Weatherization *Plus* Health

Program Materials and Protocols
to Integrate Health Concerns in to WX Projects

Working Draft: January 8, 2004

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Acknowledgements

This document and the associated resources were produced through a team effort that include the expertise and assistance of a talented group of practioners: Dave Finet, John Davies, Erin Hamernyik, The Opportunity Council; Ellen Tohn, ERT Associates; Eric Oetjen, ICF Consulting; Jim LaRue, House Menders; Courtney Moriarta, Building Performance Institute; Linda Wigington & Helen Perrine, Affordable Comfort; John Snell, Peregrine Energy; Don Ryan, Alliance for Healthy Housing; Rebecca Morley, National Center for Healthy Housing.

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Overview of Weatherization Plus Health

Health & Housing Connection - A Need Defined

The link between health and the indoor environment is well established. Research clearly shows that lead paint and dust inside homes is the primary way in which young children are lead poisoned. Similarly, a growing body of evidence documents that indoor environmental conditions can trigger asthma in children and adults. Radon, carbon monoxide and other toxic substances are also well known housing based health threats.

While weatherization has focused on reducing energy bills and improving the comfort of the recipients, many homes have remained in need of a more comprehensive approach -- an approach that reduces lead hazards, asthma triggers, carbon monoxide hazards and other health threats with same determination as energy savings.

Mission of Weatherization Assistance Program (WAP)

To reduce energy costs for low-income families, particularly the elderly, people with disabilities, and children, while ensuring their health and safety.

The Weatherization Assistance Program (WAP), funded and administered by U.S. Department of Energy, was established around the principles that a house is a dynamic structure made up of a system of interconnected components. The performance of each component affects the operation of many others. To successfully address energy, comfort, and health and safety needs of a dwelling, the whole house must be evaluated from top to bottom, including the building envelope, mechanical systems, baseloads, indoor air quality, and occupant health, as well as the interaction of these components. This constitutes a whole-house approach to energy efficiency.

While many people still perceive WAP as primarily an energy efficiency program, service providers understand that the impact of the work delivered through this program has a significant societal benefit in improving indoor air quality, thus potentially reducing health care needs for many low-income families.

Today, housing practitioners increasingly recognize that Healthy Homes principles can help improve the indoor environment and concurrently create more durable, comfortable and energy efficient housing. In most cases weatherization crews are positioned to readily incorporate new strategies *and* have the skills to accomplish these goals.

The current crisis in health care is creating a need for cost effective answers. Weatherization programs offer a unique opportunity to combine weatherization activities with practical health protections can help improve client health while lessening the burden of incurred health related costs on both the client and the health care system. A study done by the Seattle Health Department during a HUD funded Healthy Homes Program documented that improving housing conditions to reduce asthma triggers (moisture, dust, and pests) resulted in a decrease in emergency room visits. At a minimum, the weatherization of a home should not inadvertently create or exacerbate health and environmental threats and when possible work to improve the indoor environment.

Weatherization Plus Health - A Response

There is an opportunity to respond to this need. Weatherization Plus Health has grown out of a collaborative vision from a broad group of professionals from the public and private sectors closely involved with health & housing issues and the accomplishments of the Opportunity Council's Weatherization Program. These individuals believed that the capacity inherent in the many weatherization programs (which treat over 100,000 low income housing units year each) is a tremendous resource that can and should be leveraged to address building conditions that are affecting health conditions for these same families. As one team member put it "for nearly all of these families, weatherization crews are the first and usually the last publicly funded service provider they see."

The national Healthy Homes Program, funded and administered by HUD, targets improves health by improving environmental conditions in homes through a range of interventions. A grant given to the Opportunity Council, a Community Action Agency in Washington State, focused on reducing building related asthma triggers conditions in the home via weatherization. It was designed to augment what weatherization already offered, and systematically improve indoor environmental conditions for households with family members suffering from asthma. The Opportunity Council has integrated Healthy Homes principles into current Weatherization activities to create a sustainable Weatherization Plus Health Program. This work help demonstrate the benefits of combining interventions to improve health with weatherization activities.

Weatherization Plus Health utilizes the already existing structure of local weatherization programs to implement an enhanced service. This begins with quality delivery of typical weatherization service, adds the broader mission of improving health conditions and ends with higher quality overall service delivered.

What is Weatherization Plus Health?

To understand how Weatherization Plus Health works, it is helpful to first understand the basic skill set that weatherization crews already possess. Typically the concept of seeing the house as a system is the basis of all decisions. Specifically it means understanding:

- how forces and pressures in the home can move contaminants and create discomfort,
- what is the comfortable and healthy range for humidity and temperature, and
- how heating and cooling systems should function to support client health and the long term durability of the system/home.

Add to this construct a greater understanding of indoor air and environmental hazards, how building conditions can create or repair such hazards and we have a package that can create healthy conditions in homes by harnessing the experience and knowledge of weatherization programs. Figure 1 illustrates how Weatherization Plus Health easily integrates with the infrastructure of existing weatherization programs.

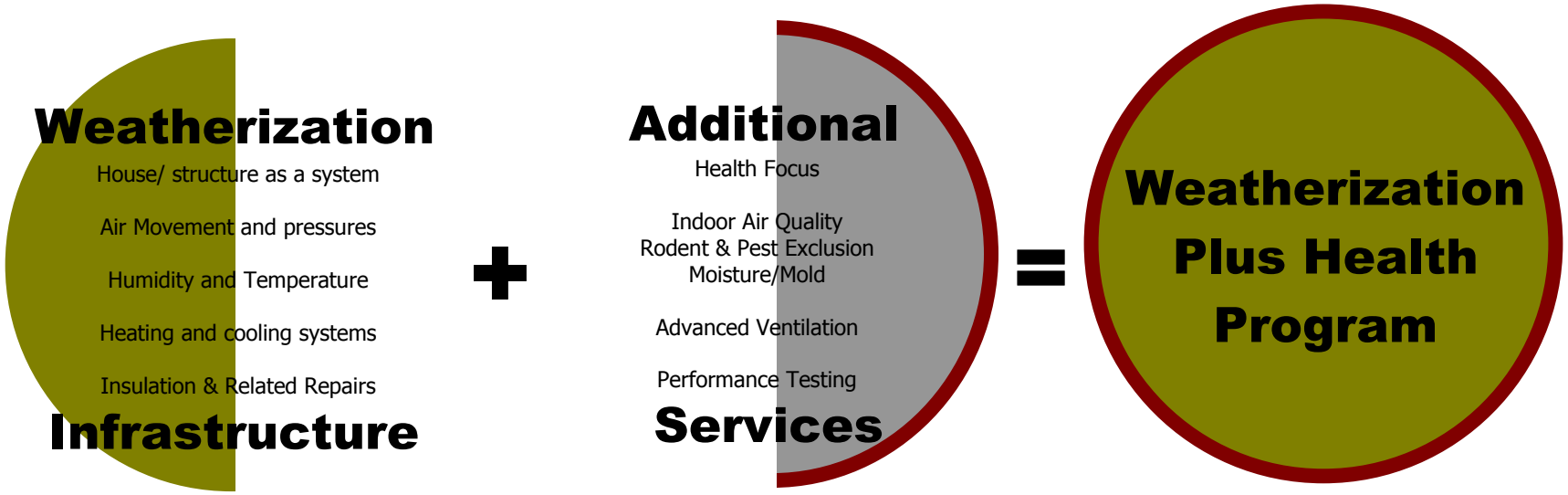
Weatherization Plus Health adds two levels of services to the core weatherization services currently provided weatherization agencies. These two levels of service are:

- Do No Harm
- Improve Indoor Environment

See Figure 2 for a description of how these additional service levels enhance basic weatherization work.

Offering two levels of services for Weatherization Plus Health gives local weatherization agencies the flexibility to tailor the level of service provide to a household in response to the property's needs and the financial resources available.

Figure 1: Weatherization Plus Health Program



Weatherization Plus Health is created by adding to National Weatherization Programs existing infrastructure.

Figure 2: Weatherization Plus Health– Three Levels

Improve Indoor Environment

Improve Indoor Environment builds on Do No Harm, adding steps to more actively fix hazards. Lead Compliance advances to Lead Hazard Reduction & Dust Clearance, Indoor Air Quality Assessment advances to a Comprehensive IAQ treatment to improve ventilation strategies through added fresh air intake and whole house systems. The Education Component offers added one on one meetings to help inform and support changes in behavior and maintenance and to establish health network connections.

Do No Harm

Do No Harm adds to Basic Weatherization the elements of Lead Safety Compliance, Visual Survey of Indoor Health Hazards, and an Educational Component for staff and clients. There is more time involved in eligibility, assessment, education and delivery of changes to the homes of the clients. These elements fill in the gaps previously experienced during typical weatherization work, and it is hoped that this will become the new "Base Level" for Weatherization Protocols.

Basic Weatherization

In Basic Weatherization the assumption is that certain diagnostics including combustion safety, a weatherization audit system, and energy saving measures are already being delivered proficiently. It is from here that weatherization providers can build to the next level of services, Do No Harm.

How Was Weatherization Plus Health Developed?

Between 1999 and 2003, the Opportunity Council (OC) has developed and incorporated a Healthy Homes component to its weatherization and home rehabilitation programs. The OC leveraged a combination of funding to develop the health component that is now called Weatherization Plus Health. Multiple funding sources were essential because none of these funding sources alone contributed sufficient funds specifically targeted toward client health issues over a long enough time frame to develop Weatherization Plus Health. This program was funded by dedicated resources from the Environmental Protection Agency's (EPA's) Environmental Justice Program and Housing and Urban Development (HUD) Healthy Homes funds. It also drew upon existing weatherization funds from the Department of Energy's Weatherization Assistance Program (DOE WAP), Health and Human Services (HHS) as well as local utility funds and was indirectly supported by the State of Washington Department of Community, Trade, and Economic Development (DCTED).

Supporting Training The Opportunity Council has relied heavily on DOE training and technical assistance funds to develop staff's technical ability in the areas of ventilation, combustion safety testing and pressure diagnostics - all important components of the WAP's Weatherization Plus initiative implemented in 1998. The Opportunity Council's perspective has been to embrace Weatherization Plus Health and continue to develop service congruent with the programs mission.

Building Upon the DOE Mission The Opportunity Council has taken advantage of DOE and DCTED support and the funding they provide to gradually integrate a program component that addresses one of the core objectives of the DOE WAP -- ensuring health and safety for program participants. Moving from a more traditional weatherization service model to a model that incorporates a health component is an incremental process that takes the support of the state office and local agency administration. The Weatherization Plus Health services are intended to give a standardized method of looking at the indoor living environment for all households receiving services and an enhanced level for those households who have someone present with respiratory illness such as asthma. One of the goals of breaking down the protocols into phases and steps is to provide agencies with stepping stones to move forward. The implementation of any step, phase or level will hopefully lead to the next and improve the quality of service provided to all participating households.

Making It Work – Implementing Weatherization Plus Health

Implementation of Weatherization Plus Health protocols starts at the local level. Not all agencies have the capacity to begin implementation of this component based program. Likely early adopters of this program are expected to be agencies that have proven expertise and systems in place to deliver the basic elements of weatherization. Agencies that have the ability to manage and deliver basic services as required by their state or DOE are prime candidates for the incremental adoption of the 2 Levels of "Do no harm" and then "Improve Environmental Conditions".

Early adopters of Weatherization Plus Health at both the state and local level will require support from funding entities in how program expenses are categorized and reported. Health and safety is already a basic tenet of weatherization and the intent of Weatherization Plus Health is to consider additional aspects of the indoor environment and its affects on the clients served by programs. The next section of this document "Integrating Weatherization Plus Health Your Program" serves as the basis for communicating the goals and objectives of Weatherization Plus Health to local agencies.

Level 1 - Do No Harm

Most of the work assessed and delivered in Weatherization Plus Health Level I are allowable program expenses under DOE WAP. In fact most of Level I is required by either DOE or policy at the state level. Most weatherization auditors already address a majority of these items informally. Weatherization Plus Health Level I will bring consistency and documentation to the local program, helping to reduce risk for the agency making sure we "do no harm" in the delivery of our services.

Adding Assessment & Compliance Tools Adopting Level 1 means revising or supplementing current auditing and assessment tools to integrate key questions and visual surveying steps laid out in the Environmental Hazard Assessment, Ventilation Worksheet, Lead Compliance Checklist culminating in a new Indoor Environmental Survey Report that documents key issues to follow during any WX work.

Adding a Health Education Component Another major component of Weatherization Plus Health Level I is the informal education component which ensures that the agency or program has a consistent message related to the health and safety of the indoor environment and particularly indoor air quality. The educational component can be implemented with minimal up front cost (using these model program materials) and requires minimal time in program delivery.

Funding Level 1 In most states HHS Low Income Home Energy Assistance Program (LIHEAP) funds are available for weatherization. In some cases 15% of the total LIHEAP funds are available and in some instances as much as 25% if the state has applied for a waiver. In either case these funds are generally more flexible and can be used to provide weatherization related repairs. These funds are a great source to combine with DOE funds to deliver Level I services.

Level 2 - Improve Indoor Environments

Improving environmental conditions is typically outside the current WX budget. Programs will need to secure supplemental flexible funding.

Adding Assessment Tools and Undertaking Repairs The program calls for several more extensive assessment and repair activities:

- Assessing and delivering more complicated ventilation strategies
- Repairing indoor hazards with a health link (i.e. moisture/mold, asbestos, lead hazards from lead-based paint and dust, radon, pests, dust mite habitats)
- Providing additional resources to maintain a healthy home (i.e., HEPA vacuums to remove dust, walk off mats, pillow and mattress covers to minimize dust mites)
- Providing technical training
- Additional time to start and coordinate a more complex project than standard WX

Adding a More Extensive Educational Component Additional time is need to deliver a more formalized education component that involves one on one discussions with residents to help them establish a workable and long term plan to maintain a healthy home. Often this entails creating a partnership where residents begin to "own" their part in reducing environmental health threats through changes in behavior and maintenance practices.

Estimating Costs It is important to recognize that not all clients will require Level II services. Experience with the WX Plus Health pilot project shows that roughly less than 15% of the homes will require this additional level of service.

Funding Level 2 A range of funding source may help underwrite the added activities to Improve Environmental Conditions and include but are not limited to:

Utility Funding

The utility may not be willing to pay for repair or health and safety measures but the energy conservation funds you receive will make your other funding stretch further.

State Matching Funds or General Fund

Some states have matching funds for utility contributions to energy conservation and/or general fund monies that are part of the weatherization funding. These funds are generally more flexible and maybe used to support Weatherization Plus Health activities.

Federal/State Housing Rehabilitation Funding

Housing funds are an excellent source of resources, particularly for Level 2: Improve Environmental Conditions. Programs may apply for funds or partner with another agency that already receives funds to deliver housing rehabilitation services.

These funds could include:

- HUD HOME Investment Partnership
- HUD Community Development Block Grant
- USDA Housing Preservation Grant
- State Housing Trust Fund

Federal Lead Hazard Control Funds

HUD provides significant funding to state and local governments to undertake lead hazard evaluation and control activities. These funds could be use to support the lead hazard reduction activities outlined in Level 2. Partner with local government housing or health agencies to apply for such funding or seek out existing lead grantees to help direct funds toward units pursuing WX Plus Health.

Program Development Funding

Areas that include underserved minority populations may be eligible to apply for an EPA environmental Justice Grant. The Agency funds education and capacity building projects which can be instrumental in building program capacity.

Federal Healthy Homes Funds

HUD provides funding to non profit and government agencies to conduct technical studies and demonstration projects.

Healthy Home Principles

The indoor environment should be…

- dry
  clean
  well ventilated
  combustion byproduct free

It should have no…

- pests
  toxic chemicals
  lead hazards

Integrating Weatherization Plus Health into Your Program

Overview of Program for Agencies

The link between health and the indoor environment is well established. The reduction of asthma triggers is recommended by the medical community as a strategy to reduce instances of asthma symptoms among children & adults. While weatherization has focused on reducing energy bills and improving the comfort of the recipients, many homes have remained in need of a more comprehensive approach, an approach that reduces asthma triggers in the indoor environment and its effect on occupant health with same determination as energy savings. There are 7 key principles that are the underpinnings of creating and sustaining healthy housing that is also durable and comfortable (See Figure ??).. In most cases, adhering to these principles also results in improved energy savings. The elements of this approach are highlighted below. In most cases weatherization crews are already working in the setting where these changes can be made easily and have the skills to accomplish these goals. At a minimum, the weatherization of a home should do no harm and ideally improve the indoor environment.

Benefits to your Agency

The benefits to a weatherization agency understanding and adopting effective methods to evaluate, document and improve indoor environmental conditions in homes receiving weatherization fall in to two main categories:

1. **Risk management** An agency will train all personnel to recognize conditions or circumstances that negatively effect the indoor environment. Training will enable staff to prevent problems, refer units to additional services as needed, and repair/address hazards in a safe manner. In addition, the agency will develop systems and protocols to help mitigate risk by ensuring that the staff are well informed and have specific protocols to follow that help minimize risk by ensuring that weatherization does not create an indoor environmental problem or make an existing indoor environmental problem worse.
2. **Capacity building and improved client service** – An agency implementing Weatherization Plus Health protocols will develop highly trained weatherization staff and expand the scope of their service. In some instances this will mean additional training for staff delivering weatherization. The result will be a weatherization process that produces a better end product for the client.

How to Implement

The key to successfully implementing the Weatherization Plus Health protocols in to your weatherization program is developing a common understanding of the benefits for the agency and it's clients. This understanding coupled with open and clear communication of roles and responsibilities leads to buy in and commitment. Identify those that will be involved every step of the process. Provide training in all areas necessary: intake/eligibility, Auditor/assessor, crews/contractor, inspector/quality assurance. Begin with big picture (7 principles of healthy housing), include background ie prevalence of Asthma in children, effects of indoor environment etc

Weatherization Plus Health

Basic Weatherization

Do No Harm

Improve Indoor Environment

Components have been color coded to create an easy to follow and transferable plan.

Program

Diagnostics
Resident Health Survey
Diagnostic Test Report

Combustion Safety Worksheet

Combustion Safety Test Report

Spot Ventilation

Energy Savings

Energy Use Evaluation

Family Energy Action Plan Plan

Indoor Air Quality Assessment

Environmental Hazard Survey

Ventilation Worksheet

Indoor Environmental Summary

Lead Hazard

Repair Lead Hazards &

Extended Educational Component

Humidity Gauge Education

HART Workbook

How Your House Works Workbook

Extended Education/Follow up

Access to Health Networks

Indoor Air Quality Action Plan

Pressurized Blower Door Testing

Basic WX

Do No Harm

Improve Indoor Environment

Component

WX Audit
Weatherization Worksheet

Lead Safe Weatherization – Work Written Compliance

Lead Compliance

Lead Safety Checklist

Basic Educational Component

Informal Educational Curriculum

General materials

HART Flyer

How you House Works Flyer

Comprehensive IAQ

Depressurization

Multi-Aire

Humidity Gauge

Integrated Ventilation Strategies

Dust Control and Non Toxic Cleaning

Walk off mats

Cleaning Methods

Non-Toxic Cleaners

Tools

Phases

1 **Eligibility**

2 **Assessment**

3 **Work Plan Development**

4 **Perform Work Plan**

5 **Final Inspection**

6 **Follow Up Education**

Eligibility

In Basic Weatherization Programs, eligibility has historically followed financial guidelines and need. This process is usually undertaken with staff during an interview appointment with the client, and gathers all pertinent financial information. The process usually takes about a half hour. Weatherization Plus Health capitalizes on this meeting by gathering information about the clients health in order to determine what level of service they should receive. In addition to standard WX procedures, the following questions are asked during the eligibility interview.

Step 1: Complete Health Questions

☐ Yes ☐ No a. Are there any household members with asthma?

☐ Yes ☐ No i. If "yes" does the person have a confirmed diagnosis of asthma by a doctor or nurse?

☐ Yes ☐ No b. Are there any household members with respiratory problems?

☐ Yes ☐ No c. Are there any household members with frequent flu like symptoms (running nose, itchy eyes)?

☐ Yes ☐ No d. Does anyone in your home have health problems that you feel may be attributed to the indoor environment? If yes explain.

Step 2: Determine Appropriate Assessment Level

If the client answers "yes" to one or more of the following questions prior to home assessment the auditor will assume the weatherization project will receive Improve Indoor Environment of Weatherization Plus Health. If they answer "no" to all they will be in Do No Harm. The client will not be aware of what level of Weatherization they will receive.

Step 3: Provide Educational Materials and Discuss Issues with Occupant

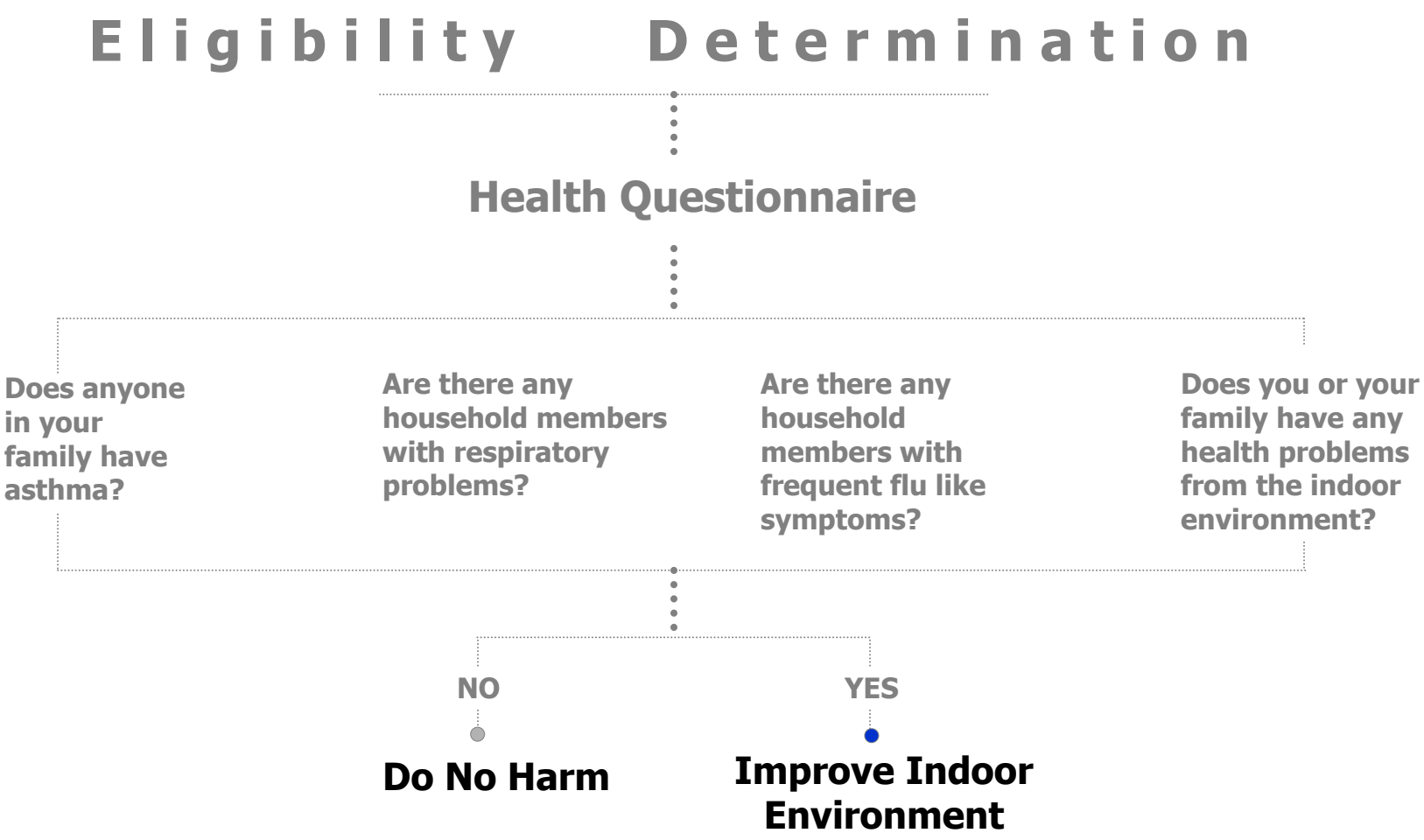
Review the informal educational curriculum with the client about how poor indoor air quality can effect their health. Use IEQ & You, (Indoor Environmental Quality) as the resource material. The auditor, weatherization crew and inspector will follow up on the core principles you introduce.

After review of IEQ & You, provide the client with the following brochures and check the box they have received them.

- ☐ **EPA Clear Your Home of Asthma Triggers;**
- ☐ **American Academy of Pediatrics Your Child and the Environment**
- ☐ **EPA Protect your family from Lead in your home**

Selected Program (circle one) **Do No Harm** **Improve Indoor Environment**

Phase 1 Eligibility Determination Health Questions Chart



Assessment

Program Phase 2

Introduction

Assessment involves meeting the client at their home, gathering all pertinent data about the home to perform weatherization services. WX Plus Health adds more tools for assessment and gathers more data about the home to create a plan that can improve the indoor environment. The tools have been set up in a modular fashion, so agencies can use what they need while building on their existing strengths. Informal Education is also happening during the interaction with client at this time.

There are 2 Assessment levels available in WX Plus Health model:

- **Do No Harm**, offers a basic approach and incorporates limited changes to a current WX program. This level is a great next step, if IAQ protocols are not currently in place.
- **Improve Health Conditions** offers a more detailed audit, more intensive solutions, and a more formal and tailored educational component.

The Assessment phase uses Strategies and Tools.

Strategies include:

- **Diagnostics** p
- **Weatherization Audit** p
- **Energy Savings**
- **Lead Compliance**
- **Advanced Indoor Air Quality**
- **Basic Educational Component**
- **Lead Hazard Reduction & Clearance**
- **Enhanced Ventilation**
- **Extended Education Component**
- **Pressurized Blower Door Testing**
- **Dust Control & Non Toxic Cleaning**

Tools Include:

Diagnostic Test Report
Ventilation Worksheet
Combustion Safety Worksheet
Combustion Safety Test Report
Weatherization Worksheet
Lead Safe Weatherization
Energy Use Evaluation
Family Energy & Indoor Air Quality Action Plan
Lead Safety Checklist
Environmental Hazard Assessment
Indoor Environmental Summary
Informal Education Curriculum
HART FlyerHow you House Works Flyer
Lead Safe Work Practices
Depressurization
Multi-Aire
Attic Pressurization
Humidity Gauge
Education
HART Workbook
How Your House Works Workbook
Extended Education/Follow upAccess to Health Network
Walk off mats
Cleaning Methods
Non-Toxic Cleaning

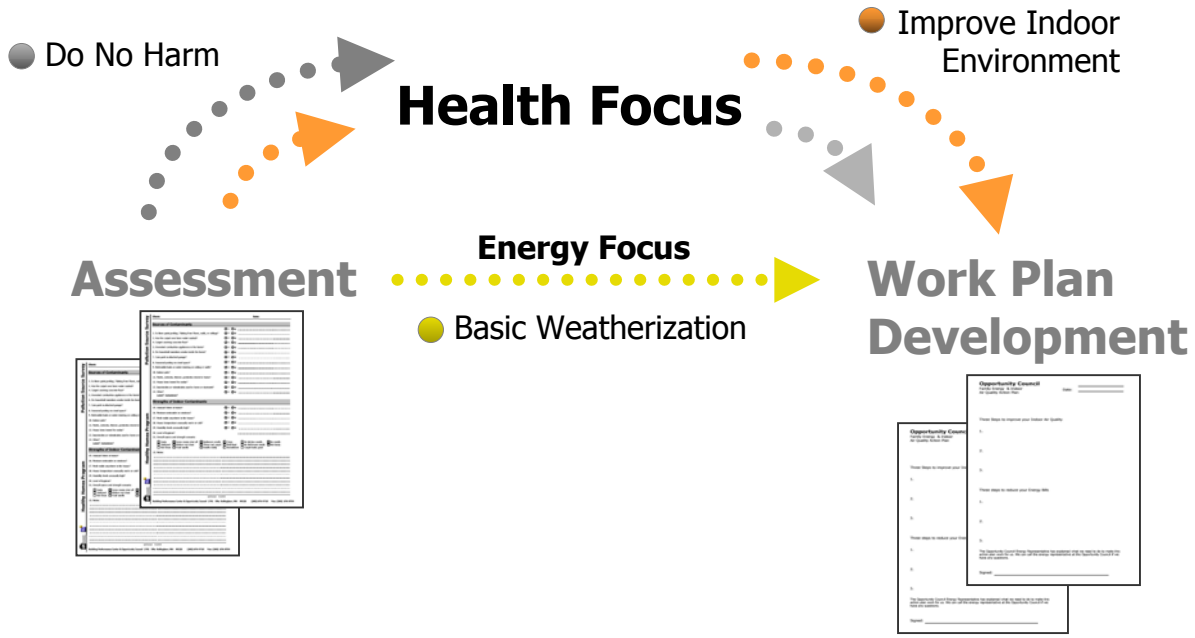
Strategies and **Tools** are described in detail in their own sections

Work Plan Development

Program Phase 3

Introduction

In general, a work plan is developed around information gathered during the Assessment phase, the expertise the WX crews, and financial limits per unit. The focus historically has mainly been energy savings, comfort, some lead and IAQ issues for the client. WX Plus Health prioritizes improving health of the clients, by adding a "Health Focus" element during the Work Plan Development Phase.



Perform Work Plan

Introduction

The work plan is carried out to specifications created in the Develop Work Plan phase. Do No Harm and Improve Indoor Environment ask the WX technicians to be sensitive to client health concerns in the home, utilize containment and other methods, to isolate clients from potential health risks and exacerbations. It is expected that if contractors performing the work are savvy to those methods the end product will be healthier and more durable in addition to being energy efficient. Informal Education should be happening within the interaction of the crews and the client.

Final Inspection

Program Phase 5

Introduction

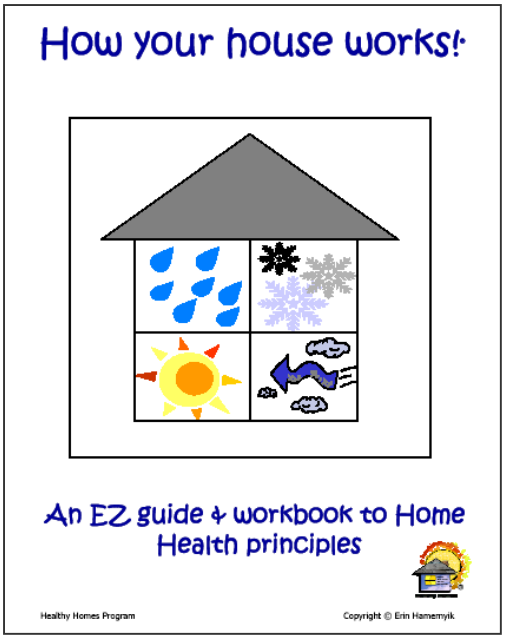
Inspection of the completed work is necessary and should be done promptly after completion. This could also be considered the commisioning stage, and every effort should be made to educate tech crews on how well they did and what could use improvement if necessary. If head hazard reduction work is completed a lead clearance test is required in houisn units built before 1960. If warrented another round of follow up inspection could be scheduled several months out to fully assess improvements. This is also a time to go over any questions the client may have and recommend adjustments as necessary and to deliver another layer of Informal Education.

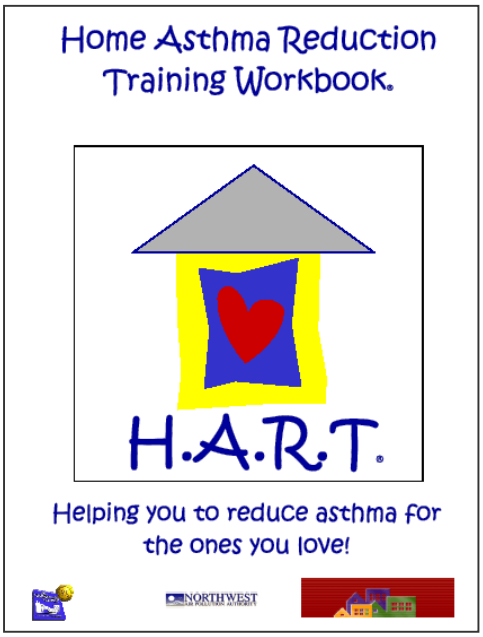
Follow Up Education

Program Phase 6

Introduction

During Improve Health Conditions a more detailed education package is delivered that promotes a partnership with the client. It includes workbooks and in house training, where possible, to change resident house related behavior that can lead to improved health outcomes. The strategy uses workbooks as tools to spur conversations with clients about *what they can do* to improve their indoor environment (e.g, reducing clutter where dust can accumulate, quick attention to leaks and moisture issues to prevent mold, use bath fans regularly to exhaust humidity). This piece augments the mechanical fixes provided by the WX Crews.





Basic Weatherization

Diagnostics

Diagnostic Test Report
Combustion Safety Test Report
Combustion Safety Worksheet

Weatherization Audit

Weatherization Worksheet
Lead Safe Weatherization – Lead Safe Written Compliance

Energy Savings

Energy Use Evaluation
Family Energy Action Plan

Level 1 Do No Harm

Diagnostics

Diagnostic Test Report

Combustion Safety Test Report
Combustion Safety Worksheet

Weatherization Audit

Weatherization Worksheet (part of most existing programs)
Lead Safe Weatherization- Lead Safe Written Compliance (part of most existing programs)

Energy Savings

Energy Use Evaluation
Family Energy & Indoor Air Quality Action Plan

Lead Compliance

Lead Safety Checklist

Indoor Air Quality Assessment

Environmental Hazard Assessment (
Ventilation Worksheet
Indoor Environmental Summary

Basic Educational Component

Informal Educational Curriculum
General materials *Pediatric Asthma, EPA Asthma brochures*
HART FlyerHow you House Works Flyer

Level 2 Improve Indoor Environment

Diagnostics
Diagnostic Test Report
Combustion Safety Worksheet
Combustion Safety Test Report

Weatherization Audit
Weatherization Worksheet
Lead Safe Weatherization – Work Compliance

Energy Savings
Energy Use Evaluation
Family Energy & Indoor Air Quality Action Plan

Lead Safety Compliance
Lead Safety Checklist

Indoor Air Quality Assessment
Environmental Hazard Assessment (change to Environmental Hazard Survey)
Ventilation Worksheet
Indoor Environmental Summary

Basic Educational Component
Informal Educational Curriculum
General materials
HART Flyer
How you House
Works Flyer

Lead Hazard Reduction & Clearance
Hazard Reduction & Clearance Checklist

Comprehensive IAQ
Depressurization
Multi-Aire
Attic Pressurization
Humidity Gauge Log

Extended Education Component
Humidity Gauge
Education
HART Workbook
How Your House Works Workbook
Extended Education/Follow up
Access to Health
Networks

Dust Control & Non Toxic Cleaning

Pressurized Blower Door Testing

Strategies

- **Diagnostics**
- **Weatherization Audit**
- **Energy Savings**

- **Lead Safety Compliance**
- **Advanced Indoor Air Quality**
- **Basic Education Component**

- **Lead Hazard Reduction & Clearance**
- **Comprehensive IAQ**
- **Extended Education Component**
- **Dust Control Strategies & Non- Toxic Cleaning**
- **Pressurized Blower Door Testing**

Diagnostics

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

Diagnostics is considered the assessment of a building's heating and ventilation systems.

In-field demonstration for any weatherization program include:

- Blower door test
- A ventilation assessment
- Installation of exhaust devices
- Understanding and ability to test mechanical heating/ventilation devices
- Ability to gather building heating & ventilation data
- Understand combustion safety
- Conduct Worst Case testing

3 Onsite Forms

Title pages shown below

Diagnostic Test Report

1

DIAGNOSTIC TEST REPORT

	Customer Name	Job#	
		Date	Date
	Technician Name		
		PRE	**POST**
1	Number of Occupants ___ x 15cfm x ___ n = BTL cfm50		NA
2	Number of Occupants ___ x 15cfm x ___ n = BTL cfm50		NA
3	Volume of conditioned living space _____ x .35 x ___ n / 60 = BTL cfm50		NA
4	Square feet of conditioned living space		NA
5	Calculated Building Tightness Limit = highest number of lines 1, 2, and 3		NA
6	Primary heat source(s) fuel type 1=Elec. 2=Nat. gas 3=Propane 4=Oil 5=Wood 6=Specify		
7	Secondary heat source(s) fuel type 1=Elec. 2=Nat. gas 3=Propane 4=Oil 5=Wood 6=Specify		
8	Pollution Source Survey completed	Y/N	NA
9	Home is being treated as Weatherization Plus Health	Level I	Level II
10	Combustion Safety Test(s) of all combustion appliance(s) completed	Y/N	Y/N
11	Windspeed MPH		
12	Outside temperature, record in degrees farenheit		
13	Blower door location		
14	Baseline without blower door on in pa (stack)		
15	Blower door conf. O=open fan A = ring A B = ring B LF=low flo ring	A B LF	A B LF
16	Total CFM50		
17	Technician recommended BTL by: use, IAQ, exposure, diag. tests, etc.		NA
18	**ZONAL PRESSURES**	NA	NA
	ZONE	NA	NA
	1 ATTIC WRT HOUSE		
	2 CRAWLSPACE WRT HOUSE		
	3 GARAGE WRT HOUSE		
	4 OTHER WRT HOUSE		
	5 OTHER WRT HOUSE		
	6 OTHER WRT HOUSE		
	7 OTHER WRT HOUSE		
	8 OTHER WRT HOUSE		
19	Intended location of existing ducts A=Inside B=outside C=inside/outside		
20	**PRESSURE BLOCK TESTS (clockwise from front door, house WRT duct)**	NA	NA
	Number S=supply/R=return Zone # I=inside/O=outside	NA	NA
	1		

2

COMBUSTION SAFETY TEST REPORT

	Customer Name	Job#	
		Date	Date
	Technician Name		
		PRE	**POST**
1	Measure existing CAZ pressure (baseline), CAZ WRT outside		
2	Outdoor wind speed		
3	Outdoor temperature		
4	Combustion appliance zone, designate appliance _____	NA	NA
5	Is there a hazardous or unsafe condition?	Y/N	Y/N
6	Are there visible signs of vent pipe leaks or damage?	Y/N	Y/N
7	Is there the smell of gas or indication of fuel leak(s)?	Y/N	Y/N
	Worst case set-up test for combustion appliance zones. Refer to the Technical Support Document for worst case procedures.	NA	NA
8	Measure CAZ WRT outdoors, Is the CAZ door **open** or **closed** (circle one)		
9	Was there flame roll-out of combustion equipment?	Y/N	Y/N
10	Did the equipment spill gases for more than one minute?	Y/N	Y/N
11	Did the flame change in the furnace when the air handler turned on?	Y/N	Y/N
12	After 5 min. measure the CO in the ambient air in the living space		
13	Measure the draft pressure in the vent of the combustion appliance Test the combustion appliance vent WRT CAZ		
	Minimum acceptable draft pressures. below 20°F -5pa, 20°to40° -4pa, 40°to60° -3pa, 60°to80° -2pa, 80°+ -1pa	NA	NA
14	Measure the CO in the exhaust gases of the vented appliance		
15	If the door of CAZ is closed - open it. If the door is open - close it. Open/closed Combustion appliance vent WRT CAZ		
16	Heat Rises: measure temperature across heat exchanger: supply plenum temp - return plenum temp		
17	Fireplace/wood stove zone worst case test: FPWSZ zone WRT outdoors Also document any vent pipe, chimney or clearance problems		
18	Measure the CO in exhaust gases of kitchen stove: Range top burner 1		
	burner 2 (after 5 min.)		
	burner 3 (after 5 min.)		
	burner 4 (after 5 min.)		
	oven (after 5 min.)		
	ambient CO after 15 minutes		
	ambient CO after 45 minutes if CO is over 8 ppm after 15 min.		
19	Return house to pretest conditions, Circle DONE when complete	DONE	DONE
	Comments	Revised 4/17/03	

Combustion Safety Test Report

3

Combustion Safety

Appliance _____ HDL ___pa initial GAZ WRT outside ___p final GAZ WRT outside ___pa

The project coordinator will number in order the recommended steps to help reduce negative pressure in the specified combustion appliance zone
Briefly describe how to improve the worst case number:

Crew Lead to initial and date all measures completed

PC	Lead		Comment
___	___	Duct sealing	_____
___	___	Down size exhaust	_____
___	___	Under cut doors/transfer grilles	_____
___	___	Add supply register to CAZ	_____
___	___	Reconfigure return side	_____
___	___	Add outside air opening to return side of furnace	_____
___	___	Isolate combustion appliance	_____
___	___	Damper supply registers in rooms remote from CAZ	_____
___	___	Install combustion air opening near appliance	_____
___	___	Install mechanical outside air supply system	_____
		Fan installed Make/Model	_____
		Measured flow of new fan	_____ cfm
		Control installed	_____
		Recommended setting	_____

Combustion Safety Worksheet

Weatherization Audit

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

Understanding the building as a system and assessing a building's structure, insulation levels, safety, electrical integrity, air leakage, basement/crawlspace, durability, comfort and lead hazard potential are covered under Weatherization Audit. Lead Safe Weatherization protocols set forth by DOE.

In field demonstration for any weatherization program include:

- Health & Safety
- Comfort /Infiltration
- Durability
- Walls, Attic Crawlspace, Roof
- Overall Building As a System

2 Onsite Forms Title pages shown below

Weatherization Worksheet 1

Housing Unit Ownership Information

1. Rental: ☐ Yes ☐ No Owner Occupied: ☐ Yes ☐ No a. Year built: ..... b. Years at address: .....

Health & Safety

2. Sanitary Problems to be addressed: ☐ Plumbing ☐ Septic ☐ Animal Waste ☐ Other
3. Indoor Air Quality problems: ☐ Yes ☐ No → ***If yes see Pollution Source Survey***
4. Knob and Tube inspection needed: ☐ Yes ☐ No Location of panel: .....
5. Electrical Repairs needed: ☐ Yes ☐ No
6. Install/repair ventilation system: ☐ Yes ☐ No
7. Accessibility repairs needed: ☐ Handrail ☐ Steps ☐ Other .....

Comfort/Infiltration

8. Install door weatherstrip kits: ☐ Yes ☐ No Location: .....
9. Window repair or replacement: ☐ Yes ☐ No
10. Door replacement: ☐ Yes ☐ No LH/RH Jamb: ☐ Inswing ☐ Outswing
    Add Deadbolt: ☐ Yes ☐ No Add peephole: ☐ Yes ☐ No
11. Mobile Door Replacement: ☐ Yes ☐ No LH/RH Jamb: ☐ Inswing ☐ Outswing
12. Air sealing Goal CFM50: .....
13. Air sealing Opportunities:

Other:

Durability

14. Moisture Problems Exist: ☐ Yes ☐ No Source .....
15. Roof Repairs Needed: ☐ Yes ☐ No Location .....
16. Repair Gutters: ☐ Yes ☐ No Location .....
    Add splash blocks: ☐ Yes ☐ No
17. Pest infestation present: ☐ Yes ☐ No Location of damage .....

Other:

3/4/2002

Healthy Homes Program

1

Building Performance Center & Opportunity Council 170 Flix Bellingham, WA 98225 (360) 676 -9718 Fax: (360) 676-9754

Weatherization Worksheet

Lead Safe Work Written Compliance Worksheet

THIS PORTION TO BE FILLED OUT BY ASSESSOR

Client: _____ Date _____
Name of assessor _____ Year house was built_____

Which of the following types of evaluations was performed on this house? (Circle one)
1) Risk Assessment 2) Surface by surface evaluation 3) No evaluation – presume lead

NOTE: If the house was built before 1978 but testing of paint has not taken place, then the presence of lead must be presumed for all surfaces that will be disturbed and lead safe work practices used.

If a report was written, is there a copy in the client file? **Y or N**

THIS PORTION TO BE FILLED OUT BY LEAD TECHNICIAN

Name of Lead Technician _____ Date _____

Enter the following information for each task that will require lead safe work practices:

Task	Technician(s)	Date(s) Start / End	Tools, materials, engineering controls used , and technologies considered in meeting the PEL	Respiratory protection and protective clothing to be used.
1				
2				
3				
4				
5				
6				

Lead Safe Work Written Compliance

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

The cornerstone of any Weatherization Program, increases in energy savings, are achieved through air sealing of building and ductwork, increased levels of insulation, improved R-Value in windows, replacement of high energy using appliances and lighting, more efficient heating systems and educating clients about their energy use patterns and guiding them to better choices.

In field energy assessment and client education for:

- Energy Bills
- Heating System
- Appliances
- Energy Use Patterns / Choices

2 Onsite Forms

Title pages shown below

1

Energy Use Evaluation
First Home Visit
Client: _____ Date: _____
_____ Household size: ____
Family member attending _____

Bill Summary:
(1) Annual Energy Cost $ _____ (all fuels) (2) Annual Energy Cost $_____ (all fuels)
Avg. monthly baseload $_____/mo.,___ Avg. monthly baseload $ _____/mo.
Cost to run appliances $ _____/yr. Cost to run appliances $_____/yr.
Cost to heat the house $ _____/yr. Cost to heat the house $_____/yr.
Heating Degree days _____ ____ Heating Degree Days_____
BTU/sq.ft./Hdd _____ BTU/sq.ft./Hdd _____

Heating System: _____ _____
Primary Secondary
Thermostat type: manual /programmable
Thermostat setting:_____ vs. actual temp ____
Night time setting: _____When away: ____ No setback practiced _____
Zone heating utilized? ___ Vents uncovered? ___ Filter Clean?_____ Blower Clean?____
Comments:

Water Heater: Age:_____Tank wrapped? _____ Pipes wrapped? ____
Measured water temp. ____ Dialed down?_____ Describe_____
Existing shower flow rate: _____GPM, New flowrate: _____GPM
Faucet aerators installed?_____ Any leaking faucets? _____
Comments:

Refrigerators: Unit 1; How old? ____ Temp. in frig. _____? Temp. in freezer comp. _____?
Condition of gasket _____ Coils need cleaning? _____ Measured KW/hr _____
Heat from compressor allowed to escape? _____ Estimated cost _____/mo. Replace Y/N
Comment:
Unit 2; How old?_____ Temp. in frig. _____?Temp. in freezer comp._____?
Cond. of Gasket_____ Coils _____ Measured KW/hr _____ Estimated cost_____/mo.

Freezer: Type_____ Size _____cu.ft., Measured Temp. _____
Adjusted thermostat? _____ Frost buildup? _____ Full .....Empty
Location: _____ Measured KW/hr. _____Estimated cost$___ ____ /mo.
Comment:

Dryer: How many loads per week? _____ Avg. time it takes to dry a load _____
Check lint screen____ Is exhaust venting properly connected? ____ free from obstructions?_____
Washer: Cold wash cold rinse, Warm wash cold rinse, Hot wash cold rinse
Does the spin cycle seem to work well for removing excess water before drying?
Comment:

Energy Use Evaluation

2

Opportunity Council
Family Energy & Indoor
Air Quality Action Plan
Date: _____

Three Steps to improve your Indoor Air Quality

1.

2.

3.

Three steps to reduce your Energy Bills

1.

2.

3.

The Opportunity Council Energy Representative has explained what we need to do to make this action plan work for us. We can call the energy representative at the Opportunity Council if we have any questions.

Signed: _____

Family Energy Action Plan

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

The goal of this compliance checklist is to document that lead safe work practices were followed for all work that touches painted surfaces in homes built before 1978 (when lead-based paint was banned from residential use). The key distinction between this checklist and the existing DOE policy is that it requires lead safe work practices even when the work is below the de minimus level established by HUD and DOE since even small jobs can create big problems if the paint has a high lead content and the activity creates substantial dust and chips (e.g., power sawing).

1 Onsite Form, Level 1 & 2

Title page shown below

1

Lead Safe Work Practices Checklist

Address:_____ Occupant Name:_____

Date Unit Survey Completed:_____ Assessor Name:_____

Level 1: "Do No Harm" (This applies to all work of any size.)

1. Seal off the Inside Work Area

- ☐ Keep children and pregnant women out of the room.
- ☐ Remove as much furniture as you can from the room.
- ☐ Cover remaining furniture with heavy plastic sheets and tape it down.
- ☐ Cover the work area floor with heavy plastic, tape or staple edges to the floor or walls. Place plastic at least 5 feet from work spot.
- ☐ Be careful not to track dust out of the area.
- ☐ Do not eat, drink or smoke while working.

2. Protect the Outside Work Area

- ☐ Keep children and pregnant women away from the work area.
- ☐ Remove toys, garden supplies, and other resident items from the work area.
- ☐ Place heavy duty plastic sheeting or landscaping fabric below and 10 feet out from work area. Hold down edges with heavy objects. Tape or staple edges to appropriate surfaces. You may use attach (tape or staple) zip lock bags below small drill holes to catch paint chips and dust.
- ☐ Close windows and doors within 20 feet of work spot.

3. Avoid Dust, Chips or Fumes that May Contain Lead

- ☐ Work wet, Water helps keep lead dust from the air. Mist paint before you scrape or sand. Use wet sanding sponges.
- ☐ Don't sand blast or power wash. This can make clouds of lead dust.
- ☐ Power sanders or grinders should have HEPA filters and hoods to trap dust.
- ☐ Do not use open flames or heat guns above 1100° F.
- ☐ Do not use paint strippers with methylene chloride.

4. Keep the Area Clean of Dust, Paint Chips and Debris

- ☐ Fold up plastic sheeting, fold dirty side in (dirty side to dirty side) to contain dust and paint chips. Seal plastic with heavy duty tape.
- ☐ Place trash in heavy plastic bags, close with heavy duty tape.
- ☐ Use a vacuum with a HEPA filter to clean up dust and debris. Vacuum carpet slowly.
- ☐ Scrub floors with soap and water. Rinse well with clean water. Change water for each room.
- ☐ For outside work, pick up an chips or debris that was not caught by the plastic sheets, landscape fabric or zip lock bags.
- ☐ Never burn trash with lead in it.

Weatherization *Plus* Health Draft 1/4/2004 10:14 PM Comments to e.tohn@comcast.net 508.358.7770 2

Indoor Air Quality Assessment

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

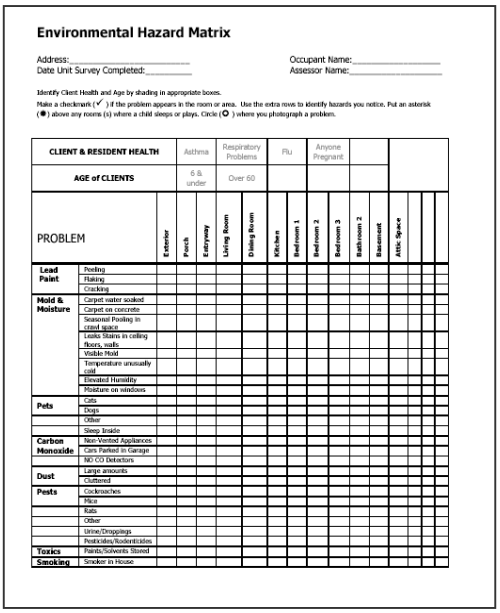
Provide the framework for IAQ work to be done. This assessment is a visual suvery for environmental health threats and includes a more extensive evaluation of ventilation.

Elements:

- What environmental and health threats may exist in the house?
- How will the Work Plan address these potential threats and Indoor Air Issues?

2 Onsite Forms, 1 Work Plan Development Form

Title pages shown below



Environmental Hazard Matrix

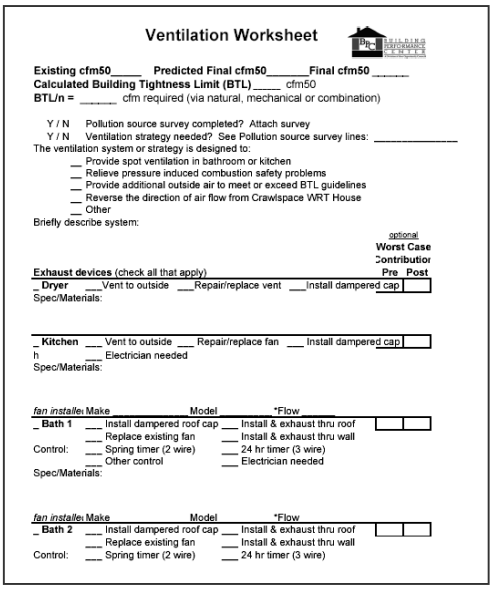
Address:_____ Occupant Name:_____
Date Unit Survey Completed:_____ Assessor Name:_____

Identify Client Health and Age by shading in appropriate boxes.
Make a checkmark (✓) if the problem appears in the room or area. Use the extra rows to identify hazards you notice. Put an asterisk (✱) above any rooms (s) where a child sleeps or plays. Circle (O) where you photograph a problem.

CLIENT & RESIDENT HEALTH	Asthma	Respiratory Problems	Flu	Anyone Pregnant											
AGE of CLIENTS	6 & under	Over 60													
PROBLEM	Exterior	Porch	Entryway	Living Room	Dining Room	Kitchen	Bedroom 1	Bedroom 2	Bedroom 3	Bathroom 2	Basement	Attic Space			
Lead Paint	Peeling														
	Flaking														
	Cracking														
Mold & Moisture	Carpet water soaked														
	Carpet on concrete														
	Seasonal Pooling in crawl space														
	Leaks Stains in ceiling floors, walls														
	Visible Mold														
	Temperature unusually cold														
	Elevated Humidity														
	Moisture on windows														
Pets	Cats														
	Dogs														
	Other														
	Sleep Inside														
Carbon Monoxide	Non-Vented Appliances														
	Cars Parked in Garage														
	NO CO Detectors														
Dust	Large amounts														
	Cluttered														
Pests	Cockroaches														
	Mice														
	Rats														
	Other														
	Urine/Droppings														
	Pesticides/Rodenticides														
Toxics	Paints/Solvents Stored														
Smoking	Smoker in House														

1

Environmental Health Survey Matrix



Ventilation Worksheet

Existing cfm50_____ Predicted Final cfm50_____Final cfm50 _____
Calculated Building Tightness Limit (BTL) _____ cfm50
BTL/n = _____ cfm required (via natural, mechanical or combination)

Y / N Pollution source survey completed? Attach survey
Y / N Ventilation strategy needed? See Pollution source survey lines: _____
The ventilation system or strategy is designed to:
__ Provide spot ventilation in bathroom or kitchen
__ Relieve pressure induced combustion safety problems
__ Provide additional outside air to meet or exceed BTL guidelines
__ Reverse the direction of air flow from Crawlspace WRT House
__ Other
Briefly describe system:

optional
Worst Case Contribution

Exhaust devices (check all that apply) **Pre Post**

_ Dryer ___Vent to outside ___Repair/replace vent ___Install dampered cap
Spec/Materials:

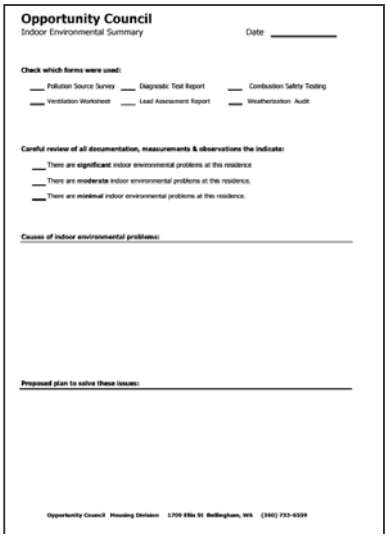
_ Kitchen ___ Vent to outside ___ Repair/replace fan ___ Install dampered cap
h ___ Electrician needed
Spec/Materials:

fan installed Make_____ Model_____ *Flow_____
_ Bath 1 ___ Install dampered roof cap ___ Install & exhaust thru roof
___ Replace existing fan ___ Install & exhaust thru wall
Control: ___ Spring timer (2 wire) ___ 24 hr timer (3 wire)
___ Other control ___ Electrician needed
Spec/Materials:

fan installed Make_____ Model_____ *Flow_____
_ Bath 2 ___ Install dampered roof cap ___ Install & exhaust thru roof
___ Replace existing fan ___ Install & exhaust thru wall
Control: ___ Spring timer (2 wire) ___ 24 hr timer (3 wire)

2

Ventilation Worksheet



Opportunity Council
Indoor Environmental Summary Date _____

Check which forms were used:

___ Pollution Source Survey ___ Diagnostic Test Report ___ Combustion Safety Testing
___ Ventilation Worksheet ___ Lead Assessment Report ___ Weatherization Audit

Careful review of all documentation, measurements & observations the indicate:

___ There are **significant** indoor environmental problems at this residence
___ There are **moderate** indoor environmental problems at this residence.
___ There are **minimal** indoor environmental problems at this residence.

Causes of indoor environmental problems:

Proposed plan to solve these issues:

Opportunity Council Housing Division 1709 Ellis St Bellingham, WA (360) 733-6559

1

Indoor Environmental Summary

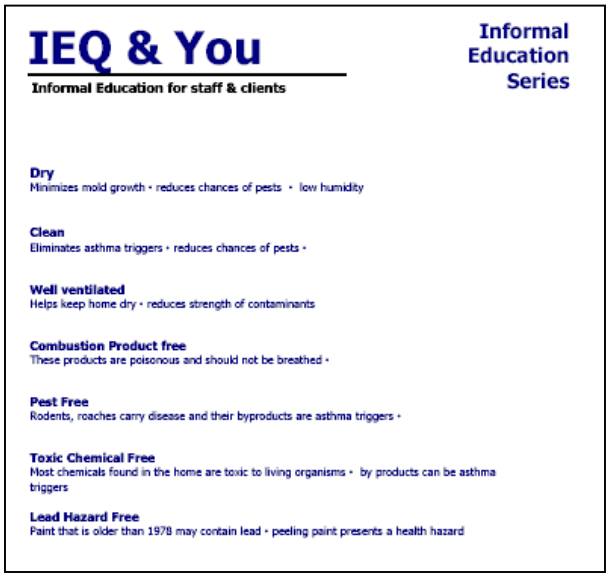
Introduction

Use during Eligibility Process and Perform Work Plan

The heart of the Education Component is the Informal Education Series. Weatherization Staff are trained in the basics of Indoor Environmental Principles , they then convey this information in every setting that they interact with the client.

2 Flyers, 1 Educational Document

Title pages shown below



IEQ & You

Informal Education for staff & clients

Informal Education Series

Dry
Minimizes mold growth • reduces chances of pests • low humidity

Clean
Eliminates asthma triggers • reduces chances of pests •

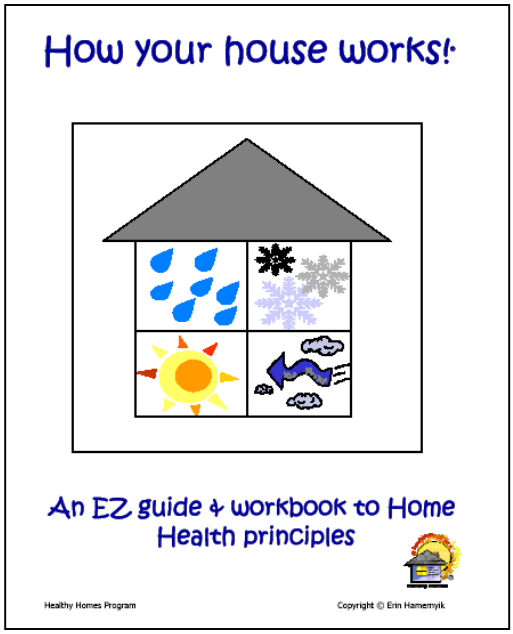
Well ventilated
Helps keep home dry • reduces strength of contaminants

Combustion Product free
These products are poisonous and should not be breathed •

Pest Free
Rodents, roaches carry disease and their byproducts are asthma triggers •

Toxic Chemical Free
Most chemicals found in the home are toxic to living organisms • by products can be asthma triggers

Lead Hazard Free
Paint that is older than 1978 may contain lead • peeling paint presents a health hazard



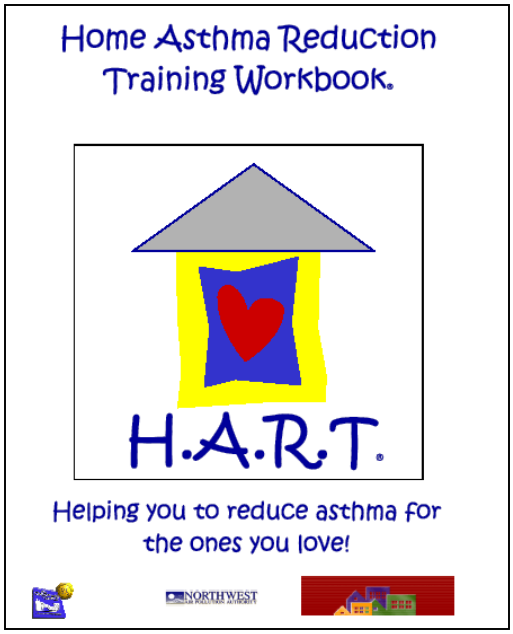
How your house works!

An EZ guide & workbook to Home Health principles

Healthy Homes Program

Copyright © Erin Hamernyik

How your House Works 1 page flyer



Home Asthma Reduction Training Workbook.

H.A.R.T.

Helping you to reduce asthma for the ones you love!

NORTHWEST

Home Asthma Reduction 1 Page Flyer

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

In Level 2, where the goal is to actively improve environmental and health conditions, the recommended lead response is to repair the key source of housing-based lead hazards (peeling, flaking, chipping lead based paint). In homes built before 1978, repair the paint and underlying source of the paint failure following lead safe work practices. In homes built before 1960 where the likelihood of higher lead content in the paint and more surfaces painted with lead-base paint is high, the protocols also require "clearance" to ensure that all paint is left intact and that dust lead levels are below the federal clearance thresholds. This added step provides and all important safety net following paint repair in older homes and is required when federal lead or rehabilitation funds are being used.

1 Onsite Form for Level 2

Title page shown below

1

Level 2: Improve Indoor Environmental Conditions
(Follow these additional steps.) Repair & Clearance

- ☐ **Repair all flaking, peeling, chipping or other deteriorated paint and the underlying source of the problem using lead safe work practices.**

  In Level 2, take proactive steps to fix lead paint hazards (make paint smooth and intact).

- ☐ **In units built in and before 1960, conduct lead dust clearance in the work area.**
  - Clearance includes a visual inspection to ensure that paint is intact and dust testing to show that dust lead is below federal and state standards.
  - Use a certified lead inspector, risk assessor or sampling technician.
  - If lead abatement or HUD rehabilitation funds are used: Conduct clearance testing in all units built before 1978. Use independent clearance personnel.
  - If lead abatement funds are used: The entire housing unit must pass dust testing.

Weatherization *Plus* Health Draft 1/4/2004 10:05 PM Comments to e.tohn@comcast.net 508.358.7770 4

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

Enhanced Ventilation utilizes techniques such as depressurization and pressurization to gain control of the air in the house. More advanced mechanical ventilation systems are considered at this level, included the Multi- Aire fresh air intake system. Also Humidity gauges are left with client to not only monitor changes but to be used as a point of reference and education.

- Depressurization
- Pressurization
- Fresh air component
- Humidity awareness

Onsite Forms

Relative Humidity Gauge Log

This log is designed for you to record your Relative Humidity levels in the home. Remember that ideally the level should be kept between 40-50%.

Date	Time	Room	Humidity Reading %

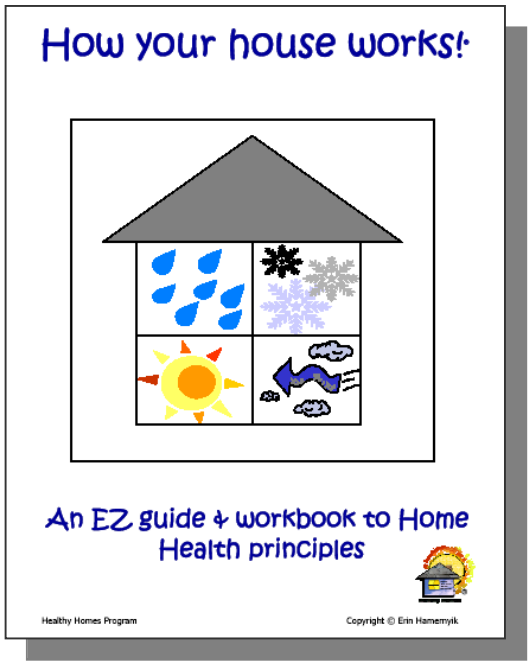
Extended Education Component

Introduction **Use during Assessment, Work Plan Development, and Perform Work Plan**

During Improve Health Conditions a more detailed education package is delivered. It includes the full workbook set of How Your House Works & The Home Asthma Reduction Training Workbook and in house training where possible. The relationship with the client may be ongoing, if allowed and encourages healthful changes in house related behavior. The idea here is to engage the client at the level they are at and educate by a variety of examples how to create an improved indoor environment. This will hopefully augment the mechanical fixes provided by the WX Crews.

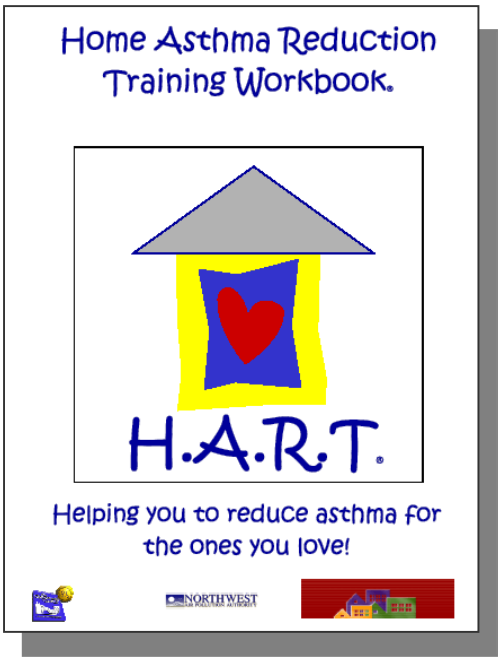
2 Workbooks Title pages shown below

1



How your House Works 1 page flyer

2



Home Asthma Reduction 1 Page Flyer

Dust Control & Non Toxic Cleaning

Introduction

Use during Work Plan Development, and Perform Work Plan

Based around Healthy Homes protocols, controlling dust and airborne contaminants is paramount to reducing respiratory irritation. Cleaning with non-toxic low dust methods is something all clients can use.

- Damp wiping
- HEPA Vacuum
- Dust Control Strategies
- Walk Off Mats
- Dust mite covers on mattresses and pillows
- Non – Toxic Cleaners and methods
- Healthy Cleaning Kit

Pressurized Blower Door Testing

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

In general, Blower Door Tests are done by depressurizing the house. However, if health concerns are present there is a risk of pulling toxic or unwanted materials from house cavities into the living space. To remedy this Preessurized Blower Door testing is recommended.

2 Onsite Forms

Title pages shown below

1

DIAGNOSTIC TEST REPORT

Customer Name | Job# | | Date | Date

Technician Name | **PRE** | **POST**

1	Number of Occupants ____ x 15cfm x ____ n = BTL cfm50		NA
2	Number of Occupants ____ x 15cfm x ____ n = BTL cfm50		NA
3	Volume of conditioned living space ____ x .35 x ____ n / 60 = BTL cfm50		NA
4	Square feet of conditioned living space		NA
5	Calculated Building Tightness Limit = highest number of lines 1, 2, and 3		NA
6	Primary heat source(s) fuel type 1=Elec. 2=Nat. gas 3=Propane 4=Oil 5=Wood 6=Specify		
7	Secondary heat source(s) fuel type 1=Elec. 2=Nat. gas 3=Propane 4=Oil 5=Wood 6=Specify		
8	Pollution Source Survey completed	Y/N	NA
9	Home is being treated as Weatherization Plus Health	Level I	Level II
10	Combustion Safety Test(s) of all combustion appliance(s) completed	Y/N	Y/N
11	Windspeed MPH		
12	Outside temperature, record in degrees farenhiet		
13	Blower door location		
14	Baseline without blower door on in pa (stack)		
15	Blower door conf. O=open fan A = ring A B = ring B LF=low flo ring	A B LF	A B LF
16	Total CFM50		
17	Technician recommended BTL by: use, IAQ, exposure, diag. tests, etc.		NA
18	**ZONAL PRESSURES**	NA	NA
	ZONE	NA	NA
	1 ATTIC WRT HOUSE		
	2 CRAWLSPACE WRT HOUSE		
	3 GARAGE WRT HOUSE		
	4 OTHER WRT HOUSE		
	5 OTHER WRT HOUSE		
	6 OTHER WRT HOUSE		
	7 OTHER WRT HOUSE		
	8 OTHER WRT HOUSE		
19	Intended location of existing ducts A=Inside B=outside C=inside/outside		
20	**PRESSURE BLOCK TESTS (clockwise from front door, house WRT duct)**	NA	NA
	Number S=supply/R=return Zone # I=inside/O=outside	NA	NA
	1		

2

Ventilation Worksheet

Existing cfm50_____ **Predicted Final cfm50**_____**Final cfm50** _____
Calculated Building Tightness Limit (BTL) _____ cfm50
BTL/n = _____ cfm required (via natural, mechanical or combination)

Y / N Pollution source survey completed? Attach survey
Y / N Ventilation strategy needed? See Pollution source survey lines: _____
The ventilation system or strategy is designed to:
__ Provide spot ventilation in bathroom or kitchen
__ Relieve pressure induced combustion safety problems
__ Provide additional outside air to meet or exceed BTL guidelines
__ Reverse the direction of air flow from Crawlspace WRT House
__ Other
Briefly describe system:

optional
Worst Case Contributior

Exhaust devices (check all that apply) **Pre Post**

_ Dryer ___Vent to outside ___Repair/replace vent ___Install dampered cap
Spec/Materials:

_ Kitchen ___ Vent to outside ___ Repair/replace fan ___ Install dampered cap
h ___ Electrician needed
Spec/Materials:

fan installe Make _____ Model _____ *Flow _____
_ Bath 1 ___ Install dampered roof cap ___ Install & exhaust thru roof
___ Replace existing fan ___ Install & exhaust thru wall
Control: ___ Spring timer (2 wire) ___ 24 hr timer (3 wire)
___ Other control ___ Electrician needed
Spec/Materials:

fan installe Make Model *Flow
_ Bath 2 ___ Install dampered roof cap ___ Install & exhaust thru roof
___ Replace existing fan ___ Install & exhaust thru wall
Control: ___ Spring timer (2 wire) ___ 24 hr timer (3 wire)

Appendix of Forms

Onsite Forms

Diagnostic Test Report
Ventilation Worksheet
Combustion Safety Worksheet
Combustion Safety Test Report
Weatherization Worksheet
Lead Safe Work Written Compliance Worksheet
Energy Use Evaluation
Family Energy & Indoor Air Quality Action Plan
Lead Safe Work Practices Checklist (Level 1 & 2)
Environmental Hazard Assessment
Indoor Environmental Summary
Summary of Work Completed

Education Tools

Informal Educational Curriculum
General materials – EPA, American Pediatrics
Flyers from Workbooks
HART WorkbookExtended Education/Follow up Access to Health Net