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EXPANDED CLAY AGGREGATE (ECA)  
AND ITS APPLICATION IN

# PETROCHEMICALS, OIL AND GAS INDUSTRIES

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Benefits of

# ECA

- ✓ 100 % Inert Product
- ✓ Light in Weight ( < 400 Kgs/CBM)
- ✓ Micro-Porous Structure
- ✓ Good Absorption Property
- ✓ Excellent Thermal Insulation - 0.09-0.12 W/mk
- ✓ Good Drainage Property
- ✓ Surface Alkalinity ( Has Neutral pH )
- ✓ Low-Coefficient of Thermal Expansion
- ✓ Non-Toxic & Eco-Friendly
- ✓ Fire Resistant
- ✓ Excellent Filtration Media for Effluents & Waste Water Treatment
- ✓ Available in 0-2mm, 2-8mm, 8-15mm, 15-30mm Sizes

## EXPANDED CLAY AGGREGATE (ECA) AND ITS APPLICATION IN PETROCHEMICAL INDUSTRIES :

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- 01 Expanded Clay Aggregate (ECA) has a high fractioning intensity, which is mainly used for oilfields as down-hole proppant.
- 02 The use of Expanded Clay Aggregate (ECA) is to increase the output of oil and gas.
- 03 Expanded Clay Aggregate (ECA) is Non-Toxic & Eco- Friendly product which is 100% natural & odorless in nature.
- 04 Expanded Clay Aggregate (ECA) is used for Wastewater/Effluent treatment and for bedding and Insulation purpose.

# PETROCHEMICAL EFFLUENTS AND ITS EFFECT

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Oil & Gas Industrial effluent has a wide variety of hazardous substances, chemicals, organic and inorganic compounds as well as radioactive substances.

If this waste water effluent is channeled into urban waste water system, it can contaminate water resources. In order to purify the water, Expanded Clay Aggregate (ECA) can be used effectively.

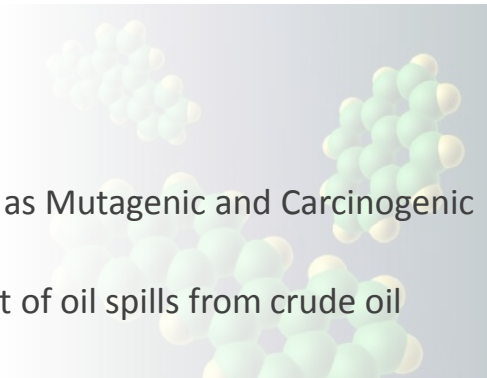
# POLLUTANTS THAT ARE PRESENTS IN PETROCHEMICAL EFFLUENTS:

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## 1. Polycyclic Aromatic Hydrocarbons (PAH),

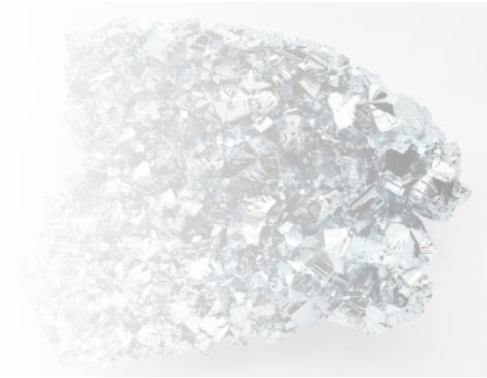
which consists of:

- Pyrene
- Phenanthrene
- Fluoranthene
- They are also known as Mutagenic and Carcinogenic materials
- They occur as a result of oil spills from crude oil



## 2. Heavy Metal, such as :

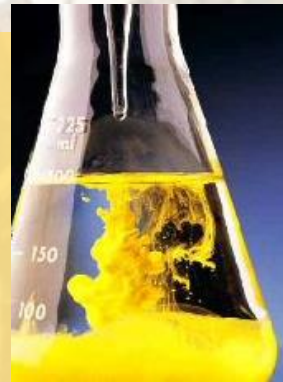
- Iron
- Lead
- Chromium
- Cadmium
- Nickel and the like



# APPLICATION TECHNIQUE

Removing heavy metals (Nickel, iron, lead, and chromium) and carcinogenic hydrocarbons (Pyrene, Phenanthrene, and Fluoranthene) from contaminated water and effluents have become an important process in making our water bodies free from pollutant.

The most widely used techniques for the removal of heavy metals and hydrocarbon from petrochemical industrial effluents are advanced treatment techniques such as:



Chemical  
Precipitation



Chemical  
Oxidation and  
Reduction



Electrochemical  
Treatment



Ion exchange  
Filtration



Reverse Osmosis

Most of these  
techniques have:



Operational  
difficulties



High maintenance  
costs



Use of costly mineral  
absorbents.

*And all these counterbalance the  
efficiency and performance  
advantages.*

# ADSORPTION PROCESS FOR REMOVING PYRENE, PHENANTHRENE AND FLUORANTHENE

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Adsorption process using Expanded Clay Aggregate (ECA) as an absorbent has the following characteristics:

01

Easy to operate among other treatment techniques.

02

High application efficiency.

03

Cost effectiveness and Ease of treatment process.

Expanded Clay Aggregate (ECA) can manually be dispersed into the treatment tank using a measuring scoop and this in turn provides easy-to-use one-step chemistry.

Expanded Clay Aggregate (ECA) has high adsorption capacity for removing carcinogenic and mutagenic hydrocarbons (Pyrene, Phenanthrene, and Fluoranthene) and heavy metals such as nickel, lead, chromium from oil and gas effluents.

With the use of Expanded Clay Aggregate (ECA), using sorption method, these pollutants can be removed. The maximum sorption level can be reached when 4g of Expanded Clay Aggregate (ECA) is added to the water. The removal efficiency would be **94.15%** for pyrene, **92.61%** for phenanthrene, and **93.91%** for *fluoranthene*.

Our treatment process with Expanded Clay Aggregate (ECA) removes heavy metals, oil and grease and suspended solids from industrial effluents. ECA absorb trace metals, soluble metals and soluble solids from effluents and allows the resulting flocculants to settle faster. Further facilitate releasing water for drier sludge cakes.



# EXPANDED CLAY AGGREGATE (ECA) FOR BEDDING AND INSULATION FOR PIPELINES

Expanded Clay Aggregate (ECA) can be used as bedding and insulator media for underground oil and gas pipeline. It helps bring practical and technical advantages as mentioned below:

- Expanded Clay Aggregate (ECA) provides a thermal resistance between the pipeline and the ground level
- It makes oil and gas pipeline easy to lay without the risk of damage and without any need for compaction
- In case of any maintenance, ECA is very easy to remove and leakage in any pipe is easy to identify.
- Expanded Clay Aggregate (ECA) protects pipeline from thrust caused by landslide, seismic event and any sort of vibration.
- Expanded Clay Aggregate (ECA) also protects pipelines from significant loading.
- Expanded Clay Aggregate (ECA) helps in elimination and drainage of stagnant water because of its excellent drainage property.



## EXPANDED CLAY AGGREGATE FOR OIL AND GAS TANK BURIAL

Tanks that are used for storing flammable liquids (oil & gas) are buried using Expanded Clay Aggregate (ECA) and it helps in reducing the risk of damages or accidents. Based on its properties, ECA is the perfect material for burying all sorts of tanks carrying oil and gas.

- ECA increases the durability of the tank both in acidic and base environments due to its neutral pH.
- It makes the oil & gas resistant to weather and thaw cycles
- ECA makes the tank incombustible and resistant to fire
- ECA provides a thermal resistance between the tank and the ground level (with lower heat loss and reduced risk of freezing).
- ECA helps in elimination and drainage of stagnant water.



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