance easily accessible?
  - Yes
  - No

Describe entrance _____

- Is there plenty of workspace available to set up all equipment at entrance?
  - Yes
  - No

Limitations:

Type of entry:
- Vertical
- Horizontal

- Horizontal Entries

How far above the ground?_____
Is there a work provided to upper elevation? _____
Is there a place to secure lifeline? _____
Is there a location to place a mechanical device? _____
Are there cut hazards that can damage rescue rope?_____

F. INTERNAL CONFIGURATION

1. Can a person:
   - Walk in erect
   - Walk in stooped
   - Crawl in on hands and knees
   - Crawl in on stomach or back

   How high are the ceilings? _____

2. What are the footing conditions inside space:

   - Flat Surface
   - Cramped or Limited
   - Round (horizontal pipe)
   - Uneven Surface
   - Slippery Footing Surfaces
   - Obstructions that have to be Stepped Over
   - Sharp Objects
   - Spilled Chemicals
   - Other:

3. Are there
   - Structural Cross Members
   - Head Hazards
   - Climb over required

H. FALL POTENTIAL

- None
- Yes, how far? _____
- Fall directly onto concrete/level surface? _____
- Fall onto something sharp? _____
- Any place to tie off/secure lanyard or winch? _____
- Extraction device available? _____

K. INTERNAL FEATURES

- Pipes/lines going through space?_____
- With mechanical joints, flanges or valves inside space?_____
- With possible openings inside space? _____
- Materials in pipes/lines? _____
- Electrical equipment that needs servicing? _____
- Possibility of engulfment? _____
- Entrapping features (converging walls, wedging situations)? _____

L. CONTAMINANTS TO SAMPLE FOR

- Oxygen
- Combustible gas? Type:
- Toxics

M. KNOWN USE OF SPACE

- Original
- Present Use
- Contained Chemicals
- Oxygen consumers? (Rust, decay, wet carbon, chemical reactions, combustion, etc.)
- Other _____

N. HAZARDS/FEATURES OF THE SURROUNDING AREA

- Piping or chemical containers?
- What chemicals?
- How far away?
- Possibility of spill into Confined Space?
- High noise levels? (Communications interference)
- Soil methane?
- Parking lot, loading area or parking spaces close by?
- Can anything fall into the hole?
- Poor lighting in the area?
- No electrical services?
- No ground point?
- Traffic hazards (in surrounding area)?

O. SEASONAL WEATHER EFFECTS

- Must the entry be made in bad weather?
- Could precipitation create a hazard - subject to rapid flooding?

P. OTHER

- High ambient noise (or anything that can hamper communications)?

- Ambient temperature extremes (heat stress, direct employee exposure, cold stress, ice formation on working surfaces)? _____

Q. HAZARDOUS ENERGY HAZARDS

- Moving machinery hazards?
- Written lockout procedures in place?
- Electrical energy hazards?
- Lockout procedures in place?
- Lockout points identified?
- Lockout points tagged or labeled?
- Are there chemical hazards?
- Is line breaking required?
- Is the shutoff valve identified or tagged?
- Is line blanking required?

R. SITE SUPPORT FEATURES

- Is there a certified grounding point available or in proximity?
- Are there electrical services present?
- How many outlets? (two separate circuits recommended)
- Is a generator required?
- Are there rope anchorage points available for rescue use?
- Other:

T. VISUAL

- Is there poor lighting?
- Can the entrants be visually observed by attendant?

U. VENTILATION

- Does the space have a configuration that will hamper effective ventilation/purging?
- Is the space a Convoluted Space?
- Is there a second or additional opening?
    - Are the exits close together
    - Will flow through ventilation be adequate?
    - What is the distance between the openings?

Estimate of Internal Volume of Space: _____

V. COMMUNICATIONS

- Is a radio required?
- Is Voice-Only adequate?
- Is there a telephone nearby?
- Is there radio or telephone interference?
    - Inside the space
    - Outside the space

W. DISTANCE INTO SPACE

- Is the distance inside the space greater than 50 feet? (length of extraction cable)
- Is the space large enough to require an extra internal attendant?

X. SEWER/MANHOLE WORK

- Telecommunications/Electrical?
- Sewer?

- Sanitary?
- Storm?

**Once the hazard assessment checklist is complete, file the completed form with the plant Maintenance Department with a copy sent to EHS. If necessary, consult EH&S for assistance.**