



# Green Operations and Management

May 27, 2015



# Maintaining Savings:

## The Role of Operations and Maintenance in Achieving 20% Savings



Better Buildings Summit  
Washington, DC  
May 27, 2015

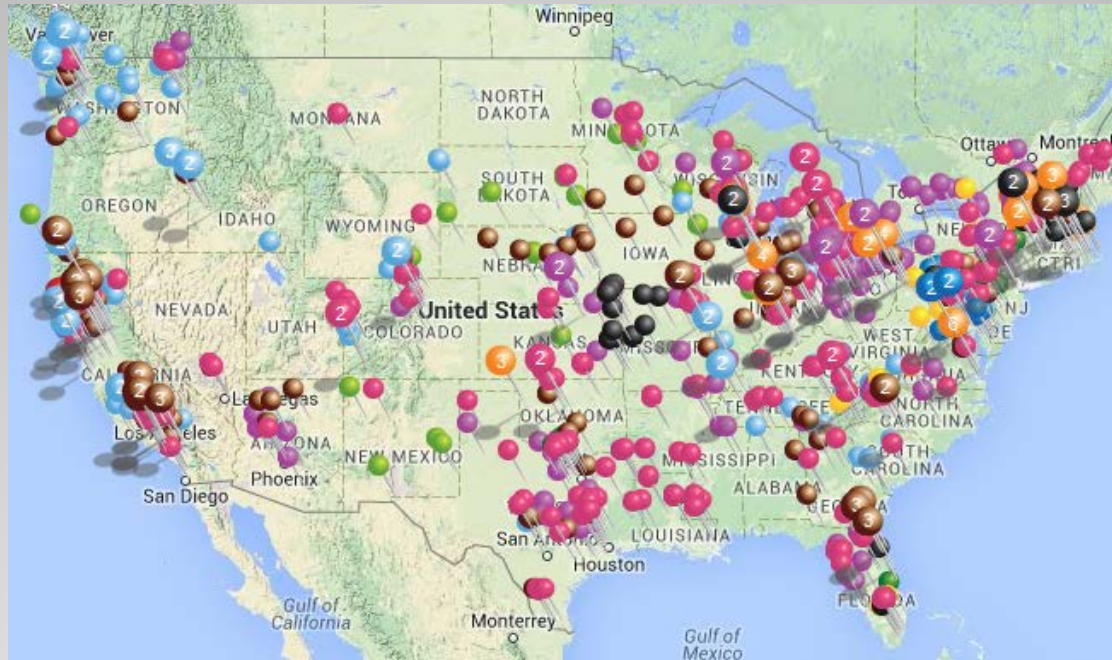
Rebecca Schaaf  
Senior Vice President, Energy  
Stewards of Affordable Housing for the Future

- Who We Are
- Better Buildings Challenge & SAHF Big Reach
- O&M Background
  - Toolkit
  - Trainings
- O&M Work w/ BBC Technical Assistance
- Wrap-up

## Agenda

# Stewards of Affordable Housing for the Future (SAHF):

- A collaborative of eleven exemplary multi-state non-profits
- Provide over 115,000 units of affordable housing across the U.S.



**BRIDGE Housing · The Evangelical Lutheran Good Samaritan Society  
Homes for America · Mercy Housing · National Church Residences · The NHP Foundation  
NHT/Enterprise · Preservation of Affordable Housing · Retirement Housing Foundation  
The Community Builders · Volunteers of America**

## Who We Are



SEARCH

[Home](#) » [Partners](#) » [Better Buildings](#) » [Multifamily Residential Partners](#)



## Expanding to Include the Multifamily Residential Sector

In 2013, the Department of Energy (DOE) and the Department of Housing and Urban Development (HUD) have partnered to expand the Better Buildings Challenge to the multifamily residential sector. This expansion is part of President Obama's Climate Action Plan, which was announced in June and recognizes the role that increased efficiency can play in reducing



[www4.eere.energy.gov/challenge/partners/multifamily](http://www4.eere.energy.gov/challenge/partners/multifamily)

# Better Buildings Challenge

- Launched in May 2013
- 20% energy and water savings from 2010 to 2020
- Savings achieved through multiple “Savings Pathways”
- Commitments:
  - Resident Engagement
  - Improved Operations & Maintenance



## The Big Reach

- Deep Efficiency at New Construction
- Deep Efficiency at Major Rehab
- Discretionary Retrofits
- Appliance Replacements
- Renewable Energy
- Retro-commissioning
- Resident Engagement
- Operations & Maintenance



## Work Plan Development: Pathways to Savings



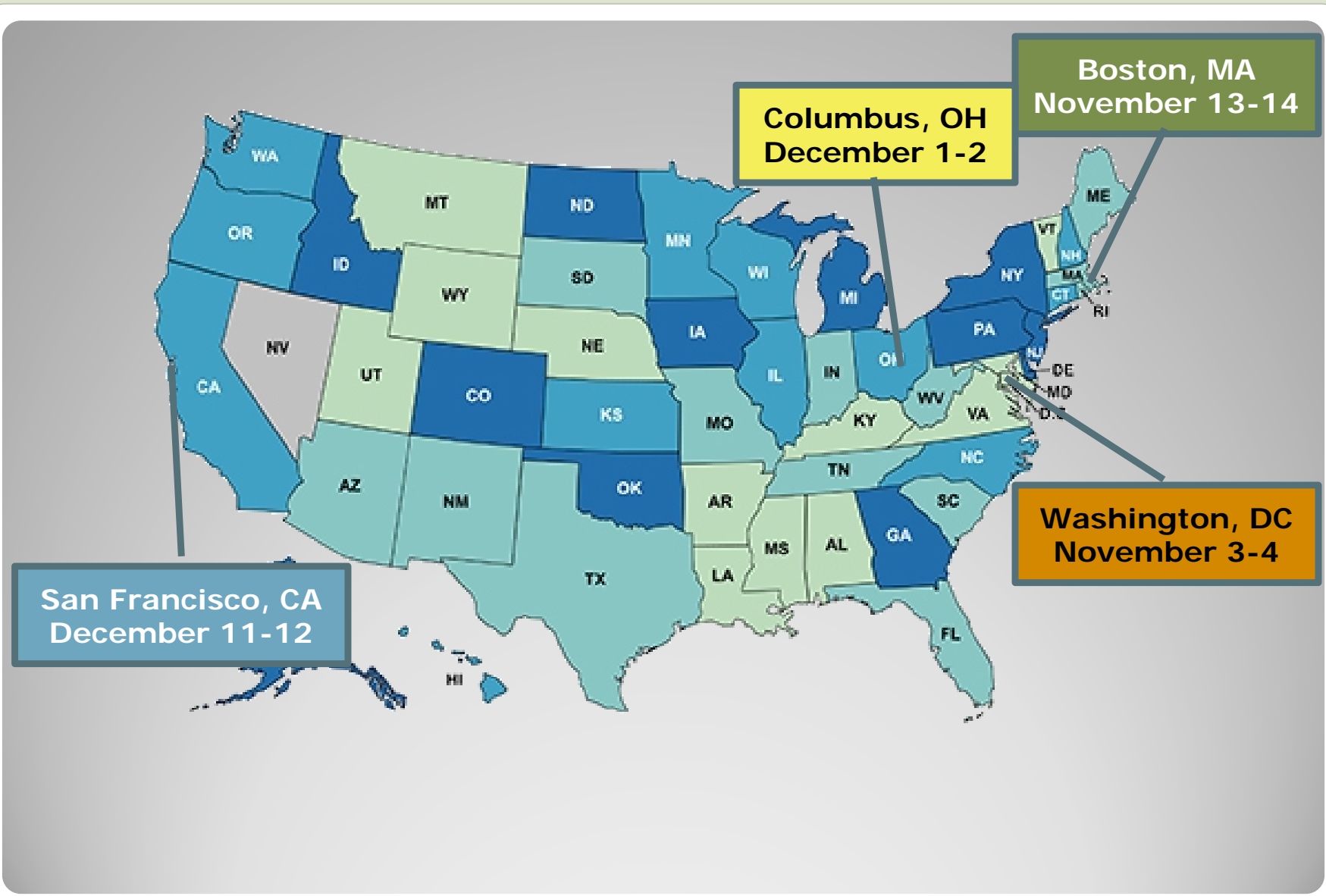
Developed with Bright Power, Inc. ([www.brightpower.com](http://www.brightpower.com))

- Checklists
- Worksheets
- Tips
- References

Available online at <http://www.sahfnet.org/energytoolkit.html>

# Operations & Maintenance Toolkit





# Regional Trainings

Location	Opportunity	Maintenance or capital?	Energy, water and/or comfort improvement?	Who saves (owner or tenant)?
<i>(1<sup>st</sup> floor hall)</i>	<i>(T-12 to T-8 lights)</i>	<i>capital</i>	<i>energy</i>	<i>owner</i>
<i>Look for Opportunities in these areas:</i>		Lighting	Heating & Cooling	Domestic Hot Water
Pumps & Motors	Ventilation	Appliances	Water	Envelope

**Example Worksheet:**

# Energy Opportunity Log



Property Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Completed By: \_\_\_\_\_ Unit #: \_\_\_\_\_

**APARTMENT INSPECTION (Page 1)**

PROCEDURE	DETAILS	Problem Found?	Details:
<b>WATER EFFICIENCY</b>			
1 <u>Bathroom : Showerhead</u> Check the rated flow rate of the showerhead.	Rated flow rate should match the value listed in the "Minimum Equipment Standards" in Property How-to Binder	<input type="checkbox"/> YES <input type="checkbox"/> NO	
2 <u>Bathroom : Faucet</u> Check the rated flow rate of the faucet aerator.	Rated flow rate should match the value listed in the "Minimum Equipment Standards" in Property How-to Binder		
3 <u>Bathroom : Faucet</u> Inspect the aerator cartridge for corrosion.	Inspect the aerator cartridge. Replace any aerators that show signs of damage.		
4 <u>Bathroom: Toilet</u> Check the rated flow rate of the toilet.	Toilet rating (in GPF) should match the value listed in the "Minimum Equipment Standards" in the Property How-to Binder		
5 <u>Bathroom: Toilet</u> Check the toilet tank for leaks.	Drop one capful of Mrs. Stewart's Liquid Bluing into the Tank. If the water in the bowl becomes discolored there is a leak and the flag should be replaced.		
6 <u>Bathroom : Shower</u> Check the tub downspout for leaks while showerhead is On.	Turn the showerhead ON. Check for leaks at the tub downspout for leaks. Repair shower diverter if leaking.		
4 <u>Bathroom:</u> Inspect all accessible plumbing for leaks.	Be sure to inspect all plumbing under the bathroom vanity.	<input type="checkbox"/> NO	



**Example Checklist:**

# Apartment Inspection



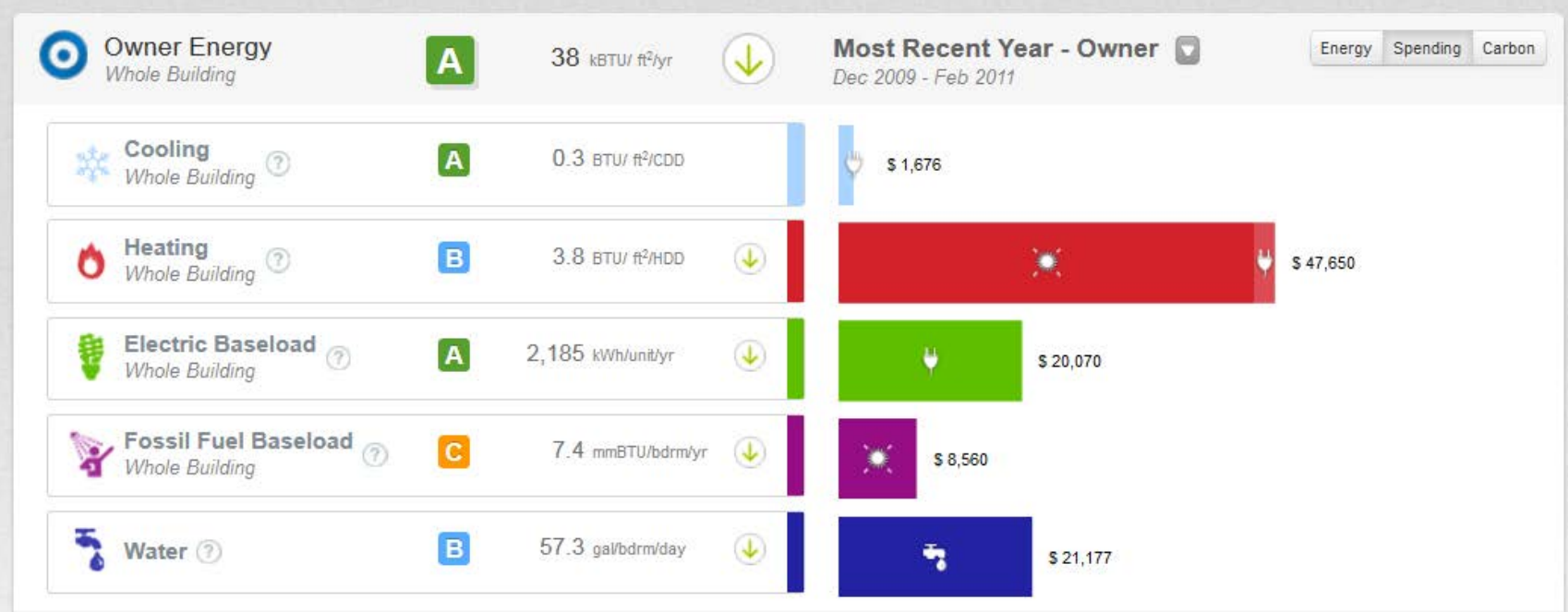
## Property



### Worksheet: Choose a Checklist

Use this worksheet to select checklists that are appropriate for your property, and keep track of checklists in use in your portfolio. Checklists are grouped into seven system types as shown below. We recommend that you **choose one sub-system** to address in the first phase of your O&M program roll out. Browse the checklists listed in this worksheet and posted on [sahfnet.org/energy](http://sahfnet.org/energy).

#### 1. Choose a building sub-system based on the highest priority area for O&M at your property:



# Example Worksheet: Set Priorities

- Water
- Lighting
- Envelope
- In-unit Inspections
- One of:
  - Small HVAC
  - Central Heating
  - DHW



# Training Curriculum

- HUD Funding
- Enterprise Community Partners
- Bright Power
- SAHF Members



**BBC TA:**

**O&M Roadmaps**

performance standards equipment  
Provide schedule  
results Protocols Energy Materials  
Survey Yardi practices Staff water  
plumbing Managers fixtures recommend  
System metrics points replacement Review  
DHW maintenance O&M on-site  
procedure set existing HVAC lighting  
data checklists reporting properties  
tracking use inspection Appliances site Conduct  
contracts operating additional Policy Test reports  
inspections procedures Develop  
minimum Property  
Document work orders preventative maintenance  
Training systems recommended

WordItOut

## Roadmap Word Cloud

Tracking

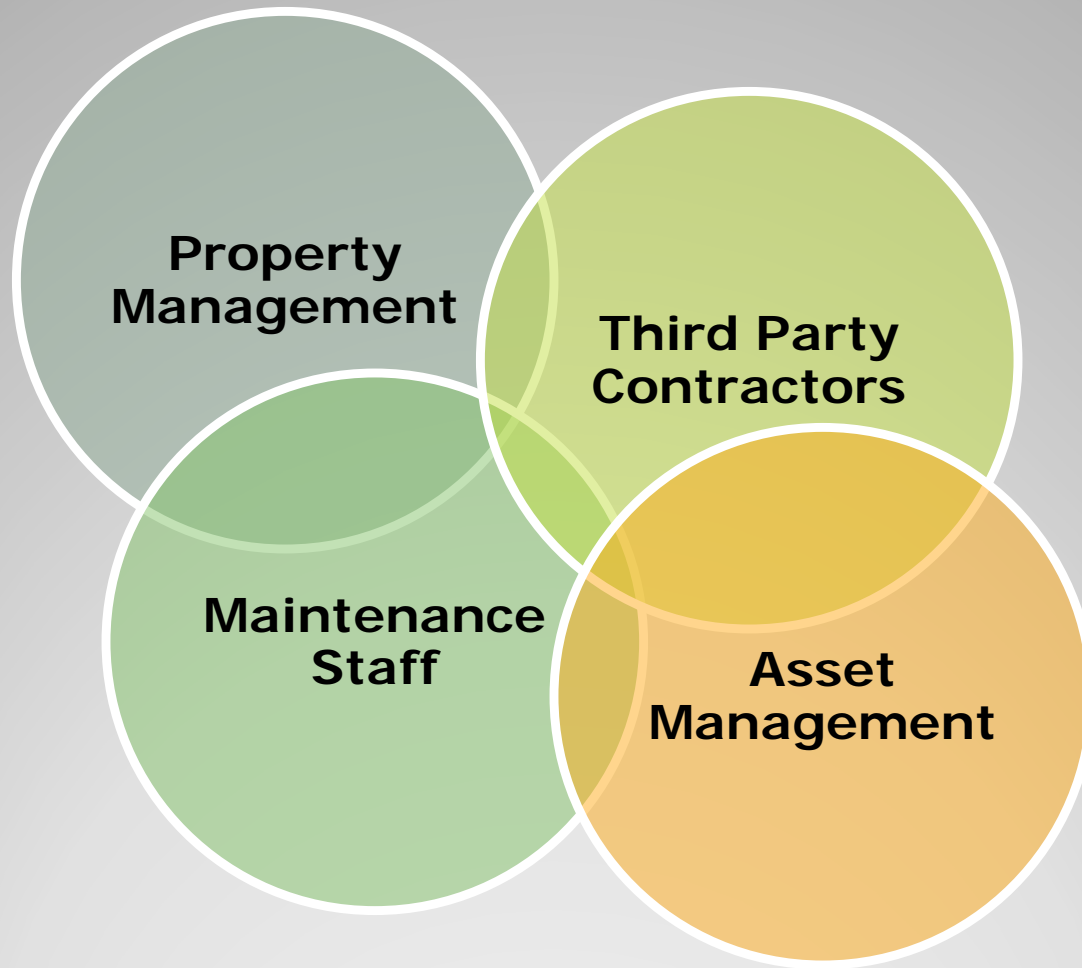
Consistency

Reporting

Portfolio Approaches







## Who's Involved

- What is written down centrally?
- Is it broad enough?
- How is it communicated to staff?
- Is it being followed?



## Energy Policies

**\*All equipment installed at this property must meet or exceed the standards listed below\***

PLUMBING	
<i>Fixture Type</i>	<i>Flow Rate (GPM)</i>
Shower	1.5
Bathroom Faucets	1.0
Kitchen Faucets	1.5
Toilets	1.28 GPF

HOT WATER TEMPERATURE	
Desired:	120 °F
Maximum:	130 °F
Minimum:	110 °F

*NOTE: Hot Water temperature should always be measured at a faucet.*

HOT WATER HEATER REPLACEMENT		
<i>Fuel Type:</i>	<i>Efficiency Rating</i>	<i>Rating Type</i>
Electric w/Tank	2.0	EF (Energy Factor)
Natural Gas w/Tank	0.67	EF (Energy Factor)
Natural Gas (Instant)	0.82	EF (Energy Factor)

CARPET & PAINTING		
<i>Material</i>	<i>Required Label</i>	<i>Brand</i>
ALL PAINT	Low-VOC	Sherwin Williams
Living Room Carpet	24 oz. Green Label	n/a
Common Area Carpet	26 oz. Green Label	n/a

HVAC Required Efficiencies		
<i>Equipment Type</i>	<i>Efficiency Rating</i>	<i>Rating Type</i>
Central A/C	14.5	SEER
Gas Furnace	90%	AFUE
Heat Pump	8.2 / 14.5	HSPF / SEER

HVAC Setpoints		
<i>Season</i>	<i>Day (7am - 9pm)</i>	<i>Night (7am - 9pm)</i>
Winter	68 °F	64 °F
Summer	78 °F	82 °F

*NOTE: See Appendix for procedures in determining if appliances meet ENERGY STAR Certification Standards*

APPLIANCES	
<i>Fuel Type:</i>	<i>Efficiency Rating</i>
Refrigerators	ENERGY STAR Label
Dishwasher	ENERGY STAR Label
Dryers (Common Area)	ENERGY STAR Label

*NOTE: ALL Common Area HVAC Systems should be equipped with programmable thermostats.*

# Standards

- Procedures, checklists, schedules
- Prioritization guidance
- Operational guidelines
  - Set points
  - Schedules
- Troubleshooting recommendations
- Reporting methodology



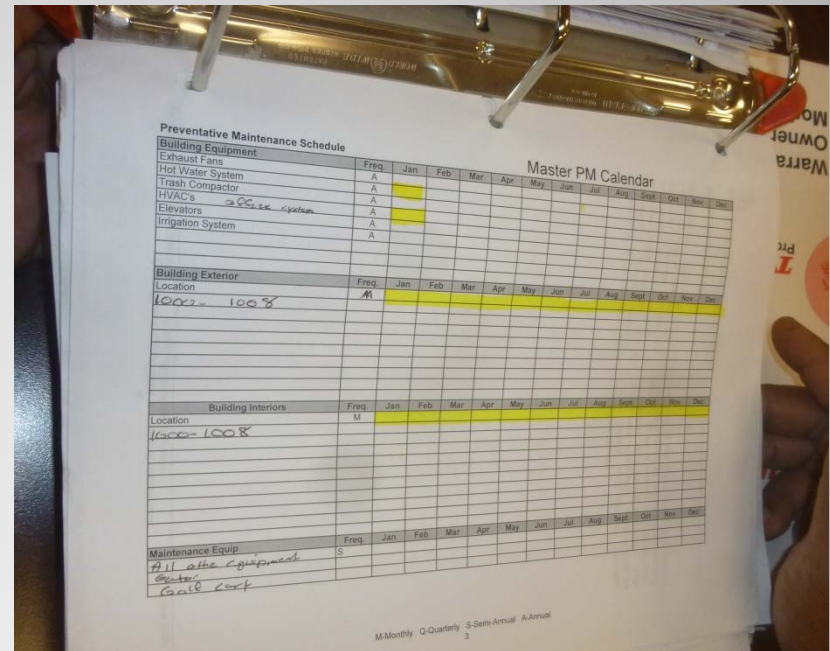
# Inspections

- Review existing contract terms
- Add additional tests/procedures
- Reporting procedures
- Report review process
- Performance criteria to trigger follow up
- Work order tracking for proactive PM



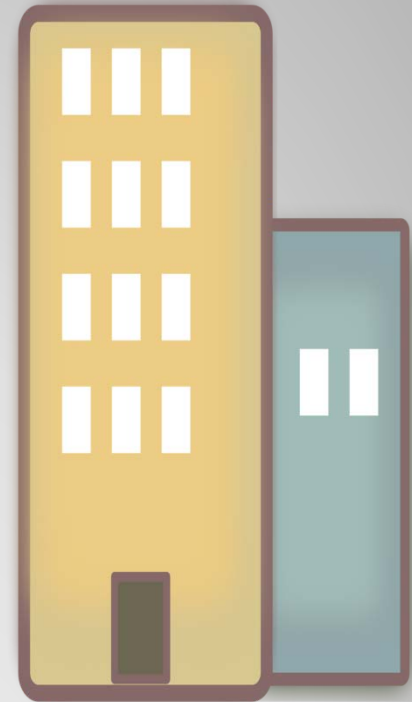
## Third Party Maintenance

- Review existing schedules/processes
- Investigate use of mobile devices
- Target worst-performing properties
- Procedures to cover:
  - Testing
  - Metrics
  - Actions
  - Reporting
  - Verification
  - Monitoring



# Preventative Maintenance

- Survey Maintenance Staff/Property Needs
- Survey Existing Equipment
- Site Visits



**Inputs**

- Staff Training
  - Curriculum, materials
- Pilot at Test Sites
  - Train, implement, collect feedback, revise
- Spot-check Procedures

O & M  
BOOT  
CAMP



**Implementation**



Vigilance



```
graph TD; A[Vigilance] --> B[Standards]; B --> C[Communication]; C --> D[Follow Through]
```

Standards

Communication

Follow Through

**What Does it Take?**

A PROMISE

&

A REQUEST

**Wrap Up**

- My Contact Info:
  - Rebecca Schaaf
  - [rschaaf@sahfnet.org](mailto:rschaaf@sahfnet.org)

- O&M Toolkit:  
<http://sahfnet.org/energytoolkit.html>

**Contact Info & Web Link**

# GREEN OPERATIONS AND MAINTENANCE

Better Buildings Summit

May 27<sup>th</sup>, 2015

Washington, DC

Toby Ast

Director of Energy Management

Preservation of Affordable Housing, Inc.

# Agenda

- Background on POAH
- Collecting Utility Data
- Green O&M Manual
- Capturing Site Information
- Measuring Results

# Non-Profit Developer and Owner



# Utility Bill Data: Outsource if you can

wegowise

Dashboard Properties Reports Help tastpoah

All Deve

Welcome POAHENERGY: [Account Settings](#) | [Contacts](#) | [Help](#) | [Sign Out](#)



MyPortfolio

Sharing

Planning

Reporting

Recognition

Properties (12)

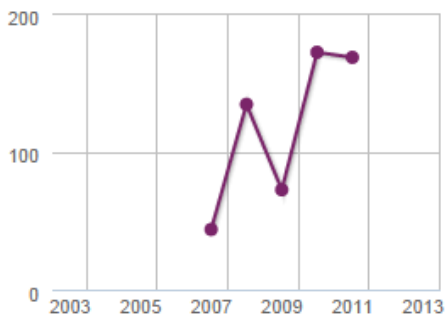
Add a Property

Notifications (1)

You are connected to [Barry Poage](#).

Clear

Source EUI Trend (kBtu/ft<sup>2</sup>)



Properties (12)

Add a Property

Filter by:

Search

Search

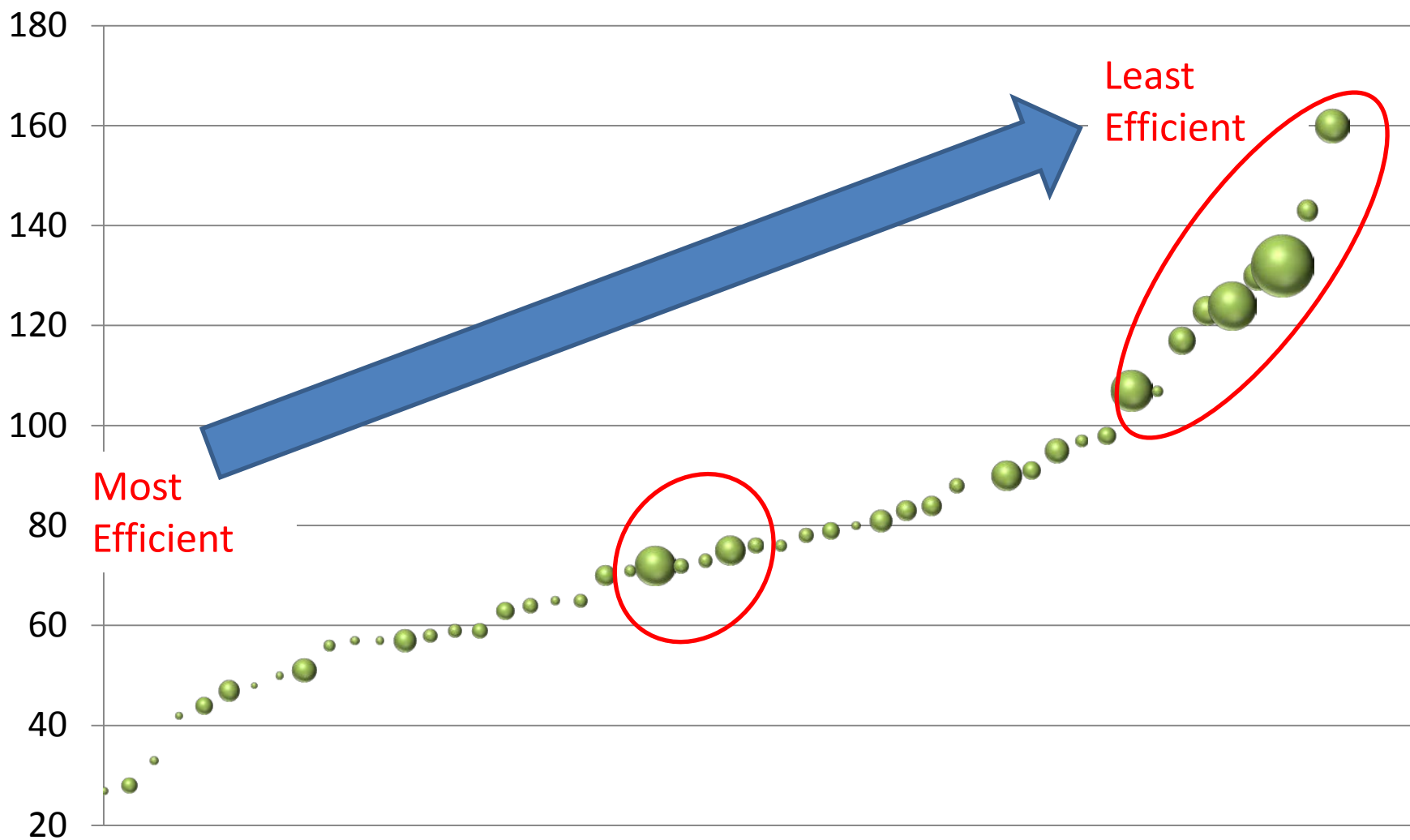
[Create Group](#) | [Manage Groups](#)

Name	Action
<a href="#">8330 On the River</a>	I want to...
<a href="#">920 On the Park</a>	I want to...
<a href="#">Blackstone</a>	I want to...
<a href="#">Colony Plaza</a>	I want to...
<a href="#">Fairweather Beverly</a>	I want to...

Total GHG Emissions Trend (Metric Tons CO<sub>2</sub>e)

6k

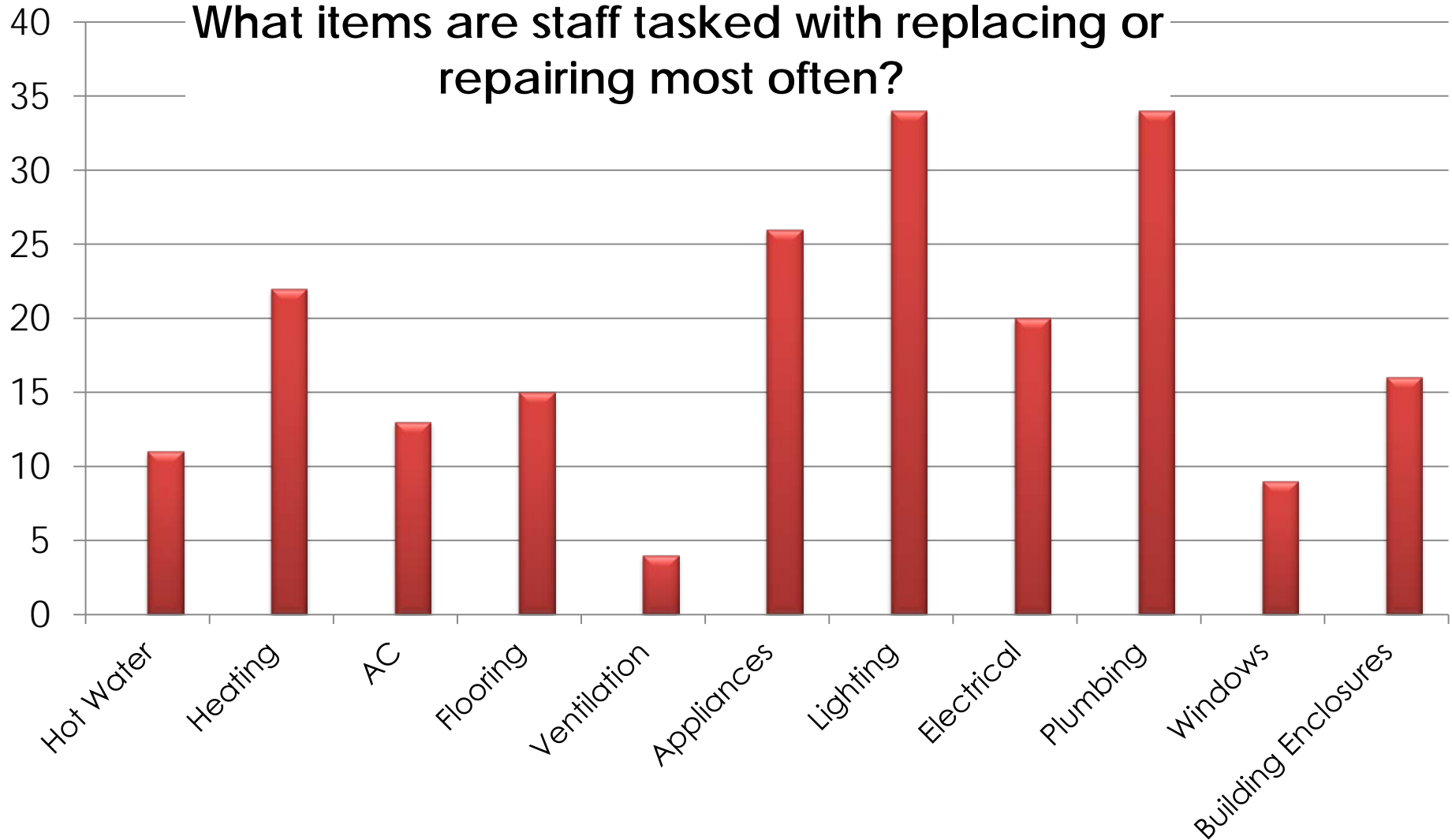
# Prioritization is Key





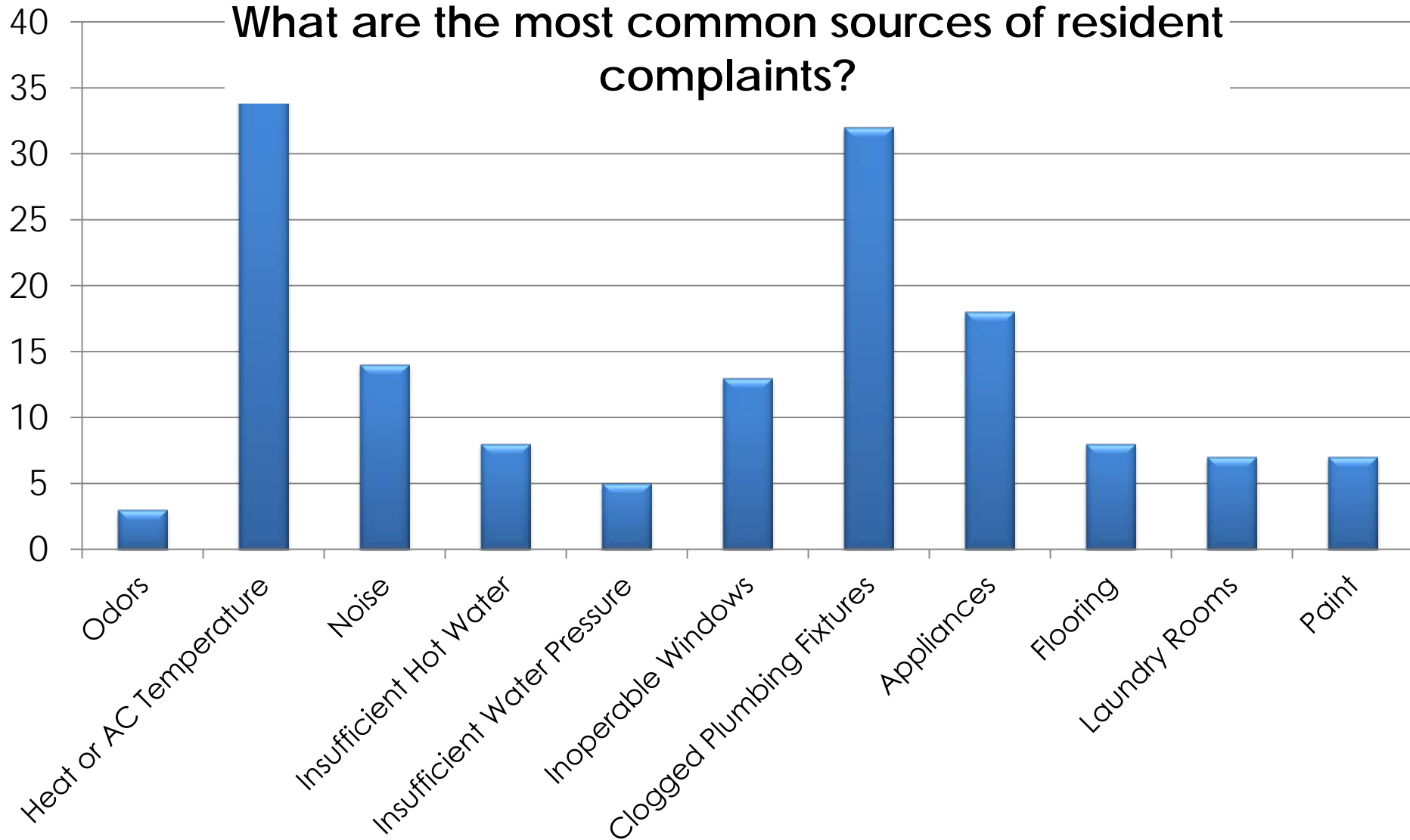
# Green O&M = Good O&M

**What items are staff tasked with replacing or repairing most often?**



# More Efficient, More Satisfied Tenants

## What are the most common sources of resident complaints?



# Guidance for the Properties

showerhead flow rate	savings potential
	0%
	10%
	20%
	30%
	40%
	50%



## 8330 On the River

Premier Senior Living

A POAH Community

Professionally Managed by POAH Communities

Labeled

S



## Garbage Disposal Do's and Don'ts

Proper maintenance and operation will extend the life of your garbage disposal and prevent plumbing and drain mishaps.

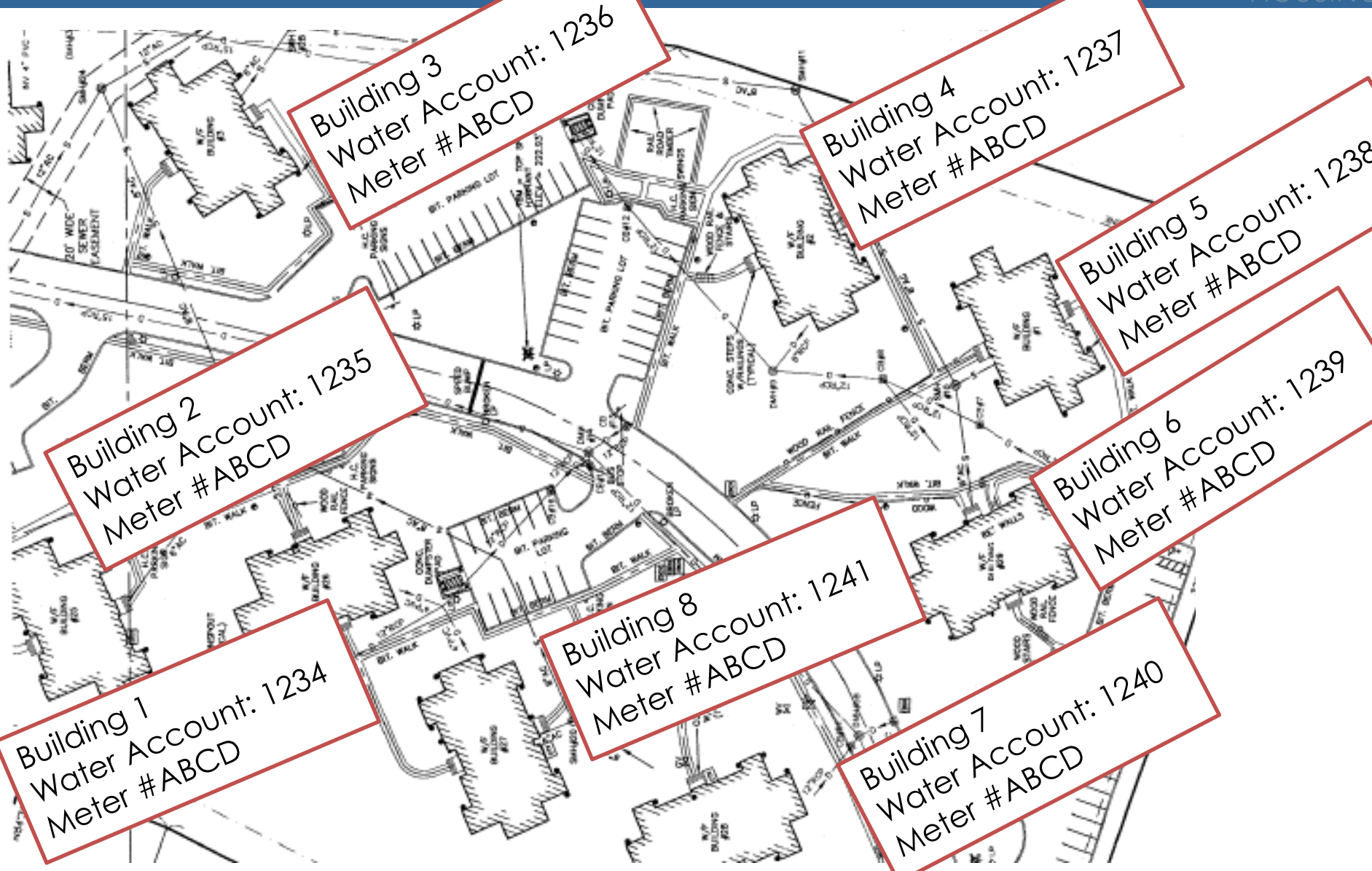


**Good Practices Today Can Prevent Major Plumbing and Drain Problems Tomorrow!**

ask about

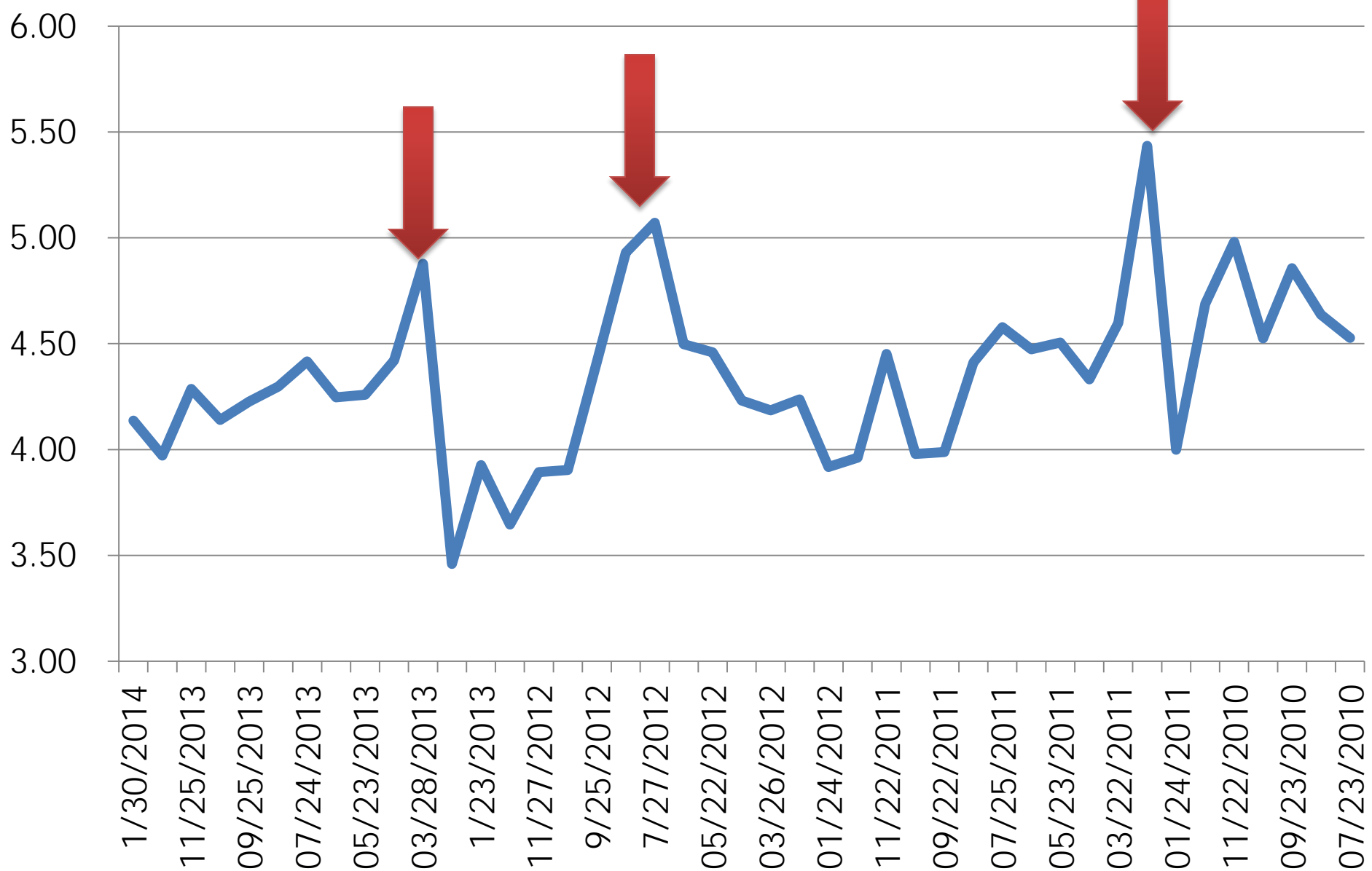


# What Account? What Building?





# Narrow It Down



# What Equipment Do I Have?

Domestic Water Heating	Space Heating	Cooling	Ventilation	General Building Information	Maintenance Feedback
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## Domestic Water Heating

The following questions relate to the domestic water heating equipment that provides hot water for the resident units at your property. This is the equipment that heats water for resident showers and sinks. The hot water can be generated by a central hot water heater, individual hot water heaters, or be supplied from the heating system equipment (boiler or furnace). If the domestic water is circulated to the units by motorized pumps please indicate yes or no and use the Circulation Pump worksheet to provide detailed information for the pumps.

### SECTION A: Domestic Hot Water System Type

1. What domestic hot water system(s) does your property utilize? Check all that apply. **\*Required**

- Central Domestic Water Heater (typically located in mechanical rooms)
- Individual Hot Water Heaters (located in residential units)

### SECTION B: Central Domestic Water Heating

If your property has a central hot water heater system, please answer this section. If not, please skip this section and proceed to "Section C: Circulation Pump- Hot Water".

2. What is the fuel source for domestic water heating system?

- Natural Gas
- Electric
- Oil
- Propane
- I don't know (describe in text box provided)

*text box*

# How Do I Take Care of Equipment?

## Water

### APARTMENT WATER TASKS

BUILDING NAME \_\_\_\_\_ MONTH \_\_\_\_\_ YEAR \_\_\_\_\_

LOCATION \_\_\_\_\_ OPERATOR NAME \_\_\_\_\_

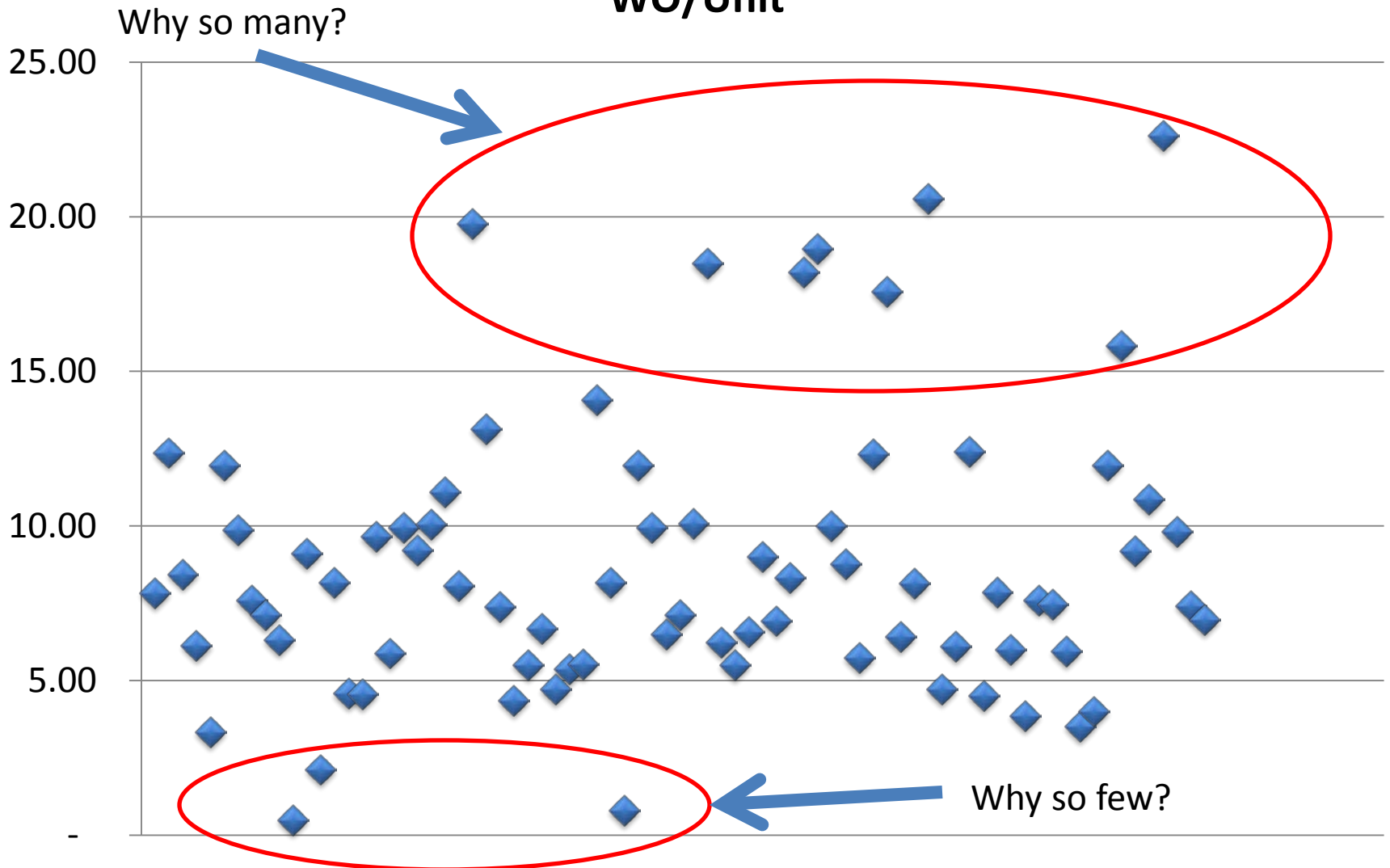
APT # \_\_\_\_\_ EMERGENCY CONTACT \_\_\_\_\_

PROCEDURE	DETAILS	COMPLETE?	COMMENTS / ISSUES	SIGN
<i>WATER EFFICIENCY</i>				
1	Confirm efficient showerhead installed in bathrooms.	Maximum flow rate of 1.5 GPM	<input type="checkbox"/> YES <input type="checkbox"/> NO	
2	Confirm efficient sink aerators installed in bathrooms.	Maximum flow rate of 1.0 GPM	<input type="checkbox"/> YES <input type="checkbox"/> NO	
3	Confirm water efficient toilet installed in bathrooms.	Maximum flow rate of 1.6 GPF	<input type="checkbox"/> YES <input type="checkbox"/> NO	
4	Check all plumbing fixtures for leaks and corrosion.		<input type="checkbox"/> YES <input type="checkbox"/> NO	
5	Check toilet tanks for leaks with dye pill.	Replace toilet flapper if leak found.	<input type="checkbox"/> YES <input type="checkbox"/> NO	
6	Check hot water temperature.	Call manager if over 120F.	<input type="checkbox"/> YES <input type="checkbox"/> NO	

<http://sahfnet.org/energytoolkit.html>

# 12 Month Average WO/Unit: 8.7

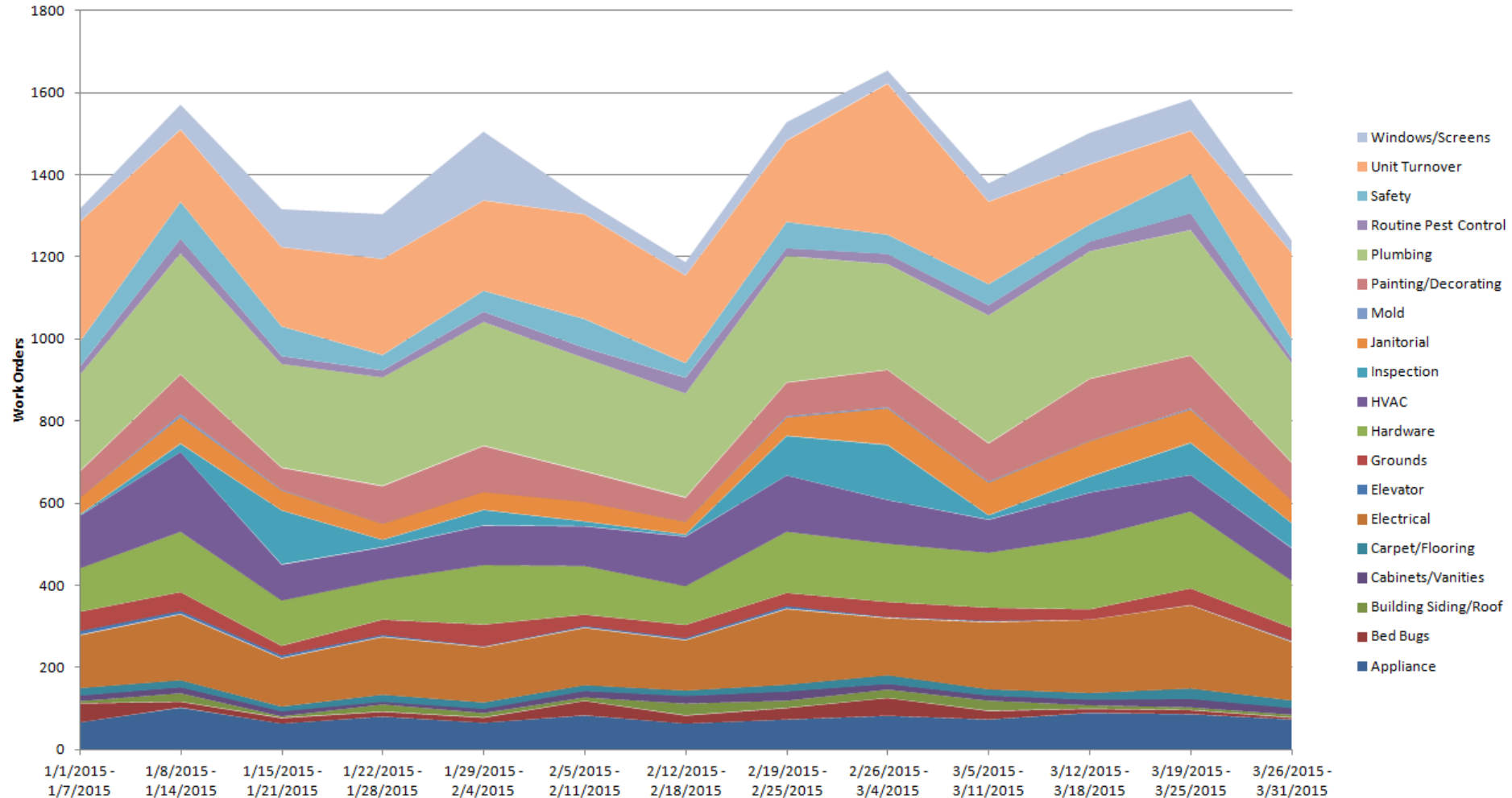
## WO/Unit





# Track Results over Time

### Number of Work Orders by Task Category



Thank You!

Toby Ast

617-449-0871

[tast@poah.org](mailto:tast@poah.org)



Quality Affordable  
Housing Communities

# Going Green in 3 “Easy” Steps – *It’s not just about the buildings, it’s how we live and work in them*

Presented by:  
Jennifer Reed - Director, Fund Development and Public Relations  
Eden Housing



Eden Housing, Inc.  
22645 Grand Street  
Hayward, California 94541  
510.582.1460  
[www.edenhousing.org](http://www.edenhousing.org)



# Set Clear Goals



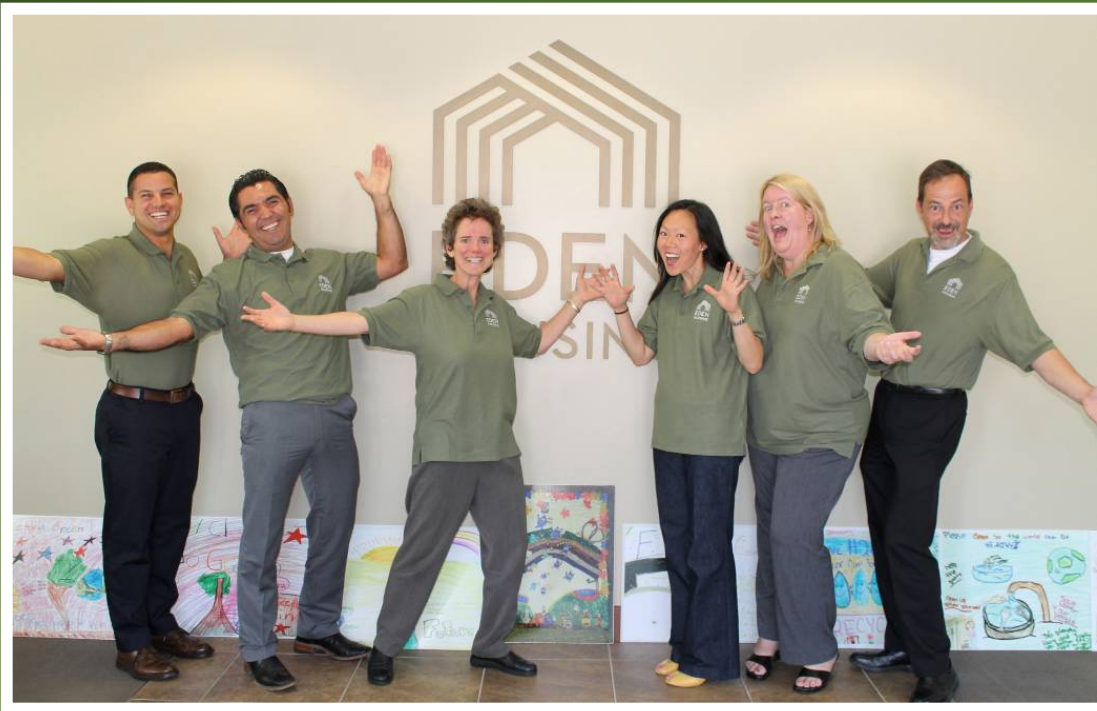
# Step 1: Building Retrofits



# Step 2: Engage the Staff



# Green Steering Committee (Green Police)





# Train the Staff



## Green Operation & Maintenance Manual



# Create “Field Leaders”





## Step 3: Engage the Residents



# Enlist the Children



# Celebrate Accomplishments!



# Measuring Our Success



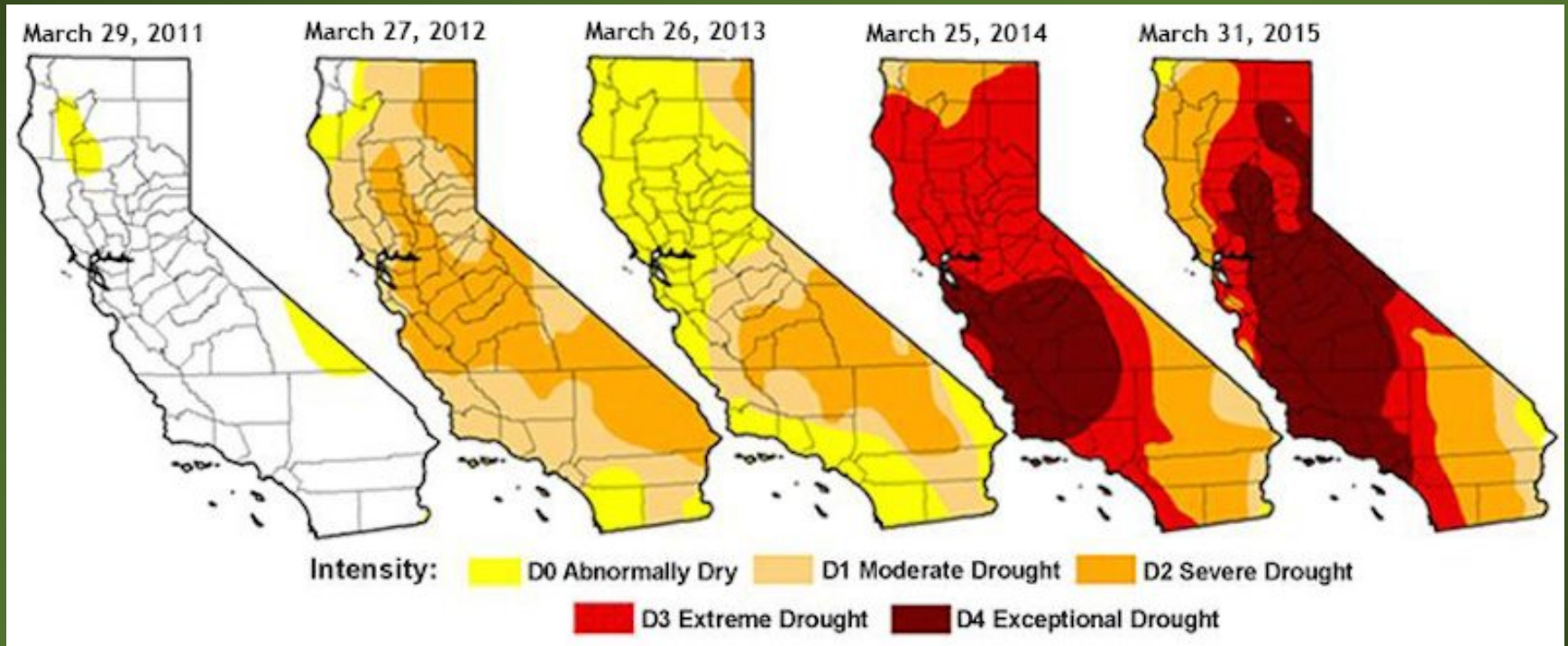
## CONSERVICE



# Lessons Learned

- Keep it Simple
- Integrate Green into Existing Work
- Peer Pressure Matters
- Savings doesn't always = reduced cost
- Pilot Projects Test Success and Problems
- Don't Expect Instant Success
- Recognition is Critical

# What's Next?





# Next Steps

- 2015: Water
- Greening the Merger Portfolio
- Measurement Tools
- Recognition





EDEN  
HOUSING

