



FLOWSCIENCE ELECTRONIC SCALE CONTROL SYSTEMS

Require Little to **No Maintenance** and Work on **Any Carbonite Scale**. Most often entirely **eliminating all jetting and liquid de-scaler use permanently**

FlowScience
GO WITH THE FLOW



LEACHATE SCALE ELIMINATOR

KEEPS **PIPES** FLOWING
AND **PUMPS** PUMPING

FLOWSCIENCE DOES THIS:

FlowScience
GO WITH THE FLOW

WE BUILT A BETTER SOLUTION

- 1 **REGULAR JETTING IS NO LONGER REQUIRED** TO CLEAN LEACHATE COLLECTION PIPE SYSTEMS
- 2 **CHEMICALS & ACIDS ARE REDUCED OR ELIMINATED** FOR DISSOLVING LEACHATE SCALE ANYWHERE
- 3 **REDUCES MAINTENANCE HOURS** RELATED TO LEACHATE SCALE VASTLY. SYSTEMS RUN 24/7
- 4 **THERE ARE 100'S OF UNITS WORKING ON LANDFILLS** AND PLENTY OF REFERENCES
- 5 **SAVES COSTS SUBSTANTIALLY & SUSTAINABLY** WITH SYSTEM LIFETIME OF 12-15 YEARS



LEARN [MORE >](#)



SAME APPLICATION

SAME FLOAT

AFTER 8 WEEKS OF PIPE TREATMENT



BEFORE

AFTER 12
Weeks with

FlowScience
GO WITH THE FLOW



FlowScience
GO WITH THE FLOW

SOLVED
SCALING ON
THESE TOUGH
PROBLEMS





KEEP IT FLOWING & RE-INVENT YOUR LEACHATE SCALE MAINTENANCE O&M PROGRAM

REDUCE HOURS & COSTS

JETTING, CHEMICALS, ACID TREATMENTS AND PIPE REPLACEMENT WILL BECOME PAST MAINTENANCE PROTOCOL. LEACHATE WILL KEEP FLOWING AND GAS MIGRATING CONTINUALLY FOR COLLECTION SYSTEMS AND PUMPS WHEN FLOWSCIENCE IS ACTIVATED

BY APPLYING OUR ELECTRONIC LSC SYSTEMS TO THE EXTERIOR OF PIPES AND PUMPS; **LEACHATE SCALE IS NOT ONLY PREVENTED BUT REMOVED CONTINUALLY AND SYSTEMS WORK 24/7. FOR A LONG< LONG TIME.**

**“THERE IS A WAY TO DO IT
BETTER - FIND IT.”**

THOMAS A. EDISON

FlowScience
GO WITH THE FLOW

ABOUT US

WE'RE COST SAVERS & SUSTAINABILITY PEOPLE

WE VET, INVEST, DEVELOP AND BRING SUSTAINABLE, COST SAVING TECHNOLOGIES TO INDUSTRY. IT MAY SOUND SIMPLE; BUT IT'S A DEMANDING PROCESS.



Leachate Scale Tech Breakthrough

In 2014 we perfected our **Leachate Scale Control System** that would help re-invent landfill maintenance O&M plans. Today are proud partners in manufacturing with FlowScience; building the very best products for performance, safety and durability. The systems are easy to install, can be powered in remote locations via solar and have a service lifetime of 12-15 years

Experience with 100's of Projects Can Have Us Guarantee Results

Our confidence and experience in the solutions we offer our clients allows us to GUARANTEE our technologies; assuring your organization that our applied technologies PROVE RESULTS. No project is too big. No project is too small. We love what we do and we stand behind it; as a company in helping create a greener planet and more efficient organizations everyday



**WE'VE WORKED
WITH**



SCS ENGINEERS



WE'VE SEEN A LOT IN 8 YEARS ON LANDFILLS



**Treatment of 6" Sump Pump That Scaled Every Few Weeks
+ Force Main Protection Throughout the Landfill**

Each Site Unique & **Always Evolving**

FlowScience Scale
Control Systems
Start Working in
Days and Are
Simple to Install

REFERENCES

AVAILABLE

ASK US



**Reduce
Costs**

Elimination of Jetting, Acids, Chemicals and Redundant Maintenance and time saves budget expenses. Initial **ROI is most often under 1-year**. And FlowScience System lifetime is 12- 15 years on average.



**Get More
Sustainable**

Mitigate environmental impact by often complete **elimination of jetting, chemicals and acids**. It's Important.
120 VAC or 12 VDC Solar for remote locations. Of note: **EPA has a 28% Rebate** when solar and FlowScience Go together.



**Corporate
Responsibility
& Innovation**

We're proven technology today that is Sustainable to boot where we should all do our part. We are very proud to create **better companies and a better earth**. Sustainable is cool. Savings while getting more sustainable is epic. We all need to do our part.



**Reduce
Maintenance**

FlowScience requires **little to no maintenance and is simple to install and adapt when things change**. Pipes stay clear continually and pumps repel hard scaling. creates time for other tasks.



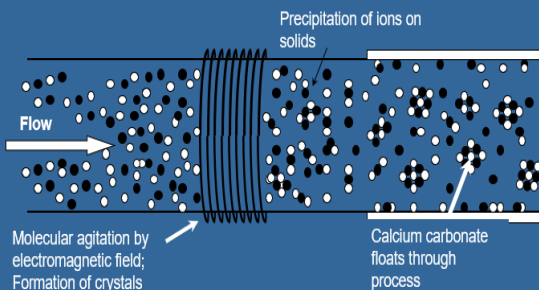
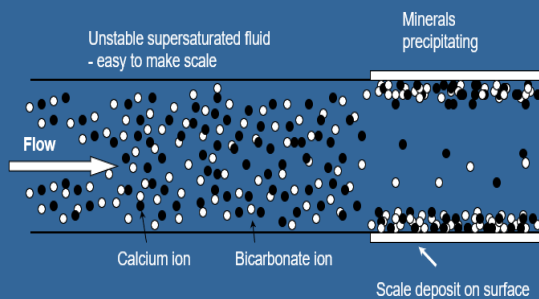
**Our
Guarantee**

How many of your vendors **guarantee results**? We stand behind what we do and put it in writing if you need us too. You can go back to the old way if we can't measure up.



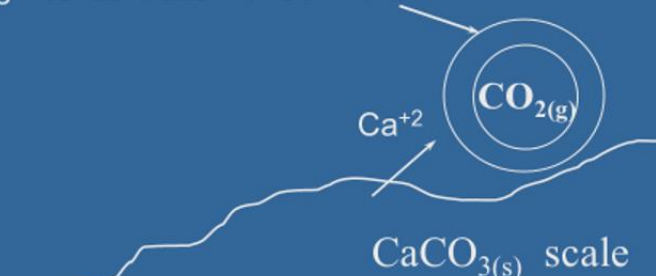
**Meet
Compliance
Standards**

Often **Municipal or State Jetting requirements** become negotiable as pipes and wells stay clear of leachate scale. Green grants are often available towards purchase.



Role of CO₂ Gas in Removal of Scale

Boundary Layer; High concentration of Ca⁺⁺ ions



HOW IT WORKS

Controls the Formation of Scale

The FlowScience system uses advanced signal generating technology applied to water via proprietary web induction treatment pads that are attached to piping, pumps or custom designed reaction chambers. This technology produces an electrically generated surface active catalytic effect in water that neutralizes the natural charge of suspended solids.

The technology, in effect, creates billions of available nucleation sites out of the suspended solids in the water that were previously unavailable due to their natural charge. When nucleation occurs, the dissolved calcium carbonate follows a path of least resistance by precipitating as microscopic seed crystals onto the suspended solids that are in solution with it and travelling at the same rate, rather than onto static piping or equipment surfaces.

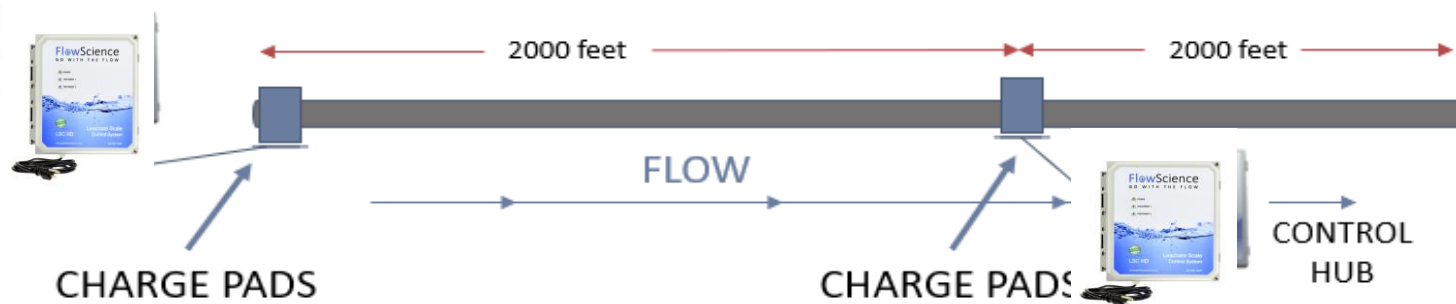
PREVENTS

MAINTAINS

DISSOLVES

CONTROL HUB

TREATMENT DISTANCE



A SINGLE SYSTEM CAN TREAT OVER 2000 FEET OF PIPE

Dissolves & Eliminates Existing Scale

In addition to controlling the formation of new scale, the FlowScience system provides two functions that allow existing mineral scale deposits to be gradually softened and removed:

1. The precipitation reaction previously outlined above transforms the previously supersaturated solution into a lesser or undersaturated solution that has greater ability to dissolve existing calcium carbonate scale and carry it in solution.
2. Descaling can also be attributed to the liberation of dissolved CO₂ from leachate solution as CO₂ nanobubbles. These nanobubbles have a localized low pH in the range of 4 to 4.5. Physical contact of the acidic bubbles with existing scale promotes a carbonic acid effect that softens existing deposits. These bubbles have little effect on the bulk pH solution.

SYSTEM SPECIFICATIONS



FlowScience **LSC Systems** are designed to last and stand up to the harshest of environments. Up to **11-Year Warranty Available**.



ESA Certified



**NEMA 4X Outdoor
Weather Resistant
Enclosures**



**100-240 VAC &
Custom Solar For
Remote Locations**

28% EPA Rebate



EPA Compliant



**ISO 9001 Manufacturing
Facility**



**Designed to Fit Pipes:
2"-24"**



**Harshest Environment
Cabling and
Components**



**Adaptable to Pumps &
Waste-Water Treatment
Applications**



Works 24/7

Sometimes the most daunting task is just getting started. FlowScience is Easy to Try. That's why it is important to understand that we've made that simple. Once a power source is determined and made available the rest of the install can be done in **as little as 20 mins** with our easy to understand **IOM** (included with every system). Your systems are drop shipped directly to the site already set for your application.



No Pipe Cutting or
Injection Points



Simply Plugs
into 120 V



Zero Maintenance
Required



A Single System Treats
up to 2000 Linear
Feet of Pipe



Treatment Pads Attach
to Pipe or Pump
Exterior in Minutes



Remote Monitoring
Available

APPLICATION IS SIMPLE



Zip Tie + Cover + Plug-In
It's That Simple

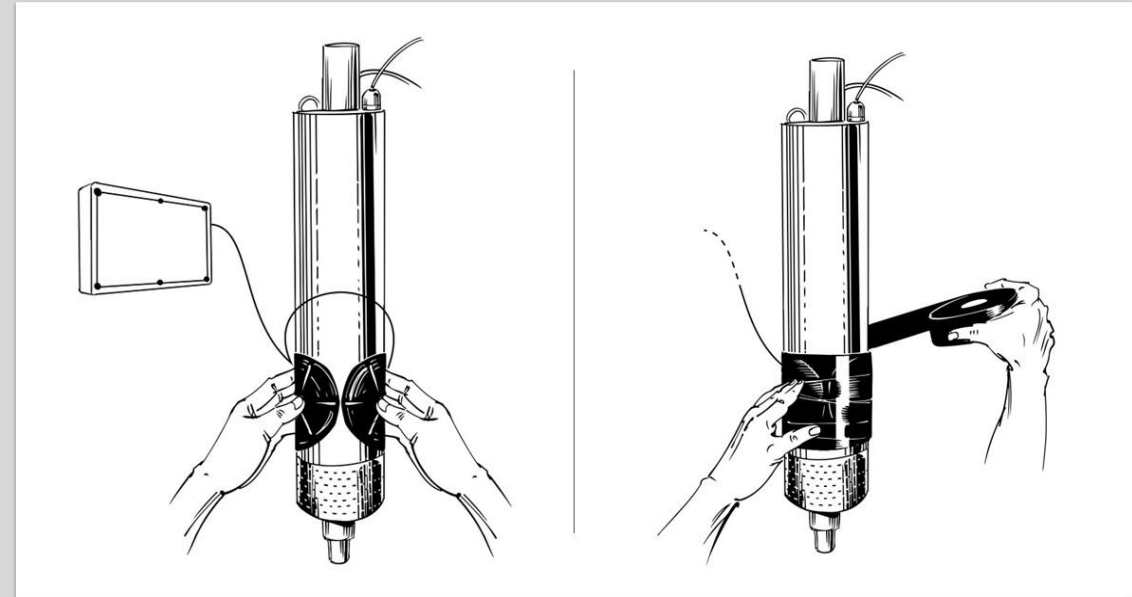
FLOWSCIENCE PUMP PROTECTORS

- 1 TREATMENT COILS ATTACH DIRECTLY ON TO PUMPS
- 2 REPELS SCALING AND DOESN'T ALLOW HARDENING
- 3 CHEMICAL TREATMENT IS ELIMINATED & MAINTENANCE IS A FRACTION OF PREVIOUS

SPECIFICATIONS

- ✓ Well Depths of Up to 200 Feet
- ✓ Rated to Function in Up to 200F
- ✓ Adapts to Any Pump But Works Better on Some Than Others
- ✓ System Lifetime of up to 15 Years
- ✓ EXTENDS THE LIFE OF YOUR PUMPS EXPONENTIALLY

PROTECT PUMPS FROM SCALING



Installs in 2 Easy Steps

LEARN MORE >

FROM YOUR OPERATING BUDGET TO
THE ENVIRONMENT;
THERE ARE SAVINGS IN YOUR PIPES.
DO YOU STILL NEED MORE
CONVINCING?

STILL NOT CONVINCED?

NOT READY TO
ELIMINATE CHEMICAL
AND JETTING
TREATMENT OF
LEACHATE SCALING YET?

FlowScience
GO WITH THE FLOW

Trial programs are available



11-YEAR WARRANTY

Full replacement 11-year
EXTENDED WARRANTY.
That's a long time.



PERFORMANCE GUARANTEE

If your FlowScience LSC System
doesn't work to your satisfaction WE BUY
IT BACK. Wouldn't it be nice if everything
in life was?



AGGRESSIVE RETURN ON INVESTMENT

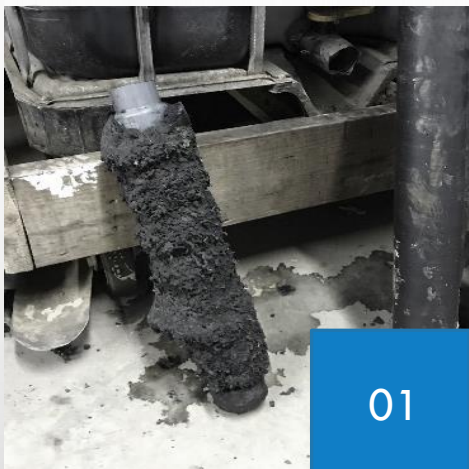
Maintenance savings create ROI that
is usually within mere months.
Apologize to the jetting guys for us.



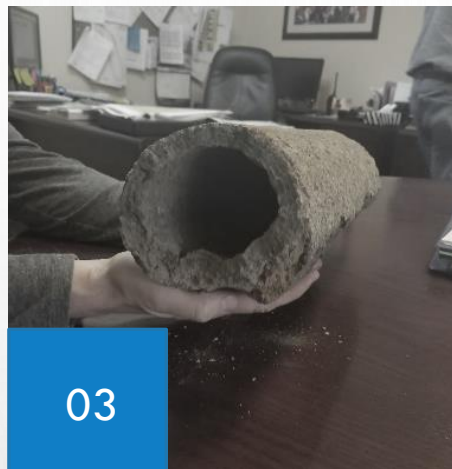
SUSTAINABLE TECHNOLOGY

Going Green is in. Low power
consumption and elimination of
diesel powered jetting trucks and
chemicals is a bonus.

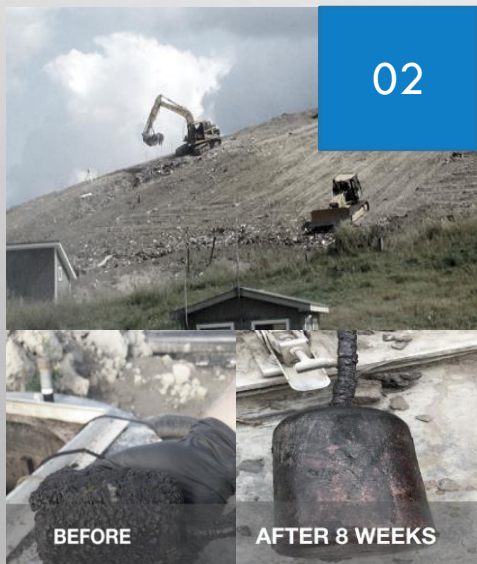
SOME PROJECTS



01



03



02



04

PROJECT ONE

LFG Wells have temperatures of close to 180F. Pneumatics are being pulled weekly for acid baths and maintenance. LSC Pump Protectors have kept the affected pumps scale free and dewatering for over a year and counting.

PROJECT TWO

A Big 3 landfill is laden with aluminum dross composition in multiple cells. Precipitation of scaling is accelerated due to elevated temperatures. The landfill was desperate for a solution as there wasn't enough hours in the day for jetting catch-up. The site started with 2 systems and today has 34 with over \$1.5 million in annual savings

PROJECT THREE

Force Mains are more frequently requiring jetting and tens of thousands of feet of pipe are affected. Jetting costs are heavy. 6 LSC systems keep nearly 14000 linear feet of force main clear to date and even removed existing deposits site personnel didn't even know existed.

PROJECT FOUR

Bio-Reactor (SMBR) media was the grow point for biologicals to treat leachate. Very effective. Over time media became covered with scale and fell to the bottom of the basins. This would require serious maintenance time and costs to clean or replace the media entirely to begin the process again. It took a few attempts but today we keep SMBR's scale free without the use of chemicals.

A CLIENT REFERENCE

Mike H.
District Manager
Big 3 Landfill



“A sustainable/green solution that will save landfills costs is a winner in my books”

REFERENCE LETTER

To Whom It May Concern:

| have had the opportunity to use Gii FlowScience Leachate Scale Control System which was able to fulfill all my expectations as a landfill Assistant District Manager. | was able to try the systems on the landfill | manage and operate to remove scaling on a 6” leachate collection pipe feeding the main tanks.

Results were as described and proved any skepticism wrong. The system was able to inhibit active scaling and eliminate existing deposits. As a solution to conventional jetting and chemical treatment | highly recommend the technology if leachate scale is a problem at your site. The product comes with a complete installation manual and was installed by my crew in under 20 minutes.

A sustainable/green solution that will save landfills costs is a winner in my books. | now know who to call if scale develops anywhere on my site. I'd encourage you to do the same as Gii Group guarantees results or they buy it back. That's pretty unique.

Very Best Regards,

Michael H. Assistant District Manager

WHAT CUSTOMERS SAY



District Manager
Big 3 Landfill

"I sincerely apologize for taking so long. Thank you for your persistence and follow-up. Now let's do the rest of the landfill"



Michel Emond
Mabarex WasteWater
Treatment

"It's tres magnifique. You solved a big problem for us"



Tami Craig
GFL – GM

FlowScience works. I've used systems at multiple sites and know exactly who to call when I have scale to deal with.

- ✓ REFERENCES
- ✓ CASE STUDIES
- ✓ TRIAL APPLICATIONS

ARE AVAILABLE

A COUPLE CASE STUDIES WE HAVE MORE

Pennsylvania Landfill – A CASE STUDY

THE SIDE EFFECTS OF CHEMICAL DESCALERS

FlowScience
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THE MSW LANDFILL

Located in Pennsylvania the MSW has experienced its share of common and not so common issues related to leachate management and treatment. Of pressing concern were areas of rapid scaling in and between the leachate treatment & holding tanks. New problems have arisen from new solutions.

CHEMICAL DE-SCALERS HAVE SIDE EFFECTS

The MSW landfill under testing is lead by one of the most talented engineers throughout the organization and is very efficiently managed. Rapid scaling impedes flow and processes and has become a continual challenge to pre-treatment and movement of leachate. Chemical de-scalers were added to solve the issue with cost being secondary. As advised the scale was dissolved and did not return, but a new problem was discovered shortly thereafter. Following several weeks of changing the chemistry and pH levels, manganese levels were out of control. A diagnostic of all the new variables was run. It was then determined the addition of chemical de-scalent was a contributing factor to increased manganese levels. A Solution Created New Problems.

ANOTHER SOLUTION COMES OUT OF THE BLUE

The DM was contacted by a Sustainable Technologies Organization; Gii Scale Control. They had a story about a technology they claimed was changing the way landfills do maintenance when it comes to the treatment of leachate scale. Even under extreme circumstances they assured us they could do the job. Following the engineering design call and determination Gii Group also gave to the site a written guarantee on performance. The technology itself uses a proprietary pulse energy signal that creates a new path of least resistance for carbonite particles. The carbonite is now attracted to solids and create microscopic seed crystals that flow through solution. Moreover the device induces a chemistry reaction that creates billions of nano CO2 bubbles that slowly dissolve the scale much like a chemical de-scaler but is a completely natural part of the reaction process. "The most significant benefit of the FlowScience LSC System to the landfill unfortunately is the most difficult to explain without going into a lot of technical jargon." "The ability to achieve effluent compliance of a water-quality based effluent limit (manganese) without experiencing crippling scaling is huge."



FlowScience LSC System Installed on EQ Tank



Control Hub

Treatment Pads on Exterior of Pipe

WHAT IS THE OPTIMAL SOLUTION FOR LEACHATE SCALE TREATMENT?

| DE-SCALERS | HYDRO-JETTING | FLOWSCIENCE |
|---------------|-----------------|-------------------------|
| After effects | Limitations | Few Limitations |
| Ongoing Cost | Ongoing Cost | 1-Time Cost 1yr < ROI |
| Maintenance ^ | Maintenance ^ | Zero Maintenance |
| Corrosive | Can Break Pipes | Permanent |
| Not GREEN | Not GREEN | GREEN Technology |

Wabash Valley Landfill – A REFERENCE STUDY

REAL INNOVATION TO ELIMINATE LEACHATE SCALE IN COLLECTION LINES & ON PUMPS



THE PROBLEM

Wabash Valley landfill had been experiencing increased precipitation of leachate scale throughout areas of the collection system and sump pumps. Formation of scaling is becoming more rapid and has reached problematic stage. Jetting is a constant battle to keep leachate flow with chemical de-scalers being a pricey option. It was a Tuesday that I saw an article on LinkedIn about a "breakthrough technology for leachate scale control". The system used a charge to treatment pads on the outside of pipes and pumps and was guaranteed to not only inhibit but also remove leachate scaling. "Highly skeptical" is a word that would best describe my thoughts on a product like this. I would have heard of it by now...



DUE DILLIGENCE



Scaled Pipe

Reaching out to the company about this "proven" FlowScience Leachate Scale Control System; a representative was in touch with me that very day. It was then I heard that this technology had in fact been used on landfills all over the country and a number within my own organization. How did I not hear about it? Upon further investigation the offer was a fraction of my annual jetting bill for a permanent solution and came with a guarantee. The references checked out everywhere. I decided to test it out. I was jetting again later if it didn't work.



Control Hub attached to 6" Pump

THE RESULTS

Attaching to 2 pumps that had to be cleaned almost weekly and 2 scaled lines that were in need of cleaning more frequently; we saw results in the first week. Wells and sumps were gathering a slurry and chunks of scale (much like after jetting) and the pumps look like new after many weeks of operation in the sumps. The LSC systems worked. My goal as an operator that knows the challenges of operating and MSW today is to let others know that FlowScience is completely legit and the overall benefits are tremendous. We're greener and we're saving costs. That's not a common thing to have in a product.

WHAT IS THE OPTIMAL SOLUTION FOR LEACHATE SCALE TREATMENT?

| DE-SCALERS | HYDRO-JETTING | FLOWSCIENCE |
|---------------|-----------------|-------------------------|
| After effects | Limitations | Few Limitations |
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| Maintenance ^ | Maintenance ^ | Zero Maintenance |
| Corrosive | Can Break Pipes | Permanent |
| Not GREEN | Not GREEN | GREEN Technology |

Tami Craig – Operations Manager



www.giiscalecontrol.com

www.getflowscience.com

1.888.97.GREEN



www.giiscalecontrol.com

www.getflowscience.com

1.888.97.GREEN

SITE **COST SAVING** RECON

LANDFILLS USING FLOWSCIENCE TODAY

*Note: Numbers are based on communication with site personnel with access to financials. Gii Group does not warrant that they view any confidential financials of any customer without express written permission.

*Forecasting model is based on past industry knowledge and experience of Gii Group and its subsidiaries.

| PROJECT DETAILS | 2000 FOOT 4" FORCE MAIN | BIO-REACTOR | HIGH TEMP LANDFILL 14 LSC SYSTEMS | TYPICAL "SCALECENTRIC" SITE - 5 LSC SYSTEMS |
|---------------------------------------|---|---|---|---|
| SUMMARY | 4" line was in need of jetting 2x per year | The suspended media within chamber scaled to fail every 6-12 months | A "Scale Cooker". Extreme conditions for carbonite environment precipitation. Pumps, pipes, WW | 3 side slop risers 2 x 6" pipes |
| PAST ANNUAL CLEANING COSTS | \$17,000 - \$21,000/year | \$60,000-\$100,000+/year | \$640,000+ | \$100,000 plus |
| FLOWSCIENCE 1-TIME COST | \$13,990.00 | \$51,000.00 | \$128,000.00 | \$61,000.00 |
| 1st YEAR SAVINGS | \$3000-\$7000 | \$9000-\$50,000+ | \$400,000+ | \$30,000 |
| 2nd YEAR SAVINGS | \$17,000 - \$21,000 | \$50,000.00 + | TBD | \$80,000+ |
| 10-YEAR SAVINGS | \$150K + | TBD \$500,000++ Trackability | \$5 million + | \$800,000 + |

3 STEPS

In 3-4 HOURS

- 1 CONSULTATION
- 2 DESIGN & QUOTE
- 3 INSTALLS IN 20 Mins to 1-HOUR



It's Easy to Try FlowScience

FlowScience WORKS
GO WITH THE FLOW

CONSULT TO INSTALL IN **HOURS**
RESULTS IN **WEEKS**



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