

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF LOUISIANA

IN RE: CHINESE-MANUFACTURED
DRYWALL PRODUCTS LIABILITY
LITIGATION

MDL NO. 2047
SECTION: L
JUDGE FALLON
MAG. JUDGE WILKINSON

THIS DOCUMENT RELATES TO:
Hernandez v. Knauf Gips KG, et al., case no. 09-6050

FINDINGS OF FACT & CONCLUSIONS OF LAW

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PROCEDURAL HISTORY

From 2004 through 2006, the housing boom and rebuilding efforts necessitated by various hurricanes led to a shortage of construction materials, including drywall. As a result, drywall manufactured in China was brought into the United States and used in the construction and refurbishing of homes in coastal areas of the country, notably the Gulf Coast and East Coast. Sometime after the installation of the Chinese drywall, homeowners began to complain of emissions of smelly gasses, the corrosion and blackening of metal wiring, surfaces, and objects, and the breaking down of appliances and electrical devices in their homes. Many of these homeowners also began to complain of various physical afflictions believed to be caused by the Chinese drywall. Accordingly, these homeowners began to file suit in various state and federal courts against homebuilders, developers, installers, realtors, brokers, suppliers, importers, exporters, distributors, and manufacturers who were involved with the Chinese drywall. Because of the commonality of facts in the various cases, this litigation was designated as multidistrict litigation ("MDL"). Pursuant

to a Transfer Order from the United States Judicial Panel on Multidistrict Litigation on June 15, 2009, all federal cases involving Chinese drywall were consolidated for pretrial proceedings in the U.S. District Court, Eastern District of Louisiana.

On September 1, 2009, Plaintiffs, Tatum and Charlene Hernandez, individually and on behalf of their minor children Grant and Amelia Hernandez, filed suit in the U.S. District Court for the Eastern District of Louisiana, alleging damages caused by the Chinese-manufactured drywall in their home. This case was consolidated with the MDL proceeding. Plaintiffs in the present matter allege that the Chinese drywall installed in their home is defective and emits levels of sulfur, methane, and/or other volatile organic chemical compounds that caused corrosion of HVAC coils and refrigerator units, certain electrical wiring and plumbing components, and other household items, as well as created noxious “rotten egg-like” odors. Plaintiffs originally brought a number of claims against Defendant Knauf Plasterboard Tianjin Co., Ltd. (“Knauf” or “KTP”) and other named defendants involved with the Chinese drywall in their home. However, the Court later issued an order dismissing all defendants other than KTP without prejudice. KTP subsequently waived service. With regard to KTP, Plaintiffs claim that it manufactured, sold, distributed, marketed, and placed into the stream of commerce Chinese drywall with the expectation that such drywall would be purchased by consumers in the United States. After an appropriate time for discovery, the present matter proceeded to trial.

The parties entered into two joint stipulations prior to the commencement of trial, the first on February 25, 2010 (Rec. Doc. No. 1438), and the second on March 15, 2010 (Rec. Doc. No. 1728). The Court accepts the stipulations and finds the facts contained therein proved. The joint stipulations provide for the following:

1. Jurisdiction is vested in this Honorable Court under 28 U.S.C. § 1332(a)(2), as Plaintiffs allege more than \$75,000 in controversy (exclusive of interests and costs) in a dispute between citizens of the State of Louisiana and subjects of China. Additionally or alternatively, jurisdiction may be founded upon 28 U.S.C. § 1367. Rec. Doc. No. 1438, ¶ 1.
2. Venue is vested in this Honorable Court. Rec. Doc. No. 1438, ¶ 2.
3. The stipulation only applies to the redhibition and fitness for ordinary use claims and associated defenses asserted by Plaintiffs. Rec. Doc. No. 1438, ¶ 3.
4. KPT stipulates that it will not assert certain defenses, including comparative fault, contribution and/or reduction in KPT's legal responsibility to Plaintiffs as a result of any alleged conduct or fault of any other party, person or entity. Rec. Doc. No. 1438, ¶ 3.
5. Plaintiffs dismissed any claims in this matter against KPT other than their claims in redhibition and fitness for ordinary use pursuant to La. Cod Civ. Proc. arts. 2520, *et seq.* Rec. Doc. No. 1438, ¶ 4.
6. The damages sought by Plaintiffs in the Amended and Restated Complaint are not precluded under the exclusivity provisions of the Louisiana Products Liability Act. Rec. Doc. No. 1438, ¶ 5.
7. Plaintiffs' redhibition and fitness for ordinary use claims have not prescribed in accordance with La. Code Civ. Proc. art. 2534. Rec. Doc. No. 1438, ¶ 6.
8. KPT manufactured and sold drywall contained in Plaintiffs' home. Rec. Doc. No. 1438, ¶ 7.

9. Plaintiffs bought certain KPT drywall. Rec. Doc. No. 1438, ¶ 8.
10. The drywall in Plaintiffs' home emits certain reduced sulfur gases and the drywall emits an odor. Rec. Doc. No. 1438, ¶ 9.
11. Pursuant to La. Civ. Code art. 2524, the drywall in Plaintiffs' home is not fit for its ordinary and/or intended purpose and is so useless and/or inconvenient that it must be presumed that Plaintiffs would not have purchased the drywall had they known about the emissions of reduced sulfur gases and odors at the time of the sale. Rec. Doc. No. 1438, ¶ 10.
12. The reduced sulfur gases from the drywall were hidden, non-apparent, and unknown to Plaintiffs at the time of delivery in accordance with La. Civ. Code art. 2530. Rec. Doc. No. 1438, ¶ 11.
13. Plaintiffs gave sufficient and timely notice of the defective drywall to KPT. Rec. Doc. No. 1438, ¶ 12.
14. Plaintiffs' redhibition and fitness for ordinary use claims are not subject to an exclusion or limitation of warranty. Rec. Doc. No. 1438, ¶ 13.
15. The proposal to use an Environmental Controlled System (ECS) as a response to Chinese drywall off-gassing in the Hernandez home will not be presented in this matter; and, accordingly, there will be no presentation of testimony or evidence concerning ECS. Rec. Doc. No. 1728, ¶ 1.
16. The use of XRF and/or wire corrosion visual inspections as a technique or combination of techniques to identify and/or remove Chinese drywall will not be proposed by KPT in this trial; and, accordingly, there will be no presentation of

evidence or testimony on this technique or combination of techniques. Rec. Doc. No. 1728, ¶ 2.

17. No evidence will be presented in this trial regarding the diminution of property value based upon Chinese drywall “stigma.” Rec. Doc. No. 1728, ¶ 3.
18. With respect to the appropriate scope of remediation for the Hernandez home, the parties agree that (except with respect to the possibility of maintaining certain “green board” in the bathrooms), all drywall in the home, both Chinese-manufactured and domestic, will be removed and replaced, as well as all insulation, all flexible duct work, all switches, all receptacles, all molding, and the countertops. Rec. Doc. No. 1728, ¶ 4.
19. The Hernandez’s will not offer testimony as to the dollar value of their home or lot. Rec. Doc. No. 1728, ¶ 6.

This matter came on for trial without a jury on March 15, 2010, and culminated on March 19, 2010. The Court has carefully considered the testimony of all of the witnesses and the exhibits entered into evidence during the trial. Pursuant to Rule 52(a) of the Federal Rules of Civil Procedure, the Court issues the following Findings of Fact and Conclusions of Law. To the extent that any finding of fact may be construed as a conclusion of law, the Court hereby adopts it as such, and to the extent that any conclusion of law constitutes a finding of fact, the Court adopts it as such. The Court will first discuss the Plaintiffs’ experience with Chinese drywall, then, the general and scientific information on drywall and Chinese drywall, followed by the proper scope of remediation, the cost of that remediation, and finally the damages recoverable by the Plaintiffs under the applicable law.

FINDINGS OF FACT & CONCLUSIONS OF LAW

I. PLAINTIFFS' EXPERIENCE WITH CHINESE DRYWALL

The Hernandez family owns a home at 68034 Marion Street, Mandeville, Louisiana, which is the subject of this lawsuit. Trial Tr. vol. II, 284:2-5, Mar. 16, 2010 (T. Hernandez). Their home is a one-story, three-bedroom, two-bath, single-family dwelling with 1,688 square feet of living space. Tatum and Charlene Hernandez have been married for almost ten years and have two children, Grant, age 4, and Amelia, age 2. *Id.* at 284:14-15 (T. Hernandez). Charlene Hernandez was born in 1980 and is a graduate of LSU Health Sciences Center. *Id.* at 505:16-19. She works as Registered Nurse at Ochsner Medical Center. *Id.* Tatum Hernandez was born in 1980 and attended Delgado college. *Id.* at 283:25-284:19. Mr. Hernandez works for the U.S. Department of State with the New Orleans passport center, supervising passport specialists to determine citizenship and prevent passport fraud and identity theft. *Id.* at 284:7-12.

The Hernandez's purchased the lot at 68034 Marion Street from a family friend, and then worked with Mr. Hernandez's uncle who is an architect and a contractor to design a home for the lot. *Id.* at 284:22- 285:24. Upon completion of construction, the Hernandez family moved into their new home during the first week of August 2006. *Id.* at 286:2-3. The home is the first and only one Plaintiffs have owned. *Id.* at 506:10-12 (C. Hernandez). They had planned on raising their family there and one day expanding the house. *Id.*

The Chinese drywall in the Hernandez's home emits an odor. *See* Rec. Doc. No. 1438, ¶ 9 (Joint Stipulation). From the time she moved in, Mrs. Hernandez noticed this unusual odor in the house. *Id.* at 506:16-19 (C. Hernandez). She thought it was due to the new construction of the house and that it would not last. *Id.* She cleaned, mopped, dusted, vacuumed, deodorized

with sprays and candles, but found that the odor did not go away. *Id.* at 506:25-25. Mrs. Hernandez described the odor as a chemical smell, like that of a burned match. *Id.* at 506:25. Mr. and Mrs. Hernandez, in an attempt to minimize the odor in the home, purchased two dehumidifiers because they were advised that the odor might be lessened if the humidity was lower. *See* Pls. Ex. 558 (FRE 1006 Summary of Property Failure Data in the Hernandez Home); Trial Tr. vol. II, 507:12-16 (C. Hernandez). They began using the dehumidifiers in April, 2009, but, by that summer, the dehumidifiers started making noises and worked only intermittently. *Id.*

Mrs. Hernandez testified that the family's clothing has a strong odor, the same as that in her home, of a burned, chemical smell. Trial Tr. vol. II, 507:17-25 (C. Hernandez). She has tried washing, drying, and dry cleaning, but the strong smell in the clothing remains. *Id.* Mrs. Hernandez once took eight large bags of her children's used clothes to a consignment shop in Mandeville. *Id.* at 508:3-14 (C. Hernandez). The shop returned the clothes, advising that no one would buy them because they had a strange smell. *Id.*

Mrs. Hernandez hired a cleaning service to steam clean a wool rug in the living room and a twin mattress in her son's room, both of which smelled of the chemical odor in the home. Trial Tr. vol. II, 508:20-509:5 (C. Hernandez); *see* Pls. Exs. 31, 32 (Stanley Steamer Quote and Invoice). After attempting to clean the items, the service advised that it could not eliminate the odor. *Id.*

The Hernandez's have experienced numerous heating, ventilation and air-conditioning (HVAC) failures since moving into their home. The air conditioner in the Hernandez home initially failed in the summer of 2007. Trial Tr. vol. II, 286:4-21 (T. Hernandez). Since that time, the evaporator coils have failed repeatedly. *Id.* Plaintiffs have had numerous problems

with their HVAC system, which was originally installed in July 2006. *See* Pls. Ex. 558 (FRE 1006 Summary of Property Failure Data in the Hernandez Home). In mid-June 2007, a leak in the system was detected, and the 11-month old HVAC coil was replaced. *See* Pls. Ex. 558. It was replaced again in August 2008, after the new coil started to leak Freon and cause damage to walls, doors, and moldings. *Id.* Two months later, in October 2008, both the compressor and the evaporator coil failed. *Id.* From October 2008 to January 2009, Plaintiffs lived without either heat or air-conditioning. *Id.* In January 2009, the entire indoor and outdoor HVAC unit was replaced. *Id.* In July and August 2009, the HVAC coils again began to leak and failed, and a new coil was sent to Bronz-Glo for anti-corrosive coating. *Id.* In September 2009, the coated coil was installed. *Id.* The thermostat that was installed in August 2006, failed and then was replaced in January 2010. *Id.* In January 2010, problems were detected with the compressor, which had been installed in January 2009, and later that same month the compressor was replaced. *Id.* Plaintiffs have lived in the home for three-and-a-half years, and currently are using the sixth evaporator coil for the HVAC system. Trial Tr. vol. II, 286:22-24 (T. Hernandez). On occasions when the air conditioning system failed during the summer, Plaintiffs found it necessary to spend some nights at a family member's home. *Id.* at 287:3-10 (T. Hernandez). They also found it necessary to borrow air-conditioning window units. *Id.* Plaintiffs have used a total of four air-conditioning window units. *Id.* at 287:18-24, 288:2-8 (T. Hernandez). One failed in just a few weeks; another didn't work efficiently; and the others have tarnished, black coils. *Id.* In January 2010, the emergency heat mode on the thermostat in the Hernandez house began to fail. *Id.* at 288:9-17 (T. Hernandez). The outside compressor also failed in January 2010. *Id.* at 288:18-22.

Plaintiffs have also experienced appliance and electrical device failures. Less than one year after the Plaintiffs moved in, the refrigerator in the home failed. Trial Tr. vol. II, 289:1-11 (T. Hernandez). The refrigerator was replaced, but now the copper connections in the back of it are black. *Id.* The microwave in the Hernandez home started to malfunction about a year after the Plaintiffs moved in. *See* Pls. Ex. 558 (FRE 1006 Summary of Property Failure Data in the Hernandez Home); Trial Tr. vol. II, 509:8-11 (C. Hernandez). Just prior to the start of the trial of this case, Mrs. Hernandez plugged in a food-frying appliance in her kitchen and a blue spark shot out of the outlet. Trial Tr. vol. II, 509:12-16 (C. Hernandez). Mrs. Hernandez contacted an electrician to address the fact that many of the lights and outlets stopped working on one side of the house. *Id.* at 509:19-510:4 (C. Hernandez). The electrician advised that one of the switches was very corroded, causing others to fail. *Id.*

Plaintiffs also had a VCR, which was working when they moved into the home, but which stopped working in 2007. *See* Pls. Ex. 558 (FRE 1006 Summary of Property Failure Data in the Hernandez Home). In addition, they had a TV which worked when they moved in, but which began to blink on and off and then failed altogether in late 2008 or early 2009. *See id.* Plaintiffs have replaced a toaster, which was working when they moved into the house in mid-2006 and stopped working in 2007. *See id.*; Trial Tr. vol. II, 289:13-24. Plaintiffs had a smoke detector installed when they moved into the house in August, 2006; and, in 2009, it started to malfunction. *See id.* In mid-2007, Plaintiffs bought a laptop. *See id.* By mid-2008, it began to malfunction. *Id.* A TV in the children's playroom worked for a few months and then it failed as well. Trial Tr. vol. II, 289:13-24 (T. Hernandez). In preparation for trial, Mr. and Mrs. Hernandez prepared a list of appliances and components of the house that have failed since they

moved in. *Id.* at 510:9-20 (C. Hernandez). A summary of the appliance and component failures in the Hernandez home was admitted into evidence under FRE 1006. *Id.*; *see* Pls. Ex. 558 (FRE 1006 Summary of Property Failure Data in the Hernandez Home).

Plaintiffs have also noticed corrosion on metal objects in their home. Corrosion was found on the cord of a lamp from the living room. *See* Pls. Ex. 651 (Hernandez lamp photograph); Trial Tr. vol. II, 511:21-25 (C. Hernandez). Underneath the plastic covering for the cord, the wire had turned black. *Id.* Mrs. Hernandez also noticed corrosion on two small metal garbage cans which she bought in August or September of 2006. *See* Pls. Ex. 219 (Hernandez trash can photograph); Trial Tr. vol. II, 512:11-23 (C. Hernandez). There are pitted areas and spots. *Id.* Mrs. Hernandez bought an identical replacement for the corroded garbage cans in January 2010, and before the time of the trial in March 2010, there was visible corrosion on it. *Id.* Plaintiffs have a silver picture frame from their wedding, which has three panels containing their wedding announcement and baby pictures. *See* Pls. Ex. 272 (Hernandez picture frame photograph); Trial Tr. vol. II, 513:14-22 (C. Hernandez). Before they moved into their house, the frame was silver and shiny. *Id.* There are now large black spots on the frame. *Id.* Plaintiffs had an antique, bronze-colored door stop in their children's bathroom. *See* Pls. Ex. 658 (Hernandez door stop photograph); Trial Tr. vol. II, 514:6-12 (C. Hernandez). It is now black with corrosion. *Id.* The door hardware in the house now looks black, like the doorstop. *Id.*

Plaintiffs first discovered conclusive evidence that there was Chinese drywall in their home in March 2009 and concluded this was the cause of the problems they were having with their home. Trial Tr. vol. II, 290:21-291:13 (T. Hernandez). They wanted to move out of their home fearing the safety and health of their family. *Id.* They contacted a realtor to help them find

comparable homes to rent in the Mandeville area. *Id.* at 291:14-20. Notwithstanding their desire to move out of their house because of the problems with Chinese drywall, Plaintiffs concluded that they could not do so because they could not afford both the mortgage on their home and rent on another. *Id.* at 281:22-24, 514:22-251 (C. Hernandez). Plaintiffs then contacted their mortgage company, and considered the possibility of a 90-day moratorium on mortgage payments. *Id.* at 515:20-516:1 (C. Hernandez). However, realizing that on the 91st day all prior payments owed would be due, Plaintiffs concluded that financially they could not elect the moratorium on payments. *Id.* The fact that Plaintiffs cannot afford to pay both their mortgage note on their home and the rental of an alternative place to live, pending remediation, has proven to be a source of significant emotional distress and mental anguish for Plaintiffs. *Id.* at 291:25-292:7 (T. Hernandez).

A friend offered to put a FEMA trailer on the Plaintiffs' lot for them to live in, but it was too small, and Mrs. Hernandez did not want her family to live the trailer because of concerns about formaldehyde. Trial Tr. vol. II, 515:1-13. There also was no bathtub in the trailer, so Mrs. Hernandez would have to hose her children in order to wash them. *Id.* Also, there was no crib or place for Plaintiffs' 2-year old daughter to sleep. *Id.*

Plaintiffs' builder had certain properties which he had not yet sold, and he offered to let them move into one of them. Trial Tr. vol. II, 516:2-13 (C. Hernandez). However, the builder advised they would have to move out of the house as soon as he sold it, so Plaintiffs had no guarantee as to how long they could stay in this house. *Id.* This was not a feasible solution for the Hernandez family. *Id.* After exploring these alternatives, the Hernandez's have reluctantly concluded that their only option is to continue to reside in their contaminated home.

In addition to the health concerns and discomfort, according to Mr. Hernandez, the presence of Chinese drywall has hampered his career. Trial Tr. vol. II, 292:21-293:7 (T. Hernandez). Passport services is a growing profession, however activity in the New Orleans area is limited. *Id.* There are job postings which would both further Mr. Hernandez's career and result in higher income, but these positions are out of town. *Id.* Mr. Hernandez testified that he cannot apply for these jobs because the present house is a financial burden and cannot be sold so he cannot be transferred outside his current passport services area. *Id.*

The course of this litigation has not been easy for the Hernandez's. The litigation has resulted in numerous home inspections by experts, electricians, plumbers and attorneys for all sides. Trial Tr. vol. II, 290:3-20 (T. Hernandez). The CPSC has inspected the home more than once. *Id.* Additionally, the Court has inspected the home at the request of the parties. *Id.*

Plaintiffs attested to having provided to J.C. Tuthill (Plaintiffs' expert Certified Public Accountant and Forensic Accountant) all available receipts for repairs related to system and appliance failures, plus cost estimates they obtained for moving out of and back into their home for the period of remediation, as well as potential rental and alternative living costs and documentation of lost income due to repairs, inspections, and litigation-necessitated absences from their respective jobs. Trial Tr. vol. II, 292:8-20 (T. Hernandez). Mrs. Hernandez verified that she provided documentation and other information, such as receipts, loss of wages, and estimates to move out and other alternative living costs to Ms. Tuthill. *Id.* at 511:11-13 (C. Hernandez).

Plaintiffs seek to have their home repaired and restored to a safe place for their family. Shortly before March 2009, they had saved money to do landscaping and pave the driveway to

improve the home's look and value, but plans have been put on hold indefinitely, pending remediation. *Id.* at 293:15-25, 294:1-4 (T. Hernandez).

Knauf has stipulated that the Chinese drywall in the Hernandez's home is defective and not fit for its intended use. The parties agree that remediation is necessary. They also agree on various aspects of this remediation. But they disagree on the full scope of the remediation and the appropriate costs thereof. The only issues in this case, therefore, are the nature and scope of the remediation necessary to properly restore the Plaintiffs' home and the resulting damages if any. To put this matter in perspective it is necessary to briefly review the background and science of gypsum and drywall.

II. BACKGROUND ON GYPSUM & DRYWALL

In *Germano v. Taishan Gypsum Co. Ltd.*, No. 09-6687, *In re Chinese-Manufactured Drywall Prods. Liab. Litig.*, 09-md-2047 (June 6, 2009), involving property damage caused by Chinese drywall and which is consolidated in MDL 2047 with the present matter, the Court discussed in detail the origin and creation of drywall in its Findings of Fact and Conclusions of Law. Rec. Doc. No. 2380. Rather than repeat this history, the Court incorporates these findings in the present matter. For purposes of the present matter, suffice it to say drywall is made of gypsum, which occurs both naturally and artificially as a byproduct of industrial processes. Gypsum has been used for drywall or similar products since ancient times and remains the favored material for drywall because it is fire-resistant, widely available, and does not require skilled workers for installation.

III. GENERAL SCIENTIFIC FINDINGS REGARDING THE CORROSION CAUSED BY THE CHINESE DRYWALL IN PLAINTIFFS' HOME

To understand the scope of the problem caused by the drywall in this case it is helpful to review the characteristics of this Chinese drywall and explore the reason it has caused problems in the Hernandez home. This Chinese drywall is different from typical benign drywall for the following reasons: it has a significantly higher average concentration of strontium and more detectable levels of elemental sulfur, and it releases odious sulfur gases which are corrosive to metals, particularly copper and silver.

Copper and silver are prevalent in most homes and buildings. Copper is used in electrical wiring and coils for HVAC systems, refrigerators, plumbing systems, and other devices. *See* Trial Tr. vol. I, 35:19-98:9 (Rutila); Trial Tr. vol. II, 282:8-14(Krantz), 315:6-329:17(Galler); Trial Tr. vol. V, 912:11-15 (Perricone). Silver is used in the contact points for light switches, fire/smoke alarms, computers, and virtually all electrical components. *Id.* These metals are selected because they generally resist corrosion. However, the Achilles Heel of both copper and silver is sulfur which corrodes these metals. *See* Trial Tr. vol. I, 35:19-98:9, Mar. 15, 2010 (Rutila); Trial Tr. vol. II, 282:8-14 (Krantz), 315:6-329:17 (Galler); Trial Tr. vol.III, 547:13-549:12; Trial Tr. vol. V, 912:11-15, Mar. 19, 2010 (Perricone). "Corrosion" is defined by ASTM G15-04 as "the chemical or electrochemical reaction between a material, usually a metal, and its environment that produces a deterioration of the materials and its properties." Pls. Ex. 134-0002 (ASTM G15-04, Standard Terminology Relating to Corrosion and Corrosion Testing); Trial Tr. vol. I, 206:20-25 (Krantz). Pitting is "corrosion of a metal surface, confined to a point or small area, that takes the form of cavities." Pls. Ex. 134-0004 (ASTM G15-04); Trial Tr. vol. I, 207:17-20(Krantz).

Corrosion was documented throughout the Hernandez home on copper and silver components. Trial Tr. vol. I, 62:16-67:11(Rutila). The evidence is conclusive that the corrosion in the Hernandez home was proximately caused by exposure to Chinese drywall manufactured and sold by the Defendant. *See* Streit Dep. 60:2-24, 61:3-12 (Feb. 12, 2010); Trial Tr. vol. I, 243:15-17; Trial Tr. vol. III, 547:13-548:1, 549:7-9, 12; *see* Rec. Doc. No. 1438, ¶ 7.

When copper is corroded by the reduced sulfur gases released by the Chinese drywall, copper sulfide is produced. Trial Tr. vol. III, 549:6-12, Mar. 17, 2010. The copper sulfide produces a black film on the surface of the copper. Trial Tr. vol. I, 221:22-25; *see e.g.* Pls. Ex. 597-0015. Copper sulfide corrosion is particularly aggressive in humid and moist environments. Trial Tr. vol. V, 896:2-7(Perricone). Silver is used in electrical contacts for practically every device that carries electrical current. Trial Tr. vol. II, 311:1-8, 313:16-314:22 (Galler); Pls. Ex. LT 0202 (Chudnovsky 2008). For example, silver is present in circuit breakers, light switches, thermostats, computers, televisions, and, generally, any device with a switch. Trial Tr. vol. II, 313:19-314:22(Galler). The sulfur-induced corrosion of silver produces silver sulfides. *Id.* at 311:16-312:11. “By the time relevant corrosion [on copper and silver components] can be detected visually, the equipment may already be in an advanced stage of degradation.” Trial Tr. vol. II, 331:1-16(Galler); Pls. Ex. LT 0195-0013 (Abbot 1993); *see also* Trial Tr. vol. II, 277:20-23(Galler).

Corrosion on copper and silver conducting surfaces increases resistance of electrical current through the connection. Trial Tr. vol. II, 313:6-15, 332:11-334:3(Galler); *see also* Pls. Ex. LT 0202 (Chudnovsky 2008). This increased resistance causes either complete failure or excessive heating of the connection when energized. Trial Tr. vol. II, 329:3-334:3 (Galler); *see*

also Pls. Ex. LT 0202-0001 (Chudnovsky 2008); Beyler Dep. 19:5-13, 75:4-76:4 (Mar. 2, 2010). Complete failure at the connection can lead to premature failure of the product. Trial Tr. vol. II, 313:6-15, 331:22-334:3(Galler); *see also* Pls. Ex. LT 0195-0013, -0027, -0028 (Abbott, 1993); Pls. Ex. LT 0202-0001, *et seq.* (Chudnovsky 2008). Complete failure at the connection can also lead to fires or create other life safety problems. Trial Tr. vol. II, 329:8-330:11(Galler); Beyler Dep. 19:5-13, 51:1-4.

Once the Chinese drywall and the dust therefrom is removed from the Hernandez home, the source of corrosive reduced sulfur gases should be eliminated. Trial Tr. vol. I, 94:9-11; Trial Tr. Vol. II, 252:10-12. However, it is disputed as to whether, if the copper sulfide remains in the Hernandez home after all Chinese drywall is removed, corrosion on copper components will continue to develop. *See e.g.* Trial Tr. vol. III, 547:3-9, 549:20-21, 557:3-17; Trial Tr. vol. V, 852:20-853:3, *contra*, Trial Tr. vol. I, 215:20-216:7; Trial Tr. vol. II, 256:17-262:24(Krantz); Pls. Ex. LT 241-0001 *et seq.* Plaintiffs argue that removal of the Chinese drywall alone will not stop future corrosion from occurring because the copper sulfide already deposited on copper will continue to develop corrosion due to its exposure to the ever-present microscopic moisture in the home. Trial Tr. vol. I, 215:20-216:7(Krantz); Trial Tr. vol. II, 256:17-262:24(Krantz); Pls. Ex. LT 241-0001, *et seq.* Plaintiffs support their argument with the expert opinion of Dr. Krantz and a scientific paper entitled *Sulfide Scale Catalysis of Copper Corrosion*. Pls. Ex. LT 24. Conversely, Knauf argues that without the source of corrosive reduced sulfur gases, the copper sulfide corrosion will cease. Trial Tr. vol. III, 547: 3-9, 548:20-21, 557:3-17; Trial Tr. vol. V, 852:25-853:2. Knauf challenges Plaintiffs' reliance upon the scientific paper *Sulfide Scale Catalysis of Copper Corrosion*, Pls. Ex. LT 241, on the basis that the paper relies upon studies of

copper sulfide corrosion in conditions inapposite to those in the Hernandez home. Knauf also argues that Plaintiffs have failed to put forth any other evidence in support of their conclusion on continuing corrosion.

Upon considering the arguments of the parties, the Court finds that the science is not sufficiently developed to allow a certain conclusion as to whether the presence of copper sulfide alone results in continued corrosion. However, at this time and in this case, the evidence presented by the Plaintiffs supports the conclusion that there is a substantial risk that the corrosion may continue in the Hernandez home even after the Chinese drywall is removed. Furthermore, there is no dispute that there is corrosion on the exposed portions of the wires. Streit Dep. 60:2-24, 61:3-12 (Feb. 12, 2010); Trial Tr. vol. I, 243:15-17; Trial Tr. vol. III, 547:13-548:1, 549:7-9, 12. There is also evidence to indicate that sulfur gases can infiltrate the insulation and corrode portions of the wire under the insulation. Pls. Ex. 592-0001; Trial Tr. vol. I, 226:18-24(Krantz); *see also* Pls. Exs. 577-0001, 580-0001, 594-0001 to -0002; Trial Tr. vol. I, 51:1-8(Rutila). In fact portions of the wiring under the insulation show evidence of corrosion. *Id.* Finally, there is evidence to indicate that the corrosion which is present can interfere with the performance and longevity of the wire. Trial Tr. vol. II, 313:6-15, 331:22-334:3(Galler); *see also* Pls. Ex. LT 0195-0013, -0027, -0028 (Abbott, 1993); Pls. Ex. LT 0202-0001, *et seq.* (Chudnovsky 2008). This can increase the risks of failure and also create safety hazards. *Id.* Thus whether or not the corrosion will increase is irrelevant in this case. The current state of the wire corrosion creates sufficient risks to require appropriate action. Accordingly, the Court finds that it is prudent to consider this risk in formulating its remediation protocol for the Hernandez home.

IV. THE PROPER SCOPE OF REMEDIATION FOR PLAINTIFFS' HOME

Based upon the stipulations entered into by the parties and the relevant evidence, there is no dispute that the following must be completely removed and replaced: all drywall, whether Chinese or domestic, all insulation, flexible duct work, switches, receptacles, molding and countertops. However, the parties are unable to reach an agreement as to the proper remediation for the electrical, plumbing, and HVAC systems, and other items which are involved in the removal of drywall or contain silver and copper components. Thus the Court will now address these matters.

A. The Entire Electrical System Must be Removed & Replaced

Based upon the evidence, the Court concludes that the entire electrical system in the Hernandez home must be removed and replaced because the electrical wires are corroded and cannot practically be "cleaned" of corrosion. Additionally, this corrosion violates applicable building codes, and, finally, complete removal and replacement of the electrical system is the most practical, economical, and efficient approach to remediation. The Court will now discuss these issues more thoroughly after providing some factual background on electrical systems.

1. General information on electrical systems

Electrical systems include both high voltage and low voltage wires. *See* Trial Tr. vol. I, 139:13-149:11 (Phillips). High voltage wires, called Romex or NM cabling, connect to the switches and receptacles throughout the house. *Id.* This cabling consists of three wires (hot, neutral and ground). *Id.* The hot and neutral wires are set in a plastic insulation, then all three wires are encased in a plastic sheathing. *Id.* During installation of switches and receptacles, the plastic insulation is stripped away on the tips of the hot and neutral wires, which, along with the

bare copper ground wires, then are attached to connection points on the switches and receptacles. *Id.* at 144:2-8. The cabling runs from the switches and receptacles through the walls to the circuit breaker box, where it connects to various circuit breakers. *Id.* Low voltage wires run through the walls and attach to, among other electronic and mechanical devices, telephone receptacles, doorbells, HVAC thermostats and alarm systems. *Id.* at 139:17-20.

2. *Electrical wires are corroded*

The reduced sulfur gases emitted from the Chinese drywall in the Hernandez home have corroded the wires in the electrical system. Streit Dep. 60:2-24, 61:3-12 (Feb. 12, 2010); Trial Tr. vol. I, 243:15-17; Trial Tr. vol. III, 547:13-548:1, 549:7-9, 12. There is evidence that both the exposed portions and various sections of the insulated portions are corroded. *Id.*; Pls. Ex. 592-0001; Trial Tr. vol. I, 226:18-24(Krantz); *see also* Pls. Exs. 577-0001, 580-0001, 594-0001 to -0002; Trial Tr. vol. I, 51:1-8(Rutila).

a. Visual evidence

There are numerous examples of visual black copper sulfide corrosion film on the electrical wires in the Hernandez home. Trial Tr. vol. I, 221:5-6, 19-25, 225:15-18 (Krantz); *see also* Pls. Ex. 597-0015. By contrast, electrical wires in control homes, *i.e.* those without Chinese drywall, are a shiny copper color, showing no evidence of corrosion thickness or pitting. *See* Pls. Ex. 597-0030. When portions of the insulation were removed, corrosion was found under the insulation. Pls. Ex. 592-0001; Trial Tr. vol. I, 226:18-24(Krantz); *see also* Pls. Exs. 577-0001, 580-0001, 594-0001 to -0002; Trial Tr. vol. I, 51:1-8(Rutila).

b. Scientific testing & standards

Cross-sections of electrical wires were taken from Plaintiffs' home and examined for corrosion. Trial Tr. vol. I, 207:25-208:7(Krantz). By generally-accepted laboratory analytical techniques, the wires were shown to have a corrosion product that is primarily copper sulfide and/or rich in sulfide. Pls. Ex. 597-0017 to -0026(Krantz SEM/EDS analysis on wiring samples from Hernandez home); Pls. Ex. LT 0195-00017, -0026, -0065, -0066 (Abbott 1993, MTI #38); Pls. Ex. LT 0228-0012(Sinclair text). The wires also demonstrated pore corrosion and creep corrosion. Pls. Ex. 597-0006 (CTL/Krantz Report); Trial Tr. vol. I, 224:2-225:4(Krantz). The corrosion thicknesses of these cross-sectioned wires were, at certain locations, measured in excess of twenty (20) microns, linear measurements equivalent to one-millionth of a meter. Pls. Ex. 590-0001 (Summary of Thickness and Pit Depth Measurements Made on Samples from Hernandez Home and a Control Home); Trial Tr. vol. I, 222:10-12(Krantz); Trial Tr. vol. III, 583:8-17(Lee). These cross-sectioned wires also demonstrated numerous pits, many in excess of twenty (20) microns deep. Pls. Ex. 590-0001; Trial Tr. vol. I, 222:2-9(Krantz). Corrosion thickness and pitting were found on the tips, middle, and ends of ground wires from other homes containing Chinese drywall. Pls. Ex. 598-0001; Trial Tr. vol. I, 231:6-19, 232:13-20(Kratz).

The wiring in Plaintiffs' home demonstrates corrosion indicative of the most severe corrosive environment and is predictive of failure under applicable scientific standards. Trial Tr. vol. I, 211:23-213:12, 228:13-17(Krantz). "Predictive of failure" means that the electrical component is predicted to fail in the future, well before the end of the component's anticipated useful life. *Id.* at 213:6-12(Krantz). Under the Battelle Classification System, a recognized measurement for the corrosivity of environments, the electrical wires taken from the Plaintiffs' home demonstrated a severe corrosive environment under both qualitative and quantitative

corrosivity criteria. Pls. Ex. 591-0001; Trial Tr. vol. I, 212:18-22, 228:9-17(Krantz); Trial Tr. vol. III, 582:18-583:1(Lee). A severe corrosive environment under the Battelle Classification System is predictive of premature future failure of the electrical system. Trial Tr. vol. I, 212:18-22.

Findings by the Consumer and Product Safety Commission (CPSC) and Sandia National Laboratories (SNL) also support the conclusion that the electrical wires in the Hernandez home are corroded. The Gill & Trotta CPSC report indicates that “Sandia National Laboratories (SNL) staff suggests that copper wiring is the most susceptible electrical component to the effects of the corrosive gases.” Pls. Ex. 059-0010(quoting Pls. Ex. 060-0001, Jill S. Glass, et al., *Interim Report of the Analysis of Corrosion Products on Harvested Electrical Components*, Sandia National Laboratories, Nov. 2009). This report also establishes that wires taken from other homes with Chinese drywall demonstrated a corrosion product rich in copper sulfide, pore corrosion and creep corrosion. Pls. Exs. 059-0013, 060-0023. Additionally, the report indicates that these wires were exposed to severe corrosive environments under the Battelle Classification System. *Id.*

All foregoing scientific testing was done using real world components. *See e.g.* Pls. Ex. 60-0003(Sandia Report); Trial Tr. vol. II, 275:2-7(Krantz). As set forth in the peer-reviewed literature, consensus standards, and the opinions of several experts in the field, the use of real world components under real world exposure conditions and durations of exposure provide more comprehensive and accurate information than the use of copper reactivity coupons, particularly if the coupons are deployed for shorts periods, such as less than one year. Pls. Ex. 129-0001(ASTM G50(2003))(Standard Practice for Conducting Atmospheric Corrosion Tests on

Metals)); Pls. Ex. LT 0236-0001(Perkins, Corrosion Manual); Trial Tr. vol. II, 274:25-275:7, 277:5-23(Krantz).

Knauf acknowledges that the electrical wires in the Hernandez home were corroded by the sulfur gases released by the Chinese drywall. However, Knauf argues that its experts' scientific findings demonstrate that the sulfide corrosion on the wires has not impacted functionality and thus the wires do not need to be removed. Knauf's tests on cross-sectional samples of wires harvested for the Hernandez home indicated that the current carrying capacity of the wires was not impacted because less than 50% of the cross-section was not lost due to corrosion. Trial Tr. vol. III, 598:13-19; Trial Tr. vol. V, 840:17-841:3, 841:6-842:12, 842:17-843:13, 850:7-851:3, 853:16-23, 907:15-19, 908:18-909:16; Def. Exs. 136-138, 142-144, 149. Knauf also relies upon temperature tests conducted by Dr. Beyler to determine whether the corrosion tarnish on wires resulted in a temperature rise sufficient to impact functionality or create a fire safety risk. Def. Ex. 0009-0024, -0034. Dr. Beyler used Underwriters Laboratories (UL) standard for the operational safety of newly manufactured receptacles to conclude that the tested wires from the Hernandez home met the UL standard for new receptacles. Beyler Dep. 21:18-22:23, 36:13-37:20, 49:1-12, 50:7-52:2, 57:24-58:7; Def. Ex. 0009-0024, -00029, -0030, -0032; Pls. Ex. 660. The Court recognizes that Knauf's experts utilized a different type of testing than Plaintiffs' experts to conclude that the corrosion on electrical wires does not impact the functionality of those wires. But the fact remains that the wires are corroded and this corrosion was caused by the Chinese drywall and that is not what the Plaintiffs expected to occur when they installed the drywall in their home.

c. Insulation on wires does not prevent corrosion

The evidence demonstrates that the reduced sulfur gases emitted by Chinese drywall permeate insulation jackets and cause corrosion on the electrical wires beneath the sheathing. Pls. Ex. 592-0001; Trial Tr. vol. I, 226:18-24(Krantz); *see also* Pls. Exs. 577-0001, 580-0001, 594-0001 to -0002; Trial Tr. vol. I, 51:1-8(Rutila). For example, the light cords in Plaintiffs' home and in other homes with Chinese drywall demonstrate corrosion underneath the plastic sheathing. Pls. Ex. 651; Trial Tr. vol. I, 63:24-64:15(Rutila); Trial Tr. vol. II, 511:22-25(Hernandez); *see also* Pls. Ex. 595-0001, -0002. The corrosive attack from Chinese drywall was also found on insulated wires within the walls of the home and well up from the ends of insulation at electrical switches and outlets. Trial Tr. vol. I, 50:24-52:14(Rutila); Streit Dep. 75:2-79:13. Additionally, the corrosion was found on insulated lighting cords which are in the center of a room away from drywall sources. Trial Tr. vol. I, 63:22-64:7(Rutila); Streit Dep. 73:13-75:6.

The Court recognizes that Dr. Beyler's UL temperatures tests determined that any tarnishing on insulated wires had no measurable effect on temperatures and the current carrying capacity of the wire. Beyler Dep. 61:3-61:10; Def. Ex. 0009-0035, -0036. However, given the contrary evidence above, the Court finds that insulation does not protect wires from corrosion and there are risks of future failure and danger to safety.

d. The corroded wires cannot be sufficiently "cleaned" of the corrosion

It is not possible or feasible to clean the wires to render them sufficiently free of corrosion as suggested by the Defendant. Trial Tr. vol. II, 281:1-5(Krantz), 334:6-15(Galler); Streit Dep. 62:12-63:2; Trial Tr. vol. III, 577:7-16(Lee); Trial Tr. vol. V, 902:8-21(Perricone). Although scrubbing the wires with a Scotch Brite pad, as the Defendant urges, may remove visible signs of

black corrosion film, copper sulfide corrosion remains. *See* Pls. Ex. 593-0001; Trial Tr. vol. I, 239:10-240:7(Krantz). Moreover, it is not feasible to scrub the insulated wires to remove the corrosion under the insulation. There does not exist an approved standard or method to clean copper sulfide corrosion from electrical wiring in a home. Pls. Ex. 600-0005 (ASTM G1-03); Trial Tr. vol. I, 242:20-243:4(Krantz). The ASTM does provide recommendations for cleaning corrosion products through repeated treatment with hydrochloric acid, but these are not meant for in-field application. *Id.*

The Court recognizes that Knauft's expert Dr. Beyler conducted UL temperature testing on wires from homes containing Chinese drywall before and after cleaning with a Scotch Brite pad and determined that there was not a significant difference in temperature between the uncleaned and cleaned wire. Beyler Dep. 37:7-38:2, 46:16-23, 49:20-50:6; Def. Ex. 0009-0031, -0032. However, given the findings above that corrosion could not be completely removed from wires and the risk that this condition poses to both functionality and safety, the Court concludes it is prudent to assume for the purposes of the present case, at the present time, that the wires cannot be cleaned to a degree that they may be safely left in the Hernandez home.

e. The corroded wires violate applicable building codes

Furthermore, to allow corrosion to remain violates building codes. The Romex insulation utilized in the Hernandez home is type NM which is not permissible for corrosive environments. Trial Tr. vol. I, 69:16-70:20(Rutila). Accordingly, engineering and general safety standards require the replacement of NM wires which are present in the corrosive environment in the Hernandez home. *Id.*

Building code provisions, which set a minimum level of safety, are not discretionary. Beyler Dep. 102:13-19. The “corrosive residue” on, and “deterioration by corrosion” to, the wires in the Hernandez home are violations of electrical building codes promulgated by Louisiana. Trial Tr. vol. III, 651:11-18(Canzoneri). Similarly, Section E3304.6 of the National electrical code does not allow corrosive residues on electrical equipment, including electrical wiring that connects to the equipment. Pls. Ex. 155-0003 (Excerpt from Electrical Code).

ASTM B-3, entitled “Standard Specifications for Soft or Annealed Copper Wire,” is incorporated into the applicable building code for the Plaintiffs’ home. Pls. Ex. 112-0001(ASTM B-3). Section 5.5 of ASTM B-3 provides that wires shall be free of all imperfections not consistent with the best commercial practices. *Id.* at -0002. Section 5.4 provides that copper wire is out of tolerance if the diameter of the wire varies by greater than 1%. *Id.* The wires in the Plaintiffs’ home in their present corrosive condition appear to violate both of these provisions because they suffer from corrosion pitting and build-up in excess of 1% of the diameters of the wire. Beyler Dep. 98:14-99:1; Trial Tr. vol. I, 228:6-17(Krantz); Pls. Ex. 591-0001.

3. *It is practical, efficient, and cost-effective to remove all wiring*

It is more cost-effective to remove and replace all electrical wiring, rather than attempt to clean, clip or splice corroded wire endings, and then confront the problem of relocating electrical boxes due to electrical code requirements that there be at least six inches of free wire inside the boxes. Trial Tr. vol. I, 114:18-25, 115:24-25, 116:1-24(Phillips). The Court recognizes that Knauf’s expert testimony suggested that the electrical code’s provision regarding six inches of free wire in boxes is not commonly used or followed by electrical contractors in the New Orleans

area, Trial Tr. vol. III, 701:14-17, but this does not warrant a factual finding from the Court which would in effect violate the electrical code, which is promulgated for safety purposes. Additionally, the labor intensive and highly skilled work required to clean, clip, and splice electrical wires is impractical and costly given that approximately 85% of electrical work costs are for labor while the electrical wire is a relatively inexpensive material. Trial Tr. vol. I, 152:10-16(Phillips). Additionally, if the wires were clipped and left in the home, and then it was later determined that some of the wires still suffered from corrosion and created a hazard or were not functioning properly, the newly installed drywall covering these wires would have to be removed and replaced again. Given the risk involved with leaving wires exposed to corrosive gases in the home, considering the current scientific dispute on continuation or effect of the corrosion on these wires and the ease of replacing the wires while all the drywall is already removed, it is prudent to completely remove and replace all electrical wires in the Hernandez home. Additionally, leaving in the electrical wiring is an impediment to proper cleaning of the home and removal of all drywall debris and dust. Trial Tr. vol. II, 385:23-386:4(Bailey). Further, National homebuilders considered alternatives to complete removal and replacement of wiring, but ultimately determined that complete removal and replacement both eliminated risk and was cost-effective. Trial Tr. vol. I, 117:2-7(Phillips).

In summary, both sides agree that there is corrosion of the wires in the Hernandez home. They disagree as to the extent of corrosion and the future effect it will have on the wires' functionality and safety. The evidence supports the conclusion that there are significant risks to both future functionality and safety. These risks can and should be eliminated now rather than later, thus avoiding potential failure and catastrophe. The cost of the wire removal must be borne

by the manufacturer of the defective drywall which created these risks and not by the innocent homeowners.

4. *All lighting fixtures may not need to be replaced*

Lighting fixtures may need to be replaced depending upon whether they contain copper electrical wiring or silver contacts. Purely superficial lighting fixtures which contain no copper or silver components may be preserved and reinstalled. However, those lighting fixtures which contain copper wiring or silver contacts must be removed and replaced.

B. All Copper & Silver Plumbing Components Must be Removed & Replaced

Because the plumbing system in the Hernandez home relies heavily upon copper and silver components, it has been compromised by the Chinese drywall in the home. Trial Tr. vol. I, 42:23-43:3(Rutila); *see also* Streit Dep. 26:16-27:13, 60:2-6. For example, the plumbing pipes are made of copper and the brazing at the joints includes silver. Trial Tr. vol. I, 36:12-37:3, 37:24-38:6, 39:25-40:5, 40:18-23, 41:25-42:17, 71:5-11(Rutila). These copper and silver components show evidence of corrosion thickness and pitting. *Id.* at 36:12-37:3, 37:24-38:6, 39:25-40:5, 40:18-23, 41:25-42:17, 71:5-22(Rutila). The hot water heaters can be properly evaluated for Chinese drywall caused corrosion only after being completely disassembled. *Id.* at 71:18-22(Rutila). National homebuilders have determined it is appropriate to replace the heater rather than spend time and money examining and attempting to replace it. *Id.* Insofar as the plumbing system contains PVC components which are not damaged by the sulfur off-gassing, these components may be preserved during remediation and reinstalled into the Hernandez home if economically feasible.

Knauf argues that the corrosion on the plumbing system is merely superficial and does not warrant removal and replacement. However, given the evidence demonstrating that there is corrosion on the plumbing systems and this corrosion may continue, that the corrosion may effect the functionality and longevity of the plumbing system, and that the plumbing components are easily removed while all the drywall is out of the home, the Court finds that the entire plumbing system should be removed and all copper and silver components replaced. To the extent that pvc and other non-metallic components may be preserved and reinstalled, such should be done.

C. The Entire HVAC System Must be Removed & Replaced

Because the HVAC system in the Hernandez home relies heavily upon copper and silver components, it has been compromised by the Chinese drywall in the home. Trial Tr. vol. I, 22:20-23:4, 39:6-42:17, 53:15-54:25, 57:6-60:2 (Rutila); Streit Dep. 26:16-27:13, 60:2-6. For example, HVAC systems include copper piping to carry refrigerant throughout the system and air-conditioning coils are made of copper. Streit Dep. 67:13-68:20. Even coated copper coils, like those recently installed to replace the last set of coils in the Hernandez's home, are vulnerable to failure in homes with Chinese drywall. Trial Tr. vol. II, 371:1-4(Bailey); Def. Ex. 195.

The entire air-handling unit must be removed and replaced. The wires and circuit boards in the air-handling unit are subject to corrosion and premature failure. Trial Tr. vol. II, 370:19-371:16(Bailey). The insulation in the air-handling unit will also need to be replaced because of exposure to the off-gassing of reduced sulfur gases. *Id.* at 371:10-12(Bailey). Further, given the time to inspect each component of the air-handling unit, and the cost of replacement of individual

components, replacement of the entire unit is more efficient and cost-effective. *Id.* at 371:12-16(Bailey).

Replacement of the outside condenser is necessary to ensure the efficiency of the HVAC system with a new air-handling unit. *Id.* at 373:7-10(Bailey). While the Plaintiffs' condenser was recently replaced, if there is substantial delay in remediation which would expose the condenser to further corrosion, it may be harmed to the point of requiring replacement. Trial Tr. vol. I, 72:21-73:2. Additionally, the current condenser is built to utilize old R-22 refrigerant which is no longer produced for use. *Id.* at 372:14-373:10(Bailey). Any new air-handler will only be useable with the new refrigerant. *Id.*

D. Appliances & Consumer Electronics Damaged by Chinese Drywall Must be Removed and/or Replaced

Plaintiffs have reported many premature failures of major appliances and consumer electronics in their home during their first three years of use of the home. Trial Tr. vol. II, 289:1-290:2(Hernandez); Pls. Ex. 558 (FRE 1006 Summary of Property Failure Data in the Hernandez Home). Laboratory analysis of the copper and silver components of these items has identified Chinese drywall as the cause of severe corrosion deposits at the operative connections in the appliances and consumer electronics. Trial Tr. vol. I, 65:18-66:6; Trial Tr. vol. II, 309:6-310:7(Galler); Trial Tr. vol. V, 912:11-15(Perricone). For example, the coils in the refrigerator and the electrical cord on a lamp have been corroded by Chinese drywall. Trial Tr. vol. I, 62:16-64:15(Rutila). These findings were made using standard techniques such as scanning electron microscopy and energy dispersive spectroscopy. Trial Tr. vol. II, 306:22-308:3(Galler). Mechanical, electrical, and electronic failures in the Hernandez home have been shown to occur

prematurely, and are predicted to continue to do so, due to the severe corrosive environment created by the Chinese drywall in the home. *Id.* at 329:8-17, 331:22-332:8(Galler); Trial Tr. vol. III, 568:20-25(Lee). The corrosion on these items which increases resistance, can lead to fires or other life safety problems. Trial Tr. vol. II, 313:8-15, 329:8-330:9(Galler); Pls. Ex. LT 0202-0001(Chudnovsky 2008). The circuit boards in appliances and electrical devices which suffer from the corrosion cannot be practically cleaned of the corrosion. Trial Tr. vol. II, 334:4-15(Galler). Even if there existed a method of cleaning circuit boards of corrosion, the damage already caused by the corrosion remains a problem. *Id.* Accordingly, Plaintiffs' appliances and consumer electronics damaged by Chinese drywall must be disposed of and replaced.

E. Everything in Front of Drywall Must be Removed & Replaced

As a practical matter, everything in front of the drywall in the Hernandez home, such as cabinets, trim, fixtures and bathroom porcelain, needs to be removed prior to removal of the drywall. Trial Tr. vol. I, 67:18-68:24(Rutila); Trial Tr. vol. IV, 758:11-16 (Mar. 18, 2010). Removal of these items can damage even those items deemed worth salvaging. *Id.* It is not worth the cost to attempt to remove, store, and replace these items, when it is likely they will be damaged and when one considers the relatively low cost of these items. Knauf's own proposed remediation protocol calls for the replacement of items damaged during remediation. *See* Def. Ex. 211. Accordingly, these items must also be replaced.

F. Flooring May Need to be Removed & Replaced

The wood floors in the Hernandez home may need to be removed and replaced if they are damaged during the remediation process. This is consistent with Knauf's proposed remediation

protocol. *See* Def. Ex. 211. However, the Court finds that with the proper care, the wood floors can be sufficiently protected. Trial Tr. vol. IV, 757:9-14.

Both parties' remediation protocols call for the removal and replacement of carpet, *See* Pls. Ex. 447-0031; Def. Ex. 211, thus the Court requires all carpet in the Plaintiffs' home to be removed and replaced.

Tile floors can be sufficiently protected during remediation and thus do not require removal and replacement.

G. Certain Non-Electronic Personal Property Damaged by the Chinese Drywall Must be Replaced

A number of the Plaintiffs' non-electronic items of personal property have been damaged due to absorbing the odor released by the Chinese drywall in their home or due to corrosion caused by the sulfur gases emitted from the Chinese drywall. Trial Tr. vol. II, 506:16-20, 25, 507:4-6 (C. Hernandez); Trial Tr. vol. I, 66:7-67:11. For example, the Hernandez's clothing has a burned chemical smell which cannot be removed by washing, drying, or dry-cleaning. *Id.* at 507:23-25 (C. Hernandez). Additionally, rugs and mattresses, even after hiring a steam cleaning service, still reek of the Chinese drywall odor. *Id.* at 508:20- 509:4 (C. Hernandez); *see* Pls. Exs. 31, 32 (Stanley Steamer Quote and Invoice). Plaintiffs' non-electronic, metallic items have also been damaged by Chinese drywall caused corrosion. Trial Tr. vol. I, 66:7-67:11. These items include, but are not limited to, door knobs and strike plates, *id.*, and a silver picture frame, *id.* at 64:16-65:14. Accordingly, all these items and similarly damaged items must be replaced.

H. After Remediation, Comprehensive Cleaning of the Home is Necessary

Drywall remediation will create substantial dust no matter how controlled the removal process. Trial Tr. vol. I, 75:5-24(Rutila); *see also* Trial Tr. vol. II, 352:18-353:15(Bailey). Complete removal of the dust requires regular vacuuming, followed by vacuuming with a HEPA filter, and finally a pressure washing or wipe-down of all surfaces with a damp cloth. Trial Tr. vol. I, 75:25-76:12(Rutila); *see also* Trial Tr. vol. II, 360:17-25, 365:18-20, 368:12-25(Bailey). After drywall removal and cleaning, Plaintiffs' home should be aired-out for up to 30 days to allow all odors and gases to be eliminated while the studs of the home are exposed. Trial Tr. vol. I, 77:6-18(Rutila). Knauf's proposed cleaning protocol is largely the same as the Plaintiffs'. Trial Tr. vol. II., 382:2-6.

I. An Independent, Environmental Consultant Must Certify the Remediation is Complete & Successful

To ensure that a full and complete remediation is accomplished, an independent, environmental consultant should be retained, have final approval authority, and certify in writing the completion and safety of the remediation. Trial Tr. vol. I, 78:3-18(Rutila). The Court finds that this certification is prudent given its importance for resale of the home, for insurance purposes, and to provide the homeowners with peace of mind.

J. Major U.S. Builders Have Successfully Utilized a Similar Scope of Remediation

The remediation protocol formulated by the Court is consistent with protocols used by national homebuilders in their remediation efforts. Beazer Homes, an established national homebuilder, has remediated or is in the process of remediating 44 homes in Florida which contain Chinese drywall. Trial Tr. vol. I, 100:16-21, 102:20-22(Phillips). Beazer has developed a remediation protocol based upon (1) fulfilling their warranty agreement with homeowners to

fully repair the damage caused by Chinese drywall, and (2) fulfilling this agreement in the most practical and cost-effective way possible. *Id.* at 105:12-106:1, 110:25-111:3; Pls. Ex. 150-0003. Beazer has determined that it is more cost-effective to replace and remove cabinetry and wood flooring, given the alternative costs of climate-controlled storage and reinstallation and the risk of damage during removal. Trial Tr. vol. I, 125:125-126:14 (Phillips). Beazer also removes and replaces all affected plumbing components, or fixtures and fittings that are made of copper or chrome as part of its remediation protocol. *Id.* at 118:20-119:1 (Phillips). Beazer considered trying to salvage parts of the HVAC system, but ultimately decided to replace everything but the condenser, or outside compressor. *Id.* at 112:2-16 (Phillips). Beazer follows a thorough cleaning and air-out protocol, since Chinese drywall dust is extremely fine and tends to disburse and settle on all surfaces during the process of removal. *Id.* at 127:4-129:10, 128:1-25, 129:1-10 (Phillips). The breakage of drywall into pieces when it is being removed is inevitable, as shown in the video-taping of this activity both in Beazer homes and in the "control" home in Mandeville used by KPT. *Id.* at 131:14-132:2 (Phillips). The scope of remediation adopted by the Court in this case is consistent with the scope of remediation which Beazer has found through trial and error to be appropriate, and is based not simply on expert theories or opinions but on Beazer's actual experience. *See* Pls. Ex. 150-0003.

K. No Reputable Contractor Would Accept the Risk of Leaving Copper and Silver Components in the Plaintiffs' Home

Irrespective of the scientific debate about corrosion, pitting, or the continuance of problems with wires in walls after removal of Chinese drywall, the Hernandez family and the contractor they may retain in the future to remediate their home, must address a now-publicized

and legitimate risk of corrosion on copper metal surfaces left in the home after the KPT drywall is removed. Trial Tr. vol. II, 477:16-21(Mallet). No reputable contractor would accept the risk of keeping copper and/or silver metal in the home after these materials existed in a corrosive environment and demonstrate significant corrosion, and neither would a reputable environmental consultant approve a remediation of the Hernandez home if the potential of continuation for such a corrosion risk remains. *Id.* at 500:3-501:14 (Mallet). Just as Beazer seeks to assure that owners are made whole without further legal recourse against the builder, a general contractor can be expected to do the same with respect to the Hernandez family. This practicality further supports the Court's remediation protocol.

V. COSTS

A. Remediation

Based upon the evidence and testimony, the Court has formulated an appropriate scope of remediation for the Hernandez home and calculated the appropriate cost of the remediation. The scope and cost of remediation formulated by the Court is comparable to that of national homebuilders, factoring into account the financial benefits national homebuilders have with regard to pricing, materials, and workers. *See* Trial Tr. vol. I, 162:16-168:4 (Phillips).

The cost of the Court's scope of remediation includes the following:

1. Removal and replacement of all drywall;
2. Removal and replacement of all components of the HVAC system;
3. Removal and replacement of the entire electrical system;
4. Removal and replacement of all insulation;

5. Removal and replacement of molding, countertops, cabinets, and other items that must be removed during drywall removal, are likely to be damaged during removal, and are cheaper to replace than to preserve;
6. Removal and replacement of copper and silver components in the plumbing system;
7. Removal and replacement of carpet; removal, storage, and reinstallation of undamaged wood flooring; and protection of tile flooring during remediation;
8. Cleaning after remediation, including use of HEPA vacuuming and wet-wiping or power-washing all surfaces;
9. Certification from an environmental consultant; and
10. Any actions incident to or necessary to carry out and finalize the above.

Plaintiffs and Knauf both submitted cost estimates for remediation of the Hernandez home. Plaintiffs' expert Al Mallet performed a room-by-room analysis, and utilized the Xactimate software program to determine what Mr. and Mrs. Hernandez should expect to pay in their community for a proper remediation of their home. Trial Tr. vol. II, 408:11-409:17 (Mallet). The Xactimate software program uses generally-accepted cost data sets and cost methodologies which are routinely used by the insurance industry, in order to finalize cost estimates. Trial Tr. vol. II, 409:9-17, 443:1-25 (Mallet); Trial Tr. vol. IV, 788:10-19, 790:4-7 (Carruba). Using this program, Mr. Mallet determined that a reasonable cost estimate for the appropriate Chinese drywall remediation of the Hernandez home is \$200,218.09. Trial Tr. vol. III, 447:18-21 (Mallet). Knauf's expert Roy Carubba also provided an estimate on the cost to remediate Plaintiffs' home. Mr. Carubba's calculations are based upon estimates he received from

plumbing, electrical, and carpentry subcontractors local to the area in which the Hernandez home is located. Trial Tr. vol. IV, 731:13-15, 732:3-5, 737:14-22, 738:2-21; Def. Exs. 212, 213, 215. Mr. Carruba estimates that it would cost between \$53,142.43 and \$58,564.93, to repair the Hernandez home. Trial Tr. vol. IV, 760:23-24; Def. Exs. 212, 237. These estimates, of course, are based on the nature and scope of remediation advanced by the parties.

The Court has considered the two different approaches taken by the parties with regard to calculating cost estimates for remediation of the Hernandez home. It finds that Xactimate provides figures which are helpful for determining the general range of costs, but does not take into account actual estimates from local contractors which are the most accurate estimates for work. The general approach used by the Court was to check the estimates submitted by the local contractors against the estimate suggested by Xactimate (R.S. Means would be another acceptable source). If the contractor's estimate is within the general range of or lower than the Xactimate estimate, the Court relied upon the local contractor's estimate unless the local estimate was so low as to be unrealistic. The Court has considered both the Xactimate estimates and estimates from local contractors and has determined the appropriate cost of remediating the Hernandez home to be \$136,940.46. The Court reached this amount by first calculating the following remediation costs by category:

1. Demolition: \$10,000.00
2. Appliances: \$4,560.05
3. Cabinetry: \$10,960.48
4. Drywall: \$11,000.00
5. Insulation: \$2,383.92

6.	Painting:	\$10,000.00
7.	Electrical:	\$15,192.00
8.	Doors:	\$2,385.00
9.	Cleaning:	\$5,218.09
10.	Carpet:	\$1,000.00
11.	HVAC:	\$10,452.74
12.	Plumbing:	\$12,373.80
13.	Mirrors:	\$273.30
14.	Countertops:	\$1,137.81
15.	Fireplace:	\$120.00
16.	Trimwork:	\$4,000.00
17.	Hardware:	\$1,417.11
18.	Storage:	\$300
19.	Temporary costs during repairs:	\$775
20.	Environmental inspection, approval, and certification:	\$10,000.00

Next, the Court considered overhead and profit for these remediation costs. The parties agree that overhead and profit for the remediation of the Hernandez home will each constitute 10% of the total remediation cost. *See* Pls. Ex. 477-0031; Def. Ex. 0237. Taking into account that the subtotal for cost of remediation based upon the foregoing figures is \$113,549.30, the overhead and profit will account for \$11,354.93 each, or a total of \$22,709.86. Adding the percentages for overhead and profit, the Court finds that the Hernandez's are entitled to \$136,259.16, for the cost of remediating their home including overhead and profit.

Then the Court considered sales tax. The parties disagree whether the sales tax for materials and equipment is a separate figure to be added to the total remediation costs or whether it is absorbed in the costs estimates for these items. Plaintiffs' added 9.25% for sales tax for materials and equipment sales each to their total remediation costs figure. *See* Pls. Ex. 477-0031. Knauf challenges this calculation on the basis that any such taxes would be reflected in the subcontractors' price quotes and actual invoices for the activities and materials they provided for the job. Trial Tr. vol. I, 184:8-23; Trial Tr. vol. IV, 764:23-765:16. The Court has considered the arguments of the parties and based upon the evidence, finds that the additional costs for sales tax should be excluded from the total remediation cost.

Finally, the Court considered permit fees. The parties agree that the total cost of remediation should include permit costs, but dispute the cost of such. *See* Pls. Ex. 477-0031; Def. Ex. 237-0001. Based upon the evidence, the Court finds that the cost of permits will constitute 0.5% of the remediation cost. Given the remediation cost of \$136,259.16, the cost of permits is \$681.30, and the remediation cost including permits is \$136,940.46.

Based upon the foregoing, the Court finds the final total cost for remediation of the Hernandez home to be \$136,940.46.

B. Personal Property

The parties disagree as to whether Plaintiffs can recover damages for personal property and if so, how these damages are to be calculated. Plaintiffs' expert Ms. Tuthill calculated Plaintiffs' personal property loss based upon the report of David J. Maloney, Jr. of Frederick Appraisal Claims & Estate Services for small appliances and electronics, corroded items, and furnishings with absorbent fabrics to be \$8,036.00. *See* Pls. Ex. 481-0003 (Tuthill's Revised

Supplemental Exhibit). Mr. Maloney conducted research on replacement prices and prepared his appraisal report. *Id.* Replacement cost new is defined as the cost necessary to replace the item being appraised with a brand-new item of like kind, quality and utility, or with a new upgraded item if the original model is out of production. *See* Pls. Ex. 103 (Curriculum Vitae); Maloney Dep. 24:1-9, 25:1-6 (Mar. 2, 2010)(Maloney). The total does not include replacement of built-in electrical appliances and electrical equipment since these were included in the remediation estimate. Trial Tr. vol. III, 498:21-499:24(Mallet Testimony).

Knauf challenges Plaintiffs' recovery of damages for personal property and Mr. Maloney's calculations for these damages. Knauf argues that Plaintiffs failed to put forth evidence that non-electronic personal property has failed or has been damaged as a result of exposure to Chinese drywall. Knauf also argues that Mr. Maloney's calculations fail to take into account the Plaintiffs' benefit of using these items over the past three years. It contends that fair market value of these items includes depreciation for use, Maloney Dep. 55:3-10, 62:13-16, 66:21-24, and thus Mr. Maloney's estimates are inflated.

Based upon the evidence presented, the Court finds that the Plaintiffs' are entitled to recover damages for personal property. The Court further finds that the Plaintiffs' benefit of using these products should be taken into account when calculating the damages. Accordingly, the Court finds the Plaintiffs' recovery of damages for personal property to be \$5,357.33.

C. Alternative Living Costs

1. Recurring

Plaintiffs' expert Ms. Tuthill calculated the recurring, monthly alternative living costs for Mr. and Mrs. Hernandez to be \$3,006.81 per month from the time when the Hernandez family

moves out of their home until remediation is completed. *See* Pls. Ex. 481-0003 (Tuthill's Revised Supplemental Exhibit). This figure includes the following costs: rent, renter's insurance, storage, furniture rental, and lawn maintenance. *Id.* (At trial, the Court reserved ruling on Pls. Ex. 48 which contains cost information on lawn maintenance. The Court now admits this exhibit into the record). Knauf's appraisal expert Richard Roddewig estimates that rental costs for the Hernandez's will be between \$1,200 and \$1,800 per month. Def. Exs. 209, 221. Based upon this evidence, the Court concludes that the appropriate rental cost is \$1,800 per month, plus \$576.81 for renter's insurance, storage, and furniture rental. Accordingly, the Court finds the total monthly costs for the Hernandez's while they are out of their home during renovations to be \$2,376.81 per month.

The parties dispute the length of time necessary to remediate Plaintiffs' home. Plaintiffs argue that the remediation will require the Plaintiffs to be out of their home for six (6) months. Knauf argues that the remediation will require them to be out of their home for three (3) months. Trial Tr. vol. IV, 759:7-11. Based upon the evidence presented, the Court finds that the Plaintiffs' will be out of their home for four (4) months during remediation. Accordingly, the total monthly alternative living costs are \$2,376.81 per month for four months, or a total of \$9,507.24.

2. *Non-recurring*

Plaintiffs' expert Ms. Tuthill calculated the non-recurring, one-time expense alternative living costs for the Hernandez's to be \$14,862.62 which will be incurred when the Hernandez family moves out of the residence while the home is being remediated. *See* Pls. Ex. 481-0003 (Tuthill's Revised Supplemental Exhibit). These costs include: moving and packing, security

deposits, cleaning costs, storage, and furniture rental. *Id.* Knauf does not include these costs in its estimate. Based upon the evidence, the Court finds that the non-recurring alternative living costs for the Plaintiffs to be \$9,562.00.

D. Repair Costs

1. Pretrial

Plaintiffs' expert Ms. Tuthill calculated the repair costs incurred by Plaintiffs prior to trial to be \$2,682.29. *See* Pls. Ex. 481-0004 (Tuthill's Revised Supplemental Exhibit). These costs include the following: repair and replacement of HVAC, repair and replacement of refrigerators, and cleaning of clothing, window treatments, rugs, and furniture. Knauf has not included these items in its estimate. Based on the evidence presented, the Court finds that Plaintiffs are entitled to \$2,682.29 for pretrial repair costs.

2. Post-trial

Ms. Tuthill calculated the repair costs to be incurred by Plaintiffs, post-trial, to be \$2,365.64. *See* Pls. Ex. 481-0004 (Tuthill's Revised Supplemental Exhibit). These costs include the following: cleaning of clothing, window treatments, rugs, and furniture; house cleaning services; and inspection of the home. Knauf has not included these items in its estimate. Based on the evidence presented, the Court finds that Plaintiffs are entitled to \$1,500.00 for post-trial repair costs.

E. Lost Wages

Plaintiffs' expert Ms. Tuthill calculated Tatum Hernandez's loss of income in the amount of \$1,601.55, and Charlene Hernandez's loss of income in the amount of \$1,392.00, due to their missing work because of repairs necessitated by the Chinese drywall in their home and expert

and inspection activity at their home necessitated by this litigation. *See* Pls. Ex. 481-0004. (The Court reserved ruling on exhibits Pls. Exs. 448, 399-407 regarding lost wages. The Court has considered these exhibits and now enters them into the record). Knauf disputes that lost wages are recoverable in the present case. Based upon the evidence presented, the Court finds that Plaintiffs are not entitled to recovery of damages for lost wages.

F. Property Tax Reduction

Plaintiffs' expert Ms. Tuthill calculated the reduction in property tax assessment afforded Plaintiffs by the St. Tammany Assessor and credited the amount of \$1,499.68 against the Plaintiffs' claims. *See* Pls. Ex. 481-0004 (Tuthill's Revised Supplemental Exhibit). Knauf has not raised any challenge to this calculation. Based upon the evidence, the Court finds that Knauf is to be credited \$1,499.68 for this property tax reduction.

VI. DAMAGES LAW & RECOVERY

The real property of the Plaintiffs is situated in Louisiana, and the losses that are the subject of this case likewise occurred in Louisiana. Louisiana's substantive law applies.

Based upon the pretrial stipulation of the parties, Defendant KPT is the manufacturer and seller of the drywall at issue in this case. As the manufacturer of the drywall, KPT is directly and independently liable to Plaintiffs for redhibitory defects existing at the time of delivery. *See Aucoin v. Southern Quality Homes*, 984 So. 2d 685, 693 (La. 2008). Further, as the manufacturer of the drywall, KPT is conclusively presumed to be in "bad faith" under Louisiana Civil Code Article 2545. *See* La. Civ. Code art. 2545, cmt.(b) ("Under this Article, a manufacturer is presumed to know the defects in the things it manufactures.... Thus, regardless of what his actual

knowledge may be, a manufacturer is deemed to be in bad faith in selling a defective product").

Based on the forgoing, KPT is liable to Plaintiffs for:

- I. the return of the purchase price of the drywall with interest from the time it was paid;
- ii. the reasonable expenses occasioned by the sale of the drywall;
- iii. reasonable expenses incurred for the preservation of the drywall and associated components;
- iv. damages; and,
- v. reasonable attorneys fees. La. Civ. Code art. 2545.

KPT is also liable for damages under Louisiana Civil Code Article 2524. *See, e.g.*, La. Civ. Code art. 2524, cmt. (b)("when the thing sold is not fit for its ordinary use, even though it is free from redhibitory defects, the buyer may seek dissolution of the sale and damages, or just damages, under the general rules of conventional obligations"); *Walton Construction Co. v. G.M. Horne*, 07-0145 (La. App. 1 Cir. 2/20/08) 984 So. 2d 827, 838(Downing, J., concurring) ("The warranty of fitness which, by law, comes with my air conditioner, doesn't just run to the guy who bought it to install it, it runs to me, the ultimate consumer, for which it was intended. This allows me, the ultimate consumer, to sue the manufacturer without also suing the (probably broke and long gone) contractor, distributor, or middle man"). Under Louisiana law, when property is damaged through the fault of another, the primary goal is to restore the property, as nearly as possible, to the state it was in immediately prior to the damage. *Coleman v. Victor*, 326 So. 2d 344, 346-47 (La. 1976); *Mossy Motors, Inc. v. Sewerage & Water Board of New Orleans*, 98-0495 (La. App. 4 Cir. 5/12/99) 753 So. 2d 269, 277; *Alpha Alpha v. Southland Aviation*, 96-

928 (La. App. 3 Cir. 7/9/97) 697 So. 2d 1364, 1372; *Summarell v. Ross*, 95-27,160 (La. App. 2 Cir. 8/23/95) 660 So. 2d 112, 116-117. It is well-settled, in this regard, that the measure of property damage is the cost of restoring the property to its former condition. *Id.* Generally, Louisiana courts consider the cost of restoration to be the proper measure of damage where the thing damaged can be adequately repaired. *Id.* No mechanical rule is applied with exactitude. *Id.* Each case must rest on its own facts and circumstances. *Id.*

Consistent with this precedent, the Court finds that the remediation protocol discussed above will adequately restore the property to its former condition. Plaintiffs purchased a new home and are entitled to have it restored to a new condition (*i.e.*, without any corrosion, tarnishing, residue, or other damage to wiring and other components). Accordingly, Plaintiffs are entitled to \$136,940.46 which the Court finds, based on the evidence, is the appropriate cost for remediation.

Additionally, based upon the applicable law, the Court finds that the Plaintiffs are entitled to recovery for personal property, alternative living costs, and repairs. Based upon the foregoing calculations, the Court finds that the Plaintiffs are entitled to a total of \$28,608.86 for these damages. However, this amount is to be deducted by the \$1,499.68 reduction in property taxes. Thus, the total calculation for these items is \$27,109.18.

Plaintiffs have requested damages for lost wages. The Court finds that lost wages damages are not recoverable under the applicable facts and law in this case.

The parties have stipulated that Plaintiffs are not entitled to damages for mental anguish, loss of use and enjoyment, inconvenience or any other forms of non-pecuniary loss. *See Pls.' Resp. To Def.'s Mot. Partial Summ. J.*, Mar. 9, 2010, at 1-2.

Plaintiffs are entitled to an award of attorneys' fees. *See* La. Civ. Code art. 2545; *see, e.g., Aucoin v. Southern Quality Homes*, 984 So. 2d 685, 698 (La. 2008); *Capitol City Leasing Corp. v. Hill*, 404 So. 2d 935, 939 (La. 1981). The Court has severed the issue, and will determine the appropriate amount of attorneys' fees and costs at a subsequent proceeding in accordance with Federal Rule of Civil Procedure 54(d)(2).

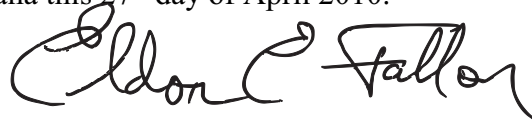
CONCLUSION

In summary, the Plaintiffs have suffered damages in the following amounts:

1. Remediation: \$136,940.46
2. Personal property: \$5,357.33
3. Recurring Alternative Living Expenses: \$9,507.24
4. Non-recurring Alternative Living Expenses: \$9,562.00
5. Pretrial Repair Costs: \$2,682.29
6. Post-trial Repair Costs: \$1,500.00

The Hernandez's damages are to be reduced by \$1,499.68 for their property tax reduction. The Court finds Plaintiffs are entitled to recover these damages. Thus, the Court awards damages to the Plaintiffs in the amount of \$164,049.64, plus reasonable attorneys' fees, the costs of these proceedings, and legal interest from judicial demand until paid. The Court will hold a hearing to determine the amount of reasonable attorneys' fees at a future date.

New Orleans, Louisiana this 27th day of April 2010.



U.S. District Judge