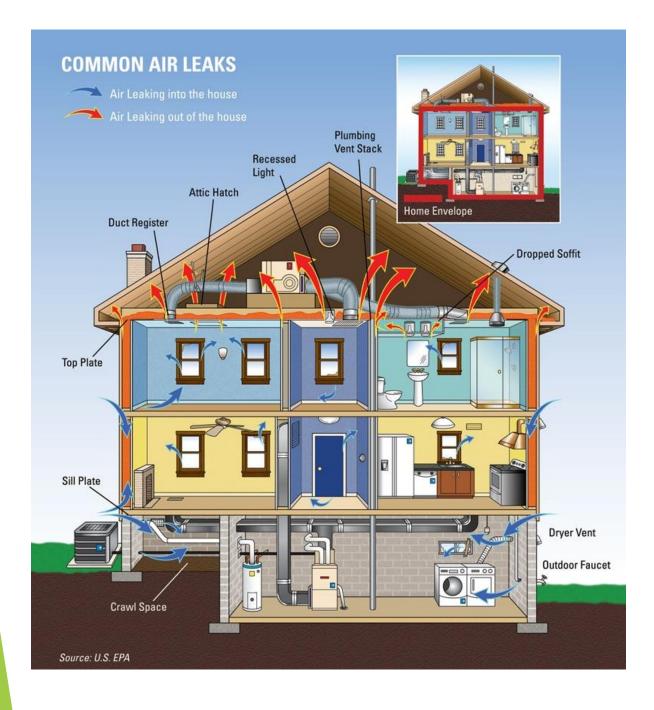


**Energy Audits** 

What are they
And
Why have one?



In typical home construction, about 25% - 40% of energy used for heating and cooling is wasted due to air leakage.

### Video:

From Energy Dept – 4 minute

https://www.energy.gov/energysaver/weatherize/home-energy-audits

## Typical Energy Audit Services:

#### Walk through

Consultation and list of recommendations

1-2 hours \$100-\$200

Reports will be a checklist of ways to reduce energy use

### Comprehensive:

Walk through with diagnostic tests including blower door test and infrared cameras, combustion

3-4 Hours \$300-\$600

A full report with diagnostic results, recommendations, costs, priorities, and payback period.

Management of rebates

#### Once you have found the leaks, Benefits of Fixing Leaks

- Improved comfort
- Improved air quality
- Lower utility bills
- Fewer condensation problems (mold and mildew)
- Increased re-sale value due to these benefits.
- Keep in mind that payback period may be long because of cheap energy in our area.
- Best of all less GHG will be emitted from your home!

## Some Possible Recommendations to Reduce Energy Use

LED lighting (85% less electricity needed)
Seal leaks in building envelope by caulking
Seal leaks in duct work
Add insulation to attic and crawl spaces
Add insulation to floors, walls, basement
Wrap 6' of water lines
Insulate Hot water heater
Weatherstrip doors and windows

When ready to replace:

New windows

New Furnace/AC, Hot Water Heater, Appliances (Energy Star)

## A few things you can do on your own to save energy - not associated with leaks

#### You can start with small changes to your daily routine

## LED Lights



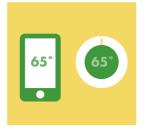
Save up to \$100 every year

Plug electronics into power strips and switch them off to prevent "vampire power" loss



Save up to 11% on water heating

Lower the temperature of your water heater to 120F



Save up to \$180 every year

Use a programmable thermostat to reduce heating and cooling when you're sleeping or away from home, without sacrificing comfort



Reduce heating and cooling costs by up to 15%

Replace old and dirty filters

#### **First Step for Residential Energy Audits:**

- Send out a request for services and costs.
- See list of accredited providers from Dominion Energy
  - (We have a list of about 50 certified auditors in the NOVA region.)
- Make sure the firm is licensed. (HERS or BPI)

#### Ask for the services they provide:

- the length of visit,
- which tests,
- the cost and
- the type of report they will provide
- help with rebates

#### **Building Performance Institute (BPI)**

certification for home performance contractors. Focusing on the house as a system approach, **BPI** emphasizes the interdependence of building systems as they relate to energy consumption.



Home Energy Rating System (HERS) The Energy Commission requires licensed contractors to seal and test the ducts of a home when an HVAC system is installed or replaced.

#### Three examples of Energy Auditors in our Area and their offerings:

#### The Home Energy Detective, Inc.

https://www.homeenergydetective.com/

**Comprehensive** 4-5 hours \$600

Blower Door and infrared Diagnostics

Combustion Efficiency for Natural gas Appliances

Full Report with results, recommendations, priorities, costs and payback periods

100% of cost can be rolled into retrofit cost

Clipboard Audit 2 hours \$300

Consultation, no diagnostics

List of recommendations

#### Three examples of Energy Auditors in our Area and their offerings:

#### **Home Energy Saving Solutions**

https://virginiaenergyaudit.net/home-energy-audit

**Comprehensive** 2-3 hours \$400

Blower Door and infrared Diagnostics

Combustion Efficiency for Natural gas Appliances

Full Report with results, recommendations, priorities, costs and payback periods

100% of cost can be rolled into retrofit cost

Visual Walk Through 1 hour \$100

Consultation, no diagnostics

List of recommendations

#### Three examples of Energy Auditors in our Area and their offerings:

#### **Edge Energy** in Maryland:

https://www.edge-gogreen.com/energy-audits/home-energy-audits/

Comprehensive 3-4 hours \$400

Blower Door and infrared Diagnostics

Combustion Efficiency for Natural gas Appliances

Full Report with results, recommendations, priorities, costs and payback periods

50% of cost can be rolled into retrofit cost

Visual Walk Through 1 hour \$100

Consultation, no diagnostics

List of recommendations

#### **Group Discounts**

They have worked with faith groups before

#### An example of a Non-Profit Energy Auditor in our Area and their offerings:

Local Energy Alliance Program LEAP (Charlottesville and NOVA)

This group also does home energy audits – a non profit

https://leap-va.org/

This group offers a comprehensive Audit for \$45 for Dominion customers: 1.5 hour with infrared cameras and blower door test. Report with findings and recommendations.

## Residential Energy Audits from Dominion

#### Program Details - provides customers with a qualified contractor:

- Conduct a 30-60 minute walk-through of your home
- Install simple measures like LED bulbs and water heater pipe insulation
- May require separate appointments with specific contractors:
  - Heat pump tune-up
  - > Duct sealing/insulation on heat pump systems/ AC units
  - > Heat pump and electric water heater system upgrades
  - > Fan motor replacements on heat pump systems and AC units

#### **Program Benefits**

- Access to pre-qualified contractors who can perform both the assessment and recommended improvements
- A personalized report containing cost-effective options and easy-to-follow recommendations to help you reduce your energy usage
- Potential financial incentives (rebates) that help to offset cost for installing the recommended improvements

Smart Thermostat Purchase, Installation and Rebate (\$100)

# Residential Energy Audits from Dominion

#### Website:

https://domsavings.com/va/rhea/

#### Sample Report:

https://domsavings.com/wp-

content/uploads/2020/01/Sample-HEA-Homeowner-Report.pdf

#### **Fairfax County Dept of Environment and Energy**

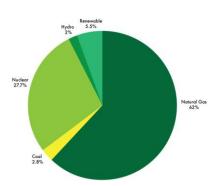
Worth looking around the site for local information

https://www.fairfaxcounty.gov/environment-energy-coordination/videos

#### VirginiaEnergySense.org

Look at Energy 101 – About your power

https://www.virginiaenergysense.org/energy-101/about-your-power/



## Tools and Tips in Energy Sense leads to Yardstick: From EnergyStar.gov

Home > Home Improvement > Home Energy Yardstick



#### Assess the energy efficiency of your home and see how it measures up:

EPA's Home Energy Yardstick provides a simple assessment of your home's annual energy use compared to similar homes. By answering a few basic questions about your home, you can get:

- Your home's Home Energy Yardstick score (on a scale of 0 to 10);
- Insights into how much of your home's energy use is related to heating and cooling versus other everyday uses like appliances, lighting, and hot water;
- · Links to guidance from ENERGY STAR on how to increase your home's score, improve comfort, and lower utility bills; and
- An estimate of your home's annual carbon emissions.

Learn more about how the Home Energy Yardstick works.

See a sample results page.

#### **Getting Started:**

To calculate your Yardstick score, all you need is some basic information about your home:

- Your ZIP code:
- Your home's square footage;
- Number of full time home occupants;
- A list of all the different fuels used in your home (e.g., electricity, natural gas, fuel oil); and
- Your home's last 12 months of utility bills (usually found in the 12 month summary provided on your bill or through a Green Button file (2).

Having trouble with the Home Energy Yardstick? Contact us at yardstick@energystar.gov.



Click here to create an account!

## Energy Audits for Commercial Buildings Such as Parish Buildings

AHSRAE Levels (American Society of Heating, Refrigerating and Air-Conditioning Engineers)

http://www.energyadvantage.com/blog/the-difference-between-ahsrae-level-1-2-3-energy-audits/

The primary function of an energy audit is to identify all of the energy streams in a facility in order to balance total energy input with energy use. The four main objectives of an energy audit are as follows:

- To establish an energy consumption baseline;
- To quantify energy usage according to its discrete functions;
- To benchmark with similar facilities under similar weather conditions; and
- To identify existing energy cost reduction opportunities.

Type of Audit	Type of Audit Brief Description
Level 1	<ul> <li>Brief on-site survey of the building</li> <li>Savings and cost analysis of low-cost/no-cost Energy Conservation Measures (ECMs)</li> <li>Identification of potential capital improvements meriting further consideration</li> </ul>
Level 2	<ul> <li>More detailed building survey</li> <li>Breakdown of energy use</li> <li>Savings and cost analysis of all ECMs</li> <li>Identification of ECMs requiring more thorough data collection and analysis (Level 3)</li> </ul>
Level 3	<ul> <li>Attention to capital-intensive projects identified during the Level 2 audit</li> <li>More detailed field analysis</li> <li>More rigorous engineering analysis</li> <li>Cost and savings calculations with a high level of accuracy</li> </ul>

#### SJN ENERGY USAGE AND CO2 EMISSIONS (Updated 3/16/2021)

#### NATURAL GAS

(Heating in Main Church, Chapel, Offices in Original Building Footprint)

Year	Heating Degree Days	Cost (\$)	Average Cost \$/therm	Normalize d Usage (therms)	CO2 Emission Factor (lbs/therm)	CO2 Emissions (tons)
2013	3,553	13,368	0.92	14,403	11.8	85
2014	4,092	13,388	0.86	13,116	11.8	77
2015	3,529	11,860	0.83	14,279	11.8	84
2016	3,281	12,837	0.85	16,149	11.8	95
2017	3,002	10,904	0.86	14,532	11.8	85
2018	3,601	12,743	0.80	15,697	11.8	92
2019	3,336	13,113	0.98	13,987	11.8	82

Cost data from SJN Utility Bills

Normalized Usage = Actual Usage from Utility Bills Adjusted for Difference in Heating Degree Days Compared to 2015 CO2 Emission Factor from EPA AP-42 Emission Factor Document, Section 1.4 Natural Gas Combustion

#### **ELECTRICITY**

(Lighting: Church, Chapel, Parish Hall, Hallways, Classrooms, Offices, Outside, Parking)
(Cooling: entire footprint)

(Heating: Heat Pumps and Resistance Heating in Parish Hall and Classrooms)

Year	Cooling Degree Days	Cost (\$)	Average Cost \$/kw-hr	Normalized Usage (kw-hr)	CO2 Emission Factor (lbs/kw-hr)	CO2 Emissions (tons)
2013	2,023	94,521	0.091	1,228,992	0.797	490
2014	1,689	78,729	0.075	1,021,220	0.787	402
2015	2,110	78,763	0.086	919,810	0.750	345
2016	2,334	67,222	0.081	835,441	0.709	296
2017	2,083	66,081	0.085	856,740	0.621	266
2018	2,337	66,354	0.082	766,767	0.614	235
2019	2,257	66,431	0.081	823,430	0.524	220

Cost data from SJN Utility Bill;

Normalized Usage = Actual Usage from Utility Bills Adjusted for Difference in Cooling Degree Days Compared to 2015 (assuming 17% of electricity use is for cooling; remainder of usage for lighting, refrigeration, computers, etc. is unadjusted); CO2 Emission Factor is a Weighted Average for Generation in Virginia, from DOE/EIA EIA-923 Monthly Generation and Fuel Consumption Time Series File coupled with EPA AP-42 Emission Factors for Coal, Oil, and Natural Gas (assuming generation from combined cycle units)

#### **ENERGY AUDIT (May 2014)**

**Pre-audit Actions (around 2012):** Installed *LED lighting* in main church area and exit signs, *motion detectors* for lighting in most offices/classrooms/restrooms

**Action 1 (late 2014):** Used *Permafrost additive* to remove "oil fouling" from air conditioning compressors, resulting in less energy use by achieving set temperatures quicker, extending the useful equipment life and improves the efficiency of the system (~20% less energy)

**Action 2 (late 2014):** Replaced single speed *air handler motors* with variable frequency drives to tune the airflow to building needs, makes the air handler more efficient (~40% less energy).

**Action 3 (late 2014):** Installed *LEDs in Parish Hall, Chapel, Parking Lot, most offices/classrooms.* LEDs use less power (watts) per unit of light generated (lumens). Chapel – 1,750 watts reduced to 140 watts, equivalent lumens; Parish Hall – 7,448 watts reduced to 836 watts; Parking Lot – 25,000 watts reduced to 2,500 watts; also reduces maintenance costs since LEDs have a much longer life.

#### **Summary:**

Consider setting up an energy audit for your home Walk through or Comprehensive

Some improvements you might do on your own, Other tasks will require a contractor

There are many easy fixes to reduce energy consumption - that translates into reduced GHG.

#### Plans for SJN?

Organize a group effort for many audits and arrange for a donation to SJN from company(ies)

Investigate non profit group to visit renters?

### List of Energy Auditors in Northern Virginia - Provided by Dominion Energy

List of Energy Auditors in Northern Virginia Region - Provided by Dominion Energy

#### Energy Auditors - HERS and BPI Certified - 062718

Company	Contact	Street	City	Region	State	Zip Phone	Email contact	Certifications
Accurate Insulation,LLC	Bob Burgess	15121 Marlboro Pike	Upper Marlboro	VA/DC/MD Metro	MD	20772301-627-6506	bobburgess@accurateinsulation.com	ВРІ
Air-Right Energy Design Inc.	Craig Carter and Rick Graham	12167 Livingston Road	Manassas	VA/DC/MD Metro	VA	20109703530-0166	CCarter@air-right.com	ВРІ
American Green Engineering Solutions	Peter M. McGuire	P.O. Box 393	Nokesville	VA/DC/MD Metro	VA	20182703-975-1759	Amerigreenengsol@gmail.com	HERS
Amicus/Access Green	Brian Uher	4080 Howard Ave	Kensington	VA/DC/MD Metro	MD	20895301-571-8590	brian@amicusgreen.com	HERS, BPI
Ardently Green	Kevin Krom	45710 Oakbrooke Court	Sterling	VA/DC/MD Metro	VA	20166703-421-1799	kkrom@ardentlygreen.com	BPI
Argent Heating and Cooling/ Amicus	David Pugh	5 Ridout St	Annapolis	VA/DC/MD Metro	MD	21401240-299-0657	pughbrothers@gmail.com	BPI
Ashe Consultants	John C. Bouman	950 Herndon Parkway, Suite 320	Herndon	VA/DC/MD Metro	VA	20170-5596 703-230-2500	jcbouman@asheconsultants.com	CEM
Astracor, Inc	Dave Daly	3660-D Wheeler Ave	Alexandria	VA/DC/MD Metro	VA	22304-6403 703-212-8294	davedaly@astracor.net	BPI
Avalon Energy Services, LLC	Jim McDonnell	5507 Lambeth Rd	Bethesda	VA/DC/MD Metro	MD	20814301-718-7321	jmcdonnell@avalonenergy.us	BPI
The Avenue Builders (Bellanca Construction, LLC)	Chris Bellanca	2210 Mount Vernon Avenue	Alexandria	VA/DC/MD Metro	VA	22301703-299-9251	chris@theavenuebuilders.com	HERS
Baretoes LLC	Mark Lidd	2770 Brooke Rd	Stafford	VA/DC/MD Metro	VA	22554540-834-8700	mark@baretoes.net	HERS, BPI
Building Performance Retrofitters LLC	Adam Letcher	201 Progress Street, Suite #6	Fredericksburg	VA/DC/MD Metro	VA	22401703-789-6884	Adam@BPRetrofitters.com	HERS, BPI
CGE Solutions, Inc.	Lee O'Neil	PO Box 221704	Chantilly	VA/DC/MD Metro	VA	20153-1704 703-574-4365	loneal@cgesolutions.com	HERS
Continuum Energy Solutions	Kent Baake	5645D General Washington Drive	Alexandria	VA/DC/MD Metro	VA	22312703-354-0262	info@ces-va.com	BPI, HERS
Conway Construction, LLC	Chris Conway	6096 Madison Point Ct	Falls Church	VA/DC/MD Metro	VA	22041 540-818-2437	chris@conwaygreenconstruction.com	HERS
CroppMetcalfe Heating & Air Conditioning	Neil Dodson	8421 Hilltop Road	Fairfax	VA/DC/MD Metro	VA	22031 240-882-5658	ndodson@CroppMetcalfe.com	BPI
Dominion Energy Rater Grp. LLC	Peter McGuire	8171 Windswept Ln	Culpeper	VA/DC/MD Metro	VA	22701703-975-1759	triple.crown2@hughes.net	HERS, BPI
East Coast Insulators, Inc.	Todd F. Holmes	P.O. Box 250	Nokesville	VA/DC/MD Metro	VA	20182703-594-2461	ckeyser@ecinsulators.com	HERS
Easy Being Green	Merry Ortberg	8595 Green Road	Warrenton	VA/DC/MD Metro	VA	20187540-878-5700	merry@easybeinggreenva.com	HERS, BPI
Ecobeco	Brian Toll	5465 Randolph Road, Unit B	Rockville	VA/DC/MD Metro	MD	20852240-396-2141	info@ecobeco.com	BPI
EcoHouse	Colin Choney, Zach Dobelbower	1425 4th Street,SW	Washington	VA/DC/MD Metro	DC	20024202-640-2820	info@e2cohouse.com	HERS, BPI
EDGE Energy	Jason Dispenza	7904 Foxhound Rd	McLean	VA/DC/MD Metro	VA	22102888-586-3343	jasond@edge-gogreen.com	HERS, BPI
Eko Smart Solutions	Daryl Smith	3213 Duke Street, Suite 717	Alexandria	VA/DC/MD Metro	VA	22314888.389.3551	contact@Eko-Smart-Solutions.com	BPI
Elysian Energy, LLC	Caroline Eshelman	1111 East West Hwy	Silver Spring	VA/DC/MD Metro	MD	20910240-381-0395	info@ElysianEnergy.com	HERS, BPI

### List of Energy Auditors in Northern Virginia - Provided by Dominion Energy, con't

Energy Efficiency Experts	Pascale Maslin	2437 15th Street NW	Washington	VA/DC/MD Metro	DC	20009202-557-9200	pascale@epower3.com	BPI, HERS
Green Homes LLC	Larry Brown	9116 Saytayana Drive	Fairfax	VA/DC/MD Metro	VA	22031703-622-1554	larry@EnergyAuditForHomes.com	HERS
GSPH LLC	Jerry Eastridge	9128 Aventon Ct.	Lorton	VA/DC/MD Metro	VA	22079703-403-7682	jerrygsph@msn.com	BPI
The Home Energy Detective, Inc.	Troy D. Tanner	8816 Cather Avenue	Manassas	VA/DC/MD Metro	VA	20110 571-359-1060	troy@homeenergydetective.com	BPI
Home Energy Medics	Scott Donelson	817 22nd Street South	Arlington	VA/DC/MD Metro	VA	22202703-447-5379	Scott@myenergymedics.com	BPI
Home Energy Specialists, LLC	Greg Caudill	9532 Liberia Avenue, Suite 729	Manassas	VA/DC/MD Metro	VA	20110703-929-2931	greg@homereviewinc.com	HERS
Home Energy Saving Solutions	Mohammed El-Ghoul	12100 Wedgeway Place	Fairfax	VA/DC/MD Metro	VA	22033703-260-1933	info@virginiaenergyaudit.net	BPI
Home Performance Auditors and Contractors	Kevin Michaelyan	1301 S Joyce St (Pentagon Row)	Arlington	VA/DC/MD Metro	VA	978-376-0478		
Home Performance Solutions	Marty Valentine	100 W. Jefferson Street	Falls Church	VA/DC/MD Metro	VA	22046703/876.9698	marty@yourhps.net	HERS, BPI
IBTS	George Neall, Kevin Powell	505 Huntmar Park Dr, Suite 250	Herndon	VA/DC/MD Metro	VA	20170703-481-2000	kpowell@ibts.org; gneall@ibts.org	HERS, BPI
Intelligent Energy Management, LLC	Andrew M. Pittman	P.O. Box 12026	Arlington	VA/DC/MD Metro	VA 22219	9-2026 703-249-4411	andrew.pittman1@gmail.com	HERS
Lensis Builders Inc.	Richard W. Lensis	12060 Cadet Court	Manassas	VA/DC/MD Metro	VA	20109703-367-8999	lensisbuilders@comcast.net	HERS
Lilker EMO Energy Solutions, LLC	Eric Oliver	3130 Fairview Park Drive, Suite 125	Falls Church	VA/DC/MD Metro	VA	22042703-205-0445 x118	eoliver@lilkeremo.com	HERS, BPI
Live Green, LLC	Suzanne Parmet	4318 Curtis Road	Chevy Chase	VA/DC/MD Metro	MD	20815301-674-1700	info@livegreenhome.com	BPI
Old Europe Construction LLC	David Duncan	1206 Summit Rd	McLean	VA/DC/MD Metro	VA	22101703-356-5665	oeclic@gmail.com	BPI
Patuxent Environmental Group (PEG Inc.)	John Hensley, Matthew Cooper	11130 Fairfax Blvd., Suite 206	Fairfax	VA/DC/MD Metro	VA	22030703-934-2777	info@pegenv.com	HERS, BPI
Piedmont Energy Analysis	Linda Mastervich	8478 Springs Road	Warrenton	VA/DC/MD Metro	VA	20186540.428.3996	Lmastervich@aol.com	HERS
Pinnacle Consulting Solutions LLC	William Ramsey	500 Utterback Store Road	Great Falls	VA/DC/MD Metro	VA	22066703-406-7657	brann@matrixfreeliving.com	HERS, BPI
Positive Energy, LLC	Patrick Michaelyan	1301 South Joyce St, Suite 6-D	Arlington	VA/DC/MD Metro	VA	22202	PositivePBM@gmail.com	HERS, BPI
Pro Energy Consultants	Gary Graff	1112 Moorefield Creek Road SW	Vienna	VA/DC/MD Metro	VA	22180703.255.2224	ggraff@proenergyconsultants.com	BPI
Pro Energy Consultants	Sona Kalra	520 Colston PI #302	Winchester	VA/DC/MD Metro	VA	22601703-623-3797	skalra@proenergyconsultants.com	BPI
Residential Energy Auditors, LLC	Earl Haynes, President	9007 Adams Chase Circle	Lorton	VA/DC/MD Metro	VA	22079703-304-2740	earlhaynes@reauditors.com	HERS
Southland Insulators, Building Science Division	Tom Ward and Juan Cruz	8521 Quarry Road	Manassas	VA/DC/MD Metro	VA	20110703-330-0005	tward@southlandinsulators.com	HERS, BPI
Standard Energy Solutions	Zachary T. Bidle	202 Perry Parkway	Gaithersburg	VA/DC/MD Metro	MD	20877301-944-5255	zach.bidle@standardenergysolutions.com	BPI
Sustainable Building Elements	Rich Gajarsky	126 S.Snead St.	Ashland	VA/DC/MD Metro	VA	23005 540-907-6463	rich@sustainablebuildingelements.com	HERS, BPI
WellHome #812 (Manassas, VA)	Michael Hogan	7400 Gateway Court	Manassas	VA/DC/MD Metro	VA 20109	9-7312 703-393-6371	Michael.hogan@wellhome.com	BPI
Windows on Washington	Eric Novotny	14221A Willard Road, Suite 400	Chantilly	VA/DC/MD Metro	VA	20151703.378.1190	enovotny@windowsonwashington.net	BPI
Complete Home Solutions	Rob Burgee	235 W Bay Front Road	Lothian	VA/MD Metro	MD	20711410-867-1202	chs@chomesolutions.com	BPI
GreenEcoSavers, LLC	Rami Soppa	12504 Forty Oaks Court	Herndon	VA/MD/DC Metro	VA	20170703-880-6658	rsoppa@greenecosavers.com	CEM
Turner's Service Co., Inc.	Lisa Turner	11512 Robertson Drive	Manassas	Entire State	VA	20109703-361-0816	lisaturner@turnersserviceco.com	BPI