

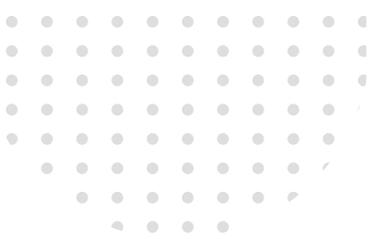


REPURPOSE  
AGGREGATES

# BUILDING A SUSTAINABLE FUTURE



A NEW OPPORTUNITY FOR  
THE AGGREGATE INDUSTRY



## **REPURPOSE AGGREGATES**

Waste is a byproduct of life that needs to be dealt with proactively; not buried and neglected to become a future problem.

Repurpose Aggregates serves the Mid-Atlantic construction industry by offering a destination for certain unused or unwanted materials from construction, demolition, and excavation (CDE) activities (e.g., concrete, brick, dirt, etc.). Once we accept this CDE material from local construction and development projects, our state-of-the-art recycling facility processes and repurposes it. It is then reusable in the industry as a substitute for virgin aggregate materials.

By partnering with the public and private sectors, we invest in best-practice technologies and sustainable solutions. These systems help reduce environmental degradation and CO2 emissions to protect the planet for future generations.



## Current Aggregate Production & Uses

Concrete has three basic components: cement, water and aggregate, combined in slightly different proportions. Every year, people use some 50 billion tons of “aggregate”—the industry term for sand and gravel, which tend to be found together. **The more virgin aggregate we extract from ecosystems today, the larger the problem we’re creating.**

### INDUSTRY SNAPSHOT

Life Cycle Stage	MATURE
Revenue Volatility	VERY HIGH
Barriers to Entry	HIGH
Competition Level	HIGH
Technology Change	LOW
Carbon Emissions	HIGH

## Did You Know?

Virgin aggregate is being extracted faster than it can be replaced.

Sand and gravel make up the most extracted group of materials, exceeding even fossil fuels.

Sand is the most-consumed natural resource on the planet besides water.

Construction sand makes up 60.2% of the overall demand of the industry.

The built environment is responsible for 58% of global greenhouse gas emissions.

Concrete is the most widely used man-made material in existence.

Cement is the source of about 8% of the world's carbon dioxide (CO<sub>2</sub>) emissions.

To meet the requirements of the Paris Agreement on climate change, annual emissions from cement will need to decrease by at least 16% by 2030.

Concrete production has increased more than thirtyfold since 1950 and almost fourfold since 1990.

# SAND: MYTH VS. REALITY

## MYTH: SAND IS CHEAP.

**FALSE**

Reality: Sand might be inexpensive at first glance, but in the long run, it is unlikely to stay that way. Because of its critical role in construction, the price of sand has quintupled in the past 30-40 years. The location of a quarry or mine can significantly influence the price of products. The level of competition within local markets is considered to be intense and the trend toward the consolidation of ownership has heightened industry competition in the past decade. Also, the high transport costs associated with this product severely limit the economic efficiency of transporting stone products long distances.

## MYTH: SAND IS READILY AVAILABLE.

**FALSE**

Reality: Sand can be found on almost every country on Earth, blanketing deserts and lining coastlines around the world. But not all sand is useful. Desert sand grains, eroded by the wind rather than water, is too smooth and rounded to bind together for construction purposes. Dubai, which sits on the edge of an enormous desert, imports sand from Australia. The sand that is highly sought after is more angular and can lock together. We never thought we would run out of sand, but it is starting to happen in some places.

## MYTH: SAND IS INFINITE.

**FALSE**

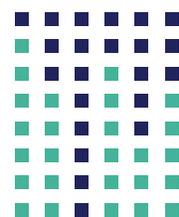
Reality: The global rate of sand use — which has tripled over the last two decades partially as a result of surging urbanization — far exceeds the natural rate at which sand is being replenished by the weathering of rocks by wind and water.

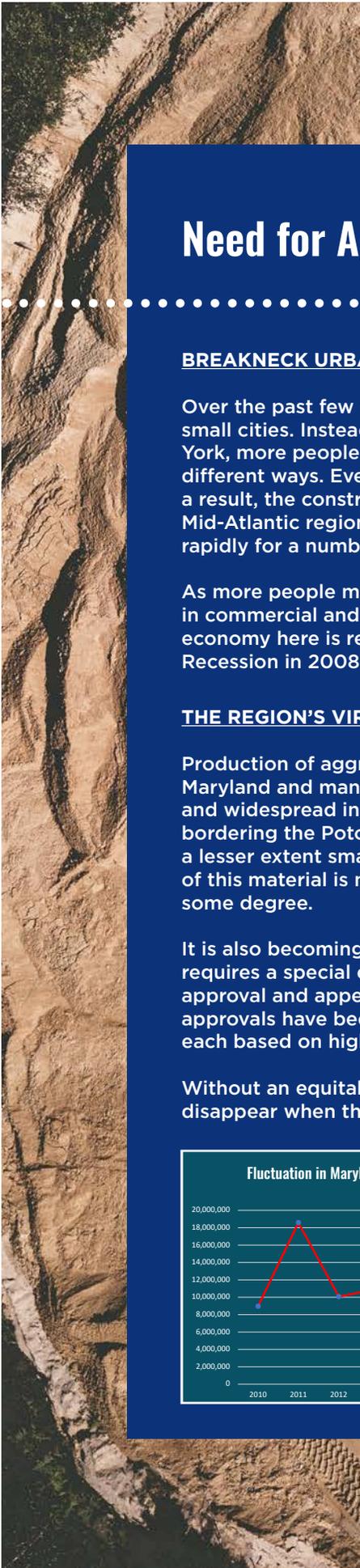
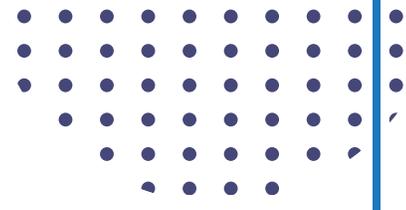
## MYTH: SAND MINING IS HARMLESS.

**FALSE**

Reality: Extraction of sand and gravel from active sources causes great environmental, social and economic harm.

It is typically sourced and extracted from seabeds, coastlines, quarries and rivers around the world. Ocean dredging has damaged coral reefs in Kenya, the Persian Gulf and Florida. It tears up marine habitat and muddies waters with sand plumes that can affect aquatic life far from the original site. Mining pocks the sand, speeding erosion along waterways. With most of the sediment gone, water depth and velocity are rapidly changing on a global scale. Increased erosion from sand mining makes coastal areas more susceptible to flooding, and may lead to the contamination of drinking water by sea salt.





# Need for Aggregate in Mid-Atlantic Region

## BREAKNECK URBANIZATION IN THE MID-ATLANTIC

Over the past few years, we've seen populations soar in what used to be considered small cities. Instead of gravitating to larger metropolians like Los Angeles and New York, more people are finding places like Washington D.C. and Baltimore appealing in different ways. Even surrounding suburban areas are seeing population increases. As a result, the construction industry in the Mid-Atlantic region of the US is booming. The Mid-Atlantic region-- specifically Washington DC, Maryland, and Virginia -- is growing rapidly for a number of reasons. Chief among them is affordability.

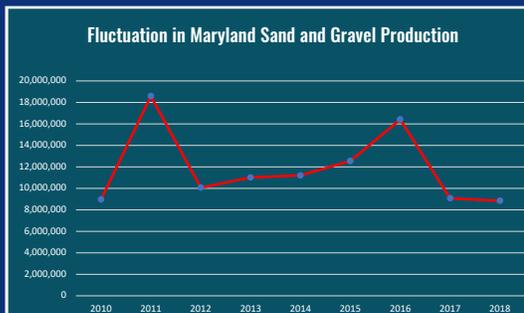
As more people move into the DC, Maryland, Virginia region, the numbers and trends in commercial and residential development match the population growth rate. The economy here is relatively stable, as it was the first to bounce back after the Great Recession in 2008. The area is also home to top-notch education and transit systems.

## THE REGION'S VIRGIN AGGREGATE SOURCES

Production of aggregate is currently the major mineral industry in Southern Maryland and many other parts of the region. Sand and gravel are most abundant and widespread in the upland deposits and to a lesser extent in the lowland terraces bordering the Potomac and Patuxent Rivers. Medium to coarse-grained sand, and to a lesser extent small gravel, is locally distributed in the Lowland Deposits, but much of this material is near or below the water table, diminishing its economic potential to some degree.

It is also becoming harder to access. Approval for new sand and gravel operations requires a special exemption from regional zoning boards, following a multi-year approval and appeals process. In one key suburban county, for instance, only two such approvals have been given in 20 years, with a predetermined lifespan of about 15 years each based on high-demand.

Without an equitable, sustainable solution, the region's supply of aggregate will disappear when the mining of virgin aggregates becomes impossible.

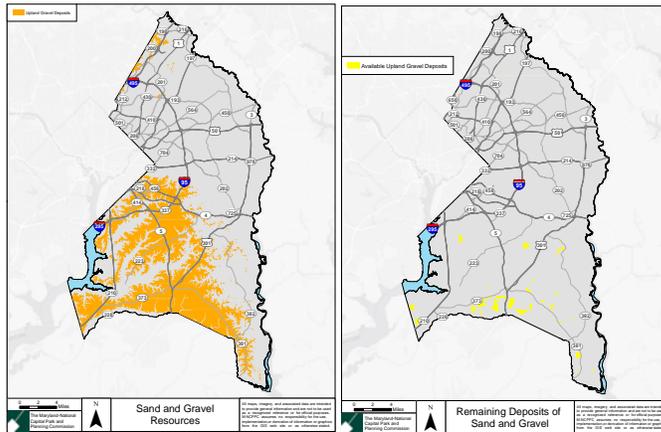


Years	2010	2011	2012	2013	
Tons	8,961,792	18,590,628	10,068,097	11,016,882	
Years	2014	2015	2016	2017	2018
Tons	11,203,202	12,548,415	16,416,819	9,073,568	8,842,635

Source: "Sand and Gravel Mining in Prince George's County Past, Present, and Future" by the Maryland-National Capital Park Planning Commission



## Zoom In On: Prince George's County, Maryland A REGIONAL CASE STUDY



Map 1 (Left): The original range of sand and gravel resource deposits in Prince George's County. Map 2: The approximate locations of remaining deposits sand and gravel with mining potential.

Prince George's County is key to both Maryland and D.C. for development, jobs, and building materials. It has consistently been second in the state for sand and gravel mining production.

The County produced 15,274,693.61 tons of sand and gravel in the 2010's, placing it second of 19 counties in the state.

As of 2018, the Prince George's County Planning Department staff had identified only about 20 remaining potential sand and gravel mining sites, covering about 1,180 acres. This acreage could theoretically be mined in approximately 8 to 20 years.

The contrasting graphics to the left clearly display the limited future potential of virgin aggregates in this area, highlighting the larger trends of the region in terms of dwindling mining resources that would be close enough to be economically practical.

### A VISION FOR CLIMATE LEADERSHIP

The construction industry is approaching a point where alternative materials will be more widely adopted due to market demand, innovative technologies, and wider concern for climate change. Across the country we are seeing the real goal of creating sustainable, zero-emissions infrastructure. What better place to demonstrate what is possible than in the communities surrounding our nation's capital?

The District's "Sustainable DC Plan," a vision for sustainable initiatives in D.C., has a stated goal of making the District the healthiest, greenest and most livable city in the U.S. by 2032.

The U.S. Green Building Council's annual list of the top states for green building once again puts Maryland and Virginia in the top 10, and if D.C. were a state, it would easily rank as No. 1.

"The Mid-Atlantic continues to show strong regional leadership, with both Maryland and Virginia returning to the list for the seventh year running," the Green Building Council said. Further initiatives such as sustainable aggregates will only further this initial success.



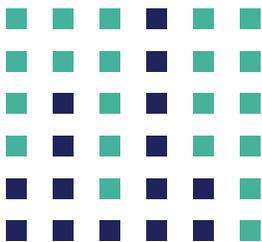


## REPURPOSE AGGREGATES

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At Repurpose Aggregates, we strive to change the perception of the leftover or discarded material from CDE activities typically regarded as unusable or unwanted (e.g., concrete, brick, dirt, etc.). We consider the impact of everything that we do and work to deliver a positive outcome to our customers, end-users, the community, and various other stakeholders. We believe in sustainability and the notion of doing well by doing good.

Repurpose Aggregates is a product of Harford Minerals and will be an extension of Harford Minerals' mission: creating a new sustainability and innovation-focused ecosystem within the aggregate industry.







# REPURPOSE AGGREGATES TIMELINE

## 1965

Harford Minerals was founded as Harford Industrial Sands, and earned a reputation for its specialization in supplying sand to the golf course industry. Over the years, the company shifted its focus to heavy industrial reclamation and recycling.



## 2014

Under new ownership, Harford Minerals made renewed investments in concrete recycling operations, becoming one of the largest industrial recycling campuses in Maryland.



## 2020

Harford Minerals began conversations to establish an ongoing public-private partnership with the Maryland Port Administration, which has been springboarded by a grant in January 2021 to begin testing dredge material from the Port of Baltimore for innovative reuse in the aggregates and concrete industries.



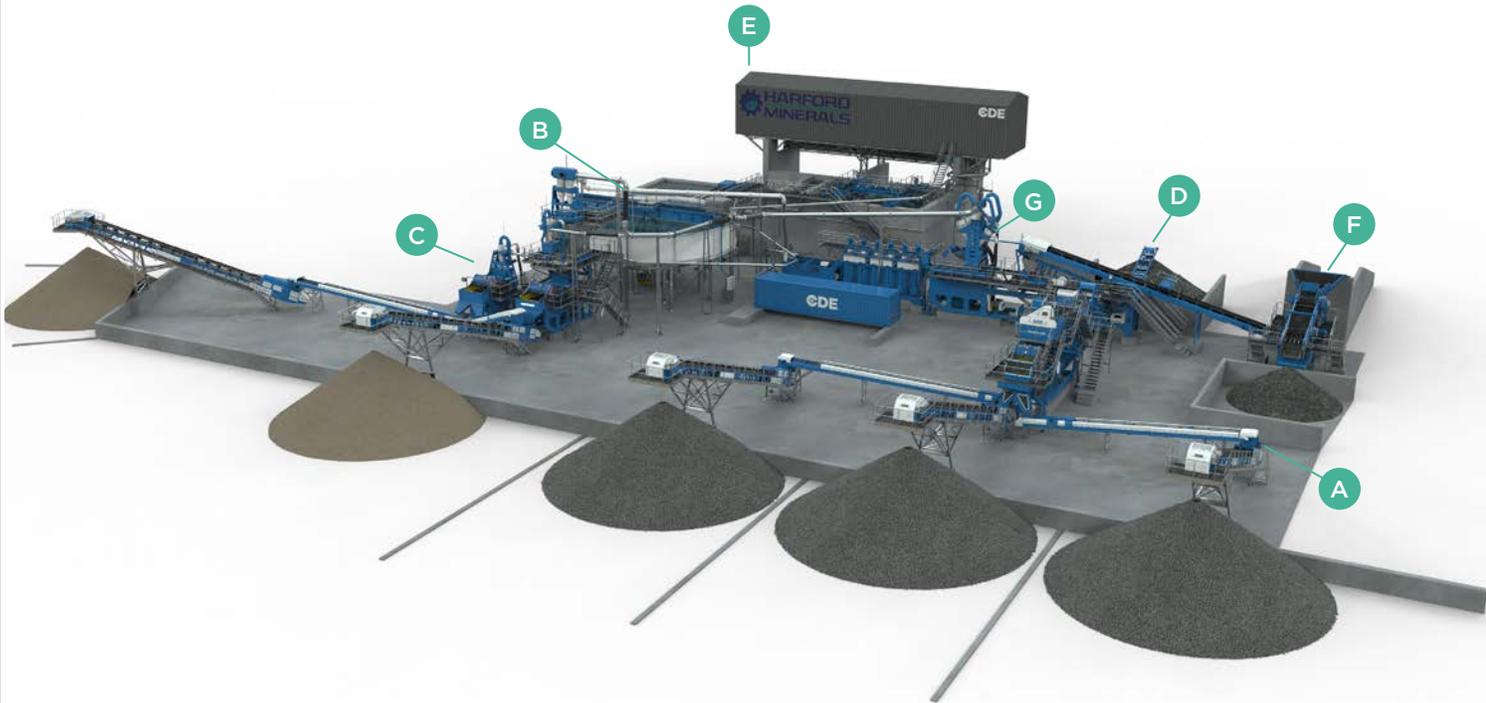
## 2021

Harford Minerals announced its partnership with CDE Global, with whom Harford Minerals developed a wet processing plant to expand recycling and reuse operations. With completion of the plant at the end of 2021, Harford became the first organization in the region to create a new life cycle for industrial sand & aggregates.



## 2022

Plant operations are in full effect, producing materials that represent the newest venture for Harford Minerals: Repurpose Aggregates, a sustainable line of sands, stones, clay, top soil, bricks, and blocks that will expand sustainability best practices in the Mid-Atlantic region.



# Harford Minerals & CDE Global

Harford Minerals, the producer of Repurpose Aggregates products, invested in CDE Global's wet processing technology in 2021. CDE Global has been co-creating with customers for nearly 30 years to complete over 2000 installations world-wide.

Harford Minerals' plant will produce washed coarse and fine sands as well as various sized, multipurpose aggregates. As the plant can be adjusted, the final product output can be fine-tuned to meet the market's needs and customers' own specifications.

Harford Minerals is the first company in the region with the capacity to recycle sand & other aggregates for reuse in construction. With the investment in a new wash plant that will recycle aggregate materials, Harford Minerals will be able to provide a sustainable source of building material for future developments. These materials have consistently tested at the same quality as virgin aggregate, while creating a source of material with less volatility than the current market leaders. It has the added benefit of diverting materials from landfills, a major step in improving climate change.



To learn more about Repurpose Aggregate's partners: [www.harfordminerals.com](http://www.harfordminerals.com) [www.cdeglobal.com](http://www.cdeglobal.com)

**A**  
**AggMax™  
Scrubbing &  
Classifications System**  
Combines feeding, scrubbing, sizing and trash removal on a compact chassis to maximize product yield

**B**  
**AquaCycle™  
Primary Stage  
Water Management**  
Recycles up to 90% of the process water for immediate re-use in the system

**C**  
**EvoWash™  
Sand Classification &  
Dewatering System**  
Patented fine material washing and refinement, ready for market straight off the belt

**D**  
**M-Series™  
Integrated Washing  
Solution**  
Screening and classification designed and built for maximum return on investment

**E**  
**Plate Press  
Filtration System**  
Dewatering minimizes waste and recycles up to 95% of process water to deliver maximum plant efficiency

**F**  
**R-Series™  
Primary  
Feeding System**  
Feed conditioning system with primary scalping screens handles difficult materials

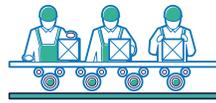
**G**  
**CFCU  
Density & Sizing  
Classification System**  
A unique sand classification system that maintains precise control of material cut point

## A Closer Look at Our Industry-Leading Wash Plant

# THE CLEAR ADVANTAGE

## REGIONAL PROXIMITY

Centrally located to the region, Harford Minerals is quickly accessible from all parts of the Mid-Atlantic for convenient delivery of material.



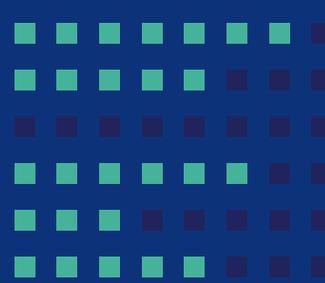
Repurpose Aggregates has a unprecedented level of consistency without the complications or unpredictability of virgin aggregate mining.

## STEADY PRODUCTION

## RELIABLE PRICING

With a reliable and inexpensive source material, recycled aggregate promises to have less volatility in pricing than virgin aggregate.





Repurpose  
Aggregates  
benefits from the  
experience of an  
expert leadership  
team that creates  
strategic  
collaborations in  
the private and  
public sectors.

## PROVEN PARTNERSHIPS

## RESPONSIVE SERVICE

A commitment to  
service helps  
Repurpose  
Aggregates meet  
customers' needs  
more efficiently and  
more effectively  
than ever before.



The newest  
technologies allow  
Repurpose  
Aggregates to  
bring new products  
to the region and  
stay at the forefront  
of industrial  
sustainability.

## INNOVATIVE TECHNOLOGY



## REPURPOSE AGGREGATES

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