

SAMPLE

**Any Street
Any Town**

on any Day

Mr. & Mrs. Informed Home Buyer

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"Home Inspections by Professional Engineers"

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TO: The Lender for:

Mr. & Mrs. Informed Home Buyer

During my inspection of any town on any day, I noted the following:

SEPTIC SYSTEM:

At the conclusion of the push test there was no apparent wastewater or significant sewage odor in the probable vicinity of the septic area. This indicates that there was no visible system malfunction on the day of inspection.

WATER SUPPLY SYSTEM:

The well was able to supply a reasonable sustained flow of water within the normal pressure range during the push test. This indicates that there was no apparent serious system malfunction on the day of inspection.

TERMITES:

I saw evidence of past termites on the day of inspection and therefore recommend seeking the advice of a pest control company.

More detailed information on the above items is included in the full inspection report.

Peter Seirup

SUMMARY

I visited the home at any street on any day for the purpose of rendering the following opinion to Mr. & Mrs. Informed Home Buyer.

The house was apparently built around 1932 with a mid-1990s addition.

The house was apparently constructed during a time when not much building was going on. Talented craftsmen had the time and motivation to do extra-good work. The house shows it.

The roof appears to be in the early stages of its expected life and free from current leaking under normal conditions. The presence of an ice protection membrane under the roof is a plus since it helps prevent leaking under severe weather conditions

The overall wood frame structure of the original part of the house appears to be a cut above average in quality and holding its shape very well. I did, however, see evidence of past termites and some damage to the sill under the front of the house near the front door and to several joists in that area. Fairly straight forward repairs are appropriate. I recommend consulting with a pest control company to determine what treatment is appropriate.

The plumbing system includes considerable updated piping but also some older brass water supply piping that will need occasional repair and eventual replacement. I did not see the need for any major plumbing repairs at this time.

The 200 amps of electric power is appropriate for the house. Internal wiring varied in age but appeared in overall good condition with minor repair.

The heating system is readily delivering heat throughout the house. Since the heating equipment is nearing the end of its expected life, I recommend you budget to replace it when necessary likely within a few years. I would budget somewhere around \$4,000 to have this work done.

Since the outside temperature was too cool, the central air conditioning system could not be fully checked. I did turn on the air handler unit for the central air conditioning system on the day of inspection and found that it circulated air throughout the house, so the system can be considered as partially checked.

No well problems were apparent from my limited aboveground inspection.

No septic system problems were apparent from my limited aboveground inspection. Nevertheless, I strongly recommend further underground investigation, given the apparent age of the leaching system.

The following is a more detailed report of this summary as well as information on more minor items for the purpose of familiarizing the client with the home.

The terminology used in this summary and in the following report “generally in good condition” or “overall good condition” does not mean the component is free from normal

wear and tear. Nor does it mean it is of ideal design or construction. It means that no significant major repairs are appropriate, in my opinion, at this time or in the near future.

Where cost figures are given in this report, they are budgetary estimates to be helpful. If you want more reliable cost figures, I suggest you get bids from contractors.

GENERAL INFORMATION:

Congratulations on the investment in your new home. The investment does not stop with the purchase. The following is some information to help you protect your investment.

Each component of a house has an expected, useful life. Expectations are a function of averages from experience on other similar components. Actual useful life can vary significantly due to the quality of that batch or run of the product, the appropriateness of the design and application, the correctness of the installation, the environment to which it is subjected, the maintenance to which it is treated, unusual circumstances, etc.

In general, treat all your components to a damp-free environment, carry out normal homeowner maintenance, have professional servicing regularly done to appropriate components, and have unusual-looking or sounding developments checked out by a professional in a timely fashion. In spite of good intentions, you may find that certain components which work well one day by their very nature will become non-functional without notice.

It has been said that one should budget between 1 and 3% of the cost of the house per year for maintenance costs. Actual costs, however, will be uneven since expenditures for major repairs or replacements can rarely be spaced out. It is therefore good to develop a fund for this. Actual long-term maintenance costs can be brought down by doing certain work (such as painting) yourself.

EXTERIOR SURROUNDINGS

HOUSE POSITION AND DRAINAGE

OBSERVATIONS:

For purposes of orientation in this report, the front door of the house is defined as facing north.

The house is set on an incline which encourages overall good drainage. The uphill side, however, is fairly flat near the house. This may cause soggy ground or foundation water pressure during periods of wet weather or high ground water.

The roof gutters appear essentially well-sloped to downspouts in appropriate locations. The downspouts direct water away from the foundation via underground and elbow pipes.

SUGGESTIONS:

Adding aboveground or underground extensions to the downspouts, where there are none, so they discharge roof rainwater runoff well away from the foundation, will help minimize water pressure against the foundation.

The material of the underground drainpipes from the roof gutter downspouts suggests that these pipes are old. Old underground drainage systems often do not drain well. This can encourage foundation water pressure and basement water penetration. I recommend these pipes be checked for flow and snaked out or retired in favor of new ones if necessary.

GENERAL INFORMATION:

In the future, when doing gardening or landscaping think in terms of encouraging water to run around or away from the house rather than up against it.

A good roof guttering system helps minimize water streaming down the sides of the house and collecting at the foundation. This way window sills and siding are preserved and foundation movement and basement water penetration are minimized.

To keep a roof drainage system working well, keep the gutters free of leaves by cleaning after heavy rain or wind storms as well as several times during the fall. Also check periodically to make sure the pipe outlets are running freely and/or replace pipes as necessary. Reslope each spring any gutters which become poorly sloped as a result of the winter's ice.

SIDEWALK, STEPS AND DRIVEWAY

OBSERVATIONS:

The sidewalk and steps appear mostly in good condition.

SUGGESTIONS:

Resetting the sidewalk right by the front steps to make the bottom step more even with the others would help reduce a possible tripping hazard.

Parts of the asphalt driveway are broken up with age. Resurfacing can be done at your discretion.

DETACHED STRUCTURES

OBSERVATIONS:

A detailed swimming pool inspection is not part of the home inspection though I made the following observations to be constructive:

The pool equipment was running smoothly on the day of inspection.

The sides of the pool are straight and/or smooth curves suggesting that the structure is sound.

Some settlement or frost heave has occurred to the apron surrounding the pool. This is fairly typical in this climate since these surfaces surrounding pools are not put on deep foundations. They should be structurally separate from the pool walls themselves so the uneven surface should not be indicative of a pool structural problem per se.

The pool was full of water on the day of inspection, suggesting that it does not leak.

The electricity for the pool is ground-fault protected for safety.

While there is a fence around the pool to help protect children and animals, the fence may not be high or substantial enough to satisfy a new insurance company providing a policy on the house.

SUGGESTIONS:

More information may be available from a pool service company if one has been servicing the pool and its equipment. Ask them what they think you should budget for improvements over the next five years. Also have them suggest a maintenance program.

RETAINING WALLS AND FENCES

OBSERVATIONS:

The stone retaining walls at backyard gardens appear well constructed and good for age.

SIDING AND TRIM

OBSERVATIONS:

The wood shingle siding of the house appears in satisfactory condition for its age.

Most of the wood trim of the house including fascias, soffits, window and door trim where readily visible appears in reasonably good condition, given the age of the house. There is some rot such as at (but not necessarily limited to) the garage door trim base. One should expect soft or rotten boards such as these to develop with age.

At this time bush and tree maintenance appears to be under control.

SUGGESTIONS:

Painting the trim and the exterior siding at five-year intervals will keep them looking good as well as preserve them. Replacing soft or rotted boards (using redwood instead of pine for the replacements since redwood lasts longer) is normally done as part of paint jobs. Caulking around windows and other open joints is also done during paint jobs. I have observed that latex paints and stains resist mildew far better than oil paints and stains. The paint job looks okay at this time.

The age category of this house causes paint to peel in some places fairly regularly. Given this fact, it might make more sense to touch up the paint from time to time rather than looking at the peeling in between complete paint jobs. By scraping loose paint and touching up once a year, and power washing the house every other year, one can stretch the time considerably in between major paint jobs, make the house look better throughout the time and save substantial costs while still protecting the house. A non-fading color such as white facilitates this strategy.

Wood components by the back door of the house do come in contact with the soil in some cases. This can promote wood decay and termite infestation. I recommend regrading enough so that wood and soil contact is eliminated.

GENERAL INFORMATION:

If water repeatedly enters a structure, it can do serious damage which may not be visibly apparent for quite some time. If a water stain should develop, it is important to follow up on it.

Keeping bushes and trees trimmed well away from the walls and roof of the house will help reduce moisture accumulation, thereby preserving the roof and wall surfaces as well as generally inhibiting rot. Keep dirt, leaves and ground cover clear from lower wooden areas of the house. Ground contact promotes decay.

If you see sawdust or mud tubes near wood framing (particularly just inside of earth-filled porches, patios and steps, the most common entry routes for termites), call a pest control company to make an inspection. Standard treatments and repairs are available. If wood decay from termites, carpenter ants or water leaks becomes exposed during any renovations, do any appropriate extermination, replace the critically affected wood and get on with your planned improvements.

Power-washing most types of siding and trim every few years can make them look much better and extend the time between paint jobs.

WINDOWS, STORM WINDOWS AND DOORS

OBSERVATIONS:

The wood-frame, double-hung windows on the original part of the house are apparently original part of house. Windows of this period tend to be very durable. These appear to be generally in good condition.

Conventional aluminum storm windows are present on the double-hung windows. This helps reduce heat loss and protects the window sash.

The windows in the rear addition are quality, wood-frame, vinyl-clad, double-glazed windows.

On the day of inspection two double-glazed window panels in the family room had visible moisture in between the glass. This indicates that the seals have failed. More fogged panels may show up under different weather conditions in the future.

Skylights with prefabricated, curbed flashings such as this are less likely to develop leaks than lesser quality units. Even good quality skylights, however, sometimes need repair.

In general, interior and exterior doors can be considered high quality but old and functional where spot-checked.

SUGGESTIONS:

Replacement double-glazed glass panels should be available for those that have fogged if you wish.

DECK

OBSERVATIONS:

The deck is constructed of pressure-treated lumber which normally has a long-term guarantee against deterioration from water or insects for decades. Nevertheless, pressure-treated wood is noted for its tendency to warp, split, crack, twist etc. Applications of wood preservative every couple of years should reduce this tendency somewhat.

The presence of a flashing between the deck and the house is good and helps protect this vulnerable joint from decay.

The deck joists are attached to the ledger board along the house with metal joist hangers, which are a more positive support than simply toenailing the joists.

The presence of lag bolts connecting the deck to the house is good.

The railings on the deck appear fairly well constructed to help protect children.

The 14' span of the 2x8 floor joists is substantially longer than appropriate for the possible loads of the deck.

SUGGESTIONS:

Install an additional beam under the mid-span of the deck joists to support that beam with three columns resting on 42" deep concrete piers.

CHIMNEYS

OBSERVATIONS:

The one brick and two stone chimneys appear to be generally in good condition from available points of observation.

SUGGESTIONS:

There is some recementing which could be done to the two older stone chimneys and the aging cement crown at the top of the chimney. This is not urgent, in my opinion, but should not be put off indefinitely since this is a progressive deterioration from water penetration followed by freezing.

GENERAL INFORMATION:

Accepted masonry practices over the years have significantly compromised the performance of chimneys in terms of water entry, draft and sometimes fire safety. An ideal masonry chimney would have many characteristics we rarely see such as a cast concrete crown and a smoothly surfaced gap-free smoke chamber. The observations in this report compare to average practice. Investigating further improvement to any masonry chimney can be done at your discretion.

Prefabricated metal chimneys are subject to both concealed installation defects and concealed age deterioration. Invasive inspections to older or otherwise high risk installations can be done by chimney specialists.

ROOF

OBSERVATIONS:

The following observations were made by walking on the roof and observing inside surfaces under the roof.

The complexity of this roof makes it more probable that flashing and/or other repairs will be necessary from time to time.

The gable type roof, which is surfaced with asphalt shingles, appears to be in the early stage of its expected life and free from current leaking under normal conditions.

It appears that multiple layers of asphalt and wood shingles were removed on the main roof in preparation for new plywood sheathing and new asphalt shingles. This is a very big job and it is an advantage that this has already been accomplished.

The relatively steep pitch of the roof is advantageous, in my opinion, because it improves roof drainage and minimizes the chance of water backing up from snow and ice buildup

The presence of at least narrow eaves at the lower edges of the roof helps somewhat to protect window sills, siding and trim while reducing the chance of water leaking into the living space from ice damming in late winter.

I looked for and found ice protection membrane under the lower edge of the roofing. Ice protection membrane helps prevent leaking through the roof from ice damming during severe winters such as we had in 1996 and 1994. The presence of ice protection membrane is not to be assumed. It is an extra.

I looked for and saw no building paper under the roof shingles. Not putting building paper under roofing shingles became popular in the 1980's. Building paper always was and still is a second line of defense against leaks at most roofs. I believe most roofing manufacturers will not guarantee their shingles unless building paper is applied underneath.

The roof flashings in general where visible appear to be reasonably complete and intact for this age house.

A trap valley is created between the original house and the addition. This type of roof configuration is prone to leaking, particularly if debris, snow and ice collects there.

SUGGESTIONS:

Sweeping off debris and heavy snow from the trap valley would be helpful in reducing the chance of leaking. Relining the valley with flashing or an impenetrable membrane would be appropriate if leaking does occur and better as a long-term upgrade.

I recommend asking the owner if there have been any roofing repairs needed in the past and whether there are any roofing areas that need special attention to prevent leaking.

GENERAL INFORMATION:

Most asphalt roof shingles have warranties for about 20 years and in fact last about that long. An additional layer of asphalt shingles should not be added if two layers already exist. Flashing repairs or point-of-wear repairs may be necessary occasionally during the roof's life span. Water stains on ceilings noticeable at the time of purchase may only leak under very specific or extreme weather conditions.

Leaking through roofs locally, particularly at lower edges and roof valleys, is common after heavy winter snows. Snow melts, runs down the roof, refreezes to ice, dams up water which finds its way between shingles into the house. This is called ice damming. Somewhere around half the houses locally leaked from this during the severe winters of 1994 and 1996. It is sometimes hard to predict and leaking can be inconsistent. There are various ways to deal with it including ice protection membranes, sweeping snow from problem areas and sometimes improving roof structure ventilation.

FOUNDATION, BASEMENT AND GARAGE

FOUNDATION

OBSERVATIONS:

The stone foundation on the original part of the house, where visible, appears generally satisfactorily constructed, sound and free from past, serious movement.

Pointing the mortar joints in between such antique stone foundations needs to be done every 50 or 100 years. The joints in this foundation are in good condition and pointing is not required, in my opinion.

The concrete block foundation of the rear addition, where visible, appears free from past, serious movement. Concrete blocks have been used for about half of the houses in this part of the country. While not quite as strong as poured concrete, concrete blocks are a reliable foundation material when put in well.

There are minor horizontal cracks in the concrete block foundation apparently from past earth, water and ice pressures. The total amount of movement does not appear to be a serious problem given the age of the house. As long as exterior property drainage is well maintained, chances are this will not require any significant repair during your stay.

The house sits mostly well up on its foundation. This helps protect the lower wood components from deterioration from water or insects. Since the back of the house is built closer to the ground than is ideal, I recommend keeping leaves, grass, etc. clear to inhibit wood decay.

Normal shrinkage cracks are visible in the basement floor slab. These take the place of construction joints that are normally found in commercial floor slab construction. The floor slab is not a structural component of the house per se.

SUGGESTIONS:

Since some lateral movement of the concrete block foundation of the rear addition has taken place, I recommend making drainage improvements suggested in the "Drainage" section of this report to reduce the peak seasonal water and ice pressures which led to the movement. I also recommend patching the small horizontal crack in this part of the foundation from within the crawlspace so that one can gauge if further movement takes place.

FOUNDATION CONTINUED:

GENERAL INFORMATION:

All concrete shrinks which causes most foundations to crack at least somewhere. Most foundations settle in the early years after construction due to normal consolidation of soils under them. Continued settlement is possible if substrata are particularly compressible or poorly-compacted fill was used. Foundation movement can also occur from washing out or extreme lateral pressure due to poor exterior drainage. If you suspect an active foundation movement, measure the cracks and see if they grow wider over time. If so, consult a structural engineer.

BASEMENT

OBSERVATIONS:

There is a crawlspace under the rear addition. I entered the crawlspace to look for evidence of chronic high moisture, wood decay and other possible concerns. None of the aforementioned seemed to be a problem in this crawlspace.

Water seepage has apparently occurred during periods of wet weather or high ground water as evidenced by the presence of efflorescence and water stains.

I did not see evidence of past deep flooding. When past flooding has been at least several inches deep usually one sees a dust ring around the perimeter on walls, posts, equipment, etc.

According to the owner, no significant basement water penetration ever covered the floor during their occupancy.

There is a subslab suction radon gas reduction system present. It was functioning.

Certain specifications have been accepted for radon reduction systems. It is considered appropriate to locate the suction fans outside of the basement or living space, to provide a monitoring device to check suction of the system, and to extend the exhaust pipe to the roof line. All three criteria have been met here.

As you requested, I placed two test kits to check the level of radon gas in the basement. The test results will be sent directly to you with a copy to me. See "Interpreting Radon in Air Test Results" furnished with this report.

SUGGESTIONS:

Improving the roof drainage as mentioned in the "House Position and Drainage" section will help reduce future possible basement water penetration.

Identifying and patching any foundation cracks or penetrations which leak water will reduce the frequency and amount of basement water penetration. A number of products are available for this.

GENERAL INFORMATION:

Maintaining roof and property drainage systems in good working order is an effective means of minimizing any future basement water penetration that might occur. Should water penetration appear in excess of what the evidence at this inspection indicates, fairly standard steps are available to reduce or eliminate it.

It is always sensible to place your stored belongings in an unfinished lower level slightly elevated off the floor. This is helpful just in case there are puddles accumulating from exceptionally heavy rains. This will help keep them dry.

Dampness should be controlled by a dehumidifier in any lower level whether water penetrates or not. If there is a floor drain, sump pump or air conditioner condensate pump, the dehumidifier can be continuously drained directly into it to preclude the need for periodic emptying of the collected water.

The relatively high humidity of this part of the country in combination with the local construction types, particularly cool basements, are conducive to the growth of molds and mildew within houses. Most people are not seriously sensitive to molds but some people can have severe reactions to some molds. If this issue concerns you now or becomes an issue in the future, seek help from an environmental company specializing in indoor quality.

GARAGE

OBSERVATIONS:

The garage floor slab is generally in good condition.

There is a slight pitch on the garage slab from back to front so that water from the cars should run out the doors rather than collect in the garage.

Fire protection is provided between the garage and the living space.

Both garage door openers responded on the day of inspection and they reversed by the electric eye and pressure.

SUGGESTIONS:

I suggest cables be installed through the center of each of the garage door springs as a safety precaution. If a spring were to break without such a safety cable, it could cause serious injury to persons and/or property.

STRUCTURE

OBSERVATIONS:

Balloon framing such as is present here was popular from about 1830 to 1940. Balloon framing is a little stronger than the currently-used platform framing. It is also more expensive and probably that is why it is not used much anymore.

The overall wood frame structure of the original part of the house appears to be a cut above average in quality and holding its shape very well. I did, however, see evidence of past

termites and some damage to the sill under the front of the house near the front door and to several joists in that area. Fairly straight forward repairs are appropriate.

The overall platform-type wood-frame structure of the addition appears to be holding its shape satisfactorily. It also appears to be free from what I would consider to be critical sags, cracks or structural deterioration to accessible wooden components from water or insects.

It is normal for wooden beams and joists to bend and compress with age. The minor deflections in this addition are in locations and of a degree which I would consider in the normal range for the age rather than being a positive indication of some structural inadequacy. The house is apparently constructed of six-inch wall studs (instead of the usual 2x4's) presumably for additional insulation. The larger studs also provide greater strength.

The method of framing the intersecting gables in the attic of the addition is the lesser desirable of the two common types. This utilizes valley beams. The longer valley beam has sagged a bit. Likely this sagging has self stabilized, but there is no way to be sure from a one-point-in-time observation. Bracing this valley beam, preferably at its intersection with the other valley beam with a strut (vertical or diagonal as suits the situation) down to a bearing wall under the attic floor could be done at your discretion.

The roof sheathing visible in the attic is actually the wood slats that the wood shingles are nailed to. These appear in generally good condition where visible and sufficient to support the roof shingles.

The stairways in the house felt sturdy and comfortable for walking.

SUGGESTIONS:

Because of the balloon construction, adding blocks of wood as fire stops to block the openings between the basement ceiling and the upstairs outside wall cavities is an easy fire protection improvement appropriate here.

I recommend consulting with a pest control firm to determine what preventative termite treatment, if any, is appropriate.

GENERAL INFORMATION:

House materials expand and contract with weather changes. Furthermore, it is natural that certain load-bearing members sag with age. These items commonly cause minor hairline cracking in plaster or sheetrock above. Major or progressive cracks can be an indication of poor framing or deterioration of wood within walls or ceilings. If you notice a significant, progressive change in a cracking system, it would be prudent to have a professional evaluate it.

PLUMBING SYSTEM

PIPING

OBSERVATIONS:

Where visible, some of the water supply piping has been upgraded to modern copper which has a long service life as long as it is not continuously subjected to particularly corrosive water for long periods of time. These pipes were free from apparent leaking and excessive corrosion. There may still be some old pipes concealed in the walls and ceilings.

Brass water supply piping exists in much of the house. Brass piping does get brittle and corrodes at the joints with age.

The presence of more than one type of metal water supply pipe encourages electrochemical corrosion of the pipes.

The copper piping on the rear addition is marked "Type L" which is heavier duty than the "Type M" frequently used.

There were no apparent, current drainpipe leaks.

Extra heavy cast-iron drainpipe, such as is present here for part of the drain piping, can last a very long time.

Galvanized drainpipe, such as is present here for some of the smaller-diameter drain piping, tends to need snaking from time to time since soap and grease combine with internal corrosion.

Plastic drain piping, such as that present for the newer drains, has been the standard locally for almost 30 years. The material has been very successful since it is slippery enough not to be conducive to blockages and it is inert enough not to corrode from most household wastewater.

Lead pans under stall showers from this era tend to fail between thirty and fifty years of age. To test the pan for leaks, I stopped up the shower drain with toilet paper and let about an inch of water stand in the shower base for an extended period of time. Water leaked through to the ceiling below during this test which suggests that the shower pan needs to be replaced.

Each plumbing fixture needs a drain with a vent. The vent allows air to escape from the drainpipe when it becomes filled with wastewater. Plumbing vent piping is clearly visible up through the roof of this house to vent these fixtures. However, I cannot be sure that each of the water fixtures is, in fact, connected to these vents. Nevertheless, by operating every water fixture while conducting the inspection, I did not find indications of poor venting.

Traps are present in the drainpipes underneath each water fixture where those drainpipes were visible. (Traps are necessary to prevent sewer gases from entering the living space.)

There did not appear to be any plumbing situations where wastewater would suck back into a water supply line. Such a situation can be unhealthy.

I operated each water fixture and ran at least some water down its drain. All drains drained. If additional quantities of water cause a drain not to flow well, functional drainage can usually be improved by snaking.

The main shut-off in the oil supply line is at the oil burner, as usual.

SUGGESTIONS:

One should expect to make occasional repairs to any piping system more than a couple decades old. A house with this vintage piping in it will require more occasional repairs and eventual replacements of most of the older piping.

I recommend replacing any old piping (except maybe extra heavy cast iron drain piping) which becomes exposed during any renovations. It is more convenient to replace pipes during work than when they leak after renovations are complete.

Replace the leaky shower pan. If I were budgeting to have this work done at my house by someone else, I would expect to pay somewhere around \$2,500 but if you want a more reliable cost figure, I suggest you get bids from contractors.

GENERAL INFORMATION:

One should expect to make occasional repairs to any plumbing system, particularly one that is getting older.

DOMESTIC HOT WATER

OBSERVATIONS:

This domestic hot water heating system utilizes a volume of boiler water circulating around an inner storage tank which is powered from the central boiler by a dedicated "heating zone. Such an indirect-fired water heater unit allows high capacity of hot water generation as well as a 75-gallon storage capacity. As a result, running out of hot water during normal use should be rare. This particular brand, Phase III, has a corrugated stainless steel inner storage tank which is generally considered the best.

There is a pressure relief valve present on this domestic water heating unit for safety.

ELECTRICAL SYSTEM

OBSERVATIONS:

The overhead electric service connection to the house and the relatively new service drop wire running down the side of the house appeared generally in good condition.

A 100-amp, 240-volt electric service such as is here is standard for houses with this complement of appliances.

There is a grounding conductor at the main electric service entrance as there should be.

A bonding wire is present between the main electrical panel ground and the copper water supply piping to help prevent accidental shock or corrosion of that piping by electrolysis.

The ratings of the main electric panel in the basement and the subpanel right beside are sufficient for the service and subservice amperages.

There were spare circuit blanks in the circuit breaker panels on the day of inspection for expansion if desired.

I looked inside the electric panels for serious corrosion or burnt wires and found none.

The individual circuit breakers appear appropriately rated for the wire sizes used.

The electric service wire is aluminum which is standard. The distribution wiring visible in the circuit panel is copper. Aluminum distribution wiring (which apparently is not present in this house) can be a problem.

Most of the outlets spot-checked were wired correctly, according to my tester.

The security system was not checked as part of the building inspection nor was other low voltage wiring, such as the telephone, cable TV, speaker systems, etc. checked as part of this inspection. More information should be available from the security system company. If you like, ask them what the monthly fee is, what the system does and what else it could do for what additional fee.

The presence of special ground fault interrupter (GFCI) outlets, such as in the bathrooms, is a safety feature usually found only in buildings built after 1979, or where some electrical upgrades have been made.

I saw what looked like battery-operated smoke detectors in the house. Make sure you keep fresh batteries in these smoke detectors.

Old BX cable such as is present here for older circuits is a grounded system, still being installed today. Older BX has insulation inside which gets brittle with age. This makes it more difficult to work with. If undisturbed, the insulation should remain intact.

As more and more modern, particularly kitchen, appliances are available, the standard electrical practices include more outlets and greater circuit breakdown. Some supplemental outlets have been added in this house to help keep pace with modern conveniences. There are still fewer outlets and circuits than in a new house.

SUGGESTIONS:

One 20-amp circuit breaker should be changed to a 15-amp breaker, given the wire size used.

In one instance, two electric circuits are doubled up on one individual circuit breaker which is not correct. While this extremely common condition is less serious compared to many other possible electric panel irregularities, it could allow wires to loosen. Providing a separate circuit breaker for each circuit would be prudent since the connections at the breakers are normally designed and tested for single wires rather than multiple wires.

GENERAL INFORMATION:

There are many details about wiring systems that are not practical to check prior to purchase including the individual connections and the layout of the circuits. Electricity deserves your respect since it can cause fatal shocks or house fires. If you experience electrical peculiarities, it is prudent to consult an electrician. It is prudent to exercise circuit breakers at least once per year.

About twenty years ago, special ground fault circuit interrupter (GFCI) outlets became accepted as part of new construction. These are used in bathrooms, at pools or wherever the possibility of water and electricity mixing became a risk to the occupant.

HEATING SYSTEM

OBSERVATIONS:

The main part of the house is heated by an oil-fired, forced, hot water, iron radiator system.

The rear addition utilizes the same hot water boiler to generate hot water for heat. Water is pumped to two individual air handlers where water-to-air heat exchangers allow the heat to be distributed ultimately to the rooms by ducts. This system allows for ducted air which is necessary for air conditioning and for separation of combustion and circulating air which is preferable for safety.

By rough rules of thumb, the capacity of the heating equipment is marginal for the expanded house. A guarantee that the system will heat each room sufficiently during any weather condition can only be provided by a heating specialist after he does detailed heat loss calculations.

The boiler is a quality cast-iron unit and is designed for long service life. It is reasonable to expect further life from it though one must understand it has considerable mileage on it and will at some time need to be replaced. Cast-iron boilers of this era normally have lower efficiency than modern equipment, however, and are therefore usually more expensive to operate.

The heat circulation pipes are fairly old. In my experience, such pipes, though they may need occasional repair, still have remaining life. The pipes were free from apparent significant leaks. I could not tell for sure if the amount of copper piping in the two water-to-air heat exchangers is sufficient to transfer sufficient heat from the water system to the air systems. If by chance the water-to-air heat exchangers are inadequate, then they could be changed or added to.

There appears to be a reasonable separation between the combustion heating equipment and combustible surfaces of the building.

There appears to be a sufficient supply of combustion air to the burner.

There is an automatic draft control present on the exhaust pipe as there should be. Such a draft control is meant to promote the flow of combustion gases up the chimney flue by automatically adjusting the chimney draft. It operated freely as it should.

The exhaust from the boiler was going up the chimney rather than backdrafting into the room. (Backdrafting would be a health concern.)

The exhaust pipe from the boiler to the chimney appears to be generally in good condition. The connection of the exhaust pipe to the chimney appears to be sufficient.

It looks as though there used to be standard early- to mid-twentieth century asbestos insulation on the main heating pipes in the basement. This appears to have been mostly removed yet white fuzz remains, particularly on certain elbows in the pipes. This suggests that the removal was not done according to EPA protocol and asbestos dust probably remains on the floor of the basement. This dust could be introduced into the air stream by walking, sweeping, etc. Since breathing sufficient quantities of asbestos can be hazardous to one's health after sufficient time consider having asbestos abatement contractors familiar with EPA protocol clean the pipes and basement accordingly.

According to the service record at the heating equipment, the system has been serviced regularly.

The heating equipment including burner, boiler, pumps and automatic valves responded to one thermostat and readily delivered heat to appropriate radiators throughout the original part of the house. The radiators themselves appeared in satisfactory condition given their age.

The heating equipment also responded to each of the two thermostats on the day of inspection and delivered hot water to the appropriate water-to-air heat exchangers. These in turn delivered heat to the appropriate adjustable registers throughout the rear addition.

SUGGESTIONS:

Annual servicing of an oil burner maximizes combustion efficiency and reliability. Service contracts are offered by most local fuel service companies at a cost of just over \$150 a year. Such contracts usually cover the annual burner tune-up, as well as any other necessary repairs to the oil burner itself during the year, at no additional charge. The Home Oil Company has apparently been providing service to this equipment.

Since the boiler is around the end of its expected life, I recommend you budget to replace it when necessary likely within a few years. I would budget somewhere around \$7,000.

Changing the return air filters every two months of operation will help with housekeeping as well as promote system efficiency and effectiveness while prolonging equipment life. The filters are located where the main return air duct meets the blower compartments of the hydro air handlers.

The ducts of forced warm air heating systems can accumulate dust and mold over time to which some people are allergic. Therefore, you might want to consider having a duct cleaning service vacuum the ducts every five years or so, particularly if you are susceptible to dust or mold. Since vacuuming ducts is a service not well known and the majority of people are not seriously affected by this, there is a good chance these ducts have never been cleaned.

Be careful not to raise dust from the asbestos insulation. Investigate and perform asbestos abatement at your discretion. If any work is done, it should be done by someone skilled in asbestos removal and EPA guidelines. Asbestos abatement work tends to be very expensive. More information on asbestos in general and its control is available from the Environmental Protection Agency and the Asbestos Abatement Contractors.

If I were budgeting to have this work done at my house by someone else, I would expect to pay somewhere around \$1,000.

Fuel is supplied from a buried oil tank. It is not practical to determine the condition of a buried oil tank in such an inspection. They do eventually wear out with age. An oil tank protection plan may be available from some fuel companies. The coverages have specific limitations and questionable long-term availability, however. It would be prudent to ask what the service company knows about this particular tank. Various technologies are available to test if leaking is a current problem. These tests usually cost in the range of \$400. These tests have somewhat less than a 100% accuracy rate. Some service companies recommend replacing tanks over 20 years old for an average cost of around \$2,500. Given the apparent age of this tank, it would make sense, in my opinion, to retire it now with the proper approvals.

GENERAL INFORMATION:

The many different types of heating systems vary in useful life. Repairs will be necessary to certain components of the system from time to time long before the whole system needs to be replaced. Since technicians can spend hours making detailed checks of individual components, the home inspection notes only the system's age, general visible condition of major components, and whether the system is functioning. More efficient heating equipment has become readily available over the past fifteen years. Often an upgraded system can be financed by the fuel savings.

It is often useful to talk to the people who have done service on the heating equipment. It may provide a second opinion as to the remaining expected life or provide other specific information about this particular equipment not readily apparent during this type of visual inspection.

Carbon monoxide detectors, like smoke detectors, have become readily available. Their use in homes served by combustion equipment such as furnaces, water heaters and boilers would be prudent, particularly if an older hot air furnace is present.

CENTRAL AIR CONDITIONING

OBSERVATIONS:

This house is equipped with four central air conditioning systems. The systems are powered by electricity and utilize a coolant which circulates between outside compressor units and inside evaporator/air handler units. This type of system is standard in the northeastern United States.

The presence of four separate air conditioning systems is a plus because they should provide better control of cool air throughout the house.

According to rough rules of thumb, the capacity of the central air conditioning appears to be in the right range.

The outside compressor units appear to be in the first half of their expected lives.

The outside compressor units are located on essentially level platforms in shady areas which is good.

I was unable to test the air conditioning units because manufacturers recommend the temperature be above 60 degrees for 24 hours before operation. Therefore, you might want to get a warranty from the owner as to their operability. The air conditioning systems do use the same blower and ductwork as the hot air heating system which I know to be in operable condition.

I did turn on the air handlers for the air conditioners on the day of inspection and found that they circulated air throughout the house.

SUGGESTIONS:

I recommend annual servicing of the air conditioning systems to insure maximum reliability.

FIREPLACES

OBSERVATIONS:

The living room and library fireplaces have working dampers and lined flues. There were no obvious signs that poor draft will be a problem.

The new family room fireplace has a working damper and a lined flue. There is some soot above the fireplace which may indicate poor draft during certain conditions.

SUGGESTIONS:

It is time to clean the library fireplace chimney flue.

Draft of a fireplace can be improved if necessary by raising the hearth, adding glass doors, raising the chimney, and/or lowering the fireplace opening in front with masonry or a metal hood. Propping the damper in the half-way open position is usually best for draft. Furthermore, holding lighted newspaper up the flue prior to lighting a fire can help. It is also important to make sure there is enough air supply to allow air to go up the chimney. Often opening a window slightly is appropriate. This is important with a newer tight house.

GENERAL INFORMATION:

A fireplace flue should be swept each year if you burn regularly, every few years if you burn occasionally and every ten years if you burn rarely.

SEWAGE DISPOSAL SYSTEM

OBSERVATIONS:

The following information was derived from observation.

At the conclusion of the septic push test, there was no wastewater leaching out of the ground or odor in the probable vicinity of the system. This indicates that there was no visible system malfunction on the day of inspection.

The approximately 70 gallons of water per bedroom push test is not meant to be an exhaustive septic inspection. This aboveground inspection is meant to simulate a family's maximum, probable, usage of water and to see from aboveground if any abnormalities occur.

More detailed subsurface analysis of leaching areas can be performed by septic design and/or installation firms. This is sometimes done if one suspects a problem. Given feedback I have gotten over the last decade, I estimate that 1% or 2% of the systems that pass this push test actually prove insufficient for the household during the first year. A detailed septic investigation may average about \$400 and cause some disturbance to the surrounding ground. The cost to rebuild the average septic system seems to be running between \$10,000 and \$20,000. The risk discussed here however, can be significantly affected by the following observations:

This leaching system, if replaced around 1970 as the owner believes, has reached about the end of the average system life, though actual length of life varies considerably depending on original design, installation, usage and maintenance over the years.

The topography in the probable vicinity of this system from aboveground appears to be sufficient for a subsurface sewage disposal system.

SUGGESTIONS:

The septic tank was reportedly pumped last year by Kaiser Battistone. Septic tanks should be pumped every few years of full occupancy to prevent sludge from building up and clogging the leaching portion of the system and to provide the opportunity for periodic inspections of the septic tank. It is always a good idea to call the servicing agent to find out his opinion of the system and whether or not there has been any trouble or need for emergency calls.

Given the age and the high cost of replacement, I strongly recommend further underground investigation of the leaching portion of the system.

GENERAL INFORMATION:

The condition of a septic system is difficult to determine from above ground. The range in expected life is very wide because so many above and below ground factors affect it. Changing drainage and soil conditions as well as how the system has been treated affect the appropriateness of the original design.

Helpful maintenance practices include having your septic tank pumped every two years of full occupancy for most systems and more often for older or smaller systems; pumping more frequently if a garbage disposal is used; only flushing specifically degradable materials down drains; and maintaining surface water drainage away from the septic system. Partial repairs of septic systems are frequently possible if trouble arises.

Spacing one's water usage out is a good practice with any system, particularly one that is getting older, in a lower area, used by a large family, or when water pressure is very strong.

WATER SUPPLY SYSTEM

OBSERVATIONS:

There is a lever-type, ball valve main water shutoff in the main water line in the basement. I turned this off and on to check its operation. It worked.

The well and equipment supplied water within the normal pressure range while I pushed the system by running approximately 70 gallons of water per bedroom.

This push test should not be confused with a yield test or recovery test which can be performed by a well service person and gives an accurate reading as to the recovery of the well itself. This is sometimes done if one suspects a problem or if one is uncomfortable with the risk associated with relying on an aboveground, non-technical screening test. The push test does, however, suggest that if water usage has been at a normal rate prior to the test, that about this much water will probably be available under normal conditions in the near future.

Given the feedback we have gotten over the last decade, we estimate that somewhere around 1% of the wells which pass this push test actually turn out to have insufficient water for normal use. While a true yield test might cost somewhere around \$400, drilling a new well seems to average about \$6,000. Hydrofraking at a cost of about \$2,500 is often sufficient to boost well yield enough. Hydrofraking, however, is usually not practical with wells that are shallower than 250 feet.

In this case, given the labeled horsepower of this pump, the amount of water we ran and the system's ability to maintain pressure, the earth almost certainly was replenishing this well at a decent rate.

Given some brown staining inside the toilet tanks it looks like there may be either high iron or manganese in the water. I took water samples to the lab to find out the level of minerals in the well water.

While submersible well pumps can last a couple of decades, our observations over the last few thousand inspections is that well pumps actually fail without notice at any time. The average life seems to be around ten years. It is good to be psychologically and financially prepared to change the pump if it becomes necessary during your stay. The average cost to change a pump seems to be a little less than \$1,500. Some homeowners insurance companies will cover replacement costs if failure is due to a lightning strike. According to the label, this pump control appears to be about five years old. This usually (but not always) means the pump was also installed at that time.

As you requested, I took water samples to check the quality of well water including bacteria, chemical, mineral, lead and radon contents. The test results will be sent directly to you from the lab with a copy to me. See "Interpreting Bacteriological and Chemical Water Test Results" and "Interpreting Radon in Water Test Results" furnished with this report.

The well pressure tank appeared in satisfactory condition. Tank failure often occurs from the inside out, however. Steel tank life seems to average somewhere around 15 years but depends a lot on how corrosive the well water is. A new tank usually costs about \$800.

Water is supplied through a plastic water service pipe. Plastic service pipes have been standard for well supplies for decades. Plastic service pipes are also used for many community wells and some municipal systems.

SUGGESTIONS:

The air charge in the upper part of the well pressure tank needs to be maintained to prevent the pump from short-cycling. This can be done by calling a well service company or plumber every year or so to add air. Signs that the tank needs air include pulsating water pressure and rapid clicking at the well pressure tank. The air charge was okay on the day of inspection.

Check your water lab report and see if, in fact, the well water has more iron or manganese in it than the recommended limit. If in fact it does, you will probably want to install some sort of iron or manganese filtration system. See the advice in "Interpreting Bacteriological and Chemical Water Test Results", included in your gray report folder. A effectively environmentally responsible iron filtration system can cost about \$4,000.

GENERAL INFORMATION:

Well water is fresh, cool and unprocessed. Laboratory water tests are available to determine chemical and bacterial content of water. Steps can be taken to reduce or eliminate both.

Reliability of water depends on the ability of the earth to supply water to the well and the condition and capacity of the well equipment. Each component of the system has a useful life which can vary.

Water pressure and sustained capacity can be varied within limits by different techniques. Annual servicing of well equipment is becoming more popular because it is an inexpensive way to help prevent major problems.

Turn off the main water valve and the power to the well pump when you are going to be away from the house for an extended period of time, particularly in the winter. This way, if pipes freeze and burst, the well won't pump water into the house until somebody discovers the condition.

INTERIOR FINISHES

GENERAL

OBSERVATIONS:

The interior finishes were generally in overall good condition, consistent with the age of the house.

The original walls of the house are surfaced with plaster rather than the more common sheetrock. Plaster walls give a more durable base for periodic patching, painting or wallpapering.

It was this era of construction where plaster reached its peak of quality.

SUGGESTIONS:

Given that the house was built during the era when lead paint was fairly common and children under the age of seven will spend a significant amount of time at the house, I suggest you consider having a lead paint hazard "Risk Assessment" performed to try to determine what risk there is of such lead poisoning and what remedial action or behavioral patterns you should so consider.

GENERAL INFORMATION:

Houses built prior to 1980 may have inside and outside surfaces at least partly coated with paint containing some lead. Houses older than 1960 most probably contain lead paint. Lead has been a known toxin for centuries. It is particularly harmful to children under the age of seven. People of all ages should avoid ingesting any lead-containing products. Lead testing companies are available to prove the presence of this paint for a fee. Nevertheless, it is impractical to completely disprove its presence. The new EPA lead regulations focus on in place management and "lead hazard" rather than lead presence alone. More information on lead poisoning is available from the EPA, from the municipal health departments, or from companies licensed to perform lead paint inspection and "Risk Assessments".

Asbestos was a very popular construction material throughout much of the twentieth century since it has excellent fire-resistant properties as well as a number of other desirable properties. As a result, asbestos appeared in thousands of construction materials, many of which are present in residential homes. Most of these asbestos-containing materials pose no real danger since the fibers are not in a state where they would be released into the air under normal conditions. Nevertheless, the homeowner should be aware of certain materials such as most vinyl asbestos floor tile and backing material on sheet vinyl floor covering

which can release fibers if power-sanded for any reason. More information on asbestos in the home is available from the EPA.

BATHROOM TILE

OBSERVATIONS:

The method of tiling in the original bathrooms was popular before 1960. It is fastened to reinforced plaster and is, therefore, much more durable than tile done with modern techniques. This tile appeared in good condition.

The presence of prefabricated shower and tub enclosures in the rear addition bathroom preclude any tile problems.

GENERAL INFORMATION:

Maintaining the tile grout will help prevent water infiltration behind which might otherwise cause leaking to the floor below or deterioration of the tile backing. Such routine maintenance helps reduce the frequency of more major repairs.

BATHROOM FLOORS

OBSERVATIONS:

The bathroom floors felt firm.

BATHROOM FIXTURES

OBSERVATIONS:

Bathroom fixtures, though not necessarily free of normal wear and tear, were each functioning on the day of inspection.

I filled the whirlpool bath with water to a level above the air jets in order to operate them to see if they worked. They did. I ran the whirlpool air jets for about ten minutes, after which I checked the ceiling below for evidence of water leaks. I saw none.

The electricity for the whirlpool is ground-fault protected for safety.

SUGGESTIONS:

The toilet in the powder room is loose and I recommend it be reset.

Mildew growth in the whirlpool pipes can be controlled by periodically filling the whirlpool with hot water and a little dishwasher soap and a pint of bleach. Run the jets for a few minutes and then drain. Fill it up again with cold water, run the jets and drain again. I recommend doing this when you move in as part of a thorough cleaning of the whirlpool prior to your first use.

KITCHEN FIXTURES

OBSERVATIONS:

I turned on the kitchen appliances to see if they responded. Each did. The kitchen was redone fairly recently.

The kitchen cabinets and counters, though not necessarily free from normal wear and tear, appear in overall good condition given the age of the house.

SUGGESTIONS:

I recommend turning these appliances on again at your pre-closing walk-through to make sure each still works.

FLOORS GENERAL

OBSERVATIONS:

The oak flooring in the house and the carpet over subflooring on the second floor of the addition, though not necessarily free of normal wear and tear, is satisfactory, in my opinion.

ATTIC, INSULATION AND VENTILATION

OBSERVATIONS:

Access to the attic is by stairs.

The attic in the rear addition is insulated with fiberglass measuring approximately nine inches thick which is excellent while the attic in the original part of the house is insulated with rockwool measuring three inches which is minimal.

The roof structure ventilation appears sufficient. Good ventilation of an attic or roof structure helps dissipate excess seasonal heat and moisture, thereby preserving roofing and sheathing.

I checked to determine the type and amount of wall insulation by looking up the balloon framing cavities in the basement.

What appeared to be rockwool insulation was present in the walls of the original part of the house where checked.

Where I removed an outlet cover to check insulation, I found the rear addition to be constructed of six-inch walls. This allows about 75% more wall insulation. This reduces heat loss and fuel costs.

No urea-formaldehyde foam insulation was visible where I spot-checked. UFFI was an insulation which was banned about twenty years ago since its tendency to off-gas formaldehyde gas in some circumstances was a health issue. Personally, I believe that UFFI no longer represents any physical problem.

Windows present in the bathrooms provide ventilation.

There are also fans present in the master and powder room bathrooms to provide ventilation.

There is a vent fan for the kitchen that has a filter that should be cleaned or changed from time to time.

The clothes dryer vent discharges outdoors.

SUGGESTIONS:

Rolling out an additional six inches of non-faced fiberglass insulation in the areas of the attic in the original part of the house not intended to be used for storage would help reduce heating costs somewhat. For the floored areas of the attic, rigid foam board insulation with plywood overtop can be used without interfering with storage.

Clean or change the kitchen exhaust fan filters from time to time.

SPECIAL SUPPLEMENT ON MOLD

INTRODUCTION:

Mold is the latest in a long list of environmental concerns that have come into the public spotlight. Like previous concerns, this one is manageable. The issues are that: a) mold is part of the natural decay process of wood and cellulose products from exposure to high moisture and b) molds create dust that can present health problems for some people.

MOLD FACTS:

- Mold spores are everywhere
- Mold requires a substantial moisture source (leak or condensation condition) to “amplify” and become a problem.
- The majority of houses do have some “red flags” for potential mold amplification:
 - damp basements
 - water intrusion into siding, trim, roofing or at gutters
 - plumbing drips
 - poor attic or bathroom ventilation
 - moisture build-up from humidifiers or excessive showering
- Most molds do not significantly affect the health of most people
- Mold mitigation includes:
 1. correcting the moisture condition and
 2. cleaning or removing affected materials
- The mold mitigation industry is not yet well developed but there are some EPA guidelines available at www.epa.gov/iaq/molds/index.html

RECOMMENDATIONS:

- Address any sources of water intrusion and indoor moisture build-up identified in this report.
- Keep up with exterior siding, roofing, drainage and landscape maintenance
- Eliminate humidifiers and let the house dry out in the winter.
- Depending on the number of “red flags” in this house and your family’s sensitivity to allergens, consider having a **Mold Screening Test** performed now. Such a test compares mold spore counts in air samples taken inside the house with air samples taken outside the house.

Substantially higher spore counts indoors for a particular mold suggests that there may be a significant indoor mold growth condition requiring further investigation. Ultimate action would depend on the type of mold, the spore count level and the sensitivity of the family. Screening tests and any follow-up investigation should be administered by trained hygienists working with reputable labs.