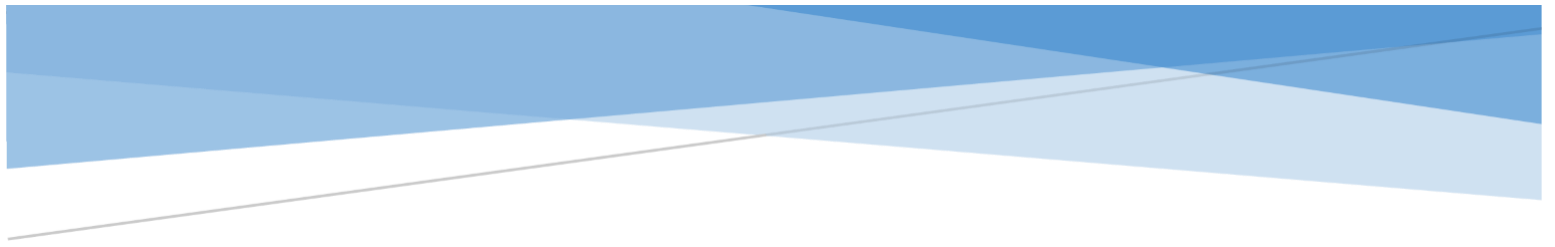


APPENDIX G

GOLF COURSE ENVIRONMENTAL MANAGEMENT PLAN

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March 2019



**INDIAN HILLS COUNTRY CLUB
FORT SALONGA, NEW YORK**

Golf Course Environmental Management Plan

March 2019

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Indian Hills Country Club Golf Course Environmental Management Plan

Introduction

The Indian Hills Country Club Golf Course Environmental Management Plan (EMP) identifies golf course management and operational procedures to minimize or avoid potential adverse environmental impacts from the golf course its amenities and future development plans. The EMP is an environmental stewardship program that is science based. East Quogue Golf Corporation as preparer, has developed the Plan in cooperation with the owner, the golf course Superintendent and specific onsite environmental conditions. The Superintendent and turf staff will administer their work in response to biotic and abiotic conditions, maintain high quality playing conditions, while implementing the Plan's standards of practice. Indian Hills Country Club is a member of the Audubon International Golf Course Certification Program and is in the process of full certification. In combination with the New York State Best Management Plan for Golf Courses, the goals of the Long Island Nitrogen Action Plan (LINAP), Cornell's recommended methods for pesticide management, and regulations set forth by New York State and Suffolk County.

The application of pesticides as a turf management tool has not been eliminated. The EMP recommends selection of pesticides be based on the USEPA Pesticide Root Zone Model (PRZM) and Field Environmental Index Quotient (FEIQ) models. Pesticide use must be based on selecting the most effective treatments and the lowest environmental risk. This is performed in conjunction with a formal Integrated Pest Management Plan (IPM), and nutrient program for the golf course and non-golf course areas.

The application of nutrients has not been eliminated because fine turf management at golf courses requires careful and consistent monitoring of nutrient programs.

The EMP for the golf course will be managed by designated Qualified Professional(s). Within their area(s) of expertise, these professionals will possess the demonstrated experience, academic achievement, professional training/continuing education, certifications, and licenses required to maintain and manage the properties.

The Indian Hill's staff understands low input turf management, water quality monitoring programs, report keeping, natural resource management, disease and pest identification, and protocols described in the EMP. Where required, management and staff has obtained and maintained all licenses and professional credentials specific to managing the developable and non-developable areas of the site. These professional manager(s) will be responsible for the administration, coordination, environmental stewardship, reporting and record keeping as described in the EMP. The EMP is a dynamic document and available to the Indian Hills' management team for review and recommended adjustments to the plan as may be necessary.

Town of Huntington Concern for Golf Course Maintenance and Operations Impacts

During the environmental reviews for the proposed development plans at Indian Hills Country Club the Town of Huntington offered the following comments regarding the golf course operations:

- **Human Health:** describe the storage and use of pesticides, herbicides and other chemicals for maintenance of the golf course will be included.
- **Anticipated Impacts:** provide a description of anticipated impacts related to impact on human health of the storage and use of pesticides, herbicides and other chemicals on the subject property; describe any changes resulting from the proposed project.
- **Proposed Mitigation:** provide control measures for spill prevention; proper handling of chemical storage; proper management practices for the golf course.

Below is a summary to the three (3) primary questions regarding human health, anticipated impacts and proposed mitigation. A comprehensive response to comments the following sections describe Indian Hills' turf management program.

Human Health: the storage and use of pesticides, herbicides and other chemicals for maintenance of the golf course will be included.

Nassau and Suffolk Counties, which for protection of ground and surface waters, are among the most restrictive and regulated areas for turf management anywhere in the United States. Suffolk County Department of Health Services under Article 12 and New York State Department of Environmental Conservation pursuant to 6NYCRR Parts 320-329 which regulate pesticide use.

Suffolk County:

Storage of pesticides is permitted for facilities located in Suffolk County. The facility must be registered pursuant to the following:

Article 12 of the Suffolk County Sanitary Code requires that "toxic and hazardous material" storage facilities be registered with the department of health services. Registration is a process of informing the county of the existence of storage tanks, both above and underground, drum storage areas or other storage vessels that contain chemical substances that can contaminate groundwater. Suffolk County includes the storing of pesticides under this category of Article 12.

Registration is a process of informing the County of the existence of storage tanks, both above and underground, drum storage areas or other storage vessels (such as pesticide storage buildings) that contain chemical substances that can contaminate groundwater.

The purpose of registration is to have an inventory of hazardous materials storage sites (including pesticides) throughout Suffolk County and to allow for the effective enforcement of the codes which regulate this storage.

The registration process consists of completing a form provided by the department and remitting a fee to cover the costs of administering the registration program.

New York State Department of Environmental Conservation:

On August 11, 2005 the NYSDEC issued Policy DSHM-PES-05-03 "Pesticide Storage Guidelines." The Policy consolidates the Bureau of Pesticides Management's guidelines on pesticide storage which are currently distributed to all Registered Pesticide Businesses, Commercial Permit Holders, Pesticide Wholesalers, Distributors, and Pesticide Applicators. The recommended standards and practices for storage of pesticides set forth in this document were developed to minimize the potential for the human health and environmental hazards associated with the storage of pesticides.

The Policy was created to summarize Pesticide Storage Guidelines for the regulated community for compliance with 6 NYCRR 326.11 which states: "No person shall store any restricted pesticide or empty containers thereof in such a manner as may be injurious to human, plant or animal life or to property or which unreasonably interferes with the comfortable enjoyment of life and property throughout such areas of the State as shall be affected thereby." Pesticide Storage Requirements which may be found on pesticide labels, is enforced under 6 NYCRR 325.2 (b), which states: "Pesticides are to be used only in accordance with label and labeling direction or as modified or expanded and approved by the Department."

[The Guidelines for Pesticide Storage at Golf Courses Pesticide Storage Facilities](#)

Pesticide Storage Guidelines for Private Pesticide Applicators, Certified Commercial Pesticide Applicators and Certified Commercial Pesticide Technicians

The purpose of the Guidelines is to recommend standards and practices for pesticide storage by private and other individual pesticide applicators. Storage of pesticides may present potential human health and environmental hazards. Precautions shall be taken to minimize these risks. The guidelines are intended to assist private and other applicators to achieve effective pesticide storage.

Pesticide storage areas shall be structurally segregated from residential, office, and general work areas; livestock quarters; food, feed, or seed storage; and water supply sources, preferably in a separate building or shed.

The pesticide storage area shall have a continuous raised berm on all sides of the floor, and berm and floor shall be sealed to create a continuous impervious surface.

Spill containment materials and fire extinguisher(s) appropriate for the pesticides stored shall be conveniently accessible in the pesticide storage area.

Personal safety equipment such as gloves, aprons and respirators, appropriate for the pesticides stored and handled shall be available, convenient to, but not within, the pesticide storage area.

The pesticide storage area shall be locked and prominently posted with pesticides storage warnings.

The local fire department shall be notified annually of the types and quantities of pesticides stored in the pesticide storage area. A basic fire response plan shall be prepared, submitted to the fire department, and reviewed annually. The Fire and Spill Emergency Pre-Plan, available from CropLife America, is a recognized model.

Pesticides shall be segregated by function and hazard. If pesticides need to be transferred to other containers because of deterioration, the new container shall be clean and must be labeled with the new contents label information, as required by Section §33-1301(1) of the ECL. However, these new containers may no longer be offered for sale.

Areas where pesticides are mixed, and equipment loaded or cleaned, shall be appropriately bermed, with impermeable floors. The rinsate shall be contained and reused for future mixing with the same concentrates. Indoor areas where concentrates are used shall have adequate vapor venting.

Where pesticides are stored in bulk containers, storage areas shall have impermeable flooring and berms. Tanks shall have locked inlet and outlet controls. If possible, areas where tanks are kept shall be secured by fences or indoor locked facilities. A containment system to collect precipitation surface run-on or spills is recommended with at least 25% of the stored capacity of the storage system.

A water supply for emergency wash or eyewash and for routine wash-up shall be located conveniently to the pesticide storage area. A quantity of water sufficient for an initial emergency wash within or immediately adjoining the pesticide storage area is recommended.

A first aid kit appropriately equipped for initial response to pesticide poisoning shall be readily available, but not within the pesticide storage area.

Mitigation: the aforementioned Suffolk County Health Department registration number for Indian Hills Golf Club pesticide storage is Facility Registration # 4-0331 and is compliant with the County's regulations.

The facility has an existing pre-fabricated pesticide storage facility that complies with the NYSDEC "Pesticide Storage Guidelines." The owner plans to upgrade to a newer storage facility as part of future site development infrastructure improvements.

NYSDEC requires more restrictive regulations for other classes of pesticide facilities and operators (such as wholesalers). Indian Hills plans to implement the following initiatives for the new storage facility as additional mitigation:

Facility Structural Recommendations

Pesticide storage areas shall be structurally separated from office and residential spaces, livestock quarters, water supply sources and food, feed or seed storage areas. Pesticide storage areas shall have separate entries if possible. The National Fire Protection Association (NFPA) has standards which provide useful references for the storage of Pesticides. NFPA-30 lists the Flammable and Combustible Liquids Code, and NFPA-434 lists the Storage of Pesticides Code.

The pesticide storage area of a building shall have security and access control provisions, including a locked door, windows which prohibit access and a perimeter fence with locked gate. The floor of the pesticide storage area shall be free of cracks and composed of an impermeable surface material. All joints shall be sealed. The building shall have a containment system, either a bermed floor which will contain at least 25% of the total stored liquid volume or a sloped floor with sump containment which can hold the same volume.

The building shall have a ventilation system sufficient to prevent accumulation of vapors. Building temperatures shall be kept under 95 degrees Fahrenheit and above pesticide freezing points.

All electrical fixtures and appliances shall be non-sparking units approved for use in facilities storing flammable and combustible liquids.

Storage of Pesticide Products

Pesticides shall be segregated by hazard class and pesticidal function; incompatible materials shall be physically separated from each other. Flammable and combustible liquids shall not be stored with other pesticides. Herbicides shall be separated from insecticides and fungicides. Potentially reactive materials shall be separated from other materials by dike, berm, wall or other physical barrier. If pesticides need to be transferred to other containers because of deterioration, the new container shall be clean and must be labeled with the new contents label information, as required by Section §33-1301(1) of the ECL.

Pesticides shall be stored on impermeable shelves, racks or pallets, maintaining adequate aisle space for easy access, particularly in the case of an emergency. Pesticide containers shall be arranged so that labels, including all warning statements, are clearly visible from the aisles. NFPA-30 requirements are for proper aisle spacing and pile volumes, depending on the type of combustible, flammable or ignitable material being stored.

Pesticide containers shall be kept tightly sealed when in storage and shall be inspected periodically for signs of leakage, severe rusting or other defects. If pesticides need to be transferred to other containers because of deterioration, the new container shall be clean and shall be clearly labeled with the new contents label information.

Safety and Emergency Procedures

Personal protection equipment, such as respirators, gloves, aprons and boots shall be available and stored near, but outside of, the pesticide storage area. An emergency eye wash and shower facility shall be immediately accessible from the pesticide storage area.

Routine wash-up facilities shall be provided near the storage area, particularly if pesticide mixing is done in the area. Spill kits and fire extinguishers appropriate for all stored pesticides shall be readily available within the storage area.

All staff working in or having access to the storage area shall receive training in safe pesticide handling; spill prevention and response (containment and cleanup); and selection, use and maintenance of personal protection equipment (at least to OSHA standards).

The manager of the pesticide storage area shall provide personal protection equipment, emergency response information, written standards for pesticide segregation pertinent to that facility, and postings and warnings in compliance with OSHA Hazard Communication and NYS Worker Right-To-Know standards.

The owner, operator or manager of a pesticide storage facility shall notify the local fire department annually of the types and quantities of pesticides stored in compliance with NYS Department of State Hazardous Materials requirements. This notification shall note any typical seasonal variations in types or quantities of materials stored. The local fire department shall be invited to visit the facility to familiarize them with the layout and materials stored.

The owner, operator or manager of the facility shall prepare an emergency response plan with which all employees or persons having access to the pesticide storage area are familiar. The local fire department, rescue squad and local hospital shall also be given copies of this plan. In addition, the owner, operator, or manager shall at all times maintain a current inventory of the pesticides in storage and keep a copy of that inventory at a location separate from and accessible in the event of an emergency involving the pesticide storage area.

A first-aid kit appropriately equipped for initial response to pesticide poisonings must be readily available, but shall not be kept in the pesticide storage area. All persons having access to the storage area shall be familiar with this kit and its use.

Pesticide Mixing Areas

Areas used for the mixing of pesticides shall have additional precautions. Health standards require that water supplies be protected with anti-siphoning devices (see DEC Program Policy PES-05-09, Backflow Prevention Devices). Areas where pesticide concentrates are handled shall be equipped with vent hoods, fans or other vapor removal equipment.

Empty container storage shall be a separate, secure section within the general pesticide storage area. All rinsates, including wash waters from cleaning of spray equipment, shall be collected and stored above ground. Stored rinsates shall be appropriately recycled, for example, as make up water in later tank loads.

Storage of Pesticide Products

Pesticides shall be segregated by hazard class and pesticidal function; incompatible materials shall be physically separated from each other. Flammable and combustible liquids shall not be stored in the same area as other pesticides. Herbicides shall be separated from other materials by dike, berm, wall or other physical barrier.

If pesticides need to be transferred to other containers because of deterioration, the new container shall be clean and must be labeled with the new contents label information, as required by Section §33-1301(1) of the ECL.

NFPA-30 contains specific provisions for indoor and outdoor storage requirements, including storage distances from property lines. In the situation where adjacent properties are residential, the storage of pesticides shall be at least 50 feet from the adjacent property line.

Pesticides shall be stored in impermeable shelves, racks or pallets, maintaining adequate aisle space for easy access, particularly in the case of an emergency. Pesticide containers shall be arranged so that labels, including all warning statements, are clearly visible from the aisles. NFPA-30 contains requirements for proper aisle spacing and pile volumes, depending on the type of combustible, flammable or ignitable material being stored.

Pesticide containers shall be kept tightly sealed when in storage and shall be inspected periodically for signs of leakage, severe rusting or other defects. If pesticides need to be transferred to other containers because of deterioration, the new container shall be clean and shall be clearly labeled with the new contents label information.

Pesticides shall not be stored in the basement of facilities. If pesticides cannot be stored in a dedicated building, the pesticide storage area shall be separated from the remainder of the building by firewalls and fire doors. Fire doors shall be kept closed or equipped with automatic closing devices. Pesticide storage areas shall be limited-access, so that the public (particularly in retail stores) cannot enter these areas.

Safety and Emergency Procedures

Personal protection equipment, such as respirators, gloves, aprons and boots shall be available and stored near, but outside of, the pesticide storage area. An emergency eye wash and shower facility shall be immediately accessible from the pesticide storage area. Routine wash-up facilities shall be provided near the storage area, particularly if pesticide mixing is done in the area. Spill kits and fire extinguishers appropriate for all stored pesticides shall be readily available within the storage area.

All staff working in or having access to the storage area shall receive training in safe pesticide handling, spill prevention and response (containment and cleanup), and selection use and maintenance of personal protection equipment (at least to OSHA standards).

The manager of the pesticide storage area shall provide personal protection equipment, emergency response information, written standards for pesticide segregation pertinent to that facility and postings and warnings in compliance with OSHA Hazard Communication and NYS Worker Right-to-Know standards.

The owner, operator or manager of a pesticide storage facility shall notify the local fire department annually of the types and quantities of pesticides stored in compliance with NYS Department of State Hazardous Materials requirements. This notification shall note any typical seasonal variations in types or quantities of materials stored. The local fire department shall be invited to visit the facility to familiarize them with the layout and materials stored.

The owner, operator or manager of the facility shall discuss the need for a neighborhood evacuation plan, in the event of an emergency, with the local fire department. Considerations such as an automatic alarm signal to the fire department, and procedures for notifying surrounding residents or building occupants shall be considered.

The owner, operator or manager of the facility shall prepare an emergency response plan with which all employees or persons having access to the pesticide storage area are familiar. In addition, the local fire department, rescue squad and local hospital shall also be given copies of this plan. In addition, the owner, operator, or manager shall at all times maintain a current inventory of the pesticides in storage and keep a copy of that inventory at a location removed from and accessible in the event of an emergency involving the pesticide storage area.

A first-aid kit appropriately equipped for initial response to pesticide poisonings must be readily available, but shall not be kept in the pesticide storage area. All persons having access to the storage area shall be familiar with this kit and its use.

The facility shall be clearly posted on all exterior sides with warning signs describing pesticide storage hazards. The local fire department shall be contacted for local sign requirements.

Pesticide Mixing Areas

Areas used for the mixing of pesticides shall have additional precautions. Health standards require that water supplies be protected with anti-siphoning devices. Areas where pesticide concentrates are handled shall be equipped with vent hoods, fans or other vapor removal equipment. Empty container storage shall be a separate, secure section within the general pesticide storage area. Rinsate shall be confined and stored above ground.

All rinsates, including wash waters from cleaning of spray equipment, shall be collected and stored above ground. Stored rinsates shall be appropriately recycled, for example, as make-up water in later tank loads.

Anticipated Impacts: Describe the anticipated impacts related to impact on human health of the storage and use of pesticides, herbicides and other chemicals on the subject property; describe any changes resulting from the proposed project.

The anticipated impacts are assessed to be small in nature because of the facility meets the requirements set forth under Suffolk County Department of Health Services Article 12 registration and the NYSDEC “Pesticide Storage Guidelines.”

Proposed Mitigation: Control measures are in place for pesticide storage, mixing and spill prevention; proper handling of chemical storage; proper management practices for the golf course. The Indian Hills Country Club has an approved “backflow” prevention device installed at the pesticide mixing area.

Indian Hills Country Club requires all pesticide applicators be New York State certified and maintain NYSDEC annual pesticide reporting records. The pesticide applicator and pesticide use regulations are summarized below:

The USEPA is responsible for the administering the national program that assures a desired level of technical competence associated with private and commercial pesticide applicators. In New York State, the lead agency designated for pesticide registration, pesticide use, applicator certification and enforcement of state and federal regulations is the NYSDEC, Division of Materials Management Bureau of Pesticides Management. Commercial pesticide applications can only be performed by a NYS Certified Commercial Pesticide Applicator. General eligibility requirements for certification are:

- Qualify as a Commercial Technician- Minimum age of 17; Completion of 30-hour NYSDEC approved training program.
- Pass Core Exam – 90 minutes 50 questions- closed book.
- Pass Technical Exam- 90 minutes 50 questions-open book.
- Provide Proof of One-year experience with pesticide applications performed under supervision of a NYS Certified Commercial Applicator.
- Complete 12 hours of category specific certification training credits from pesticide courses approved by the NYSDEC.
- Pay NYS Certification fees.

NYSDEC regulates pesticide applications pursuant to 6NYCRR Part 325 Rules and Regulations Relating to the Application of Pesticides. Part 325.16 describes twelve categories of commercial pesticide applications. Generally turf professionals are certified in the category 3A: Ornamentals and Turf. On-site staff involved in the application of pesticides shall at a minimum be NYS Certified Commercial Pesticide Applicators- Category 3A.

The NYSDEC also registers pesticides for use in the state, such that all USEPA registered pesticides are not legally permitted for use in New York unless the product is also registered by the state. The NYSDEC further restricts pesticide use within specific counties, with Nassau and Suffolk Counties having the most restrictions on pesticides available for use and limitations of annual cumulative application quantities for specific pesticides.

Pesticides are available in several different formulations. These include aerosols, granules, ready-to use (RTU), emulsified concentrates (EC), wettable powders (WP), soluble powders (SP), flowables and fumigants. Controlling drift is important for the commercial applicator. The pesticide's formulation together with selection of pesticide application equipment can be effective in reducing the potential for drift. For example a pesticide as an aerosol formulation would have a greater potential for aerial drift than that same pesticide in a large particle granule formulation. With regard to equipment, an accurately calibrated drop spreader would apply a pesticide in a more precise location than a broadcast spreader; yet each would have less potential for aerial drift than the same pesticide applied from a helicopter.

To be effective, the pesticide must be applied precisely on the target at the correct rate, volume and pressure. Particle drift can be influenced by particle size, nozzle design and orientation, pressure, temperature, humidity, evaporation, height of release, air velocity and movement, and each must be considered.

Emergency Spill Response:

In response to concerns of accidental spills, the Indian Hills staff utilizes the recommended response from Cornell University, summarized below. The Club maintains a Spill Response Kit and has trained personnel and procedures for emergency response.

As per Cornell, a pesticide spill refers to any unplanned spill or leakage into the environment that occurs during storage, use, transport, or disposal of a pesticide. For example, a spill can be caused by a single container falling off a truck, or a 55 gallon barrel punctured by a forklift. A serious spill could even involve fire and the explosion of leaking containers. The spill risk increases with the size of the operation and the number of persons involved in pesticide handling. The most hazardous activities involving pesticides are mixing and loading of concentrates.

The environment can be easily harmed by careless mixing and filling procedures. Areas where pesticides are mixed and equipment is filled have significant potential to contaminate groundwater and surface water if proper precautions are not taken. Carefully choose the pesticide mixing and loading area. It shall be outside, away from other people, livestock, and pets. Pesticides shall not be mixed in areas where a spill or overflow could get into a water supply. If possible, mix and load pesticides on a concrete pad so that spilled pesticides can be removed without entering the soil. Handling areas frequently must be near a pond or stream bank, as water is needed to fill the sprayer. If this is the case, the area shall be graded to slope away from the water. If you must work indoors, or at night, be sure there is adequate ventilation and light to minimize the chance of an accident. Have a supply of clean water and soap available and, if possible, do not work alone.

If you are transporting pesticides, have an emergency plan in place for accidents. Since accidents are often caused by others, you must be ready with a spill action plan.

Education can effectively reduce the risk of a pesticide spill and the harm that it may cause. Below is a short list of items for pesticide spill prevention planning:

Accident management: first aid to injured people, keeping others from exposure and using appropriate personal protective equipment (PPE).

Spill prevention, control and clean up procedures:

Know the three "C's"

Control the spill (minimize the quantity released)

Contain the spill (into as small an areas as possible)..

Clean up the spill right away.

Spill prevention habits

Methods of handling and storing pesticides.

Shop safety and fire procedures.

Properly securing pesticides in vehicles and storage areas.

Inspection procedures for storage areas.

Spill response requires regular education and updating of personnel in prevention, control, and cleanup procedures. Employees are trained using regular drills and rehearsals of spill handling procedures to prepare pesticide handlers to respond appropriately to an accident.

Spill Cleanup

Proper cleanup of the spillage is essential to remove all health and environmental hazards created by the spill. Use the buddy system when cleaning, and do not work alone. Everyone **must** be wearing the proper PPE. Assure that there is good ventilation when cleaning and decontaminating the site.

- 1) Dry spills. (granular, dust, wettable, dispersible and soluble powder formulations)
 - a) Cover the spill with plastic or a tarp to prevent a breeze from moving the material.
 - b) Put weights on the cover.
 - c) Use a broom, dust pan or shovel to sweep up the spill while rolling back the tarp to expose only a small area at a time.
 - d) Place spillage in metal or plastic containers. Plastic bags may be used, but only as a last resort.
 - e) Secure and label the containers for later disposal. If at all possible, assess the volume of spilled material, review the label and application rates, and then apply as a legal application. Use of the product, though not necessarily for pest control, is legal and allows the material to breakdown under normal application conditions; thus, negating the possible need to handle the material as an expensive hazardous waste. If application is not possible, dispose of as a hazardous or non-hazardous waste. Pesticide Disposal



- 2) Liquid spills.
 - a) Soak up the liquid with an appropriate absorbent. (sweeping compound, sawdust).
 - b) Use a broom to work the absorbent into the spill.
 - c) Gather the combined material and deposit it in a labeled plastic or metal container.



- d) Contaminated soil may need to be removed. Soil shall be packaged in labeled containers for later disposal. If at all possible, assess the volume of spilled material, review label and application rates, and then apply as a legal application. Use of the product, though not necessarily for pest control, is legal and allows the material to breakdown under normal application conditions; thus, negating the need to handle the material as an expensive hazardous waste. If application is not possible, dispose of the material as a hazardous or non-hazardous waste depending on the product. Pesticide Disposal



Decontaminate the Area.

After the bulk of the spill has been removed, apply the appropriate decontamination material. The material chosen depends on the pesticide spilled.

- 1) Apply the appropriate solution and allow 1 to 6 hours for the chemicals to work.
- 2) Use an absorbent to collect the residues.
- 3) Dry decontaminants are sprinkled in a thin layer over the spill area. The powder needs to be activated with water. A watering can is used to wet the powder lightly.
- 4) Liquid decontaminants may be applied lightly to the spill area with a watering can.
- 5) The decontamination procedure is repeated until all the spilled pesticide is removed.
- 6) Tools are cleaned with soap and water or an appropriate decontaminant.
- 7) Collect all used decontaminants and rinse water for disposal.

Pesticide Decontaminants

Depending on the particular pesticide, chlorine bleach, caustic soda (lye, sodium hydroxide) or lime can be used to decontaminate most spills. Many pesticides, especially the organophosphate pesticides, decompose when treated with lye or lime. Fewer pesticides are decomposed by bleach (sodium hypochlorite). Other pesticides cannot be effectively decontaminated, and shall only be treated with detergent and water to help in removal. Check the pesticide label and Material Safety Data Sheet (MSDS) for information on cleaning up spills. Only use a little liquid. Sprinkle absorbent material on the clean-up solution, and then put the absorbent material into the disposal container with the other contaminated materials.

A practical guide for applying decontaminants is as follows:

<i>Percent AI% ingredient</i>	<i>Amount of decontaminant needed</i>
1-10%	Use an amount of decontaminant equal to the quantity of pesticide spilled.
11-79%	Use an amount of decontaminant equal to 1.5 times the quantity of pesticide spilled,
80-100%	The amount of decontaminant used shall be equal to twice the quantity of spilled pesticide

WARNING: There is a slight potential for creating toxic by-products when using these procedures. In critical situations, samples of affected components (soil, sediment, water, etc.)

shall be taken and sent to a laboratory for analysis in order to determine if decontamination was successful.

Lye (caustic soda) or Lime

Pesticides amenable to treatment using lye or lime may be decontaminated when mixed with an excess quantity of either of these materials. These materials can be used in either the dry form or in solution. A 10% solution of lye or lime can be made as follows:

Mixing directions: Mix 0.75 pounds of lye or lime in 3.5 quarts of water to make 1 gallon of 10% solution.

Caution: Lye can cause severe eye damage to persons not properly protected. Protect against contact by wearing unventilated goggles, long-sleeved work clothes with coveralls, neoprene gloves, and chemical-resistant apron. An approved respirator also shall be worn. Do not use lye on aluminum surfaces.

Bleach Treatment.

Certain pesticides can be degraded by treatment with bleach (sodium hypochlorite). Generally, one gallon of household bleach, which contains approximately 5 percent sodium hypochlorite, shall be used per pound or gallon of pesticide spilled. If bleaching powder is used, first mix it with water (one gallon of water per pound of bleach), and add a small amount of liquid detergent. For safety purposes, a preliminary test must be run using small amounts of bleach and the spilled pesticide. The reaction resulting from this test must be observed to make sure the reaction is not too vigorous. Do not mix chlorine bleach with amine-containing pesticides or store near them. Co-mingling of these materials can cause a violent reaction resulting in fire. Calcium hypochlorite is not recommended as a decontaminating agent because of the fire hazard.

Spill Kit Contents

Spill kits shall be labeled and designated for use in handling pesticide spills only, and shall be strategically placed where spills are most likely to occur. The label shall list the contents, and the kit shall be sealed to discourage item loss.

Shop kit	Vehicle kit
1 instruction sheet 1 55-gallon open-head drum 4 pairs nitrile gloves 2 pair goggles 2 respirators and pesticide cartridges 2 aprons (chemical resistant) 2 pairs rubber boots 2 pairs of cotton coveralls 1 dustpan 1 shop brush 1 square-point 'D' handle shovel 1 dozen polyethylene bags w/ties 1 push broom with synthetic fibers 1 gallon liquid detergent 3 gallons household bleach 80 lbs absorbent material 1 bung wrench 1 drum spigot 1 1-3/8' open-end wrench 1 drum pump (manual) 30 ft 1/2" polyethylene tubing or 1 25-ft garden hose blank labels	1 instruction sheet 1 5-gallon pail 2 pairs of nitrile gloves 1 pair goggles 1 respirator and cartridges 1 pair coveralls 1 dustpan 1 shop brush 10-30 lbs absorbent material 1 pint liquid detergent 6 polyethylene bags w/ties 1 portable eyewash blank labels 1 first aid kit 1 pair rubber boots 1 apron

SOURCE: <http://pesticidestewardship.org/spill/Pages/SpillDecontamination.asp>

Compiled by Ron Gardner Cornell University

Indian Hills Golf Club has developed a formal golf course environmental management plan as the Indian Hills Country Club Golf Course Environmental Management Plan (IHGCEMP). The Plan is helpful for identifying golf course management and operational procedures coupled with environmental stewardship programs. The Plan minimizes or avoids potential adverse environmental impacts of concern regarding the Indian Hills Golf Course development. Summarized below are management goals offered by the applicants, who shall:

- **Continue Management of the Golf Course in Accordance with Best Management Practices for New York State Golf Courses, (BMPNYS) February, 2014:**

In response to the Town of Huntington's concerns for adequate protection of the environment, and as a component to the Club's Integrated Turf Health Management Plan, turf management will continue to meet or exceed the Best Management Practices for New York State Golf Courses (NYSBMP). The BMP was developed with Cornell University, New York State's golf course superintendents, the NYSDEC and other stakeholders. It is a State standard for turf management practices, designed to protect natural resources, with an emphasis on water quality. The BMP is a decision making tool with tools for post decision monitoring and record keeping, conducted to evaluate and adjust applied turf management strategies. The course operations and any modifications caused by the proposed residential development will meet the BMP principals and additional healthy turf management strategies. Indian Hills currently exemplifies environmental stewardship, and coexists with adjoining residential land uses without negative impacts to the environment.

- **Indian Hills Participation in Audubon International**

For a holistic approach to turf management, coupled with its commitment to environmental stewardship Indian Hills is a member of Audubon International. The Club's goal is achieving full Audubon International Certification. The Audubon program is a recognized environmental stewardship program for golf courses. The program includes six individual certifications to achieve full certification: Environmental Planning, Water Conservation, Water Quality, Chemical Reduction, Wildlife & Habitat, and Public Outreach. The application process requires submission of descriptive maps, photographs, detailed statement of environmental goals, and documentation on how and when goals will be achieved, water quality sample analysis (TKN, BOD, COD, pH, etc.) wildlife inventory counts, and other similar requirements. The Club is currently developing its Environmental Planning initiatives.

- **Golf Course Environmental Management Plan (GCEMP)**

The GCEMP approach uses plant health science based technologies coupled with an Integrated Pest Management (IPM) program. The Plan is based on scientific methods for managing turf, with minimal inputs, known in the turf industry as an Integrated Turf Health Management Plan. These methods create a system of protocols to *manage healthy turf* by using science, technological resources and cultivation practices to grow healthy turfgrass. Healthy dense turf is the cornerstone of minimizing inputs. The applicants will implement the GCEMP program as an effective management tool to minimize inputs, thereby reducing potential impacts. The GCEMP program is implemented through the course operations and includes: soil amendments; irrigation system management; turf equipment; support technologies; selection of turfgrass cultivars; daily scouting for pests and turf conditions, monitoring pest thresholds; laboratory based disease/pest identification; recordkeeping and monitoring; timing and characteristics of selected and applied

fertilizers and pesticides. All are factors and tools to be used by the professional golf course Superintendent to accomplish the goal of minimizing impacts. The turf managers will promote healthy turf with improved soil health (maintaining types and quantities of microbes; maintaining adequate oxygen; sustaining correct water retention and organic matter, etc.). Management will improve the surface conditions for turf health by managing shade, improving air circulation, controlling light exposure and minimizing wear. Decision making within the GCEMP approach gives priority to cultural practices and natural methods of turf care. The GCEM Plan is dynamic and responsive to environmental changes. The GCEMP includes the Integrated Pest Management Plan (IPM). IMP uses preventative pest and disease strategies of an integrated organic pest management approach, and offers a reduction in non-organic pest treatment technologies commonly used on Suffolk County golf courses. Pesticide use is limited to applications during extreme pest pressure conditions, when other treatments fail to prevent or cure the pest problems whereby turf loss would be catastrophic, and are typically restricted to spot treatments and primarily restricted to greens. Preventative and curative pest treatment technologies will be reviewed by the Superintendent to assess efficacy. The current nutrient inputs have been reduced to a not to exceed limit of 2.5-pounds of total nitrogen per 1000 SF per year throughout the golf course turf area, excluding the roughs. Suffolk County Fertilizer Law was enacted to reduce nitrogen impacts to ground and surface water. It exempts golf courses but recommendations are to apply 3-pounds of nitrogen per 1000 SF per year. Current industry and governmental goals are set to lower this to 2.1 pounds per 1000 SF. The Indian Hills fertilizer records indicate golf course annual nutrient applications are less than 2-pounds of total nitrogen per 1000 SF. This represents a 66% reduction in applied nitrogen compared to the allowable amount designed to protect ground and surface water. Applied nutrients to golf course roughs are minimized, with grass clippings from tees and greens dispersed in the roughs to provide nutrients stored in the grass clippings and accounted for in the overall nitrogen mass balance equation.

- **Utilize Bio-Filters to Reduce Sediment and Stormwater Generated Pollutants:**

Where practicable (determined by topography, clearing limits, and peak flow analyses) stormwater from the golf course is pre-treated using bio-filters (grassed swales). The bio-filters collect and retain sediment and absorb nutrients from the stormwater before it reaches ponds and/or leaching pools. Bio-filters include the secondary roughs which are naturalized areas designed to treat stormwater runoff generated at the golf course as well as throughout the developed property.

- **Voluntary Participation in and Compliance with the Standards of The Peconic Estuary Nitrogen Management Challenge for Golf Courses:**

This voluntary program was developed with Cornell University, USEPA, Peconic Estuary Program stakeholders, SCDOH, USGA, and local east end golf course superintendents. The program limits the long term average nitrate in groundwater to ≤ 2.0 ppm; well below the New York and Federal Standard for groundwater of 10 ppm.

- **Utilize State of the Art Irrigation Control Systems:**

Golf course irrigation systems today use computer controlled irrigation sprinklers and drip irrigation that are managed by in-ground soil moisture meters, hand held moisture meters and above ground weather stations. These technologies maintain soil moisture levels near field capacity. High efficiency electric variable frequency drive (VFD) pumps and individual sprinkler head controls allow water to be applied where and when it is required, without sequencing of entire

zones. This reduces over and under watering which can decrease plant health, increase stress and disease pressure, and hold potential for pesticide and nutrient runoff and leaching concerns. Turf areas that comprise the bunker surrounds will be irrigated by subsurface “drip” irrigation to minimize water entering the sand bunker. The system reduces the watering time, minimizes and conserves water resources. When necessary, wetting agents will be used to reduce water inputs and improve water dispersion to the root zone.

- **Develop Cultural Practices for Promoting Turf Health**

The selection of turfgrasses, and management practices includes implementing scheduled cultivation to promote healthy turf and improved soil conditions. The program includes aerification with topdressing soil (sand/soil/peat) as prescribed by physical soil tests; aerification to relieve compaction and to improve drainage and soil gas exchange; verti-cutting to remove excessive thatch (organic matter); drill and fill (deep soil coring to improve soil conditions); mowing height adjustments to relieve turfgrass wear and stress. Cultivation will be used to improve air circulation and provide proper soil moisture throughout the course. To date several trees and shrubs that restrict adequate air circulation have been pruned or removed.

- **Utilize State of the Art Equipment and Resources and Trained Personnel for Turf Management**

The turf industry offers improved technologies for equipment and continuing education programs for its industry members. Hybrid (electric/fossil fuel) fairway mowers and battery powered hand green mowers, and greens rollers have significantly improved energy conservation goals and reduced the golf industry’s fossil fuel use. The course managers use a powered turf boom sprayer with spray nozzle boom curtain with computerized application controls (designed to specifically apply inputs and direct nozzle spray downward with zero to minimal drift potential). The existing turf management facilities are equipped with emergency response and spill cleanup kits, trained personnel, concrete wash down pad; fuel and chemical storage and handling equipment that exceeds the minimum standards for SCDOH and NYSDEC. Continued education and personnel training minimizes unintentional turf chemical applicator error, (over and under sprays) and conserves inputs by treating only areas of specific need. The fertilizer spreaders and turf sprayer equipment are carefully calibrated to minimize drift, and potential for errors. Mowers and irrigation system controls are serviced by professionals as part of an overall turf management system. Turf and soil samples are routinely collected and analyzed by qualified laboratories to determine nutrient levels, plant physiological conditions, physical properties of soils and turf pathogen identification. Daily record keeping is performed using turf management specific software and hand held or desk top computers.

- **Operate and Maintain a Sustainable Golf Course Facility**

Today’s professional golf facility management is based on sustainability. Clubhouse menus are designed around local food sources and season availability. Clubs often grow their own herbs and vegetables, install solar panels to recharge batteries in electric golf carts and turf equipment, and supply heated water for pools, showers and buildings. Several facilities recycle their kitchen and golf course organic waste for compost, compost teas, topdressing and landscape garden mulch. Integrated with these programs are ornamental gardens with selected plants to attract and maintain populations of butterflies, bees, and hummingbirds, bluebirds, bats, purple martins, and provide

wood duck houses that are installed throughout the course and grounds. Sustainability reduces operating costs and provides users a connection to the local environment.

- **Provide Public Outreach Programs for Turf Management**

Turf and ornamental plantings are mainstays of local residential properties. The Indian Hills staff will offer its professional and technical support to the local community. Using website communications and local presentations the Club will educate the community on how to improve turf health and its quality with minimal inputs to protect water quality. Local students will be invited to observe and participate in natural resource educational projects, birding and similar educational forums.

The Indian Hills golf course turf management strategies include: annual soil and plant tissue testing as measures for assessing the nutrient status of turf; a weekly monitoring program of clipping yield to assess turfgrass growth and density; control of thatch and mat accumulation; water quality monitoring of groundwater and ponds, streams, or other water bodies for determining if runoff and leaching are occurring; moisture metering and irrigation system monitoring for improved water conservation with limits on course irrigated areas; use of cultural practices to reduce turf stress and disease pressure; and adverse impact potential from variations in the formulation of supplemental nutrients.

Methods to estimate nitrogen loading were developed by the USEPA, USGA, Peconic Estuary Program stakeholders and Eastern Long Island golf course superintendents in a program called the “East End Nitrogen Reduction Program for Golf Courses.” This program has been in place for more than a decade, has specifically targeted a reduction of golf course generated nitrogen limited to 2.0 mg/L, is still active and administered by Cornell Cooperative Extension. Cornell calculates the nitrogen loading from participating golf courses by using the quantity (expressed in pounds) of applied nitrogen to the area of fertilized as well as unfertilized land within the entire golf property boundaries (expressed in square feet or acres). Therefore, when nitrogen applications are measured as a mass per unit of area the potential of nitrogen loading from properly managed turf it is expected to be much less than managed turf in areas of Suffolk County.

The results from nearly 15-years of groundwater monitoring studies at the Bridge in Bridgehampton, NY and 10-years of monitoring at Sebonack Golf Club in Southampton, NY has provided a sound history of baseline results on nitrogen and pesticide fate generated at Long Island golf courses. The Bridge was requested to monitor groundwater as a post construction condition of its approval. The facility has nine (9) groundwater monitoring wells and one (1) background groundwater well. The wells are used for water sampling and analyses to determine the course’s nutrient and pesticide concentration impact to local groundwater. Lysimeters are also used as collection points and as early warning sample locations. The long term average goal for nitrate in groundwater is limited to 2.0 mg/L. To achieve these goals the Bridge is limited to a total nitrogen fertilizer application rate of 3000 pounds per year or the equivalent of 0.9 lbs. N/1000 SF (based on total property land area).

The Bridge’s groundwater monitoring program includes analyses for pesticides. The 2011 technical review found the, “the overall quality of the groundwater has not been significantly

affected by the golf course pest management operations at the Bridge golf course.”¹ The report also evaluated the course’s use of bio-fungicides and recommended evaluation of additional fungicides rated as “Low Risk” by the USEPA. The 2013 report resulted in the same conclusion of the Bridge having no impact to groundwater (Petrovic).

Similar water monitoring programs conducted at Sebonack Golf Club indicate local water quality was not significantly impacted by the golf course operations (Petrovic 2014).

[New York State Best Management Plan for Golf Courses](#)

In February 2014 Cornell released Phase One of the NYSBMP for Golf Courses. The document is a guidance/standards of practice document for managing golf turf and facilities. It offers information within the following categories:

- Environmental Concepts
- Water Quality Management
- Site Analysis and Water Quality Protection
- Irrigation
- Nutrient Management
- Cultural Practices
- Integrated Pest Management
- Pesticide Storage and Handling and Applications
- Maintenance Facilities
- The NYSBMP initiative has many goals but its main objective is protecting water quality.

Developing the website content was the primary goal of Phase One. Phase Two’s purpose is to validate what is stated in the NYSBMP manual by quantifying how New York State Superintendents’ are applying and confirming their adherence to the NYSBMP, thus ensuring the golf course management is protecting water quality. Phase Two is an on-line self-assessment tool that records and documents on-going turf management practices for compliance to the standards set forth in the NYSBMP manual. The release of Phase One (February 2014) of the NYSBMP had envisioned incorporating a self-assessment tool, to be implemented at a future date. Completed Phase Two reports will be available for review by NYSDEC and Cornell University.

A summary of key points from the NYSBMP are quoted below.

“Golf courses rely on a healthy environment that includes water and wildlife. It is of paramount importance to enhance and protect water quality. A significant body of research exists that indicates successful implementation of BMPs virtually eliminates the golf course risk to water quality. In fact, several studies have shown that implementing BMPs enhances water quality on its journey on and through the golf course property.

¹ Petrovic & Cambareri, Technical Review of Test Results and Implementation of the Groundwater Monitoring Protocol the Bridge Golf Course, Southampton, NY Part 1 and Review of Protocols Modification Proposals and Recommendations Part 2, April 18, 2011.

Additional incentives for golf courses in New York State to implement BMPs include the following:

- potential for more efficiently allocating resources by identifying management zones
- cost savings associated with applying less fertilizer and pesticide
- improved community relations
- recognition by club members and the community at large as environmental stewards

Through a cooperative approach between the golf industry and friends and neighbors outside the industry, practices have been developed that benefit all parties. Golf course BMPs are designed to minimize the transport of potential water quality contaminants (such as nitrogen and phosphorus) from the golf course into surface waters and groundwater. A decade of public and privately funded research concerning the fate of fertilizers and pesticides applied to turf has concluded that golf courses using BMPs pose little to no risk of contributing to water pollution. Specifically, several studies investigated the movement of nutrients and pesticides through the perennial turfgrass system and found that maintaining a dense, vigorous turf, identifying environmentally sensitive areas, and recognizing potential risks of certain soils and climatic conditions are essential to protecting water quality.

Regulatory compliance is the first step in aligning golf course management with BMPs. New York has some of the nation's strictest state regulations on pesticides and fertilizers. Golf course superintendents must be aware not only of regulations on the purchase, storage, handling, and application of fertilizers and pesticides, but also of the potential water quality contaminants, sources, and impacts associated with these compounds.

The next step in successful BMP implementation is to recognize the many management decisions that involve potential contamination of surface waters and groundwater and address course management practices in a systematic fashion. Once course management becomes aligned with regulations and water quality protection BMPs, additional value can be gained by using water quality monitoring as a final step to assess the actual water quality entering and leaving the course.”



Figure 1. Buffer Zone Concept for Golf Courses

Source: NYS BMP Website, Cornell Cooperative Extension, Feb. 2014

Cultivation Practices

The selected turfgrass will require scheduled cultural practices to promote healthy turf and improved soil conditions. The program includes topdressing with soil (sand/soil/peat) as prescribed by physical soil tests, aerification to relieve compaction and improve drainage and soil gas exchange; verti-cutting to remove excessive thatch (organic matter); drill and fill (deep soil coring to improve drainage and soil gas exchange); solid and hollow coring to improve soil drainage and gas exchange; mowing height adjustments to minimize stress; rolling of managed turf areas; and over/inter-seeding programs to enhance turf density. Soil moisture levels will be monitored and controlled by soil moisture meters connected to the irrigation controls.

Cultivation programs relieve turfgrass wear; maintains and improves air circulation and proper soil moisture throughout the course. Monitoring thatch levels (organic matter) in greens to (\leq) 3/8-inch in creeping bent grass greens typically requires verti-cutting greens each 7-10 days and topdressing with sand. Improved greens speeds can be achieved with daily rolling, which university research has determined to reduce dollar spot, a persistent disease of Long Island turfgrass.

Dollar spot is also controlled by daily removal of guttation from the plant tissue and reduce the severity of the disease. Methods of removal include whipping/poling (wiping the greens with a flexible pole); dragging a hose or mat across the turfs; rolling the turf and light syringing.

Turf Management Facility

The existing turf management facility occupies approximately 15,000 square feet within the golf course facilities. The facility is equipped with SCDOH Article 12 approved pesticide storage building and above ground fuel tanks that are in compliance with SCDOH and NYSDEC permitting regulations. Fertilizers, other plant nutrients and plant bio-stimulants are stored in a separate building and separated from the pesticide storage and mixing facilities. These nutrient products must be maintained in a building constructed with a concrete floor, with no floor drains, whereby the products are completely sheltered from the weather.

The maintenance buildings include an equipment shed, a fertilizer and spray rig storage structure, and a repair shop with associated offices; these buildings are located in the northeastern portion of the subject property, adjoined by a common paved parking area. The maintenance facility includes outdoor storage for bunker and top-dressing sand, chopped wood piles, drum storage, and outdoor storage areas for turf equipment. A Phase 2 Environmental Site Assessment was conducted at the site by Nelson, Pope & Voorhis. According to the report there was no staining observed in the vicinity of any of the outdoor drums or equipment.

The repair shop consists of a one-story concrete block building with concrete floors and an attached office with vinyl siding. The maintenance shop contained several motor oil drums. Minor staining was observed in several areas on the concrete floor of the repair shop; however, the staining is not expected to adversely affect the subject property, since there are no floor drains

present. A dirt-filled pit covered with wood boards was observed in the concrete floor towards the center of the repair shop. According to John Paquette, the Golf Course Superintendent, this was formerly a concrete maintenance pit that did not contain any floor drains and was backfilled approximately a year ago.

The maintenance area includes an equipment wash-down pad where wash water is captured at a French drain. Soil samples collected from this area and analyzed for chemical compounds. The following presents an evaluation of the results of the Phase 2 investigation:

“The drywell on the south side of the main clubhouse, the Pro Shop sanitary system leaching pool and the former maintenance pit from the maintenance garage were sampled and analyzed for the presence of volatile and semi-volatile organic compounds and metals. No elevated concentrations of any semi-volatile organic compounds and metals were detected in any of the samples. Several of the analyzed volatile constituents exhibited elevated concentrations; however, only three (3) constituents from sample CHK exceeded the regulatory guidance values set forth in the SCDHS SOP 9-95. Since these concentrations exceed the SCDHS guidance values, it is recommended that CH-K be remediated under the auspices of SCDHS personnel along with the other structures which were identified during the original Limited Phase II ESA report.” (*NP&V, December 30, 2016*).

Other types of wash down equipment is in use on New York golf courses and is manufactured and supplied by EDS, a company specializing in wash down equipment. After washing equipment, a series of settling tanks remove solids (soil, grass clippings), cyclones reduce particulate matter, and carbon activated filters clean the wash water prior to water reuse. Solids from the wash water treatment system are collected from the tanks, removed to a secure temporary storage area, placed on an impermeable surface, and covered with plastic sheets to minimize runoff. The wash down solids are transported off site and disposed of at an approved NYSDEC solid waste facility. The State’s BMP for golf courses cites the importance of turf management facilities as emergency response centers for accidental spills of fuels and chemicals. Typical facilities provide staff break rooms, locker rooms, mechanical repair/parts areas, soil and sand topdressing storage areas, equipment warehousing and act as informational centers for turf employee records, OSHA and MSDS and turf related communications.

Pesticide Applications

The NYSDEC is in the process of developing a pesticide strategy for Long Island. Applications of pesticides are performed only by persons possessing valid NYS Commercial Pesticide Licenses. Licensure requires classroom and field training, passing of the NYSDEC examination and mandatory/verifiable continuing education. Applicators are required to maintain daily records of pesticide applications and submit the records to NYSDEC each year. The GCEMP program uses IPM options other than chemicals (unless as an emergency response) to solve turf health problems. Pesticide applications may be required once alternative (non-pesticide) treatments have become unsuccessful or when emergency uses are necessary. The NYSDEC and the USEPA have developed lists of reduced risk pesticides. In compliance with the NYSBMP, the applicants have available for use the following assessment tools for predicting potential impacts and decisions regarding pesticide use.

Pesticide Environmental Impact Quotient

The Superintendent utilizes an IPM program that sometimes requires treatment methods using pesticides. IPMs depend on a hierarchy of solving pest problems. The IPM establishes thresholds for pest tolerances (insect counts from traps, weed counts, disease impact measured by square foot areas and locations of turf damage). Pest problems can often indicate other agronomic issues that, once corrected can reverse the problems. For example, crabgrass often invades areas where soils are compacted, turf has been removed and where drainage is poor. Improving the soil compaction by solid tine or hollow tine aerification, adding soil amendments with organic matter, seeding with turf grass and providing supplemental irrigation will establish a dense stand of turf which will out compete the crabgrass for space. The cultural practices would minimize or eliminate the need for treating the crabgrass only with herbicides.

The Environmental Impact Quotient (EIQ) was developed to rate the risk of pesticides to human health and non-target organisms. The EIQ value is derived from mathematically weighting all the risk factors into a quotient. The EIQ is multiplied by the rate of application and percent active ingredient (% AI) to calculate the Field Use EIQ Rating (FUEIQ):

$$\text{FUEIQ} = \text{EIQ} \times \text{Rate (lbs. /acre)} \times \% \text{ AI}$$

The FUEIQ provides a measure of the weighted risk or toxicity of a pesticide expressed as a value per acre. Multiplying the FUEIQ by the number of acres treated provides a risk/toxicity rating for the treated area. Summarizing all applications in this manner provides a summation of risks/toxicity for the entire property over a period. Cornell provides an online EIQ calculator to compare FUEIQ results (<http://www.nysipm.cornell.edu/EIQCalc/input.php>). A FUEIQ under 25 is desirable. Any value over 100 poses high risks to applicators and the environment.

The *2015-16 Cornell Guide for Commercial Turfgrass Management* lists the range of FUEIQs for the rate range on each pesticide registered for use in New York. The Cornell publication *Reducing Chemical Use on Golf Course Turf: Redefining IPM* describes the methodology to evaluate pesticide environmental toxicity using EIQ. Indian Hills will continue to operate the golf course on the basis of the GCEMP program. Once applications of pesticides are considered, the turf manager will (in accordance with the BMP) calculate the EIQ for the pesticides under review and compare the FUEIQ results to select the treatment that is suitable for pest control with the lowest FUEIQ; and a goal of less than 25.

Nutrients

During the past several decades the golf turf industry has come under intensifying scrutiny for its role of impacts to natural resources. The increased golf course development projects worldwide which occurred from 1990-2005 generated questions regarding land use, habitat loss, surface and groundwater quality and quantity impacts, economic and social issues, traffic concerns, pesticide fate and other ecological impacts. In some areas of the United States, such as high population areas in Suffolk County, New York that have strong advocacy groups formed for environmental protection, these questions continue to linger and have recently refocused on fertility and turf management programs at existing and proposed golf courses. The Suffolk County

Legislature adopted a change to the Suffolk County Code known as the Fertilizer Law, Chapter 459 (Appendix 16). The law places restrictions on the use, dates, amounts and types of fertilizer mixes applied within Suffolk County.

For the protection of human health and welfare and protection to natural resources it is critical that turf managers employ practices to avoid or minimize environmental impacts to soils, groundwater, surface waters and wetlands. This section of the analysis includes literature search and review, explores and summarizes the validity of predictable and potential environmental impacts from nitrogen leaching to groundwater, and pollution from runoff generated by golf courses; provides information toward improved understanding and approaches to turfgrass nutritional programs.

There is a need to identify what role a golf course plays in nitrogen loading to groundwater. Researchers from SUNY (SOMAS), Stony Brook, NY, introduced research on nitrogen impacts to the maritime ecology. The research generated in comments to the New York State and Federal mandates regarding the acceptable allowable recharged nitrogen concentrations in groundwater water (10 mg/L) and whether the nitrogen MCL is sufficient to protect the marine environment. The university research suggests that N loading to groundwater at or above 10 mg/L (as leachate) is the major source of N inflow to the local Long Island bays. The cause and effect reflected in the research is based on the hydrology of Long Island's unconfined aquifer, which permits precipitation to first recharge vertically (conveying surface contaminants along with it) downward and after entering groundwater, flow in a down gradient-horizontal direction to the bays. In general terms, Long Island's freshwater surface waters, freshwater groundwater and maritime bay waters behave as single water resource and basically share an "inter-connected hydrology."

In January 2014, the Office of the Suffolk County Executive, released the *Executive Summary Update, January 2014 Suffolk County Comprehensive Water Resources Management Plan*. The plan states, "Nitrogen is public water enemy #1, as nitrate contaminant from unsewered and fertilizer use pose a threat to both drinking water supplies and coastal marine habitat and resources."

The 1992 *Long Island Comprehensive Special Groundwater Protection Area Plan* (Koppelman, Kunz, Tanenbaum & Davies) included a section to address golf course as a land use within the groundwater protection areas as *Appendix G: Golf Course Management and Nitrates in Groundwater*, as originally authored by Petrovic. In the assessment, compared with other land uses evaluated in New York State, "the portion of golf courses having the highest potential for nitrate leaching represents an insignificant threat to the environment as a whole."

The analysis of impact potential of nitrogen leaching and runoff affirms previous university research projects that have addressed nitrogen leaching and runoff generated by fertilizer applications on turfgrass. Many of these historical research projects were conducted with input from the USGA. During the late 1990s golf course superintendents from Long Island's Suffolk County volunteered their resources to the USEPA, SCDOHS, NYSDEC and local environmental groups to develop a nutritional program applicable to Long Island golf courses located within the Peconic Estuary watershed. The program, called the "East End Nitrogen Reduction Program for

Golf Courses” has specifically targeted a reduction of nitrogen limited to 2.0 mg/L, is still active and administered by Cornell Cooperative Extension.

In February 2014, the New York State Best Management Practices for Golf Course was released by Cornell, Ithaca, NY. The proposed Indian Hills has incorporated the BMP into its golf course turf management program. With authorization from the authors of the NYSBMP, the criteria is utilized throughout this assessment with the expectation that the course would be designed, constructed and operated within the framework of the BMP.

One objective of this impact assessment is to provide a clearer understanding of how significant golf course generated nitrogen loads and current turf management contribute to large scale environmental degradation of ground and surface waters. A second objective is to provide improved management strategies for nutritional requirements and control of disease and pest populations in order to minimize adverse environmental impacts. A third objective is to clarify methods used to evaluate environmental impacts and/or adverse conditions generated by golf course turf management. The goal is to offer an objective understanding of best management practices recognized as modern management guidelines, used by golf course turf managers and provide information about these practices.

The assessment also identifies the nutritional requirements of golf course turf, water management, fertilizer selection and timing of applications, plant tissue sample and analyses, clipping measurements, soil samples and soil chemistries. Key areas currently under study by the turf industry are: how to clarify the definition of “Healthy Turf,” and how one measures optimal turf.

Unlike crop sciences, that use crop yield (for example: the number of bushels of a corn generated per acre) to measure results of nutritional needs or other plant management practices; turf science has no clear or universal “yard stick” to use as a single standard. Typically researchers use turf color, density, plant physiological assessment; or perhaps root mass, or green speed, or player satisfaction, perhaps disease and stress tolerance or simply whether the turf is dead or alive and any combination of these qualitative and quantitative means. The turf industry is working to determine what turf quality and health metrics it will universally accept and apply and how these are specifically measured. It is perhaps difficult to demonstrate to the general public, golfers, environmental groups, and legislators what professional turf managers and turfgrass researchers utilize to measure “successful turf” and what is needed in the form of inputs to meet that goal.

Currently turf managers and turf scientists are defining quality turf as “Healthy Turf.” The following definition was developed by the “Plant Health Academy” a cooperative effort among the Environmental Institute for Golf, university researchers (UNC, Clemson, Virginia Tech,) Bayer Crop Sciences, and a highly qualified group of nationally selected superintendents;

Healthy Turf is: “Optimal plant performance where environmental conditions are balanced with management inputs.”

Hence if the plant or turf is performing at its optimal level within dynamic environmental conditions, it is in balance; and if it is not, then managing inputs to influence and counter-balance the environmental conditions is necessary to retain optimal plant performance.

Golf Course and Turfgrass Nitrogen Source Contaminant Factors

A SRI International survey of New York State's golf industry reported 818 golf courses that generated a total economic benefit of \$5.3 billion and supported 56,600 employees with incomes of \$1.6 billion. Suffolk County reports 73 golf courses; 35 private clubs and 38 public/municipal courses (Portmess & Petrovic 2011). Suffolk County is home to some of America's finest and oldest golf courses and has hosted premium golf tournaments including men's and women's national championships. Long Island's dominance of well-draining sandy soils provides desirable conditions for golf course construction and provides a pathway for leachable contaminants to enter groundwater via precipitation recharge. The native sands and gravels are used for sand-soil-peat blends to build greens, tees and fairways that meet USGA recommendations. Many of Long Island's greens use native gravels for drainage layer construction with no intermediate layer needed. However the local sandy and gravelly soils (Carver, Plymouth and Riverhead Series) are often rated as having low fertility and high permeability (USDA Soil Survey, Suffolk County, 1975) producing conditions for the potential to leach contaminants to groundwater.

Table 1. The Essential Turfgrass Nutrients.²

Nutrient	Symbol	Available form(s)*	Sufficiency range**
*Bold type indicates the form more commonly available to turfgrasses.			
**Sufficiency ranges are expressed as percentages or parts per million (ppm) on a dry weight basis. Values were obtained from publications by J. B. Jones, 1980, <i>Turf Analysis</i> , Golf Course Management, 48:1, 29–32; H. Marschner, 1995, <i>Mineral Nutrition of Higher Plants</i> , Academic Press, New York; and E. Epstein, 1972, <i>Mineral Nutrition of Plants: Principles and Perspectives</i> , John Wiley, New York. Ranges in some cases are based on general observations and are not necessarily applicable to all turfgrasses or every growing condition or management situation.			
Macronutrients			
Carbon	C	CO ₂	44%
Hydrogen	H	H ₂ O	6%
Oxygen	O	O ₂ , H ₂ O	44%
Nitrogen	N	NO₃⁻ , NH ₄ ⁺	2.75-4.2%
Phosphorus	P	H ₂ P₀⁴⁻ , HPO ₄ ²⁻	0.3-0.55%
Potassium	K	K⁺	1.0-2.5%
Calcium	Ca	Ca ²⁺	0.5-1.25%
Magnesium	Mg	Mg ²⁺	0.2-0.6%
Sulfur	S	SO ₄ ²⁻	0.2-0.45%
Micronutrients			
Iron	Fe	Fe²⁺ , Fe ³⁺	30-100 ppm
Manganese	Mn	Mn ²⁺	20-150 ppm
Zinc	Zn	Zn ²⁺ , ZnOH ⁺	20-55 ppm
Boron	B	B(OH) ₃	10-60 ppm
Copper	Cu	Cu⁺ , Cu²⁺	5-20 ppm
Molybdenum	Mo	MoO ₄ ⁺	0.15-0.5 ppm
Chlorine	Cl	Cl ⁻	not known

² This publication is available from the Publications Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Building, University Park, PA 16802. For information telephone 814- 865-6713.

Turfgrass and ornamental plants require nitrogen for physiological functions that produce proteins as enzymes, nucleic acids, amino acids, and chlorophyll. Table 4 provides general recommendations for total nutrient levels of turfgrasses.

For turf and ornamental plant cultivation, nutrients and soil amendments are commonly added to soil media to supplement nutrient and soil requirements needed for enhanced plant health. Managing soil pH is important for maximizing efficient uptake of organic and applied nitrogen. Root zone pH can be managed by understanding chemical forms of nitrogen to avoid toxic build-up of ammonium and control pH at the root zone (Mattson, Leatherwood & Peters). Turf roots take up available nitrogen commonly found as nitrate, ammonium and urea from the surrounding soil media; and the form of nitrogen applied will directly impact root zone pH level.

The ionic charges assigned to these nitrogen compounds are: NH_4^+ Ammonium (positive ionic charge); NO_3^- Nitrate (negative ionic charge); and $(\text{NH}_2)_2\text{CO}$ Urea (neutral ionic charge). Depending on which form of N the plant root takes up, the plant root releases an oppositely charged molecule to maintain a pH balance between the root and the root zone soil media. As forms of positively charged cations of N in the form of ammonium are absorbed, the root releases positively charged hydrogen ions (H^+) which reduces the soil's pH. As N is taken up in the form of nitrate, which is negatively charged, hydroxyl molecules (OH^-) are released from the root tip to the root zone soil and pH increases. Different forms of N added to the soil can be converted by natural processes and produce another form of N. For example urea can be converted to ammonium and ammonium converted to nitrate by soil bacteria. Urea is converted to ammonium very quickly (<48 hours) and after two days the ammonium taken up by the root tip will result in releasing hydrogen molecules and decreasing root zone soil pH.

Mattson, Leatherwood and Peters demonstrated the effect of nitrogen form on growing medium pH by growing rose plants hydroponically in nutrient solutions containing different percentages of ammonium. After five days, the treatments of 8 percent and 16 percent ammonium solutions taken up by the roots initially dropped the pH one to two units, as bacteria converted the ammonium to nitrate. As nitrate became available in these treatments the pH increased over time as only nitrate was available. In the treatment using 31 percent ammonium solution, after the two to three unit drop in pH, the pH remained fairly constant for five days both forms of N as nitrate and ammonium were available. Forms of N as urea and ammonium are commonly grouped together as "ammoniacal nitrogen." Although soil pH can be adjusted with addition of limestone the experiment illustrates how the form of applied N impacts soil pH.

Nitrification occurs once ammonium is added to warm, moist soils and the bacteria in the soil convert ammonium to nitrate. In sandy soils, the most important nitrogen change in the environment is the nitrification process (Wolkowski, Kelling & Bundy).

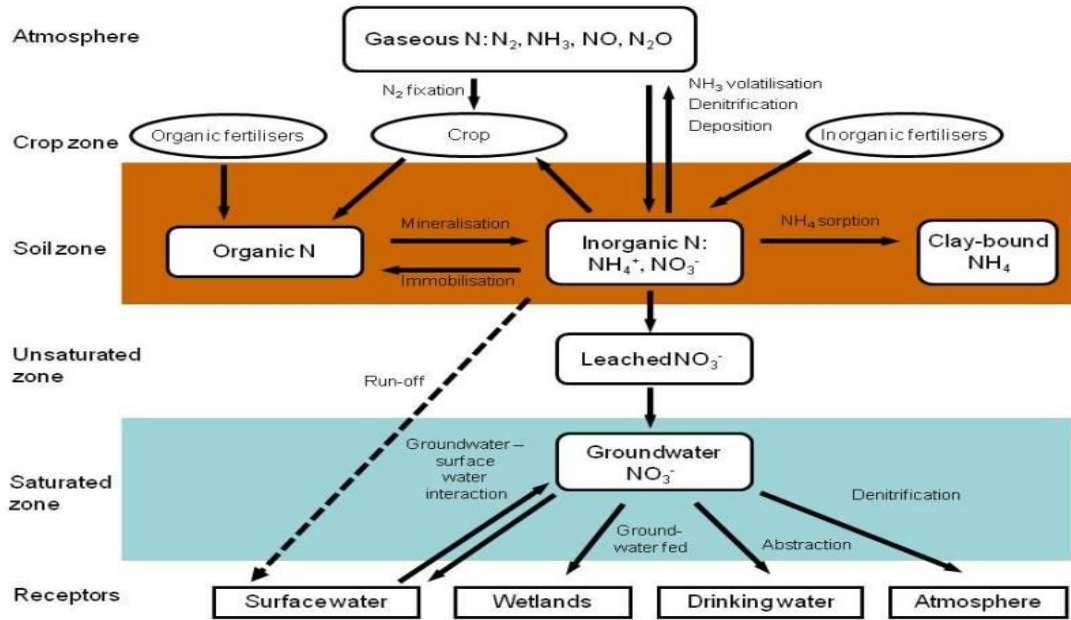


Figure 2. The Nitrogen Cycle

(Source: google search)

Nitrate (NO₃⁻) leaches more readily in sandy soil than finer-textured soils because sandy soils have a lower water holding capacity and typically sandy soil characteristics are chemically inert (there are fewer chemical bonds formed between sandy soil particles and nitrogen ions as compared with soils that contain silts and clays). Nitrate can leach rapidly through channels formed in sandy soils by insects, burrowing animals, and deep roots. Organic matter in sandy soils is usually lower than fine-textured soil. The organic matter is a source of nitrogen. Golf course management controls thatch (organic matter) levels on greens, tees and fairways. These management processes include core aeration, deep verti-cutting and straight sand top dressing programs.

Golf course turf management has come under a high level of environmental scrutiny and is often categorized in the same context as agriculture and sod farm management. However there are significant differences in how crops are managed and how a playing surface for golf is managed, even within the same geographic region. Dr. Bruce Clark, a noted turf pathologist at Rutgers, the State University of New Jersey, reminds us that turf management science is still a relatively new and evolving science; with many historical evaluations based on agricultural crop sciences. Although there may be very broad similarities of nutrient programs among crop and turf land uses there needs to be more refined discussion on golf course turf management and environmental impacts aimed to separate and distinguish playing turfs from crops, including sod.

Modern golf course turf management and its potential impact to local environmental degradation can best be understood by education. To help educate municipal land planners, the USGA published, "Reviewing Golf Course Proposals, Materials for Local Officials," prepared by Cook College, Rutgers. The publication offers information and additional resources for

municipalities to use for golf course environmental impact assessments, practical options for site use, land use regulations, community impacts, preservation areas, mapping of ecological conditions, construction issues, water resources, IPM, maintenance facilities, and post construction monitoring. Today, the golf industry's direction is toward "sustainability."

At the GCSAA 2014 Industry Conference, Orlando Florida, sustainability was defined having three interrelated components; people, planet, and profits. Each of these components depends on the other two for sustainability to be successfully realized.

The significance of N loading to ground and surface waters from golf course managed turfgrasses may be misunderstood by the general public, regulatory/municipal administrators and even researchers that have been exposed to poorly prepared studies. Kenna and Snow provide an excellent summary of this problem. Golf courses became the subjects of environmental concerns during the late 1970's and early 1980's when droughts occurred in California. During those decades, golf courses became highly regulated with respect to water use. As new course construction boomed in the late 1980's through the 1990's course development projects came under attack due to potential impacts on natural habitats, pesticide use, and nitrogen loading. Unsubstantiated claims were made by anti-development groups about harmful impacts generated from golf courses simply to fight off real estate development projects.

By 1989, the USGA implemented an environmental impact assessment program to evaluate golf course development and management by conducting university studies focused on fertilizer and pesticide impacts on ground and surface water. Nitrogen leaching was investigated by seven universities primarily by using bucket lysimeters to evaluate the potential for downward movement by water of nitrogen through the turfgrass-soil system. The studies reported that very little nitrogen leaching occurred when nitrogen was properly applied, soil types were considered, and water management for supplemental irrigation and rainfall were properly planned for (Kenna & Snow). Sandy soils were more prone to leaching than loam soils; during year one of establishing turf and resulted in nitrogen leaching potential ranging from 11 percent of applied N for pure sand root zone mixes to one percent or less for root zones containing greater percentages of silt and clay. Simply by utilizing a USGA recommended root zone mix for greens construction, the N leaching potential was reduced to about three percent compared to a pure sand green construction where leaching potential was approximately 7.6 percent of an annual application rate of 12 pounds of N per 1000 sf. Pure sand greens resulted in N loading that exceeded the Federal MCL of 10 ppm; in no cases did the USGA recommended green construction with sand-peat root zone mix did the concentration of N leachate exceed 10 ppm. As newly established turf matured through years two and three, less nitrogen leached and light applications of slow release nitrogen sources applied frequently provided excellent control to avoid leaching potential.

Branham who conducted the research for the USGA reported that over a two and one half year period, in undisturbed loam-soil, N leaching was less than one percent through a depth of four feet. The nitrogen was recovered in grass clippings (38 percent to 35 percent), thatch 17 percent to 13 percent) and soil (25 percent to 13 percent); and Branham suggested the remaining was lost through de-nitrification and volatilization (40 percent to 18 percent).

The USGA examined the impact of nitrogen loading by experiments conducted in Pennsylvania on fairway plots. The plots were described as having slopes of 9 percent to 13 percent, good quality loam soil, and turfs comprised of either creeping bentgrass or perennial ryegrass maintained at ½-inch height, with annual applications rates of N of 4 lbs. per 1000 sf. Other studies were performed to evaluate N loading and runoff impacts in Georgia, and the effects of buffer strips in Oklahoma. The results of the studies showed that dense turf cover reduces the potential for runoff losses of nitrogen, with greater runoff losses expected on highly compacted soils; and on soils with very high moisture content. Buffer strips reduced nitrogen runoff when soil moisture was low or moderate, but were not effective when soil moisture was high. Nitrogen runoff potential was reduced significantly when a slow release product (sulfur coated urea) was used compared to a more water soluble product (urea). Several factors determine the leaching potential of a fertilizer applied to turf (Petrovic, A.). These include: the rate of application, the source of the N and how soluble or readily available it is, the season the application is made, irrigation/rainfall events and the soil types. Turfgrass management can control the rate of application, timing of application and selection of the source of nitrogen. Thus according to Petrovic, nitrate leaching potential can be maintained near zero, or at an acceptable level with proper turfgrass management.

The risk of runoff laden nitrogen and conveyance to surface waters was found to be much greater than nitrogen leaching to groundwater. The study conducted at Oklahoma State University designed a management program to reduce pesticide and nutrient runoff from Bermudagrass turf maintained under fairway conditions (Baird, J. Basta, R., et al.). The study compared buffer treatments of various sizes to evaluate effectiveness in reducing runoff under simulated rainfall events. All buffer treatments reduced chemical runoff compared to treatments applied to areas with no buffer. Vegetated buffer strips can be used to effectively control both runoff containing sediments and nitrogen; and can be as simple as grassed swales adjacent to fairways and greens that capture and slow the velocity of “first flush” rainfall generated runoff (Corbitt).

Environmental damage can occur when excessive losses of turf nutrients (nitrogen and phosphorous) are released into surface waters. Aquatic problems include increased algal growth, hypoxia and eutrophication. Algal blooms can be triggered by total nitrogen and phosphorous concentrations in the range of 1.0 ppm and 25 ppb (Baird). New York State and Suffolk County regulations have removed phosphorous in standard fertilizer mix applications unless the application is performed to establish new turf on bare soils and/ or soil sample analyses performed by a qualified laboratory determine phosphorous is needed. All fertilizer applications are banned between October 31 and April 1 (regardless of other factors such as soil temperatures, turf tissue analyses or soil chemical analyses) (Suffolk County Legislators, 2010).

Human health is also effected by high concentrations of nitrogen; the primary pathway for the toxin’s entry being ingestion. Toxicology, the study of poisons, teaches us, “all things are toxic, depending on the dose” (Casarett & Doul). The amount of nitrogen consumed is relevant to the mass weight of the subject; and infants are at particular risk because of their low body mass. Feeding liquid diets to infants (usually less than 3-4 months old) with formulas mixed from water containing high concentrations of N subject the infant to risks of a condition whereby the oxygen carrying capacity in the blood is reduced by the presence of nitrates; known as methemoglobinemia (“blue baby” syndrome). To protect human health from consuming nitrogen contaminated water,

the USEPA limits the MCL of N to 10 mg/L in drinking water. The lowest recorded concentration of nitrogen in water that posed reported health problems was 20 mg/L (Petrovic).

The CDC records show the first infant fatality reported in the U.S. was caused by well water contaminated with nitrogen in 1945. Over the next 25 years, 2000 cases of methemoglobinemia were reported worldwide with a 10 percent mortality rate. Sporadic cases were reported during the 1980s, 1990s and 2000s. Petrovic reports virtually no cases in the U.S. in recent years; with a 1982 occurrence involving a well containing a concentration of 121 mg/L of nitrate and a six week old infant; who recovered once the child's formula mix no longer used the well's contaminated water.

East End Nitrogen Reduction Program for Golf Courses

During the late 1990s, in direct response to concern for Long Island's water quality, the USGA, USEPA, SCDOH and local golf course superintendent developed the "East End Nitrogen Reduction Program for Golf Courses" which is administered by Cornell Cooperative Extension. The program includes reduction of potential nitrogen loading to groundwater from golf courses nutrient programs to a maximum of 2.0 mg/L.

The voluntary reduction in nitrogen load (2.0 mg/L) at golf courses within the Peconic Estuary watershed represents less than half the nitrogen loading from residential development (USEPA). Local golf courses continue to come under environmental scrutiny and superintendents respond by participating to voluntarily reduce turf chemical inputs. The local golf industry was recognized for their past efforts for participating in the Nitrogen Reduction Challenge as summarized by the following USEPA news release:

"NEW YORK -- More than 88 percent of the golf courses on the east end of Long Island have accepted a challenge from the U.S. Environmental Protection Agency (EPA) and its government and private partners to protect the health of the Peconic Estuary and other local waters by reducing their use of fertilizers. This is the first time that a group of golf courses in one geographic area of the country have voluntarily agreed to better manage their fertilizer use to limit the amount of nitrogen that enters ground water, ultimately winding up in rivers, streams and the estuary. Thirty of the thirty-four East End public and private golf courses are participating in the program.

'This is the first time that a large segment of the golf industry in one area has voluntarily come together to reduce fertilizer use and the nitrogen it produces to protect the future of our estuaries,' said EPA Regional Administrator Jane M. Kenny. "The protection and restoration of coastal waters requires everyone to do his or her part, and the golf courses of eastern Long Island are certainly setting a laudable example.'

Through the Challenge, the USGA and Cornell provide technical assistance to participating public and private golf courses, enabling each course to better manage its fertilizer use.³"

3 USEPA website news announcement.

One of the primary concerns for turf managers is the response from golfers and course owners when nutrient programs and turf management practices are voluntarily changed in response to outside environmental pressures or controlled by legislative mandates. Another concern turf managers have is what the long term outcome is with respect to overall turf quality, diseases, and stress.

Typical university field studies are excellent indicators; however actual applications on the golf course can yield varying degrees of success and failures. One long range study performed on the golf course was conducted by Dr. Frank Rossi, Cornell University. Rossi conducted a long term field evaluation of turf management practices, turf quality and environmental impact by using reduced chemical applications at Bethpage State Park. The reduced chemical management of the putting surfaces was conducted over a five year period and included a golfer survey to evaluate satisfaction with ball speed roll and visual quality. Although the project involved various treatments to evaluate the effects of low input levels on turf and sustainability, the golfer survey indicated the putting surfaces provided acceptable visual quality and ball roll. This suggested that for the golfer, visual and playability may have a wide range of acceptance. Furthermore, healthier turf is expected when mowing heights are raised, fertilizer applications increased and mowing frequencies decreased from seven days per week to five (Rossi, F. & Grant, J.).

Snyder and Cisar evaluated nitrogen leaching by monitoring the vadose zone on warm season grasses grown on USGA constructed greens. Although the study did not expressly address cool season grasses, it remains relevant to understanding nitrogen leaching potential. The researchers found appreciable levels of nitrogen leached (20 ppm to 200 ppm) from greens constructed on sand soils during the early stage of grow-in, but decreased with increased turf density. Fairways evaluated in the study which cover larger areas of a course compared to greens, were found to leach less nitrogen and showed no increase of nitrate in groundwater during the seven month study. In part the study identified turf density was essential to reductions in nitrogen leaching potential.

Cation exchange capacity (CEC) is influenced by the soil texture, type of clay present, and percentage of organic matter and to some extent the soil pH. With predominately high sand content in constructed greens there is increased potential for low CEC, a concern for turf managers. Increasing CEC (with topdressing containing peat; leaving clippings and managing thatch) will increase soil moisture holding potential and can reduce nitrogen leaching potential (Frank & Horgan). Dr. Kevin Frank (Michigan State University) and Dr. Brian Horgan (University of Minnesota)⁴ reported mature turf should be fertilized at reduced rates to minimize leaching potential. During a ten year on-going study at MSU after approximately four years after grow-in, high rates of N applications (5 pounds N per 1000 SF) produced high nitrate-nitrogen leachate levels at concentration of 20 ppm to 40 ppm; while low rates of nitrogen applications (2 pounds of N per 1000 SF) resulted in leachates with concentration at or below 5 ppm. Fertilization programs need to be adjusted based on specific golf course turf and environmental conditions, season of application, regulatory requirements, water needs, disease pressure and general plant health.

One important aspect of nitrogen leachate prediction is accounting for dissolved organic nitrogen (DON); which is a source of total nitrogen loading that is often misunderstood as a

⁴ "Cool-Season Turfgrass Nutrition, Fertilizers and Programing" 2014 GCSAA Conference, Orlando, FL.

significant source in older turf stands. A planned fertilization program that minimizes potential for excessive nitrogen applications is discussed in the following section.

Turf Management to Avoid or Minimize Potential N-Loading

In a 2011 summary report, Petrovic offered turf management practices to minimize or avoid potential water quality damage from nitrate leaching and run off. The recommendations follow monitoring programs at golf courses in Suffolk County and literature reviews that summarized and debunked previous assumptions regarding turf fertilization and nitrogen fate. Petrovic has clarified the golf course turf and nitrogen-water quality issue. He found that on average about 25 percent to 35 percent of fertilizer nitrogen applied is expected to be lost to the atmosphere by de-nitrification and volatilization, especially when urea is used. Fertilizer nitrogen stored in thatch and soils was approximately 36 percent to 47 percent of the amounts applied. The high sand content of areas on the golf course is generally limited to greens which are normally 2 to 4 acres of turf within the 60 to 100 acres of turf on an 18-hole golf course. Comparatively, with nearly 1000 golf courses in New York State, there would be nearly 2000 acres of greens, out of a total of 30 million acres in the state; or 0.00007 percent of the land area.

Cropland in New York accounted for 20 percent and residential lawns 2.3 percent of land area. Petrovic illustrated that suggesting golf courses hold the highest potential for nitrate leaching to groundwater was grossly misunderstood and that research showed the threat to the environment as a whole was insignificant. When research did show nitrate leaching potential from turfgrass, the use of best management practices could be employed as mitigation measures. Leaching potential increased in circumstances where excessive nitrogen rates were used; more frequently when highly water soluble formulations of urea, ammonium nitrate, ammonium sulfate, and potassium nitrate are used; when fertilizer applications were made during turfgrass dormant periods; and where excessive irrigation increased potential for leaching nitrate through the soil. Petrovic explains the worst case scenario is substantial amounts of water passing through the soil when formulations of soluble nitrogen are in the soil.

Turf managers consider additional approaches to refine their specific turf nutritional needs that yield high turf quality with minimal environmental risk. Solely relying on turf color, or “traditional” fertilization dates offer less reliable diagnostic and science based assessments of nutritional needs. When asked what the most common mistake turf managers make in fertilization programs, Horgan and Frank replied immediately with, “Overwatering.”

The dynamics of nitrogen uptake by turfgrass is driven by water and mass flow; nitrogen laden water is absorbed by the root hairs and trans-located by the vascular system. Nitrogen applied by foliar methods is absorbed by the plant at the stomata with residual amounts that enter the soil available for root absorption. After fertilizer applications excessive irrigation rates and natural rainfall events significantly increase risks of nitrogen leaching and runoff potential. Soil type, temperature and root density are important to factors governing nitrogen leaching rates (Frank & Horgan). Selection of fertilizer physical characteristics, release mechanisms, and carrier types should be considered to minimize leaching and runoff potential. Physical aspects include prill size and blends, carrier types are quick release, slow release or a combination of each and release mechanisms include: microbial, osmosis, hydrolysis and physical breakdown.

Turf managers are challenged with providing optimum turf conditions at the lowest cost. Decision for selecting a quick release versus a slow release fertilizer is sometimes cost driven with different leaching and runoff potential outcomes, and benefits as summarized in Table 2.

Table 2. Comparison of Nitrogen Carriers (Frank & Horgan)

Factor	Quick Release	Slow Release
Cost	Less Expensive/Lb. N	More Costly/lb. N
Initial Plant Response	Rapid	Slow
Burn/Salt Index	High to Moderate	Slow
Duration of Response	Short to Moderate	Moderate to Long
Leaching Potential	High to Low	Low
Efficiency	Generally good	Good over time

Table 3. Tissue Sufficiency Range for Nitrogen in Cool Season Grasses (Frank & Horgan)

Species	Tissue Sufficiency Range (Nitrogen expressed as percent)	Typical Annual N Needs (Lbs. N/1000 SF)
Creeping Bentgrass	4.50 - 6.00	2.5-3.5
Perennial Ryegrass	3.34-5.10	3.0-5.0
Kentucky Bluegrass	4.0-4.5 (est.)	2.0-5.0
Fine Fescue	1.5-2.5 (est.)	1.5-3.0
Annual Bluegrass	4.0-4.5 (est.)	3.5-4.5
Typical Greens/Tees	4.0-5.0 (est.)	2.0-6.0
Typical Fairways	4.0-4.5 (est.)	2.0-4.5
Typical Roughs	0.0-2.0 (est.)	0.0-2.5

Estimated tissue sufficiency – no data reported

Table 3 shows typical nitrogen sufficiency ranges for cool season turfs. These guidelines are important to recognize when planning fertilization programs but cannot be considered independent of the following factors:

Optimum Temperature Ranges

- For shoot development: (60-75 F: air temperatures)
- For root development: (50-60 F: 4-inch-soil temperatures)

Seasonal Growth Activity

- Dormant stage: No application is necessary
- Early spring: Generates good color, competitive advantage over weeds, and good density (but may produce rapid growth and deplete carbohydrate reserves needed for summer stress).
- Late spring: Generates intermediate responses, improves stress prevention before summer.
- Summer: Provide light applications of nitrogen (0.5 lbs. N/1000 SF) for color; providing disease pressure is low (for example gray leaf spot pressure and its impact on rye grass).
- Fall and late fall: DiPaola and Beard describe late fall as, “around the last fall mowing.” When growth has essentially stopped and there is no clipping production. Roots are active and photosynthesis continues; producing carbohydrates but little growth. Risks with late fall fertilizer programs include promoting snow molds and wrong selection of fertilizer carrier types (N carriers that are dependent on soil microbes for nitrogen release would be a poor choice for late fall programs and potentially increase pollution potential).

Turf managers recognize that nitrogen release mechanisms influence the applicability of fertilizer choices as it pertains to the release mechanisms and environmental factors:

- Microbial action mechanisms are driven by soil microbes, which are themselves affected by soil temperatures, moisture levels and oxygen levels and would be a poor choice for late fall applications in the northeast.
- Osmosis release mechanisms are driven by nutrient (ion) concentration levels and naturally move from a higher area of concentration to a lower area.
- Hydrolysis releasing mechanisms allow water to break down compounds and release nitrogen into the soil, obviously influenced by water, particularly unpredicted rain storm events.
- Turf managers also consider the salt index when selecting fertilizers that use hydrolysis as the basic release mechanism. Most quick release nitrogen carriers are water soluble and can cause nitrate to leach to the soil. Salt release can cause plant injury (burn) and discoloration and over time require flushing past the root zone and upper soil profile.
- Physical breakdown mechanisms depend upon breakage of the coatings to release nitrogen. Physical breakdowns occur when the particles are mowed, walked on, dragged with a brush mat and releases are often rapid. Table 4 provides a listing of nitrogen release mechanisms of common fertilizers and the respective salt index associated with water soluble mechanisms of release.

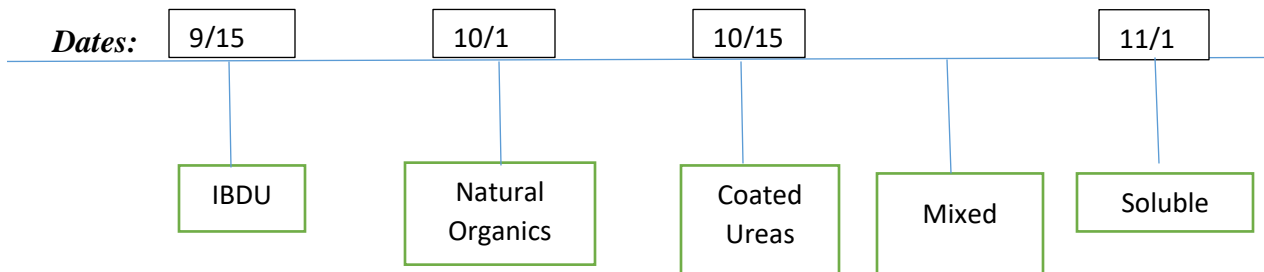
Table 4. Fertilizer Types and Nitrogen Mechanism Considerations

Quick Release N Carriers (salt types)	Release Mechanism	Salt Index
Ammonium nitrate	water soluble	105
Ammonium sulfate	water soluble	69
Potassium nitrate	water soluble	74
Monoammonium phosphate (MAP)	water soluble	30
Diammonium phosphapte (DAP)	water soluble	34
Calcium nitrate	water soluble	53
Urea	water soluble	75
Quick/Slow Release Carriers (Methylene Urea)	Microbial/water soluble if blended	75
Slow Release N Carriers		
Synthetic organic N carriers- methylene urea based	Microbial/water soluble	24
Natural Organic (animal waste, sewage sludge)	Microbial	2
Isobutyaldehyde (IBDU)	Low solubility/hydrolysis	5
Polymer and Sulfur Coated Urea	Temperature driven due to low solubility ; low microbial action	

According to Frank and Horgan the following recommendations are considered for late fall applications:

- Soluble N sources should be applied about the time turf growth ceases.
- Sulfur coated ureas should be applied 10 to 14 days before turf growth ceases.
- Natural Organics should be applied 3 to 4 weeks before turf growth ceases.
- IBDU: Should be applied 4 to 6 weeks before turf growth ceases.
- Mixed Soluble and slow release: Should be applied 4 to 10 days prior to turf growth ceasing depending on the percent of slow release and type of carrier.

Frank & Horgan: Typical Cool Season Turf Late Fall Timing Strategies



Turf managers use spoon-feeding methods on sandy soils with low nutrient retention capabilities. Spoon feeding applies low rates N at frequent intervals. (Carrow, et tal). Vargas emphasizes how proper turf nutritional programs are essential to fungicide efficacy. It is common knowledge that turfgrasses already stressed due to poor nutritional programs take longer or fail to recover from foliar diseases such as dollar spot, rust and leaf spot. Increased potential for snow mold can be exacerbated by excess nitrogen applications in the late fall. According to Vargas there is an abundance of data that supports nitrogen ability to reduce disease. A summary of nitrogen and disease impacts from Vargas is shown in Table 5.

Table 5. Effects of Nitrogen Application on Turfgrass Disease

<u><i>Severity of Diseases Increases</i></u>	<u><i>Severity of Disease Decreases</i></u>
<i>Pythium</i> blight	Dollar spot
Brown Patch	Rust
Gray leaf spot	Red thread
Stripe smut	Pink patch
<i>Microdochium</i> patch	Anthracnose
<i>Typhula</i> blight	Necrotic ring spot
	Summer patch
	Melting-out
	Leaf spot
	Take-all patch

The correct balance of available N is necessary to maintain optimum turf physiological performance, fungicide efficacy, and when properly applied will maintain the turf’s physiological equilibrium. This balance provides turf with only the nitrogen needed for health requirements, offering less residual nitrogen forms that negatively impact the environment through leaching and runoff. Measuring turf nutritional needs only by subjective visual analyses (color, density, and growth) is often inconsistent and varies due to time of day, moisture levels and each observer’s interpretation. Vargas recommends (as a rule of thumb) 0.5 lbs. N /1000SF per growing month in order to receive the maximum benefit of fungicide applications.

Establishing the overall nutrient balance is essential to optimal plant health. The Bridge has monitored groundwater for the past nine years to determine the course’s nutrient and pesticide concentration impact to local groundwater. The long term average goal for nitrate in groundwater is limited to 2.0 mg/L. To achieve these goals the total nitrogen fertilizer application rate is limited to 3000 pounds per year or the equivalent of 0.9 lbs. N/1000 SF of the Bridge entire parcel area. To date, at the Bridge, there have been no reported significant impacts to the groundwater quality or negative impacts to the golf course.

The impact of nitrogen on turf disease control and the efficacy of an applied fungicide will only be realized when the turf manager has properly identified the pathogen. The turf manager will use a qualified turf pathology laboratory to correctly diagnose the turf disease, select fungicides based on the NYSBMP model and NYS reduced risk pesticide list (as first methods of treatment as applicable to the specific pathogen) and determine if nitrogen will help or worsen the condition. The turf manager will determine what environmental condition(s) exist that increased

disease risk and implement cultural practices to reduce the persistence of pathogen incidence. Improvements to soil health will be evaluated to determine if the disease risk can be minimized by soil amendment and microbial activities.

Table 6 represents typical microbial levels recommended for two mixes of turfs, bluegrass/rye and bentgrass/fescues. The microbial levels are part of the soil food web; and inoculation of soils with microbes and soil amendments with compost are higher priorities than applications of synthetic inputs. The Indian Hills' GCEMP program requires soil sample analyses for these organism populations on a seasonal basis. The applicants will analyze the soil for microbial levels prior to the final design of the project, to determine the necessary levels with respect to the selected turf species. Microbial levels will continue to be monitored throughout the operational stages of the golf course as part of the GCEMP program.

Table 6. Suggested Microbial Levels for Turf Grass Mixes

Spring	Bluegrass/Ryegrass	Bentgrass/Fescue
Active bacteria	15 to 25	15 to 25
Total bacteria	100 to 300	100 to 300
Active fungi	10 to 20	15 to 25
Total fungi	50 to 175	100 to 300
Flagellates	10000 +	10000 +
Amoebae	10000 +	10000 +
Ciliates	50 to 100	50 to 100
Nematodes	20 to 30 no root feeders	20 to 30 no root feeders
% Mycorrhizal Colonization	40 to 80	40 to 80
Summer		
Active bacteria	10 to 25	10 to 25
Total bacteria	150 to 300	150 to 300
Active fungi	5 to 20	10 to 25
Total fungi	100 to 200	150 to 300
Flagellates	10000 +	10000 +
Amoebae	10000 +	10000 +
Ciliates	50 to 100	50 to 100
Nematodes	20 to 30 no root feeders	20 to 30 no root feeders
% Mycorrhizal Colonization	40 to 80	40 to 80
Fall		
Active bacteria	1 to 5	1 to 5
Total bacteria	75 to 100	175 to 300
Active fungi	1 to 5	1 to 5
Total fungi	50 to 75	175 to 300
Flagellates	5000 +	5000 +
Amoebae	5000 +	5000 +
Ciliates	50 to 100	50 to 100
Nematodes	10 to 20 no root feeders	10 to 20 no root feeders
% Mycorrhizal Colonization	40 to 80	40 to 80
Note: units are ug/gram of soil		
Source: Appendix G DEIS Bayberry Project (Sebonack Golf Club)		

- **Turf Tissue Sampling**

Turf tissue sample testing is growing in popularity to assess turf nutrient balance. Table 6 provides recommended levels of nitrogen tissue levels for various cool season turf. There are two methods that can be used to monitor nutrient level and relate the condition to the response from fertilizer; diagnose nutrient deficiencies (micro and macro nutrients) to (1) determine underlying turf problems and (2) to provide verification of visual observations (Murphy). The preferred tissue test method is the total analysis of the elemental content of plant tissue and sap. The method is quantitative and precise. The second method is a rapid test of the soluble nutrients in the plant sap.

For the Indian Hill's GCEMP, tissue samples will be collected at least monthly during the growing season from areas of good and poor turf; and avoid collection of weeds, debris and other foreign matter. The laboratories will be contacted in advance of sample collection and shipment to clarify all sample preservation requirements and diagnostic processes. There are final decisions about the use of turf tissue analyses. These include frequency of sample collection (weekly, seasonal); composite sample collection or discreet sample collection; and accuracy with respect to the dynamic conditions of turf's physiological activity and environmental influences (traffic wear, mower damage).

Unlike crops where critical nutrient level standards can be set based on yield; turf does not equate to a "yield based standard" and critical nutrient levels are instead based on density, color, and other turf qualitative parameters as well as its growth (Murphy). Murphy found there is a "significant limitation to the use of tissue analysis for nitrogen status monitoring because the "interpretation of results suffers from limited quantitative nitrogen response data" (as compared to maximum yield goals for crops). Optimum yield is used for turf rather than maximum yields as is used for crops. Murphy suggested and evaluated the relationship of dollar spot disease severity on *Penncross* creeping bentgrass in a randomized complete block design experiment with five replications; analyzing nitrogen content in clipping samples (to evaluate various treatments of N application) to define a parameter for optimum levels of tissue nitrogen content. Murphy also found that the clipping yield (as a measurement of creeping bentgrass growth) increased in a linear fashion with increasing tissue content of N. A content in clippings of 4.5 percent N will provide bentgrass recovery from dollar spot; and suppression of dollar spot will require clipping nitrogen content of approximately 5 percent but will increase growth rates and could reduce carbohydrate reserves and limit root development (Murphy). These percentages of optimum nitrogen levels are impacted by periods within the growing season and should be considered in terms dynamic; not static conditions. Murphy brings attention to the obvious need for the turf industry to establish a "universal standard" to define optimal turf conditions, which may not be possible with respect to the dynamic state.

The applicability of tissue sample analyses to determine nutrient decision making was examined by Gelernter and Stowell. They suggest that misleading nutrient deficiencies may be reported in tissue test results; but the lack of nutrients may be caused by secondary soil related issues including: soil compaction, waterlogging, black layer, high salt levels, and anaerobic conditions. Their research discovered that nutrients were in the soil, and simply unavailable for root uptake because of limitations caused by the soil physical properties. The researchers found

tissue samples collected during different periods of growth during the day or collected in areas of shade or no shade will show different tissue analytical results for nutrient levels. Using a regression coefficient calculation of the results, a comparison of 197 golf course green soil and tissue analyses was used to correlate 20 different nutrient parameters; with no statistically measureable correlation found except for a weak correlation between copper and nitrogen values. The researchers discouraged using tissue sample analyses alone to decide turf nutrient level requirements. The Hill's will utilize multiple diagnostic tools (soil and tissue chemistry, microbial levels, soil moisture holding capacity, etc.) for turf management decision making.

- **Soil Sampling**

Cultural practices are critical to turf nutrient balance to optimize turf health. Shearman and Rieke acknowledge there is no soil test for predicting nitrogen nutritional needs for turf. There are several reasons for this problem. Soil analytical results can show adequate nitrogen concentration in the soils, yet the nitrogen is unavailable for turf root uptake. Causes include lack of oxygen in the soil which blocks aerobic bacteria activity; poor drainage and saturated soils (causing low O₂ levels), and temporal quantities of N that exceed plant uptake needs (due to soil temperatures, seasonal growth, compaction, sunlight/shade exposure timeframes, and salt). Nitrogen and calcium supplemental sources that include sulfur as a base chemical can under anaerobic conditions, lead to formation of black layers in the soil profile. Many of these conditions can be corrected through cultural means including: soil aeration, improved sunlight exposure, soil amendments, and proper irrigation. Soil analyses will include physical characteristics to evaluate soil properties and evaluate what conditions exist or can be altered to provide the most efficient environment for root zone nutrient uptake. The turf manager will be cognizant of which fertilizer release mechanisms (Table 4) are involved, what form the nitrogen is in, if the salt index is a concern, and what background soil conditions influence availability of nutrients and the efficiency of root uptake.

- **Clipping Weight & Clipping Management**

Clipping weight measurement is a useful tool to evaluate shoot growth and can be used to fine tune nutrient programs. Depending on the turf species desired in the stand and time of season, monitoring growth through clipping weight can aid in understanding when to aid the cultivar population in gaining a competitive advantage over less desirable turfgrass. Turf managers desiring higher populations of bentgrass over *Poa annua* must not only correctly time nutrient supplemental applications to promote bentgrass and “starve” *Poa* but also use clipping weights to aid in monitoring of progress of plant population shifts. Clippings management is also critical because clippings are a source of nitrogen, with 35 to 38 percent of the applied nitrogen found in clipping tissue. Clipping weights are a more effective nitrogen management tool when used in conjunction with turf tissue analysis. Clipping weights will be measured weekly for monitoring growth rates of greens and tees and every other week for fairways during the period of May 1-October 1. Daily clippings collected in mower baskets from tees and greens will be used as a mulch/topdressing for broadcast applications to the practice range and roughs.

The turf managers will typically return clippings to fairways and roughs and must account for the nitrogen loads from this source within the annual nutrient budget and ground-surface water monitoring program. Two recommendations of the “East End Nitrogen Reduction Program for Golf Courses” are turf equipment wash-down pads with wastewater collection and treatment

facilities; and removal of grass clippings placed on bare soils as bulk storage (i.e. compost piles) to minimize sources for nitrogen loadings due to runoff and recharge. Clippings generated from the site and not needed for supplemental nutrients will be collected and disposed of off-site. Clippings and equipment wash down solids can be consolidated and temporarily stored on impermeable storage areas (either on concrete, in metal containers or on impermeable liner barriers, and covered until collected. This will avoid potential impacts to groundwater generated by grass clippings.

- **Dissolved Organic Nitrogen (DON)**

Pare, et al performed an experiment with ^{15}N isotope to trace applied nitrogen to various turfgrasses and collected water that passed through lysimeters to evaluate leaching potential. The researchers' conclusions are quoted below in their entirety, because of the significance of their findings regarding the measurement of dissolved organic nitrogen and its contribution to the total nitrogen mass balance equation of accountability:

“In this lysimeter experiment, the amounts of NO_3 lost through leaching were inversely related to plant N uptake. The application of ^{15}N -labeled fertilizer demonstrated that one-third to one-half of the NO_3 - leached was derived from N accumulated in soil **before** the ^{15}N application, presumably from re-mineralized organic N. Therefore, the mineralization of soil organic N should be accounted for when determining the fertilizer requirements for golf greens to reduce the risk of N leaching. Dissolved organic N was a significant component of the total N leached from golf-green profiles, and was assumed to be derived primarily from background soil and rhizospheric N. Measuring DON in leachates allowed for a nearly complete recovery of the applied fertilizer ^{15}N in most planted lysimeters. We conclude that part of the N losses traditionally attributed to gaseous N emissions (volatilization and denitrification) in golf greens would be due to the leaching of dissolved organic N.”

The aforementioned quote emphasizes a common error with theoretical calculations used by some reviewing agencies during golf course impact with respect to nitrogen leaching potential. DON must be considered when predictive methods are used to evaluate potential leaching from additional nitrogen applications and it is particularly important when older turf stands are involved (Frank & Horgan). The actual fate of nitrogen is influenced by a number of factors, including soil pH, moisture, organic matter, temperature, aeration, N carrier, clippings, and soil texture and structure. The Pare research was conducted in a greenhouse in Canada, and one must cautiously apply these conclusions to Long Island outdoor locations.

Field experiments conducted at the University of Illinois showed that 52 percent of the N applied as fertilizer found its way into the thatch and soil organic matter, 30 percent was removed in the clippings, 8 percent volatilized, 6 percent was in the plants, and *none leached*. The only way to accurately determine the fate of nitrogen on a turf in Long Island is to measure it (Turgeon 2014).

- **Soil Moisture**

Irrigation and rainfall cannot be overlooked when evaluating nitrogen leaching and runoff potential. Water is not only the resource that becomes contaminated by excessive nitrogen but also the driving media that moves nitrogen compounds from the soil to water. Course topography and soil characteristics play important roles, but water is the primary attribute in nitrogen concentration levels, leaching and runoff potential. Moisture meters (www.specmeters.com) measure the moisture level in upper 4-inches of the soil and have become widely accepted by the industry. The meters can be either hand held or permanently installed. The installed meters are commonly integrated with the irrigation system's central controller; and allow irrigation only in areas directed by the moisture meter settings. Handheld meters hold a slight advantage because they are site specific and applied by professional staff that also inspect the overall conditions of the turf. The use of moisture meters will have a profound impact on controlling nitrogen loading generated by applications of excessive irrigation water which has direct impacts to runoff and groundwater recharge. As Frank and Horgan have expressed, the greatest and most common mistake turf managers make with their cool season turf nutrient program is "overwatering."

Excessive irrigation can increase runoff potential and easily drive nitrate molecules from sandy soils to groundwater. One of the more sensitive conditions that increase potential nitrogen loading to ground and surface water is the golf course grow-in period.

The Superintendent utilizes hand held moisture meters for site specific, more frequent soil moisture metering during periods of abiotic stress (drought, heat, wear, and shading). Moisture meters reduce risks of overwatering; can increase the success of seed germination; can be adjusted for providing advantageous conditions for selected turf species; minimize release of nitrogen to the environment.



Figure 5. Integrated Turf Health Management Triangle (OSU Extension, Management of Turf Diseases, L-187, Mar. 2011)

- **Cultivar Selection**

Cultivar selection is of superior importance. Trewarth's climatic classification for Long Island, NY is Dcfc; temperate continental, with no dry season, and cool summers; allowing good conditions for cool season grasses of the *Pooidea* subfamily of grasses. More common turfgrasses

used in the Long Island region include fescues, bluegrasses, ryegrasses, and bentgrasses. The turf managers have a relatively broad range of turf varieties from which to select.

- **Soils and Soil Amendments**

Amended soils will require sampling and analyses for physical properties, (particle size distribution, bulk density, organic matter content, porosity and saturated hydraulic conductivity) to evaluate how the soil properties influence the fate of applied water, chemical inputs, nutrient uptake, and their fate with respect to groundwater. At a minimum of once per year, post grow-in, the Superintendent will collect soil samples for these analyses and cross reference the results with the ground and surface water monitoring programs.

This information will be used to evaluate the impacts(s) that soils may or may not have on ground and surface water quality, and what mechanisms (cultivation, soil amendments, changes in turf management) may be implemented to minimize or avoid potential negative impact. conditions.

It is not advisable for land clearing/organic debris to be buried within the playing areas of the course. As the debris decomposes it can cause settling and uneven surface conditions, or encourage fungus problems that interfere with fine turf management. There is opportunity to process and till some of the debris into the roughs, practice area of naturalized/restored areas. Excess land clearing debris will be removed from the site and processed at an approved facility.

Table 7. Nitrogen Requirements for Cool Season Grasses (Frank & Horgan)

Species	Typical Annual N Needs (Lbs. N/1000 SF)
<i>Creeping Bentgrass</i>	2.5-3.5
<i>Perennial Ryegrass</i>	3.0-5.0
<i>Kentucky Bluegrass</i>	2.0-5.0
<i>Fine Fescue</i>	1.5-3.0
<i>Annual Bluegrass</i>	4.0-6.0

Estimated tissue sufficiency – no data reported

Table 8. Establishment Vigor of Popular Cool-Season Turfs (Turgeon)

<u>FAST RATE OF ESTABLISHMENT & VIGOR</u>
<i>Perennial rye grass</i>
<i>Tall fescue</i>
<i>Fine fescue</i>
<i>Creeping bentgrass</i>
<i>Colonial bentgrass</i>
<i>Kentucky bluegrass</i>
<i>Rough bluegrass</i>
<u>SLOW RATE OF ESTABLISHMENT & VIGOR</u>

Table 8 represents the rate and vigor of turfgrass establishment and illustrates how turf selection during the grow-in period can impact nitrogen applications and for potential leaching and runoff. Runoff will be directed to “naturalized” areas where the sediments and nutrients conveyed by rainfall can be absorbed by the otherwise unfertilized, minimally managed areas.

Golf Course Environmental Management Program & Protocols

The GCEMPs are based on the Integrated Turf Health Triangle (Figure 5) developed Ohio State University. OSU recommends the following management practices to improve success.

Diagnosing Turfgrass Problems

Proper diagnosis is a critical step in the management of plant diseases. Without a solid diagnosis, it is impossible to suggest or develop an adequate management strategy. The more the superintendent knows, the better equipped the turf manager will be to take corrective action. For turfgrass disease diagnosis, the more one knows about the host, environmental, and biotic factors that favor disease development (the disease triangle), the greater likelihood of making a correct diagnosis. Confirmation of disease diagnostics will be conducted at recognized turf diagnostic laboratories. The following 6-step approach will be used for diagnosing turfgrass problems.

Define the problem

The staff will gather as much information as possible about the situation such as grass species, cultivar or variety, age of the stand, recent fertilizer or pesticide applications made, cultural practices implemented, weather trends, irrigation practices, use of growth regulators, history of problems, etc. It is essential to correctly identify the plant affected and to be familiar with its healthy state and characteristics. Staff will take seasonal effects into account.

Examine the entire turfgrass plant community

The applicant’s approach will be to observe the entire plant community. For example, if there is a potentially diseased fairway, staff will look at other golf courses in the area to assess what may be happening, and contact other golf course superintendents within close proximity of the Hills to

inquire about similar conditions. Turf staff will inspect other fairways to see how widespread the damage is and examine the entire fairway; noting light conditions, wind direction, slope of the land, air movement, soil conditions, etc. Once completed, staff will focus on the affected plant(s) or area. By examination of the leaves, stems, crowns and roots, staff will make observations to avoid quick decisions or a wrong diagnosis.

Patterns: Diseases don't occur in straight lines

It is important to look for patterns. Is only a single plant affected? Is the problem restricted to a certain area or a single species? Are the symptoms randomly distributed or are there distinct patterns or clear lines of demarcation between healthy and affected plants? Is the damage occurring in a pattern consistent with recently performed maintenance practices? Random patterns often are indicative of diseases or insect pests whereas uniform damage such as streaks or lines or damage over a large area is indicative of an abiotic (chemical, physical, or mechanical) culprit.

Timing of events: How did the problem develop?

Did it appear suddenly or over time? Has the damage spread or stayed in the same location? Does the damage coincide with changes in the weather? Progressive development and spread of a problem over time is commonly associated with a pest or pathogen. Acute damage is typically caused by abiotic factors: environmental stress, mechanical damage (caused by mowers, topdressing, abrasive sand, etc.) or chemical injury.

Look for evidence of a pathogen or pest activity

The Superintendent will look for key diagnostic signs or symptoms that are indicative of pathogens or insect pests. For instance, the presence of large numbers of fruiting bodies or mycelium might lead one to suspect a fungal infection. If after gathering sufficient background information, staff finds no evidence of a chemical misapplication and/or staff has eliminated the possibility of pathogens and insect pests, the superintendent will retrace his steps and focus his diagnosis on abiotic factors. This is where diagnosis may require the services of a plant pest or disease diagnostic laboratory to narrow the probable causes. Photographs or digital images to aid the diagnostician will be taken with any samples of turf collected for lab analysis.

Seek professional help

The Club will utilize agronomists from USGA; disease experts from U-Mass, Amherst, Penn State, and Rutgers.



Figure 6. Disease Triangle

Plant pathologists have developed a simple model called “The Disease Triangle” to illustrate this concept. Practices which influence the temperature, moisture and fertility status of the turfgrass have the greatest impact on disease development. (Source, Management of Turfgrass Diseases, Mar. 2011 OSU Extension Bulletin L-187)

As pressures mount to reduce inorganic fertilizer and pesticide inputs on turfgrass, interest has increased regarding the development and use of integrated pest management (IPM) programs that either forego or limit the use of pesticides. Although voluntary in some situations, fungicide use is prohibited or strictly regulated in other situations such as in the case of home lawn or residential turfgrass disease management. The first line of defense to preventing or minimizing disease is through the selection and/or use of disease resistant turfgrass species/cultivars and the use of certified seed.

Information regarding disease resistant turfgrass will be obtained by contacting local seed distributors, extension specialists and via the National Turfgrass Evaluation Program (NTEP; <http://www.ntep.org>). The use of genetically resistant turfgrass shall be considered when establishing or renovating turfgrass areas or in situations where over-seeding is used, such as the range.

The second line of defense against turfgrass diseases is the use of cultural management practices that favor turfgrass health over pathogen activity. Cultural practices related to seedbed preparation prior to establishment are critical for seedling and root diseases such as *Pythium* damping-off and the patch diseases. Sand-based root zone mix considerations for putting greens and athletic fields are equally critical. Under certain situations, it may be possible, although difficult, to modify poor quality soil conditions under existing turfgrass swards through the use of core aeration and organic matter topdressing programs. Disease management in established turfgrass swards is often achieved by modifying cultural management practices such as mowing, watering, fertilization, tree pruning, top-dressing and core aeration. As mentioned previously, intensely managed golf course turfgrass is often more predisposed to environmental and biotic

stresses and so it is crucial that agronomic practices be timed to optimize health. By providing growing conditions that favor plant growth over pathogen development or activity, it is possible to minimize or avoid disease.

Plant pathologists have developed a simple model called “The Disease Triangle” to illustrate this concept (Figure 6). Practices which influence the temperature, moisture and fertility status of the turfgrass have the greatest impact on disease development.

Fungicide applications are often essential where there is a demand for high quality turfgrass during environmental periods that favor pathogen growth. In general, fungicides are most effective when applied prior to the onset of disease symptoms (referred to as preventive applications). Fungicides applied after the onset of disease symptoms are typically made to slow or stop pathogen activity and to protect asymptomatic or healthy turfgrass. These type of applications are referred to as being curative. Keep in mind the pathogen is not killed with curative applications.

Other considerations for effective use of fungicides include: (a) selection of product; (b) use of proper water volume (i.e., minimum of 2 gallons per 1,000 ft²); and (c) sprayer nozzle selection (for liquid applications), and spreader calibrations for granular applications.

The NYSDEC requires certified applicators read and follow label recommendations when applying fungicides as with any pesticide.

Several recent advances in the use of biological control strategies to manage turfgrass diseases have been reported, such as the application of material rich in organic matter and the use of antagonistic microorganisms. Relatively few products are commercially available that provide consistent and predictable reductions in disease.

Lastly, high-value turfgrass systems, such as golf course putting greens are intensively managed (i.e., daily mowing, irrigation, core aeration, topdressing applications.). Although frequent manipulation allows for timely intervention of problems, it can also lead to increased wear and the predisposition of turfgrass to environmental and biotic stresses.

The following lists of some of the many complex factors provided by OSU that are considered by golf course superintendents as they strive to manage healthy golf course turfgrass.

The GCEMP Complexity Factors Considered When Managing Golf Course Turfs

Human Relations

- Client Relations
- Crew Size and Organization
- Human Error Language/ Ethnicity Dynamics
- Experience Level of Employees
- Expectations & Opinions
- Amount of Play/Use

Budget

- Staff
- Equipment
- Management options
- Revenue Generation

Cost

- Recovery Equipment
- Irrigation system Characteristics
- Mowers
- Sprayers and Spreaders
- Injection Equipment

Environment

- Weather
- Shade
- Thatch
- Air Movement
- Water Dynamics
- Temperature
- Soil or Root zone Mix Characteristics
- pH
- Soil Compaction

Agronomics

- Fertility (dates for fertilizer applications are limited to between April 1 and October 31)
- Mowing heights and frequencies
- Air Movement
- Irrigation
- Thatch
- Core Cultivation
- Heat Stress
- Drainage
- Shade/Sunlight
- Trees & Flowers

Playability

- Aesthetics
- Compaction & Wear
- Topdressing
- Hard Surface Maintenance
- Traffic
- Syringing
- Turfgrass Selection (genotypes)
- Water Quality
- Repair
- Mulching
- Soil Type
- Age of Turf Stand/Facility Turfs

Pathogens & Pests

- Diseases
- Insects
- Grassy and Broadleaf Weeds

- Wildlife Management

Regulatory Concerns

- Product Availability & Selection
- Rates & Means of Delivery
- Environmental Stewardship

For standard IPM/BMP/GCEMP practices, the Superintendent conducts daily course monitoring and surveys to monitor pest and disease issues.



IPM requires establishing thresholds for when pests need to be tolerated and when damage exceeds this threshold. The above photograph is of grub damage in a “naturalized native grass area” where no abatement measures were needed.

Equipment and Products for GCEMP Relevant to Turf Management and Turf Chemical Reduction

In addition to the standard mowing equipment (fairway, greens and rough mowers) the GCEMP will require specific turf equipment to maintain the course. The following equipment can be used in conjunction with best management practices:

- Greens aerator with various tines
- Fairway aerator with various diameter and depth tines
- Fairway soil reliever (solid tines and solid knives)
- De-thatching units for fairways and greens
- Powered turf boom sprayer with GIS system, computer and spray nozzle boom curtain
- Irrigation control systems and Fertigation System
- Soil biological, physical and chemical sample collection equipment
- Plant tissue sample collection equipment
- Lysimeters
- Water sample collection kits
- Disease diagnostic kits

Turf products will include materials that contain bio-stimulants:

- Cytokinins
- Auxins
- Sea kelp extracts
- Amino-acids
- Fungicides
- Bio-pack mixtures (microbial stimulates, microbes and soil enhancements)
- Dolomitic Lime
- Plant Growth Regulators
- Certified seed mixes

These materials stimulate plant growth and can be found in products such as: Sea-Cal; Growth Products Bio-packs, Companion and Restore, Civitas and Primo Maxx.

Summary Comments

Long Island's geology is dominated by glacial till comprised of gravel and sandy soils; and its public drinking water supply is from the sole source aquifer with a federal standard of MCL for nitrogen (N) of 10 ppm designed to protect human health and the environment. Although a MCL of ≤ 6.0 ppm may be desirable to protect aquatic resources, unsewered sanitary systems, especially residential systems installed in close proximity to the shoreline are the primary source of N. N leaching and runoff from golf courses has been shown to be minimal based on water quality monitoring, professional turf management practices, existing regulations and implementation of GCEMP and BMP protocols. The Indian Hills golf course is expected to yield a maximum nitrogen discharge of ≤ 2.0 ppm, well below the 10 ppm standard set for public health protection.

The research papers and literature reviewed for this assessment of impacts and for outlining the Indian Hills golf course integrated turf health management plan, identified approximately 40 years of university and industry experiments and data assessment to determine the significance of inputs from golf courses and potential impacts to ground and surface waters.

As early as the middle 1980s the USGA and researchers concluded that established turf grass stands, when properly managed by turf professionals posed low potential for environmental damage from inputs. The use of historical and current management tools available to turf managers, minimizes potential for leaching and runoff to the ground and surface waters, even in soils dominated by sand.

The turf management strategies include the following: monitoring turf nutritional requirements through soil and tissue testing as measures to assess nutrient status, monitoring clipping yield to assess turfgrass growth and density, controlling thatch and mat accumulation to maximize soil moisture levels and soil gas exchange, periodic sampling and monitoring water quality at ponds, streams, and other water bodies to determine if runoff is occurring, soil sampling for physical and chemical characteristics, including CEC, implementing moisture metering for improved irrigation controls, and using NVDI instruments to record conditions as impartial and consistent method of measurement.

This management plan explains how professional turf management programs minimize environmental degradation of ground and surface waters. Without reductions in turf quality, university research concludes that golf courses can reduce inputs including nitrogen loads (≤ 2.0 mg/L, well below the Federal and New York State drinking water standard of 10 mg/L).

Best management strategies for nutritional requirements minimize potential adverse environmental impact. These techniques have been outlined above and in the NYSBMP for Golf Courses. Methods of evaluating environmental impacts and adverse conditions must be consistent and objective. There are many sources of nitrogen, with sanitary discharge and disposal methods used on Long Island a major contributor; well in excess of nitrogen generated from turf.

Turf management and operations at Indian Hills complies with the NYSBMP initiative, record keeping and assessment tools. This approach provides additional monitoring and record keeping of turf management practices in accordance with NYSBMP recommendations.

There is a growing trend in golf turf management to utilize Precision Turf Management (PTM). PTM uses global positioning satellite mapping (GPS) of golf course micro-environments (3,000-5,000 SF units) for improved and select use of turf management practices (pH adjustment, irrigation, pesticide and nutrient applications). According to the February 2014 issue of Golf Course Industry magazine, the use of this technology is expected to grow. The technology can significantly reduce the use of resources applied as inputs which will be placed only in specific areas of need and these areas continuously monitored. The growing acceptance of this technology already in practice on large scale agricultural properties, may in the long run be a critical factor in reducing the potential for nitrogen leaching and runoff concerns. The Club is in the process of assessing this technology and its applicability with respect to the anticipated construction and operation of its golf course.

Concerns for “drift” described as the dispersion of applied products beyond the intended area of application can be minimized and avoidable by equipment selection and calibration. Powered turf boom sprayers with air induction spray nozzles include boom curtains. The spray nozzles for turf applications are located 20-inches from the ground surface. The turf boom sprayer is specifically designed for product application in a downward direction (on to the turf). Spray rates (gallons per minute) and ground speeds (amount of the product applied per area, i.e. fluid ounces of the product per 1000 square feet of turf area) is governed by an onboard computerized sprayer pressure and vehicle ground speed regulating system. The computer is preprogrammed by the certified applicator with the required spray rate. As the vehicle’s ground speed changes (such as with topography) the rate of spray is changed by adjusting the pressure and therefore the flow. This system provides an automated calibration to occur in real time, so that the correct amount of product is consistently applied to the turf regardless of the boom sprayer’s vehicle speed. Certified applicators are required to inspect spray equipment and calibrate the sprayers before applications. With the turf sprayer control system is a GIS system. The system is designed to specifically operate the equipment and apply inputs only within the predetermined GIS mapped areas. The GIS map is created for the areas only where the inputs are intended (i.e. each green, fairway and tee) and automatically activates only the sprayer nozzle(s) (typically located 14 to 20-inches apart horizontally) programmed for the mapped area. The over spray or under spray during product

application is for practical terms eliminated or in the worst case reduced to 14 to 20-inches. For additional control of inputs boom sprayers are equipped with a boom curtain. The curtain covers the boom from the above the spray nozzle to approximately 2 inches above the turf canopy. This attachment reduces impact from changing wind directions, wind speeds and vehicle direction operations on the spray applications, thus directing the spray downward on to the turf.

The Club's turf management program utilizes professionally trained turf managers, a highly qualified superintendent, with more than 20 years of service at Indian Hills and state of the art equipment.

In the United States, the legal use of pesticides is controlled by the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), enacted in 1947. The most significant amendment to FIFRA was the Federal Environmental Pesticide Control Act (FEPCA) of 1972. One significant part of the amendment required the USEPA to register all pesticides as well as each use of that pesticide and approve the product label. In summary the USEPA reviews all pesticides brought to market and either rejects or registers the pesticide for use. The pesticide label is required to provide product information as mandated by federal law. This labeling requirement is generally interpreted as, "the pesticide label is the law." Each pesticide label includes:

- Product Name
- Active Ingredients (by percent)
- Inactive Ingredients (by percent)
- Signal Words (Caution, Warning, Danger)
- First Aid
- Precautionary Statements (hazards to humans, animals, aquatic environments, etc.)
- Personnel Personal Equipment (PPE)
- User Safety Requirements
- Engineering Controls
- User Safety Recommendations
- Environmental Hazards
- Directions for Use (Agricultural and Non-Agricultural)
- Aerial Drift Advisory Information
- Integrated Pest Management Statements
- Target Organism Resistance Management
- Mixing, Loading and Application Instructions
- Application Rates and Application Sites and Timing
- List of Target Organisms Controlled
- Maximum Allowable Quantity of Active Ingredient Allowed per Application per Year.
- Storage and Disposal.

There are three classifications for pesticides that are used to categorize toxicity and provide warning statements used to advise the applicator. The product's safe handling by the applicator is detailed on each pesticide label. The label is required to provide "signal words" that advise applicators of potential concerns.

- Class I "Caution" mildly toxic
- Class II "Warning" moderately toxic
- Class III "Danger/Poison" (skull and cross bones) highly toxic

All registered pesticide labels state, "Keep-Out of Reach of Children."

Personal Protective Equipment (PPE) generally required for each classification:

- Class I: Wear work clothes including long pants, long sleeve shirt, socks, and shoes.
Class II: Wear coveralls over your work clothes or wear chemical resistant overalls.
Class III: Wear chemical resistant overalls, chemical resistant boots and gloves.

If the chemical is an eye irritant applicators wear eye protection.

The applicator makes the final decision on what PPE is necessary based on the statements provided on the product label. Every pesticide label is reviewed for its specific personal safety requirements based on its specific toxicity rating. For golf courses, the majority of pesticide applications are fungicides, which generally are listed as Class I and II; with less frequent applications of herbicides and insecticides listed as Class I and II. Soil fumigants such as *Basamid* (Dazomet) are Class III. Soil fumigants are commonly used for pre-plant controls of soil nematodes, fungi and weeds and are unnecessary at the Indian Hills operations.

The USEPA is also responsible for the administering the national program that assures a desired level of technical competence associated with private and commercial pesticide applicators. In New York State, the lead agency designated for pesticide registration, pesticide use, applicator certification and enforcement of state and federal regulations is the NYSDEC, Division of Materials Management Bureau of Pesticides Management. Commercial pesticide applications can only be performed by a NYS Certified Commercial Pesticide Applicator. General eligibility requirements for certification are:

- Qualify as a Commercial Technician- Minimum age of 17; Completion of 30-hour NYSDEC approved training program.
- Pass Core Exam – 90 minutes 50 questions- closed book
- Pass Technical Exam- 90 minutes 50 questions-open book
- Provide Proof of One-year experience with pesticide applications performed under supervision of a NYS Certified Commercial Applicator
- Complete 12 hours of category specific certification training credits from pesticide courses approved by the NYSDEC
- Pay NYS Certification fees

NYSDEC regulates pesticide applications pursuant to 6NYCRR Part 325 Rules and Regulations Relating to the Application of Pesticides. Part 325.16 describes twelve categories of commercial pesticide applications. Generally turf professionals are certified in the category 3A: Ornamentals and Turf. On-site staff involved in the application of pesticides shall at a minimum be NYS Certified Commercial Pesticide Applicators- Category 3A

The NYSDEC also registers pesticides for use in the state, such that all USEPA registered pesticides are not legally permitted for use in New York unless the product is also registered by the state. The NYSDEC further restricts pesticide use within specific counties, with Nassau and Suffolk Counties having the most restrictions on pesticides available for use and limitations of annual cumulative application quantities for specific pesticides.

Pesticides are available in several different formulations. These include aerosols, granules, ready-to use (RTU), emulsified concentrates (EC), wettable powders (WP), soluble powders (SP), flowables and fumigants. Controlling drift is important for the commercial applicator. The pesticide's formulation together with selection of pesticide application equipment can be effective in reducing the potential for drift. For example a pesticide as an aerosol formulation would have a greater potential for aerial drift than that same pesticide in a large particle granule formulation. With regard to equipment, an accurately calibrated drop spreader would apply a pesticide in a more precise location than a broadcast spreader; yet each would have less potential for aerial drift than the same pesticide applied from a helicopter.

To be effective, the pesticide must be applied precisely on the target at the correct rate, volume and pressure. Particle drift can be influenced by particle size, nozzle design and orientation, pressure, temperature, humidity, evaporation, height of release, air velocity and movement, and each must be considered.

To avoid aerial drift, and mitigate the potential for the spread of pollutants to sites outside of the project area, the applicator shall be required to follow the pesticide label. Typical label instructions are:

- Use the largest particle and droplet size
- Use the lowest practical pressure
- Select nozzles that produce large numbers of large particles
- Apply as close as practical to the target
- Use a drift control additive (aka "stickers")
- Not apply when wind, temperature or humidity are unfavorable
- Choose non-volatile pesticide formulations
- Increase flow rates of the application
- Establish buffer zones to avoid ecologically sensitive areas and waterways
- Use new technologies including: drift reduction nozzles, spray shields-boom curtains, air-assist spray and GPS area control equipment.

There are three primary methods of applying pesticides to turfgrass and ornamental plantings:

1. Low pressure (30-60 psi) boom sprayers, typically mounted on a small utility vehicle with multiple (11-21) nozzles located approximately 20 inches above the ground surface. This equipment is used for pesticide formulations that are mixed with water (emulsified concentrates, wettable powders, soluble powders, emulsifiable concentrates, and flowables).

2. Spreaders either rotary broadcast spreaders or drop spreaders either walked or towed by a tractor or utility vehicle. This equipment is used for dry particle pesticide applications (granules).
3. Hand held/back-pack sprayers are used for “spot spraying” generally defined as placing the hand held discharge nozzle directly on the target organism (typically a weed). Spot spraying applications are generally limited to areas of 900 square feet or less per application.

All pesticide application equipment must be calibrated by the applicator to determine the rate of the application and adjust the equipment for the correct discharge of the active ingredient whereby pesticides are not over or under applied.

Typically the majority of golf course pesticide applications utilize a low pressure boom sprayer. Depending on the product formulation and environmental conditions, rotary and broadcast spreaders are also used, and low pressure hand held sprayers utilized for spot spray weed control.

To minimize the potential for the pesticides used to maintain the golf course to become airborne, and causing the spread of pollutants to sites outside of the project, the Indian Hills NYS Certified Commercial Pesticide Applicators will in addition to product label instructions, utilize a powered turf boom sprayer, equipped with a spray nozzle boom wind-curtain. The boom curtain encapsulates the boom (the boom is where the nozzles are mounted approximately 20-inches above the ground), isolates the spray from the weather conditions and directs the spray directly to the turf. The use of the curtain reduces the potential of drift to nearly zero. The controls are designed to specifically apply inputs at pre-set rates, continuously adjusted for various ground speeds. The equipment directs application of nozzle spray downward, only within the designated areas, with zero to minimal potential for overspray.

The use of hand held sprayers for spot spraying and low pressure boom sprayers equipped with spray shield-boom curtains, together with experienced certified applicators and pesticide label instructions, particle drift is expected to be avoided or be limited to areas within the immediate Indian Hills property boundaries. Label instructions require applicators to follow specific set-back distances from environmentally sensitive areas, water resources and non-target plants.

The Indian Hills turf management facilities will be equipped with PPE, OSHA required MSDS and employee hazard communication programs, emergency response and spill cleanup kits, trained personnel, wash down and wastewater recycling equipment.

Turf and soil samples will be routinely collected and analyzed by qualified laboratories to determine nutrient levels, plant physiological conditions, evaluate physical properties of soils and identify turf pathogens. This part of the Integrated Pest Management (IPM) and GCEMP provide alternative controls to pesticide applications necessary to address turf health.

Turfgrass when compared to other cultivated plants (vegetable crops, nursery stock) creates a “carpet-like” canopy and dense root system. Turf provides more significant area for input collection and uptake than most row-crop plantings. Row-crop plantings allow for a greater area of un-vegetated soil exposure, where applied inputs by-pass the plant leaves and roots and if

mobile, move through the soil profile to groundwater or hold potential for dispersion via sediment laden runoff. Acre for acre turfgrass offers more vegetative cover than most all agricultural and nursery products.

The NTEP uses a system of rating turfgrass performance trials and is based on visual observations, rating each parameter (color, density, etc.) on a scale of 1 to 9 with 9 being the highest qualitative number. The NTEP rating is used by trained professionals that understand its use and their abilities to arrive at consistent and useful turfgrass ratings. There is no need to significantly change or eliminate the NTEP rating system largely because its use is limited to the NTEP. What must be considered is a tool for the broader use that can evaluate turf health; and provide a consistent standard that is acceptable to a wide range of stakeholders.

To accurately perform GCEMP, historical turf information (chronic insect populations, persistence of plant disease, cultural practices including dates for aeration and materials used for topdressing etc.) will be developed by the turf manager and will be evaluated over time. Soil sample (collected from tees greens and fairways) analytical results, plant tissue analysis and cultivar types are all necessary for long term GCEMP development.

All major varieties of turf grasses are not the same and within the particular major types available for use at the site (Kentucky bluegrass, fescue, bentgrass, annual bluegrass and rye grass). There are hundreds of genetic variations of these grasses. These genetic variations have a profound effect on how each cultivar reacts to specific turf management practices. What may be good for one type of cultivar (i.e. high rates of fertilization) may not produce the best results for another cultivar of the same turf type. This can provide growth advantages to one type of plant compared to another. However while that type may do well with increased fertilizers (and the other be not as responsive) it may not perform well under high heat stress, or rebound after insect attack. The surrounding ecology and environmental conditions (soils, available sunlight, and topography) will be indicators for selection of turfgrass selections to avoid the “wrong” plant that will require large inputs of water and turf chemical applications to maintain it.

The concentration of soil based nutrients required for healthy turf and turf growth varies depending upon the turf species, specific cultivars, and the specific nutrient. Ideally turf grass will be sustained with supplemental macro nutrients, micro nutrients and water such that their carbohydrate production levels, utilization and production of plant enzymes, respiration and biochemical reactions during photosynthesis remain in physiological equilibrium. Basically, healthy turf depends upon plant physiology, and plant physiological reactions can be very specific among different plant species, cultivars within the species and their tolerance to biotic and abiotic stresses.

The critical concentration for each nutrient is defined as the concentration level in the plant tissue at which the plant achieves 90% of its maximum growth. The successful GCEMP is therefore based on the science of the turf grass, plant genetic characteristics, and soil and tissue analyses for each cultivar used within the golf course (tees, greens, fairways and roughs).

Although many “organic” products are available for turf management, our turf management team depends upon science to evaluate the most suitable materials and cultural practices for yielding the best results, while minimizing environmental impact. This does not

exclude “organic” based products, however some “organic” products such as weed control herbicides made from pepper juice are non-selective and kill the weed as well as the grass.

For the IPM it is imperative to establish what level of damage or organism population size is acceptable before actions are implemented. For example, are 10-20 dandelions per hole acceptable if located in the rough? Likely this would go unnoticed. How about 10-20 dandelions on the putting surface?

The applicants have direct access to the recognized turf management experts from Cornell University, Pennsylvania State University (PSU), University of Massachusetts (UMASS) Amherst, Center of Agriculture Plant Diagnostic Lab for providing analysis, identification and ecologically sound management strategies for diseases, insects, weeds and nematodes found in turf and ornamentals.

GCEMP will begin with an independent and objective soils analysis likely conducted by Brookside Laboratories, Inc., New Knoxville, OH considered among the finest agricultural testing labs in the country and recognized for their science based linkage of existing soil chemistries with turf plant health. Brookside will be sent soil samples from areas of the site proposed for fairways, tees and greens and conduct an analysis and audit of soil conditions.

Once the background soil analyses are determined, the applicants will assess the results with respect to turf selection. The NTEP reports will be used in conjunction with university field trials (Rutgers, Penn State, U Mass and URI) to evaluate the selection of turfgrasses most adapted to the local environment.

NTEP is designed to develop and coordinate uniform evaluation trials of turfgrass varieties and promising selections in the United States and Canada. Test results can be used by national companies and plant breeders to determine the broad picture of the adaptation of a cultivar. Results can also be used to determine if a cultivar is well adapted to a local area or level of turf maintenance.

While the IPM approach often includes use of cultural practices to improve the hardiness and sustainability of the plants, the emphasis is still on pest management. For the Hill’s golf course a healthy plant system will be developed that generally resists invasion by weeds, is more resistant to disease attack, is better able to withstand insect attack, and can better recover from extreme weather conditions (i.e., drought, heat, and cold). The current thinking is embodied in the idea of Plant Health Care (PHC), or in our case GCEMP.

IPM is still a necessary component of turf management and the Indian Hills will continue to utilize IPM in accordance with management practices required by NYSDEC Pesticide Certification requirements for turf and ornamentals, the NYSBMP and the GCEMP.

The Audubon International certification program will provide long term post construction water quality information that can be used to adjust onsite management of turf and ornamental plantings. Fuel and chemical storage and handling equipment will meet the minimum standards required for approval of installation and storage pursuant to SCDOH and NYSDEC regulations.

Pesticide Drift Response: An applicator must be a NYSDEC certified pesticide applicator and comply with all pesticide laws. To avoid aerial drift, and mitigate the potential for the spread of pesticides to sites beyond the target organism’s area, the applicator shall be required to follow the

requirements of use stated on the product's label. For all pesticides registered for use in NYS, the "Label is the Law." With respect to drift, the label instructs the applicator:

Use the largest particle and droplet size

Use the lowest practical pressure

Select nozzles that produce large numbers of large particles

Apply as close as practical to the target

Use a drift control additive (aka "stickers")

Not apply when wind, temperature or humidity are unfavorable Choose non-volatile pesticide formulations

Increase flow rates of the application

Establish buffer zones to avoid ecologically sensitive areas and waterways

Use new technologies including: drift reduction nozzles, spray shields-boom curtains, air-assist spray and GPS area control equipment.

There are three primary methods of applying pesticides to turfgrass and ornamental plantings:

1. Low pressure (30-60 psi) boom sprayers, typically mounted on a small utility vehicle with multiple (11-21) nozzles located approximately 20 inches above the ground surface. This equipment is used for pesticide formulations that are mixed with water (emulsified concentrates, wettable powders, soluble powders, emulsifiable concentrates, and flowables).
2. Spreaders either rotary broadcast spreaders or drop spreaders either walked or towed by a tractor or utility vehicle. This equipment is used for dry particle pesticide applications (granules).
3. Hand held/back-pack sprayers are used for "spot spraying" generally defined as placing the hand held discharge nozzle directly on the target organism (typically a weed). Spot spraying applications are generally limited to areas of 900 square feet or less per application.

All pesticide application equipment must be calibrated by the applicator to determine the rate of the application and adjust the equipment for the correct discharge of the active ingredient whereby pesticides are not over or under applied. Typically the majority of golf course pesticide applications utilize a low pressure boom sprayer with the boom nozzle approximately 18-inches above the ground surface- the direction of spray is downward to the ground where the target organism is located in the turf (as compared to spraying an apple orchard or vineyard).

Depending on the product formulation and environmental conditions, rotary and broadcast spreaders are also used, and low pressure hand held sprayers utilized for spot spray weed control.

To minimize the potential for the pesticides used to maintain the golf course to become airborne, and causing the spread of pollutants to sites outside of the project, the Club's NYS Certified Commercial Pesticide Applicators will in addition to product label instructions, utilize a powered turf boom sprayer, equipped with a spray nozzle boom wind-curtain (Appendix 22). The boom curtain encapsulates the boom (the boom is where the nozzles are mounted approximately 20 inches above the ground), isolates the spray from the weather conditions and directs the spray directly to the turf. The use of the curtain reduces the potential of drift to nearly zero. The sprayer uses a GPS

system with on-board real time computerized application controls. The controls are designed to specifically apply inputs at pre-set rates, continuously adjusted for various ground speeds, within the GPS pre-programmed mapped areas (footprints of the greens, tees and fairways are programmed into the sprayer's on-board computer and GPS). The equipment directs application of nozzle spray downward, only within the designated areas, with zero to minimal potential for overspray. In combination with the boom curtain, the GPS system is the most advanced sprayer technology available designed to minimize applicator error, conserve inputs and avoid impacts to non-target areas and organisms.

The use of hand held sprayers for spot spraying and low pressure boom sprayers equipped with spray shield-boom curtains, together with experienced certified applicators and pesticide label instructions, particle drift is expected to be avoided or be limited to areas within the immediate Hills property boundaries. Label instructions require applicators to follow specific set-back distances from environmentally sensitive areas, water resources and non-target plants.

Today's golf course operations are managed by professional turf managers, commonly known as Golf Course Superintendents. The Superintendent is responsible for understanding and responding to golf course conditions, dictated by not only his or her region of the world, seasonal changes, turf types, pest identification, and desired playability, but also the course's micro-climates. Micro-climates are slight variations in the course's environmental conditions generally caused by small temperature and moisture variations which impact soil conditions and turf. For example an area exposed to long hours of sunlight, and located on the crest of a hill top will dry out faster, than low-lying areas, shaded by trees. These differences in the micro-climate require modified turf management, and an experienced Superintendent, who is both academically and professionally trained, understands the nuances and complexities associated with the sophisticated levels of fine turf management.

Intro. Res. No. 2117-2007

Laid on Table 11/7/2007

Introduced by Presiding Officer, on request of the County Executive and Legislators Losquadro, Romaine, Horsley, D'Amaro and Stern

RESOLUTION NO. 1369 -2007, ADOPTING LOCAL LAW NO. 41 -2007, A LOCAL LAW TO REDUCE NITROGEN POLLUTION BY REDUCING USE OF FERTILIZER IN SUFFOLK COUNTY

WHEREAS, there was duly presented and introduced to this County Legislature at a meeting held on November 7, 2007, a proposed local law entitled, "**A LOCAL LAW TO REDUCE NITROGEN POLLUTION BY REDUCING USE OF FERTILIZER IN SUFFOLK COUNTY**" and said local law in final form is the same as the amended copy filed with the Clerk of this Legislature on December 3, 2007 and presented to this Legislature on December 3, 2007; now, therefore be it

RESOLVED, that said local law be enacted as follows:

LOCAL LAW NO. 41 -2007, SUFFOLK COUNTY, NEW YORK

A LOCAL LAW TO REDUCE NITROGEN POLLUTION BY REDUCING USE OF FERTILIZER IN SUFFOLK COUNTY

BE IT ENACTED BY THE COUNTY LEGISLATURE OF THE COUNTY OF SUFFOLK, as follows:

Section 1. Legislative Intent.

This Legislature hereby finds that overapplication and/or misuse of fertilizer products has led to the degradation in the local water quality, and has harmed groundwater, drinking water, and wetlands and surface waters within the County of Suffolk.

This Legislature further finds that excess nitrogen in drinking water can threaten human health, as fertilizer leachate has contaminated groundwater and groundwater is the sole source of drinking water on Long Island.

This Legislature also finds that nitrogen contamination trends in groundwater are worsening, in that 17% of Upper Glacial public water supply wells in the Upper Glacial Aquifer now exceed 6 milligrams/liter (mg/l) nitrogen (degraded), an increase from 9% in 1987.

This Legislature further finds that in 2006, 15 community public water supply wells, and nearly 10% of private wells in Suffolk County were found to violate the 10 mg/L Maximum Contaminant Level (MCL) set for nitrates to ensure safe drinking water.

This Legislature further finds that various factors may cause excess leaching of fertilizer nitrogen, including use of quick-release fertilizer, percentage of nitrogen in fertilizer, labeling which results in excess application rates of fertilizer, organic/inorganic/polymer formulations, soil types, lawn type and condition, timing of application, and total nitrogen applied per year.

This Legislature further finds that fertilizers are responsible for approximately 50% of the total nitrogen loads to groundwater in the Peconic Estuary and throughout medium-density residential land uses in Suffolk County.

This Legislature further finds that groundwater is, by far, the largest local source of nitrogen to estuaries, and nitrogen loadings to the Peconic Estuary have increased by more than 200% since the 1950s, due to fertilizers and sanitary systems.

This Legislature also determines that excess nitrogen inputs result in depressed dissolved oxygen (hypoxia), harming aquatic life, causing excessive algal blooms, and diminishing water clarity to further impair habitat for aquatic plants.

This Legislature further finds that numerous Suffolk County waterbodies have been added to New York State's list of impaired waterbodies due to nitrogen over-enrichment, including the sensitive, westernmost areas of the Peconic Estuary, and eelgrass, a critical habitat, has substantially disappeared west of Shelter Island in the Peconics.

This Legislature further finds that more than half of Long Island Sound suffers from hypoxia every summer, that several areas of the South Shore Estuary Reserve are also seeing effects of eutrophication, and that several fish kills have been reported throughout Suffolk County due to low dissolved oxygen.

This Legislature further finds that fertilizer should not be applied to turf when ground is likely to be frozen, or when grass is not actively growing, so that fertilizer use on turf should be banned in cold-weather months, and public education and outreach should be utilized to prevent application during periods of summer dormancy.

This Legislature also determines that the Homestead A-Syst Task Force (Suffolk County Resolution No. 544-2006) sought to address this problem by establishing public education programs and holding public hearings, and that various other educational programs exist through agencies and estuary programs, but these efforts can be coordinated, refined, and expanded.

This Legislature further finds that current information regarding the use of fertilizers is confusing to consumers, and leads to the misapplication of fertilizer and contamination of groundwater, drinking water, and estuaries.

This Legislature also determines that the quality of our water should be considered a higher priority than the aesthetics of lawns, and that high maintenance lawns require more nitrogen and are more likely to leach excess nitrogen, so that high maintenance lawns should be discouraged.

This Legislature also determines that Suffolk County has already begun implementing programs to reduce nitrogen pollution, and those programs should continue to be refined and formalized as County policy, to serve as a model for residences, the private sector, and other levels of government.

This Legislature also determines that, based on the Peconic Estuary Program Comprehensive Conservation and Management Plan a goal of 10% to 25% fertilizer reduction is a reasonable initial target for existing residential fertilizing programs.

Therefore, the purpose of this law is to cause a reduction in the amount of nitrogen released into the groundwater by eliminating the use of fertilizers where practicable on lawns and on County property, decreasing the overall use of fertilizer, and optimizing the use of fertilizers when they are applied.

Section 2. Definitions.

As used in this law, the following terms shall have the meanings indicated:

A.) **"COMMISSIONER"** shall mean the Commissioner of the Suffolk County Department of Environment and Energy.

B.) **"DEPARTMENT"** shall mean the Suffolk County Department of Environment and Energy.

C.) **"ESTABLISHMENT"** shall mean a store or person located within Suffolk County that sells or offers fertilizer for sale.

D.) **"FERTILIZER"** shall mean any organic or inorganic material of natural or synthetic origin which is added to soil, soil mixtures, or solution to supplement nutrients and is claimed to contain one or more essential plant nutrients. The term "fertilizer" does not include unmanipulated animal and vegetable manure and agricultural liming materials used to reduce soil acidity.

E.) **"PERSON"** shall mean any individual, firm, partnership, corporation, company, society, association, or any organized group of persons whether incorporated or not.

F.) **"TURF"** shall mean any area of earth principally vegetated by grass.

Section 3. Prohibitions.

A.) Fertilizer shall not be applied to County owned real property, except as authorized under Section 8 of this law.

B.) Fertilizer shall not be applied to any turf on any non-County owned real property any non-County owned real property by any person between November 1 and April 1 of every year, except as authorized by Section 8 of this law.

Section 4. Requirements.

A.) An establishment shall conspicuously post a sign and informational brochures on fertilizers and turf management, which shall be furnished by the Department, within ten (10) feet of the establishment's fertilizer display area. If an establishment has more than one fertilizer display area, and the display areas are not substantially contiguous, then signs and brochures must be displayed within ten (10) feet of each display area.

B.) The Department shall prepare a report, no later than July 1 of each year, which presents information on fertilizers sold in the preceding year. This report will be based on records available from the New York State Department of Agriculture and Markets. If the Commissioner deems that additional information is needed, the Commissioner is authorized to promulgate rules and regulations necessary to implement a Suffolk County reporting system on fertilizer sales for establishments.

Section 5. Education and Reporting.

A.) The Department shall work in conjunction with other persons and organizations to expand educational programs already in place regarding the risks of fertilizers for retailers, consumers and landscapers. These organizations include, but are not limited to:

- i.) Cornell Cooperative Extension (CCE);
- ii.) Grassroots Healthy Lawn Program (GHLP);
- iii.) Neighborhood Network;

- iv.) Homestead A-Syst Task Force, as created by Suffolk County Resolution No. 544-2006;
- v.) United States Environmental Protection Agency (USEPA);
- vi.) Nassau Suffolk Landscape Gardeners Association (NSLGA);
- vii.) Long Island Sound Study;
- viii.) South Shore Estuary Reserve;
- ix.) Peconic Estuary Program
- x.) Turfgrass Science Program, Cornell University
- xi.) Cornell University New York State Integrated Pest Management (NYSIPM) Program
- xii.) Suffolk County Water Authority (SCWA)
- xiii.) Such other organizations as deemed appropriate by the Commissioner of the Department.

B.) The Department, in consultation with the Suffolk County Department of Health Services, shall develop, within one year of the effective date of this law, information regarding the risks of fertilizer related to turf and suggested guidelines to delineate which types of fertilizers, fertilizer application methods and best management practices support healthy vegetation, while posing the least harm to the environment. Best management practices may include such practices as low-maintenance lawns and landscaping, proper mowing, and modification of fertilizer application rates or times. In developing the guidelines, the Department shall consider factors which may contribute to excessive and unnecessary degradation of local water quality by nitrogen pollution, including harm to groundwater, drinking water, wetlands and surface waters. Factors considered shall include, but not be limited to:

- i.) Nitrogen content and formulation of fertilizers;
- ii.) Rate of nitrogen release and leaching potential;
- iii.) Soil type, soil conditions, land use, lawn age, and lawn condition;
- iv.) Weather or temperature conditions;
- v.) Impact on aquatic organisms and vegetation;
- vi.) Definitions of fertilizer label terminology;
- vii.) Information about proper application techniques, including, but not limited to, timing, total nitrogen per application and total cumulative nitrogen applied per year;
- viii.) Impact on sensitive groundwater and surface water; and
- ix.) Such other factors as deemed appropriate by the Suffolk County Department of Environment and Energy.

C.) The Department shall establish, within one year of the effective date of this law, an interactive website concerning turf and fertilizer-related issues. The website shall present educational materials on fertilizers and County law and policy, including advisory signage and brochures, the prohibition on usage of fertilizers on turf from November 1 to April 1, landscaper training, and the guidelines developed pursuant to section 5(B). The website may also include a simple computer-based method of determining the amount of fertilizer required for a specific site. Links to other related educational resources shall also be provided.

Section 6. Annual Report and Program Evaluation Reports.

A.) The Department shall prepare an annual report summarizing information received pursuant to Section 4 of this law and the report shall show, at a minimum, the total quantities of fertilizer sold in Suffolk County. The report shall also analyze this data

with respect to factors deemed to be significant by the Department, which may include, but not be limited to, nitrogen and phosphorus content of fertilizers, slow-release vs. quick-release fertilizers, and organic content of fertilizers. This report shall be completed no later than July 1 of the given year, shall be filed with the Clerk of the Legislature within 15 days of completion, and shall be made available to the public.

- B.) The Department shall also prepare a report, every five years, beginning in 2014, which evaluates the effectiveness of this law, in terms of fertilizer sales information, environmental impact data, and any other information the Commissioner deems necessary. This report shall be completed no later than September 30 of the given year, shall be filed with the Clerk of the Legislature within 15 days of completion, and shall be made available to the public.

Section 7. Signs and Brochures.

The Department, in consultation with the Suffolk County Department of Health Services, shall develop, within one year of the effective date of this law, the signs and brochures referred to in section 4(A). The signs and brochures shall be written in a clear and simple manner and shall contain the suggested guidelines referred to in Section 5(B).

Section 8. Exemptions.

- A.) Section 3 of this law shall not apply to land used in farm operations, as defined in the N.Y. Agricultural and Markets Law Section 301.
- B.) Section 3(A) of this law shall not apply to:
- i.) Golf courses, provided, however, that only the minimum amount of slow-release and organic fertilizer shall be used that is needed to sustain healthy turf on golf courses, and that fertilizer application rates shall be limited to 3 lbs. of nitrogen/1000 sq. ft. per year, over the golf course as a whole, consistent with the Organic Maintenance Plan adopted via Suffolk County Resolution No. 608-1998.
 - ii) The Suffolk County Farm; provided, however, that the Suffolk County Farm shall be subject to a goal of nitrogen reduction. The Suffolk County Departments of Planning and Health Services, in consultation with the Department, shall establish strategies to achieve this goal. Recommendations made in the following document shall be considered in developing the strategies:

A Strategy to Develop and Implement the Suffolk County
Agricultural Stewardship Program - A Report to the
Agricultural Environmental Management Task Force for
Nitrogen and Pesticides Load Reduction - Final Report (May
26, 2004).
 - iii) Athletic fields, provided, however, that the County department with jurisdiction of the fields shall develop and comply with an annual plan containing best management practices to reduce use of fertilizer and avoid fertilizer leachate. The plan shall be submitted to the Department for review and approval.
 - iv) Newly-seeded or planted landscapes and newly-seeded or newly-sodded areas.

- C.) Any reporting requirement which is promulgated by Suffolk County pursuant to Section 4B shall not apply to an establishment selling less than one thousand (1000) pounds of fertilizer in total during the preceding calendar year.

Section 9. Waivers.

Upon written application to the Department by a person utilizing County-owned property, a waiver of the prohibition in Section 3(A) of this law may be granted upon such terms and conditions as deemed appropriate at the Commissioner's sole discretion. The decision to grant a waiver shall be based upon the following factors:

- A.) Whether the waiver application is in general conformity with this law;
- B.) Whether the uses of groundwater, surface water and drinking water supplies will be impaired;
- C.) Whether the application conforms to a comprehensive management plan and/or well accepted best management practices, and;
- D.) Whether the proposed use can be modified so that the project will not require a waiver.

Section 10. Enforcement.

The Suffolk County Department of Health Services shall enforce the prohibitions and requirements of Section 3 and 4 of this law, in accordance with the enforcement procedures established by Suffolk County Sanitary Code Article II, §§ 760-202 through 760-220.

Section 11. Penalties.

- A.) Any violation of Sections 3 and 4 this law shall be subject to a civil penalty, in an amount not to exceed \$1,000.00 per violation.
- B.) Each day of continued violation shall constitute a separate additional violation.

Section 12. Rules and Regulations.

The Department, in consultation with the Suffolk County Department of Health Services and Suffolk County Office of Consumer Affairs, shall issue and promulgate such rules, regulations and standards as deemed necessary and appropriate to carry out the provisions of this law.

Section 13. Amendment.

Section 345-17 of Article II of Chapter 345 of the Suffolk County Code is hereby amended as follows:

**ARTICLE II
Home Improvement Contractors**

* * * *

§ 345-17. License required.

* * * *

- F.) Every person applying under this Chapter for a license to engage in, or applying for the renewal of a license to engage in, home improvement contracting, as that term is used in this Chapter, and who applies any fertilizer in the operation of such home contracting business, shall take a turf management course approved by the Commissioner of the Department of Environment and Energy, pursuant to rules, regulations and standards to be promulgated by the Department of Environment and Energy.

[F] G.)

* * * *

Section 14. Reverse Preemption.

This law shall be null and void on the day that Statewide or Federal legislation goes into effect, incorporating either the same or substantially similar provisions as are contained in this law, or in the event that a pertinent State or Federal administrative agency issues and promulgates regulations preempting such action by the County of Suffolk. The County Legislature may determine via mere resolution whether or not identical or substantially similar statewide legislation has been enacted for the purposes of triggering the provisions of this section.

Section 15. Applicability.

Sections 3, 4 and 13 of this law shall apply to all actions occurring on or after January 1, 2009.

Section 16. Severability.

If any clause, sentence, paragraph, subdivision, section, or part of this law or the application thereof to any person, individual, corporation, firm, partnership, entity, or circumstance shall be adjudged by any court of competent jurisdiction to be invalid or unconstitutional, such order or judgment shall not affect, impair, or invalidate the remainder thereof, but shall be confined in its operation to the clause, sentence, paragraph, subdivision, section, or part of this law, or in its application to the person, individual, corporation, firm, partnership, entity, or circumstance directly involved in the controversy in which such order or judgment shall be rendered.

Section 17. SEQRA Determination.

This Legislature, being the lead agency under the State Environmental Quality Review Act, N.Y. Env'tl. Conserv. Law Art. 8 ("SEQRA") and Chapter 279 of the Suffolk County Code, hereby determines that this local law constitutes a Type I action, pursuant to 6 N.Y.C.R.R. §617.4. This Legislature further finds and determines that implementation of this action will not have a significant impact on the environment for the following reasons:

1. The proposed action will not exceed any of the criteria in Section 617.7 of Title 6 NYCRR, which sets forth thresholds for determining significant effect on the environment, as demonstrated in the Environmental Assessment Form;
2. The proposal does not appear to significantly threaten any unique or highly valuable environmental or cultural resources as identified in or regulated by the Environmental Conservation Law of the State of New York or the Suffolk County Charter and Code; and

3. The action will have significant beneficial impacts by minimizing nitrogen leachate to groundwater and surface waters, which will minimize hazards to drinking water and human health, while alleviating cultural eutrophication stresses to surface waters.

In accordance with Section 279-5(C)(4) of the Suffolk County Code, the Suffolk County Council, on Environmental Quality is hereby directed to prepare and circulate any appropriate notices or determinations in accordance with this resolution.

Section 18. Effective Date.

This law shall take effect immediately upon filing in the Office of the Secretary of State.

[] Brackets denotes deletion of existing language
___ Underlining denotes addition of new language

DATED: December 18, 2007

APPROVED BY:

/s/ Steve Levy
County Executive of Suffolk County

Date: January 16, 2008

After a public hearing duly held on January 15, 2008
Filed with the Secretary of State on January 31, 2008



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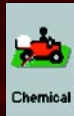
GCS interfaces with the Palm VII™ connected organizer to allow real-time access to your GCS system, the Internet, e-mail and much more. Using cellular phone technology, the Palm VII™ connected organizer is always in touch with your office based systems.

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SAVE TIME AND INCREASE PRODUCTIVITY *GCS™ Is Designed to Increase the Productivity of Supervisors.*

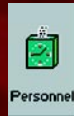
From day-to-day activities such as work scheduling and inventory control to detailed budget analysis and labor tracking, GCS helps supervisors efficiently organize and interpret grounds care activities. GCS also helps save time. Related sections automatically share data to minimize data entry.

Chemical/Fertilizer



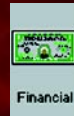
- Automatically calculates instant, accurate tank mixtures.
- Generate application work order details automatically from this section.
- Information logs automatically for audit trail and reporting.

Personnel



- Comprehensive employee information at your fingertips.
- Easy to track employee performance.

Financial



- Financial transactions post automatically from other sections.
- Intuitive graphs used to compare budgeted and actual expenditures.

Weather/Irrigation



- Track weather and irrigation data for any range of dates.
- Degree days calculate automatically and are graphically displayed.
- Interfaces with most weather stations.

Reference



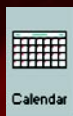
- Full color reference for pH chart and particle size chart.
- Every conversion reference imaginable.
- Math section for area and volume calculations.



GCS™ Main Screen

Your custom logo appears in the center of the main GCS screen. Across the top of the screen, various buttons display each section on a convenient toolbar. To access a specific section, simply click on the desired button.

Calendar



- Schedule important events for you and your staff.
- Review your schedule by day, month or year.
- Scheduled work orders post automatically to the calendar.

Equipment Maintenance



- Audible and visual alerts (on screen and via reports) when equipment requires service.
- Generate service work orders directly from the equipment section quickly and easily.
- Preventative maintenance schedules pre-loaded for your convenience.

Grounds



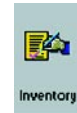
- Set up ground dimensions in square footage/acreage (metric also available).
- Incorporate scanned images of your entire course and/or individual areas.
- Comprehensive vegetation database.

Work Orders

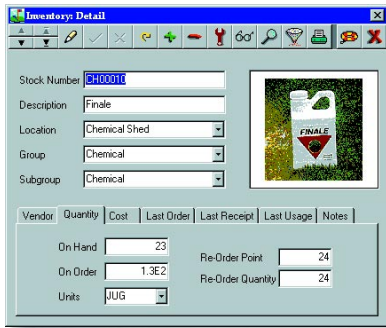


- Simply point and click with your mouse to assign an employee(s) to a particular task(s).
- Easy to determine cost and time spent for employee activities.
- Materials used for a work order are automatically subtracted from inventory.

Inventory

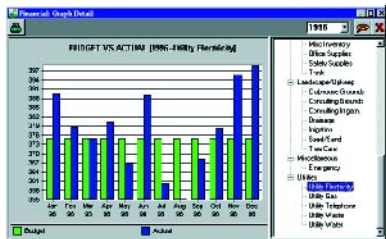


- Always know current inventory on hand.
- Professionally formatted purchase orders faxed or e-mailed directly from your PC.
- Choose from many different reporting options.



INVENTORY
*Know Current Inventory,
 Required Inventory, and All Types
 of Other Inventory Information.*

The Inventory section provides comprehensive information for your entire inventory, such as on-hand quantity, last usage, average cost, etc. This section also includes Purchase Orders, Order Receiving, Inventory Transactions, Inventory Validation, a Vendors Database, and more. Extensive reporting options indicate required inventory, inventory transaction histories, open purchase orders, etc. For inventory flagged as "Equipment," a detailed reference screen displays replacement parts, labor history, parts history and more!

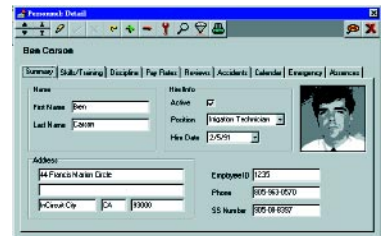


FINANCIAL
*Easy to Compare Budgeted Versus
 Actual Expenditures.*

Very little data entry! Financial transactions post automatically from other sections. To scrutinize budgeted versus actual expenditures, simply highlight the desired expense category, then choose from a variety of graphing options to visualize budget variances for that category. In addition, by simply selecting any given month with your mouse, the underlying detailed transactions/expenditures from that month will appear for your review.

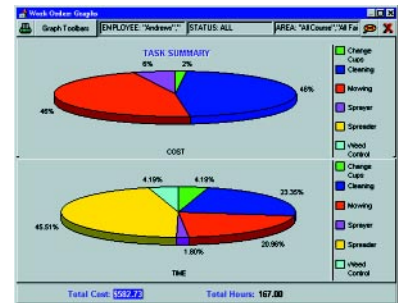
PERSONNEL
*Comprehensive Employee
 Information at Your Fingertips.*

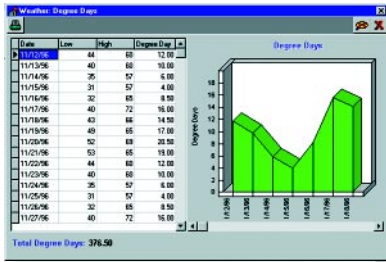
At a glance, view all types of employee information including a color photograph of each employee. With GCS, it's easy to track employee performance. The Personnel section includes an employee main listing, a performance review database, an accident report database, a pay-rates database, a calendar, and much more. GCS also includes a detailed labor tracking section.



LABOR TRACKING
*Graph Labor Times and Costs for
 Different Tasks and Areas.*

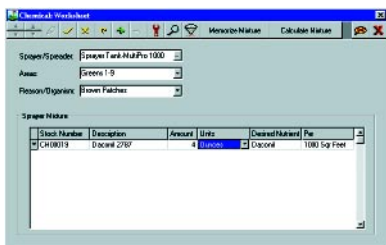
It's simple to analyze individual, group, or total employee performance. Pie graphs indicate how much time and money is being spent for employees by task or area. Use your mouse to drill down to additional expense details, including work order labor cost, inventory cost, fuel cost, etc.





WEATHER/IRRIGATION
Tracking Weather and Irrigation Data is a Snap With GCS™.

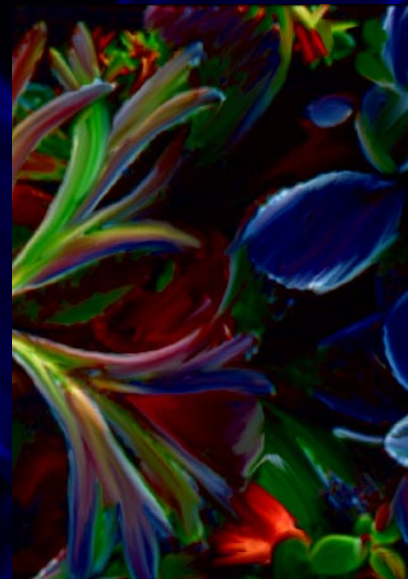
Precipitation, humidity, high and low temperatures and various other weather conditions can be recorded daily. GCS is designed to interface directly with most weather stations. Check irrigation history and treated areas by date with easy-access graphs. Degree days calculate automatically and are graphed for quick viewing.



CHEMICAL/FERTILIZER
No More Manual Calculations.

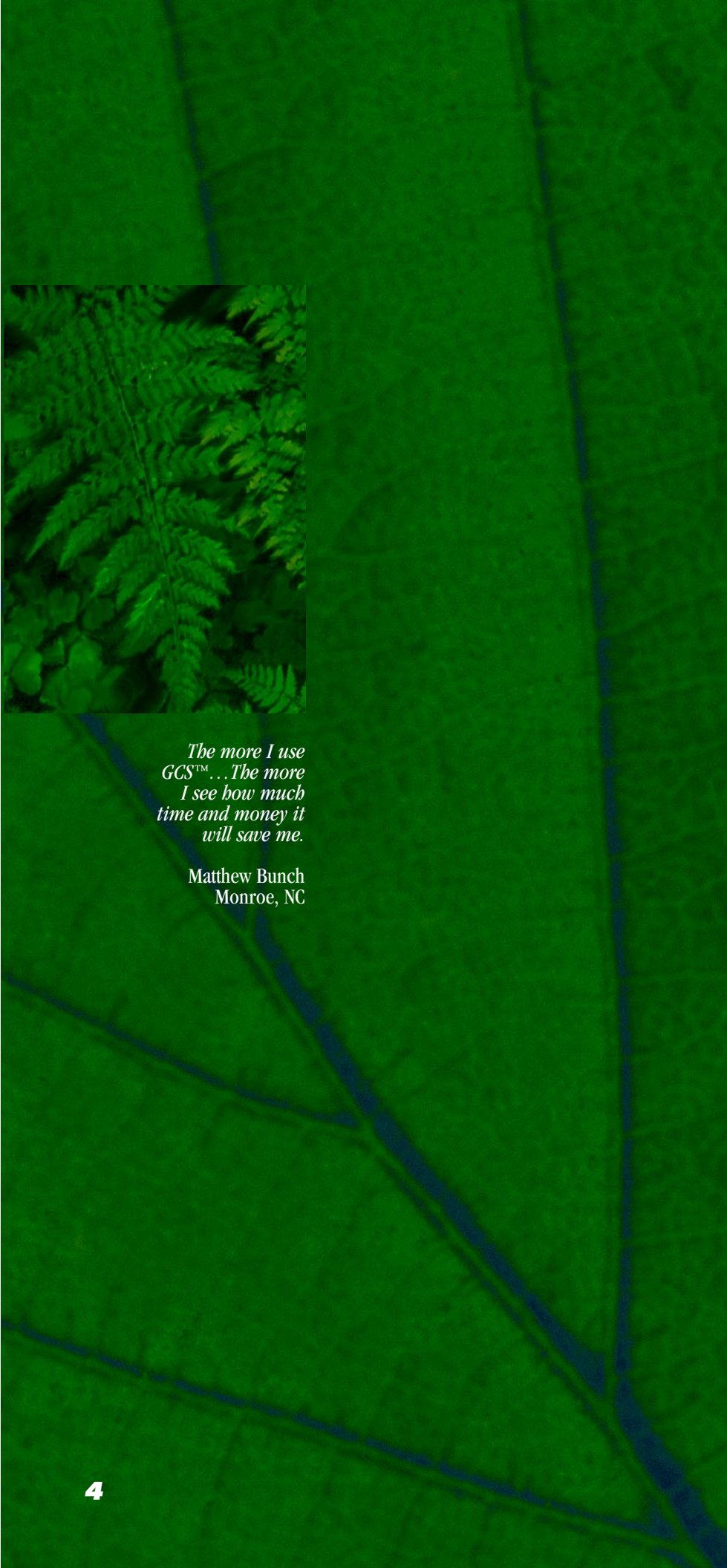
The Chemical and Fertilizer section allows the user to set up detailed information on sprayers, spreaders, chemicals, and fertilizers. To calculate a mixture, simply choose a sprayer or spreader, the areas you intend to treat, and the chemicals or fertilizers to be used, and GCS calculates instant, accurate tank mixtures.

GCS automatically logs all applications for future reference and reporting. Track information on date/time of application, equipment and personnel utilized, safety precautions, reason for the application, areas treated, weather conditions, and more. GCS provides proven methods for ensuring accurate applications and monitoring their results.



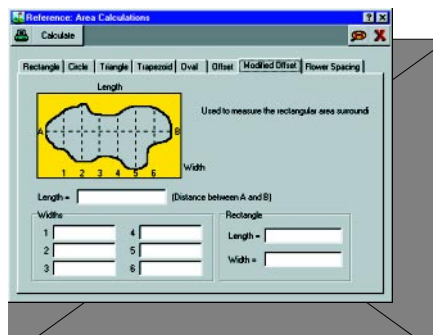
You just fill in the blanks on the screen...then select the areas to spray and GCS™ does the rest in a few seconds!

Landon C. Miller, Ph.D.
 Clemson University



*The more I use
GCS™... The more
I see how much
time and money it
will save me.*

Matthew Bunch
Monroe, NC



REFERENCE *GCS™ Includes Lots of Quick References for Your Convenience.*

Full color reference for pH and particle size charts. Reference every imaginable conversion. Calculate complex math equations quickly and easily. Area calculations include: Rectangle, Circle, Triangle, Trapezoid, Oval, and Offset. Volume calculations include: Curve, Cylinder, Cone, and Top-dressing.

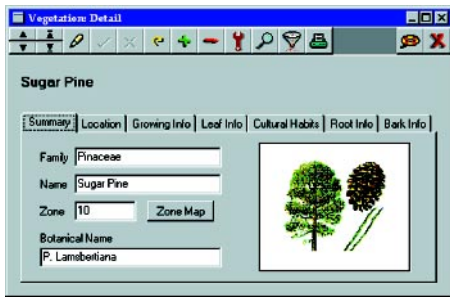
CALENDAR

Schedule events for your employees or keep track of important equipment and supplies. View your schedule by day, month, or year. Work orders automatically post to the Calendar section for your convenience.

Stock Number	Description	Substance	Last Dtg	Hours	Units
EQ05810	Franklin 218 - 2 1/2 H D	Mower, Reed, Pile		237	Hr
EQ06930	Redhawk 500 D	Mower, Reed, Pile		1,215	Hr
EQ07174	EQ 7400-90 Vow Sweeper	Sweeper		2,015	Hr
EQ07215-1	Volvo 4000D	Tractor		2,760	Hr
EQ07215-2	Volvo 4000D	Tractor		152	Hr
EQ08800	Land Plo 14 480	Land Ploiler		1,460	Hr
EQ09110	Exxon 5000A	Generator, Walk		91	Hr
EQ09501	Fahrer 4000	Generator, Toward		167	Hr
EQ10214	Exxon 5000A-224	Mower, Reed, Pile		399	Hr
EQ12500	Exxon 5000A-224 L	Mower, Reed, Pile		95	Hr
EQ14151-1	Mult Pro - 100	Tractor		3,760	Hr
EQ14151-2	Mult Pro - 100	Tractor		139	Hr
EQ14120	Scout Task-Mult Pro 1000	Tractor		395	Hr
EQ14150	Pro - 2 Speed-Mult Pro 1000	Tractor		212	Hr
EQ14150	Tractor Speed-Mult Pro 1000	Tractor		2,230	Hr
EQ14430-1	Topdresser 5000	Topdresser		4,105	Hr
EQ14430-2	Topdresser 5000	Topdresser		0	Hr
EQ14500	Ph-21 Speed-Mult Pro 9000	Tractor		306	Hr
EQ14600	Turf Sweeper 5000-L	Sweeper		4,369	Hr

EQUIPMENT MAINTENANCE *Keeping Track of Required Maintenance on Equipment is as Easy as Clicking the Mouse.*

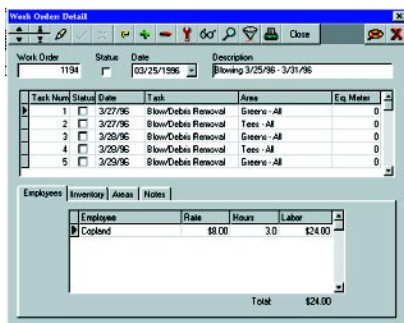
Simply click on "Required Maintenance" to view current maintenance requirements for any item in inventory. Items in need of service are outlined in red on the computer screen. Simply click on "Generate Work Order" to automatically create the order to service an item. All service requirements and equipment information automatically transfer to the Work Order section to reduce data entry. Analyze year-to-date and cumulative labor, parts, fuel, and other costs for any item to help with replace or repair decisions.



GROUNDS

Maintain Ground Dimensions, Course Drawings and Pictures, and a Comprehensive Vegetation Database.

The Grounds section includes a database for maintaining all ground dimensions in square footage/acreage (metric settings also available). Include scanned images of your entire course or individual areas in the Pictures database. The vegetation library includes all types of information including growing characteristics, cultural habits, etc.



WORK ORDERS

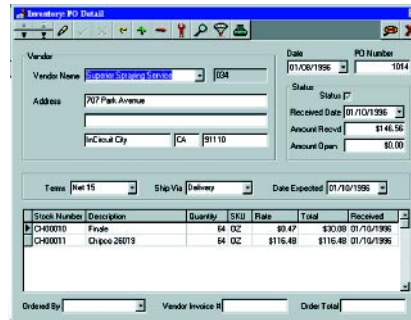
Schedule Work Orders for Employees in Seconds!

The Work Orders section is comprehensive, flexible, and easy to use. This section incorporates intuitive graphs that indicate employee cost and time spent for various tasks or areas. Choose "Add" to begin a new work order, then use the drop down menus to select a task, area, employee, etc. Choose the filter option to review work orders for an employee(s) on any given day, range of days, or all days. The "security" option even allows employees to fill in their own labor times while the rest of the application remains password protected. Materials used on work orders are automatically subtracted from inventory. Labor costs automatically post to the Financial section for proper budgeting. All transactions are cross-referenced and updated automatically.

PURCHASE ORDERS

Order Supplies and Equipment On-Line using Secure E-Commerce.

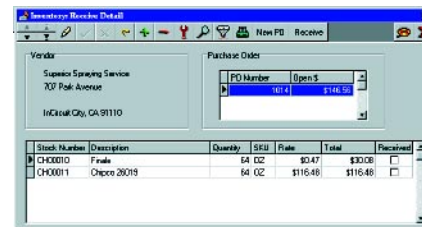
Create electronic or printed purchase orders quickly and easily with GCS. Automatic reminders indicate items that need to be reordered. With a few simple key strokes you can send an electronic or printed order to your preferred vendor. Once items are received, GCS automatically updates your on-hand inventory and financial ledgers.



RECEIVING SCREEN

Receiving Ordered Inventory Is Fast and Simple.

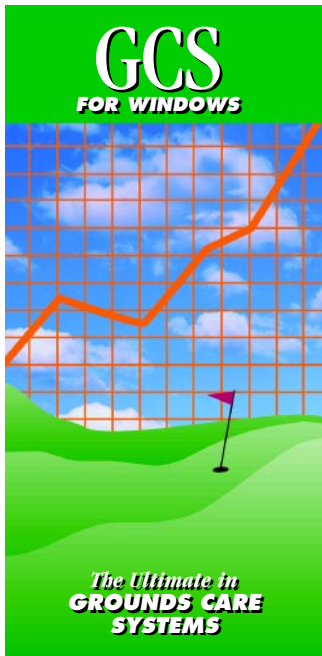
It's easy to take delivery of ordered goods. Simply highlight the vendor you are receiving from and choose the appropriate PO. Enter the requested information such as receiving date, quantity, and amount. GCS will automatically update the on-hand amount in inventory and the associated cost in the financial ledgers.



OTHER FEATURES

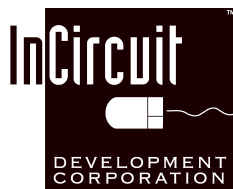
GCS™ Includes Many Additional Custom Features.

- QuickLoad Feature to Automatically Download Equipment Information (PM schedules and Replacement Parts), Chemical and Fertilizer Information, Parts Lookup, and Vegetation Library
- Integrated MSDS and Label Information for all Chemicals and Fertilizers
- Automate GCS Data Entry with Palm VII™ Connected Organizers for Equipment Maintenance, Work Order Scheduling, Spray Applications, Inventory Management, and much more.
- Create Unlimited Custom Reports with the Built-in Report Writer
- File Export/Import Utilities to Transfer Data with Other Business Software (*Excel, Lotus, Quattro, Quicken, etc.*)



OUR COMMITMENT

In addition to designing and delivering top-rated custom applications, InCircuit™ is committed to providing best-of-breed customer support.



7000 Bee Caves Road
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Austin, Texas 78746

Local Phone: (512) 347-7400
Internet: sales@incircuit.com
Web: www.incircuit.com

*Want to know more about GCS™? Call
800-963-1925
for a demo of the ultimate grounds care system.*

UP AND RUNNING

If you need any assistance or have questions concerning the best way to set up your system, InCircuit is only a phone call away. We will walk you through the installation step-by-step and make any necessary recommendations. However, the installation of your custom system is just the beginning of your relationship with InCircuit. At InCircuit, we measure our success based on follow-up business. We are committed to providing exceptional post-sale support. InCircuit will be by your side after the installation to ensure your continued success.

System Requirements

To Install and Use GCS™, You Need:

	Recommended / Minimum	
Computer	Pentium III	Pentium I
RAM	64 MB	32 MB
Monitor	Super VGA	VGA
Microsoft® Windows®	2000	'95 or better
Free Hard Disk Space	100 MB	50 MB
Floppy Disk Drive	3.5 inch	3.5 inch
CD-ROM Drive	Yes	Yes
Mouse or Pointing Device	Required	Required
Browser	I.E. 5.5 or Better	Not Required

WORLD-CLASS TECHNICAL SUPPORT

InCircuit developed the best-selling grounds care system by listening to the requests of our users. We value a close working relationship with all our customers and want to provide you with the most comprehensive and easy-to-use software system possible. After all, the objective of a custom system is to increase your productivity. If you need any assistance to help get the most out of your system, give us a call. InCircuit is available 24 hours a day, every day of the year!

COMPREHENSIVE SUPPORT PLANS

For customers who want a complete support plan at a fixed annual rate, InCircuit offers you several packaged support options. These options include unlimited technical support, special upgrade offers, and other custom consulting features. Ask your InCircuit customer representative for additional details.

A Method to Measure the Environmental Impact of Pesticides, Table 2: List of Pesticides, Part 3: Herbicides 2012



Action: IGR = insect growth regulator, PGR = plant growth regulator, PA = plant activator, CP = crop protectant, BP = biopesticides, B = bactericide, AC = acaricide, I = insecticide, F = fungicide, H = herbicide, Fum = Soil fumigant

EIQ Revision Date: Date of latest revision. Original = EIQ value from 1992 bulletin

Old EIQ Rating: EIQ value from original 1992 bulletin or from previous revision.

Missing Data: None=no missing data values, B= toxicity to beneficial insects, P=plant surface half life, Z= toxicity to bees, C=chronic health effects, R=runoff potential, L=leaching potential, S=soil residue half life

Formula Symbols: DT = Acute dermal toxicity D = Toxicity to birds F = Toxicity to fish Z = Toxicity to bees L = Leaching potential R = Runoff potential S = Soil residue half life SY = Mode of action C = Chronic health effects P = Plant surface health effects B = Toxicity to beneficials

Formulas			(Farm Worker+ Consumer+ Ecological)/ 3						C(DT*5)	C(DT*P)	C(DT*5) +C(DT*P)	C* ((S+P)/2) *SY	L	C* ((S+P)/2) *SY)+L	(F*R)	(D*((S+P) /2*3)	(Z*P*3)	(B*P*5) (Beneficial)+ (Plant 1/2L)	(D+B) (Bird)+ (Beneficial)	(Fish)+(Bird) +(Bee)+ (Beneficial)
Common Name	Trade Name	Action	EIQ total	EIQ Rev Date	Old EIQ Rating	Missing Data	Applicator Effects	Picker Effects	Farm Worker	Consumer Effects	Grd H2O Leaching	Consumer + Leaching	Fish	Birds	Bee	Beneficials	Terrestrial	Ecology		
Herbicides																				
1,3-dichloropropene	Telone	H	27.75	Mar-09	35.70		30.00	11.40	41.40	2.90	5.00	7.90	3.00	4.35	17.10	9.50	30.95	33.95		
2,4-D butyl or butoxyethyl ester	Tufon, Weedone	H	15.33	Apr-04	17.33		5.00	3.00	8.00	2.00	3.00	5.00	3.00	6.00	9.00	15.00	30.00	33.00		
2,4-D dichlorophenoxyacetic acid	various	H	16.67	Apr-08	18.67	P	5.00	3.00	8.00	3.00	5.00	8.00	1.00	9.00	9.00	15.00	33.00	34.00		
2,4-D dimethylamine	Dacamine	H	20.67	Apr-04	22.67	none	15.00	9.00	24.00	2.00	5.00	7.00	1.00	6.00	9.00	15.00	30.00	31.00		
2,4-D ethyl ester	various	H	15.33	Apr-04	17.33	none	5.00	3.00	8.00	2.00	1.00	3.00	5.00	6.00	9.00	15.00	30.00	35.00		
2,4-DP, azin acetic acid	Weedone vinegar	H	12.40	Jan-04	15.33	B	5.00	1.00	6.00	1.00	1.00	2.00	15.00	3.00	3.00	8.20	14.20	29.20		
acetochlor	Guardian	H	19.86	Mar-09	New	B, P	7.50	3.15	10.65	2.33	3.00	5.33	15.00	4.65	6.30	17.64	28.59	43.59		
acifluorfen-sodium	Storm	H	23.57	Mar-09	47.50	B, S	10.00	6.00	16.00	5.80	3.00	8.80	3.00	8.70	9.00	25.20	42.90	45.90		
acrolein	Magnicide	H	31.76	Mar-09	New	D, Z, S	22.50	13.50	36.00	4.35	5.00	9.35	5.00	9.83	9.90	25.20	44.93	49.93		
alachlor	Lasso	H	17.86	Mar-09	18.30	P, B	7.50	3.15	10.65	2.33	3.00	5.33	9.00	4.65	6.30	17.64	28.59	37.59		
allidochlor	Randox	H	28.96	Original	Original	B,C,Z	15.00	6.36	21.36	2.46	3.09	5.55	10.29	7.38	6.36	35.93	49.67	59.96		
ametryn	ametryn	H	24.18	Mar-09	New	P, B	15.00	6.30	21.30	7.65	3.00	10.65	9.00	7.65	6.30	17.64	31.59	40.59		
amino triazole (see amitrole)	Weedkiller 90	H	31.80	Original	Original	None	15.00	6.30	21.30	4.65	3.00	7.65	3.00	4.65	6.30	52.50	63.45	66.45		
aminopyralid	Milestone	H	22.67	May-12	New	none	5.00	3.00	8.00	3.00	8.00	1.00	9.00	27.00	15.00	5.00	51.00	52.00		
amitrole (amino triazole)	Amitrole	H	31.80	Apr-04	18.67	P	15.00	6.30	21.30	4.65	3.00	7.65	3.00	4.65	6.30	52.50	63.45	66.45		
ammonium sulfamate	Sulfamate	H	23.66	Mar-09	38.30	DT, F, C, B, D	11.00	6.60	17.60	4.40	5.00	9.40	2.10	6.78	9.90	25.20	41.88	43.98		
asulam	Asulox, Asulam	H	18.67	Apr-03	Original	None	10.00	6.00	16.00	4.00	3.00	7.00	3.00	6.00	9.00	15.00	30.00	33.00		
atrazine	Atrazine	H	22.85	Apr-03	22.90	None	5.00	3.00	8.00	4.00	3.00	7.00	9.00	12.00	9.00	23.55	44.55	53.55		
azafenidin	Milestone	H	8.00	Jan-05	Original	none	5.00	1.00	6.00	1.00	3.00	4.00	3.00	3.00	3.00	5.00	11.00	14.00		
azimsulfuron	Gulliver	H	14.67	Jan-05	Original	none	5.00	3.00	8.00	2.00	3.00	5.00	1.00	6.00	9.00	15.00	30.00	31.00		

benefluralin, benefin	Balance	H	17.00	Apr-08	15.67	None	7.50	1.50	9.00	3.00	1.00	4.00	25.00	6.00	3.00	5.00	14.00	39.00
bensulfuron methyl	Rozal	H	12.03	Mar-09	New	P	5.00	2.10	7.10	1.55	3.00	4.55	3.00	4.65	6.30	10.50	21.45	24.45
bensulide	Prefar	H	26.00	Apr-08	26.00	none	5.00	1.00	6.00	3.00	1.00	4.00	25.00	9.00	15.00	19.00	43.00	68.00
bentazon	Basagran 4S	H	18.67	Apr-08	20.33	P	10.00	6.00	16.00	4.00	5.00	9.00	1.00	6.00	9.00	15.00	30.00	31.00
bispyribac-sodium	Regiment	H	11.47	Mar-09	New	R, L, P	5.00	1.90	6.90	1.45	3.10	4.55	3.40	4.35	5.70	9.50	19.55	22.95
bromacil	various	H	12.63	Mar-09	20.00	P	5.00	1.90	6.90	2.45	5.00	7.45	1.00	7.35	5.70	9.50	22.55	23.55
bromoxynil	Brominex, Buctril	H	17.00	Apr-08	20.00	P	7.50	4.50	12.00	3.00	3.00	6.00	3.00	6.00	9.00	15.00	30.00	33.00
butafenacil	Inspire	H	17.33	Jan-05	Original	B	5.00	3.00	8.00	2.00	3.00	5.00	9.00	6.00	9.00	15.00	30.00	39.00
butoxydim	Falcon	H	17.33	Apr-04	Original	None	5.00	3.00	8.00	2.00	3.00	5.00	9.00	6.00	9.00	15.00	30.00	39.00
butylate	Butylate	H	16.41	Mar-09	8.70	P, B	5.00	2.10	7.10	1.55	3.00	4.55	9.00	4.65	6.30	17.64	28.59	37.59
carfentrazone	SpeedZone	H	20.18	Mar-08	21.52	none	5.00	3.00	8.00	2.00	3.00	5.00	9.00	6.00	9.00	23.55	38.55	47.55
chloramben	Amiben	H	15.70	Original	Original	R,B	12.50	2.50	15.00	2.50	3.00	5.50	3.60	3.00	3.00	17.00	23.00	26.60
chlorimuron-ethyl	Classic	H	19.20	Apr-04	28.00	B	5.00	3.00	8.00	2.00	5.00	7.00	3.00	6.00	9.00	24.60	39.60	42.60
chloroxuron	Tenorán	H	39.00	Mar-09	Original	P, B	11.20	6.72	17.92	6.50	9.59	9.59	3.43	26.10	9.00	50.85	85.95	89.38
chlorpropham	Sprout	H	30.58	Mar-09	19.30	P	10.00	4.20	14.20	5.10	3.00	8.10	3.00	7.65	6.30	52.50	66.45	69.45
chlorpropham	Sprout	H	30.58	Mar-09	19.30	P	10.00	4.20	14.20	5.10	3.00	8.10	3.00	7.65	6.30	52.50	66.45	69.45
chlorsulfuron	Glean	H	26.67	Mar-07	9.30	none	5.00	3.00	8.00	3.00	5.00	8.00	1.00	9.00	9.00	45.00	63.00	64.00
cinidon-ethyl	Lotus	H	15.33	Jan-05	New	none	5.00	3.00	8.00	2.00	1.00	3.00	5.00	6.00	9.00	15.00	30.00	35.00
clethodim	Select	H	17.00	Dec-00	17.00	none	7.50	4.50	12.00	3.00	5.00	8.00	1.00	6.00	9.00	15.00	30.00	31.00
clodinafop-propargyl	Moolah	H	25.33	Apr-04	Original	none	10.00	6.00	16.00	4.00	1.00	5.00	25.00	6.00	9.00	15.00	30.00	55.00
clofencet	Genesis	H	39.67	Jan-04	55.00	B	7.50	7.50	15.00	18.00	3.00	21.00	15.00	12.00	15.00	41.00	68.00	83.00
clomazone	Command	H	19.63	Mar-09	11.70	P	7.50	3.15	10.65	3.83	3.00	6.83	3.00	7.65	6.30	24.47	38.42	41.42
clopyralid	Stinger	H	18.12	Apr-08	18.10	none	5.00	3.00	8.00	3.00	5.00	8.00	1.00	9.00	9.00	19.35	37.35	38.35
cloquintocet-mexyl	Horizon	H	15.33	Apr-04	15.33	C	5.00	3.00	8.00	2.00	1.00	3.00	5.00	6.00	9.00	15.00	30.00	35.00
cloransulam-methyl or chloransulam-methyl	FirstRate	H	15.33	Jan-03	15.33	B, P	5.00	3.00	8.00	2.00	3.00	5.00	3.00	6.00	9.00	15.00	30.00	33.00
cyanazine	Bladex	H	20.06	Mar-09	19.80	F, P, B	10.00	4.20	14.20	5.10	3.00	8.10	6.30	7.65	6.30	17.64	31.59	37.89
cyclanilide	Finish	H	27.48	Mar-09	22.70	P,B	7.50	3.15	10.65	2.33	3.00	5.33	3.00	4.65	6.30	52.50	63.45	66.45
cycloate	Ro-Neet	H	17.33	Jan-05	15.30	B	10.00	2.00	12.00	4.00	3.00	7.00	9.00	6.00	3.00	15.00	24.00	33.00
cyhalofop-butyl	Clincher	H	25.20	Jan-08	34.00	B, C	5.00	3.00	8.00	2.00	1.00	3.00	25.00	6.00	9.00	24.60	39.60	64.60
dalapon-sodium	Dalapon	H	19.82	Mar-09	37.50	P, B, C	11.00	4.62	15.62	5.61	3.00	8.61	3.00	7.65	6.93	17.64	32.22	35.22
DCPA	Dactal	H	15.43	Jan-04	15.43	none	7.50	1.50	9.00	3.00	1.00	4.00	15.00	6.00	3.00	9.30	18.30	33.30
desmedipham	Betanex	H	17.75	Mar-09	21.70	P, B	5.00	2.10	7.10	1.55	1.00	2.55	15.00	4.65	6.30	17.64	28.59	43.59
dicamba, sodium	Dicamba, Clarity	H	26.33	Apr-08	28.00	none	7.50	4.50	12.00	3.00	5.00	8.00	5.00	30.00	9.00	15.00	54.00	59.00
dichlobenil	Casoron	H	23.45	Apr-03	20.78	none	7.50	4.50	12.00	6.00	3.00	9.00	9.00	12.00	9.00	19.35	40.35	49.35
dichlorprop	Dicopur DP	H	17.41	Mar-09	13.80	P, B	7.50	3.15	10.65	6.98	3.00	9.98	3.00	4.65	6.30	17.64	28.59	31.59
diclofop-methyl	Foper	H	26.00	Mar-09	29.00	P,B	12.50	4.75	17.25	6.13	1.00	7.13	25.00	7.35	5.70	15.58	28.63	53.63
diclosulam	Strongarm	H	9.73	Jan-08	13.33	P	5.00	1.00	6.00	2.00	3.00	5.00	1.00	6.00	3.00	8.20	17.20	18.20
diethyl-ethyl	Antor	H	14.70	Original	Original		5.00	1.00	6.00	2.00	17.00	1.00	3.00	9.00	6.00	3.00	26.00	35.00

difenzoquat	Avenge	H	24.91	Mar-09	30.08	C, P	12.50	4.75	17.25	6.13	1.00	7.13	5.00	7.35	28.50	9.50	45.35	50.35
diflufenzopyr	Distinct	H	17.52	Jan-01	Original	none	5.00	3.00	8.00	2.00	3.00	5.00	1.00	6.00	9.00	23.55	38.55	39.55
dimethenamid	Frontier	H	12.02	Dec-00	Original	none	7.50	1.50	9.00	1.50	3.00	4.50	3.00	3.00	3.00	13.55	19.55	22.55
dinoseb	Dinoseb	H	47.00	Feb-10	Original	None	75.00	15.00	90.00	3.00	6.00	3.00	6.00	9.00	3.00	17.85	29.85	44.85
diphenamid	Diphenamid	H	17.73	Dec-04	20.67	B	15.00	3.00	18.00	3.00	3.00	6.00	9.00	9.00	3.00	8.20	20.20	29.20
diquat-dibromide	Razor Burn	H	39.20	Mar-09	31.70	B	22.50	13.50	36.00	6.00	1.00	7.00	5.00	36.00	9.00	24.60	69.60	74.60
dithiopyr	Dimension	H	15.73	Apr-08	22.00	P,B	5.00	1.00	6.00	3.00	3.00	6.00	15.00	9.00	3.00	8.20	20.20	35.20
diuron	Karmex	H	26.47	Mar-09	20.50	none	12.50	7.50	20.00	7.50	1.00	8.50	5.00	9.00	9.00	27.90	45.90	50.90
ecolyst	Ecolyst	H	28.67	Jan-03	27.30	B, P	5.00	5.00	10.00	5.00	1.00	6.00	15.00	15.00	15.00	25.00	55.00	70.00
ecolyst	Ecolyst	H	28.67	Jan-03	27.30	B, P	5.00	5.00	10.00	5.00	1.00	6.00	15.00	15.00	15.00	25.00	55.00	70.00
endothall	Des-I-Cate	H	25.22	Mar-01	-	D,F,Z,P	15.00	6.30	21.30	1.55	5.00	6.55	5.00	5.02	6.30	31.50	42.82	47.82
EPTC	Eptam	H	9.43	Apr-03	13.3	none	5.00	1.00	6.00	1.00	3.00	4.00	3.00	3.00	3.00	9.30	15.30	18.30
ethametsulfuron-methyl	Muster	H	19.87	Jan-04	28.67	B	5.00	3.00	8.00	3.00	3.00	6.00	3.00	9.00	9.00	24.60	42.60	45.60
ethephon	Proxy	H	24.80	Apr-08	13.07	P	15.00	6.30	21.30	4.65	1.00	5.65	5.00	4.65	6.30	31.50	42.45	47.45
ethofumesate	Nortron	H	25.82	Apr-08	29.95	none	5.00	3.00	8.00	3.00	3.00	6.00	9.00	9.00	9.00	36.45	54.45	63.45
ethoxysulfuron		H	12.67	Jan-05	-	B	5.00	1.00	6.00	2.00	3.00	5.00	3.00	6.00	3.00	15.00	24.00	27.00
fenoxaprop ethyl	Excel	H	43.67	Apr-08	23.67	P	7.50	4.50	12.00	3.00	1.00	4.00	25.00	6.00	9.00	75.00	90.00	115.00
flazasulfuron	Katana	H	18.53	Jan-05	-	B	5.00	3.00	8.00	2.00	5.00	7.00	1.00	6.00	9.00	24.60	39.60	40.60
florasulam	Boxer	H	15.33	Jan-05	-	B	5.00	3.00	8.00	2.00	5.00	7.00	1.00	6.00	9.00	15.00	30.00	31.00
fluaizop-P-butyl	Fusilade	H	28.71	Mar-09	44.00	P	7.50	3.15	10.65	2.33	1.00	3.33	15.00	4.65	31.50	21.00	57.15	72.15
flufenacet	Axiom	H	11.33	Jan-04	-	B, P	5.00	1.00	6.00	2.00	3.00	5.00	9.00	6.00	3.00	5.00	14.00	23.00
flumetsulam	Python	H	15.61	Mar-09	New	S,P,B	5.00	2.10	7.10	2.45	5.00	7.45	1.00	7.35	6.30	17.64	31.29	32.29
flumiclorac	Resource	H	25.13	Mar-09	New	C, B	11.00	6.60	17.60	6.60	5.00	11.60	3.00	9.00	9.00	25.20	43.20	46.20
flumioxazine	Sumisoya	H	23.97	Jan-05	23.97	L, B, S	10.00	6.00	16.00	4.00	2.10	6.10	10.20	6.00	9.00	24.60	39.60	49.80
fluometuron	Cottenex	H	14.27	Jul-07	New	P, B	5.00	2.10	7.10	1.55	3.00	4.55	3.00	4.65	6.30	17.22	28.17	31.17
fluroxypyr	Starane	H	36.67	Apr-08	13.30	P	5.00	3.00	8.00	3.00	5.00	8.00	1.00	9.00	9.00	75.00	93.00	94.00
flurprimidol	Cutlass	H	31.80	Mar-09	New	P	15.00	6.30	21.30	4.65	3.00	7.65	3.00	4.65	6.30	52.50	63.45	66.45
flurtamone	Bacara	H	21.87	Jan-05	-	B	5.00	3.00	8.00	3.00	3.00	6.00	9.00	9.00	9.00	24.60	42.60	51.60
fluthiacet-methyl	Action	H	25.33	Jan-04	23.67	none	10.00	6.00	16.00	4.00	1.00	5.00	25.00	6.00	9.00	15.00	30.00	55.00
fomesafen	Flexstar	H	24.46	Mar-09	45.30	P, B	22.50	9.45	31.95	3.83	5.00	8.83	1.00	7.65	6.30	17.64	31.59	32.59
foramsulfuron	Aramo	H	15.33	Apr-04	27.33	B, C	5.00	3.00	8.00	2.00	5.00	7.00	1.00	6.00	9.00	15.00	30.00	31.00
forchlorfenuron	Forchlorfenuron	H	37.33	Jan-09	-	B	5.00	5.00	10.00	15.00	1.00	16.00	15.00	15.00	15.00	41.00	71.00	86.00
glufosinate-ammonium	Rely	H	20.20	Jan-04	28.25	B	7.50	4.50	12.00	3.00	3.00	6.00	3.00	6.00	9.00	24.60	39.60	42.60
glyphosate	Roundup	H	15.33	Apr-08	15.30	P	5.00	3.00	8.00	2.00	1.00	3.00	5.00	6.00	9.00	15.00	30.00	35.00
halosulfuron methyl	Sandea, Permit, Manage	H	20.20	Apr-08	17.00	B, P	7.50	4.50	12.00	3.00	3.00	6.00	3.00	6.00	9.00	24.60	39.60	42.60
hexazinone	Velpar	H	18.00	Apr-04	18.00	none	5.00	3.00	8.00	4.00	3.00	7.00	3.00	12.00	9.00	15.00	36.00	39.00
imazamox	Raptor	H	19.52	Jan-03	19.52	B,P	5.00	3.00	8.00	3.00	5.00	8.00	1.00	9.00	9.00	23.55	41.55	42.55
imazapic, imazameth	Cadre, Flame	H	21.20	Jan-04	30.00	B	5.00	3.00	8.00	4.00	5.00	9.00	1.00	12.00	9.00	24.60	45.60	46.60
imazapyr	Arsenal	H	22.30	Apr-04	18.00	none	5.00	3.00	8.00	4.00	1.00	5.00	5.00	12.00	9.00	27.90	48.90	53.90
imazaquin	Image	H	15.33	Mar-09	New	none	5.00	1.00	6.00	3.00	5.00	8.00	1.00	3.00	3.00	25.00	31.00	32.00
imazethapyr	Pursuit	H	19.57	Mar-09	27.30	C, P, B	11.00	4.62	15.62	5.61	5.00	10.61	1.00	7.65	6.30	17.54	31.49	32.49
iodosulfuron-methyl-sodium	Hussar	H	15.33	Jan-05	New	B	5.00	3.00	8.00	2.00	5.00	7.00	1.00	6.00	9.00	15.00	30.00	31.00

isoxaflutole	Balance	H	24.00	Jan-04	22.67	nonw	15.00	9.00	24.00	6.00	3.00	9.00	9.00	6.00	9.00	15.00	30.00	39.00
linuron	Lorax	H	19.32	Mar-09	40.30	P, B	7.50	3.15	10.65	3.83	3.00	6.83	9.00	7.65	6.30	17.54	31.49	40.49
maleic hydracide	MH-30	H	26.03	Mar-09	31.60	P, B	5.00	2.10	7.10	1.55	5.00	6.55	1.00	4.65	6.30	52.50	63.45	64.45
MCPA	Bronate	H	36.67	Jan-01	36.70	B	20.00	12.00	32.00	8.00	1.00	9.00	3.00	6.00	9.00	51.00	66.00	69.00
MCPA acid	various	H	17.06	Jan-05	-	D	5.00	3.00	8.00	3.00	3.00	6.00	3.00	10.17	9.00	15.00	34.17	37.17
MCPA amine	various	H	22.67	Jan-05	-	B	5.00	3.00	8.00	3.00	5.00	8.00	1.00	27.00	9.00	15.00	51.00	52.00
MCPA/B	Thistrol	H	18.28	Jan-01	18.28	None	12.50	2.50	15.00	7.50	5.00	12.50	3.00	9.00	3.00	12.35	24.35	27.35
MCPAsodium	various	H	22.67	Jan-05	36.70	B	5.00	3.00	8.00	3.00	5.00	8.00	1.00	27.00	9.00	15.00	51.00	52.00
mecoprop, MCPP	Mecoprop	H	15.33	Apr-08	21.00	P												
							5.00	3.00	8.00	2.00	5.00	7.00	1.00	6.00	9.00	15.00	30.00	31.00
mefenpyr-diethyl	Mesomezz	H	12.40	Jan-05	New	B	5.00	1.00	6.00	1.00	1.00	2.00	15.00	3.00	3.00	8.20	14.20	29.20
mefluidide	Embark	H	8.00	Mar-08	New	none	5.00	1.00	6.00	1.00	3.00	4.00	3.00	3.00	3.00	5.00	11.00	14.00
mefluidide	Embark	H	8.00	Mar-08	New	none	5.00	1.00	6.00	1.00	3.00	4.00	3.00	3.00	3.00	5.00	11.00	14.00
mesosulfuron-methyl	Atlantis	H	22.67	Jan-04	27.67	none												
							5.00	3.00	8.00	3.00	3.00	6.00	3.00	9.00	27.00	15.00	51.00	54.00
mesotrione	Callisto	H	18.67	Mar-09	18.00	C, P, B	10.00	6.00	16.00	4.00	3.00	7.00	3.00	6.00	9.00	15.00	30.00	33.00
metolachlor	Dual	H	22.00	Jan-03	22.00	none	7.50	4.50	12.00	6.00	3.00	9.00	9.00	12.00	9.00	15.00	36.00	45.00
metosulam	Eclipse	H	15.33	Jan-04	20.33	C, B	5.00	3.00	8.00	2.00	3.00	5.00	3.00	6.00	9.00	15.00	30.00	33.00
metribuzin	Sencor, Lexone	H	28.37	Apr-03	28.40	B	5.00	3.00	8.00	3.00	5.00	8.00	1.00	27.00	9.00	32.10	68.10	69.10
metsulfuron-methyl	Ally, Escort	H	16.67	Mar-09	16.67	none												
							5.00	3.00	8.00	3.00	5.00	8.00	1.00	9.00	9.00	15.00	33.00	34.00
MSMA Methylarsonic acid	Trimec	H	18.00	Apr-08	18.00	P												
							5.00	3.00	8.00	4.00	1.00	5.00	5.00	12.00	9.00	15.00	36.00	41.00
napropamide	Devrinol	H	12.57	Apr-03	12.60	none	7.50	1.50	9.00	3.00	3.00	6.00	3.00	6.00	3.00	10.70	19.70	22.70
naptalam, acid	Alanap	H	11.65	Dec-00	16.30	B	12.50	2.50	15.00	1.25	5.00	6.25	1.00	1.50	3.00	8.20	12.70	13.70
nicosulfuron	Accent	H	19.52	Dec-00	18.85	none	5.00	3.00	8.00	3.00	5.00	8.00	1.00	9.00	9.00	23.55	41.55	42.55
norflurazon	Zorial	H	17.50	Mar-09	18.80	D,Z,P,B	5.00	2.10	7.10	3.55	3.00	6.55	3.00	11.50	7.12	17.22	35.84	38.84
oryzalin	Surflan	H	18.10	Apr-03	19.43	none	7.50	1.50	9.00	3.00	3.00	6.00	9.00	18.00	3.00	9.30	30.30	39.30
oxadiargyl	Topstar, Raft	H	11.33	Apr-04	11.33	F, C												
							5.00	1.00	6.00	1.00	1.00	2.00	15.00	3.00	3.00	5.00	11.00	26.00
oxadiazon	Ronstar	H	44.67	Apr-08	26.70	none	17.50	10.50	28.00	14.00	1.00	15.00	25.00	12.00	9.00	45.00	66.00	91.00
oxasulfuron	Expert	H	18.53	Jan-05	New	B	5.00	3.00	8.00	2.00	5.00	7.00	1.00	6.00	9.00	24.60	39.60	40.60
oxyfluorfen	Goal	H	33.82	Apr-03	33.80	none	7.50	4.50	12.00	6.00	1.00	7.00	25.00	12.00	9.00	36.45	57.45	82.45
paclobutrazol	Cultar, Bonzi	H	26.43	Apr-08	28.67	P												
							15.00	6.30	21.30	3.55	3.00	6.55	3.00	10.65	6.30	31.50	48.45	51.45
paraquat-dichloride	Gramaxone	H	24.73	Mar-09	31.00	P, B												
							22.50	9.45	31.95	5.33	1.00	6.33	5.00	10.65	6.30	13.97	30.92	35.92
pebulate	Tillam	H	19.87	Mar-09	16.00	none	11.00	4.62	15.62	3.41	3.00	6.41	9.00	4.65	6.30	17.64	28.59	37.59
pendimethalin	Prowl	H	30.17	Mar-08	29.70	7.5	7.50	4.50	12.00	4.50	1.00	5.50	25.00	9.00	9.00	30.00	48.00	73.00
penoxsulam	Grasp	H	18.72	Mar-09	New	F, S	7.50	4.50	12.00	4.35	5.00	9.35	2.10	8.70	9.00	15.00	32.70	34.80
phenmediphan	Spin-aid	H	16.38	Mar-09	30.20	C, P	5.00	2.10	7.10	1.55	3.00	4.55	9.00	4.65	6.30	17.54	28.49	37.49
picloram	Pathway	H	18.00	Apr-04	20.00	none	5.00	3.00	8.00	4.00	5.00	9.00	1.00	12.00	9.00	15.00	36.00	37.00
picolinafen	Sniper, Paragon	H	26.53	Jan-05	-	P, B												
							5.00	3.00	8.00	3.00	1.00	4.00	25.00	9.00	9.00	24.60	42.60	67.60
primisulfuron-methyl	Beacon	H	18.53	Apr-04	27.33	B												
							5.00	3.00	8.00	2.00	5.00	7.00	1.00	6.00	9.00	24.60	39.60	40.60
prodiamine	Barricade	H	11.73	Apr-08	16.17	P, B	7.50	1.50	9.00	3.00	1.00	4.00	5.00	6.00	3.00	8.20	17.20	22.20

prohexadione - CA	Apogee	H	8.67	Jan-04	8.67	none													
							5.00	1.00	6.00	3.00	1.00	4.00	5.00	3.00	3.00	5.00	11.00	16.00	
prometon	Prometon	H	24.46	Mar-09	New	S, P, B, C	11.00	4.62	15.62	17.18	3.00	20.18	3.00	10.65	6.30	17.64	34.59	37.59	
prometryn	Caparol	H	15.37	Feb-10	34.00	P, B	5.00	2.10	7.10	2.55	3.00	5.55	9.00	7.65	6.30	10.50	24.45	33.45	
pronamide is now propyzamide	Kerb	H	19.36	Mar-09	36.00	B, P													
							7.50	3.15	10.65	3.83	3.00	6.83	9.00	7.65	6.30	17.64	31.59	40.59	
propanil	Stam	H	17.86	Mar-09	28.30	P, B	7.50	3.15	10.65	2.33	3.00	5.33	9.00	4.65	6.30	17.64	28.59	37.59	
propazine	Milogard	H	11.73	Dec-00	17.70	B	5.00	1.00	6.00	3.00	3.00	6.00	3.00	9.00	3.00	8.20	20.20	23.20	
propoxycarbazone-sodium	Olympus, Attribute	H	16.67	Jan-05	-	B													
							5.00	3.00	8.00	3.00	5.00	8.00	1.00	9.00	9.00	15.00	33.00	34.00	
propyzamide (was pronamide)	Kerb	H	19.36	Mar-09	36.00	B, P													
							7.50	3.15	10.65	3.83	3.00	6.83	9.00	7.65	6.30	17.64	31.59	40.59	
prosulfuron	Peak	H	19.87	Jan-05	30.50	B	5.00	3.00	8.00	3.00	5.00	8.00	1.00	9.00	9.00	24.60	42.60	43.60	
pyrazon	Pyramin	H	16.01	Original	Original	M,O,B,R,L	5.00	1.00	6.00	2.00	5.00	7.00	3.00	9.00	3.03	20.00	32.03	35.03	
pyraflufen-ethyl	Ecopart	H	24.50	Apr-04	24.50	none	10.00	6.00	16.00	3.00	1.00	4.00	25.00	4.50	9.00	15.00	28.50	53.50	
pyridate	Lentagran	H	12.03	Feb-10	Original	P	5.00	2.10	7.10	1.55	3.00	4.55	3.00	4.65	6.30	10.50	21.45	24.45	
pyrithiobac-sodium	Staple	H	21.70	Jan-04	30.50	B													
							7.50	4.50	12.00	4.50	5.00	9.50	1.00	9.00	9.00	24.60	42.60	43.60	
quinclorac	Drive	H	32.07	Sep-12	New	B	5.00	3.00	8.00	4.00	5.00	9.00	9.00	36.00	9.00	25.20	70.20	79.20	
quizalofop-P-ethyl	Assure	H	22.14	Mar-09	51.70	B, P													
							7.50	3.15	10.65	2.33	1.00	3.33	25.00	4.65	6.30	16.49	27.44	52.44	
rimisulfuron	Matrix	H	15.84	Dec-00	15.84	Z	5.00	3.00	8.00	2.00	1.00	3.00	1.00	6.00	10.17	19.35	35.52	36.52	
safllufenacil	Kixor	H	22.29	Oct-12	-	B	8.33	5.00	13.33	3.33	5.00	8.33	5.00	6.00	9.00	25.20	40.20	45.20	
sethoxydim	Poast	H	20.89	Mar-09	27.50	P	5.00	2.10	7.10	1.55	3.00	4.55	3.00	4.65	18.90	24.47	48.02	51.02	
siduron	Tupersan	H	11.73	Apr-08	16.30	P, B	5.00	1.00	6.00	3.00	3.00	6.00	3.00	9.00	3.00	8.20	20.20	23.20	
simazine	Princep	H	21.52	Mar-09	15.70	P	7.50	3.15	10.65	11.48	3.00	14.48	3.00	7.65	6.30	22.47	36.42	39.42	
sodium chlorate	Pramitol	H	34.79	Mar-09	New	P, B, Z	33.00	13.86	46.86	5.39	5.00	10.39	1.00	8.31	6.30	31.50	46.11	47.11	
sulfentrazone	Authority	H	11.73	Jan-04	14.67	B	5.00	1.00	6.00	3.00	5.00	8.00	1.00	9.00	3.00	8.20	20.20	21.20	
sulfometuron-methyl	Oust	H	19.87	Apr-04	28.67	B													
							5.00	3.00	8.00	3.00	3.00	6.00	3.00	9.00	9.00	24.60	42.60	45.60	
sulfosate	Touchdown	H	26.67	Mar-01	26.67	B	5.00	3.00	8.00	3.00	3.00	6.00	3.00	9.00	9.00	45.00	63.00	66.00	
sulfosulfuron	Monitor, Maverick	H	28.00	Apr-08	20.33	P													
							10.00	6.00	16.00	4.00	3.00	7.00	1.00	6.00	9.00	45.00	60.00	61.00	
tebuthiuron	Spike	H	23.40	Mar-09	30.00	B	8.33	5.00	13.33	6.67	3.00	9.67	1.00	12.00	9.00	25.20	46.20	47.20	
tembotrione	Triketone	H	45.78	May-12	New	none	11.67	7.00	18.67	4.67	9.67	1.00	6.00	27.00	75.00	5.00	108.00	109.00	
tepraloxydim	Aramo	H	21.90	Mar-09	20.33	B	7.50	4.50	12.00	4.50	5.00	9.50	1.00	9.00	9.00	25.20	43.20	44.20	
terbacil	Sinbar	H	22.13	Mar-09	16.80	C, P, B	11.00	6.60	17.60	8.80	3.00	11.80	1.00	12.00	9.00	15.00	36.00	37.00	
terbutryn	Terbutrex	H	20.69	Dec-08	New	B, P	7.50	3.15	10.65	3.83	1.00	4.83	15.00	7.65	6.30	17.64	31.59	46.59	
thiazopyr	Mandate, Visor	H	15.07	Jan-04	18.00	B													
							7.50	1.50	9.00	3.00	1.00	4.00	15.00	6.00	3.00	8.20	17.20	32.20	
topramezone	Clio	H	27.17	Dec-09	NEW	none	7.50	4.50	12.00	4.50	1.00	5.50	1.00	9.00	9.00	45.00	63.00	64.00	
tralkoxydim	Achieve, Grasp, Splendor	H	22.00	Jan-03	22.00	none													
							10.00	6.00	16.00	4.00	1.00	5.00	15.00	6.00	9.00	15.00	30.00	45.00	
trebuthiuron	Trebuthiuron	H	15.32	Original	Original	None	5.00	1.00	6.00	3.00	5.00	8.00	3.00	9.00	3.00	16.95	28.95	31.95	
tri-allate	Avadex BW	H	27.07	Mar-09	18.00	B	10.00	6.00	16.00	6.00	1.00	7.00	15.00	9.00	9.00	25.20	43.20	58.20	

tribenuron-methyl	Express	H	17.17	Apr-04	15.00	None	7.50	4.50	12.00	3.00	3.10	6.10	3.40	6.00	9.00	15.00	30.00	33.40
triclopyr	Garlon	H	11.00	Apr-08	9.00	none	5.00	1.00	6.00	2.00	5.00	7.00	1.00	6.00	3.00	10.00	19.00	20.00
trifluralin	Treflan	H	18.83	Apr-08	18.80	none	7.50	1.50	9.00	4.50	1.00	5.50	25.00	9.00	3.00	5.00	17.00	42.00
trinexapac-ethyl	PrimoMax	H	19.03	Apr-08	New	P	5.00	2.10	7.10	1.55	3.00	4.55	3.00	4.65	6.30	31.50	42.45	45.45

INDIAN HILLS COUNTRY CLUB GOLF CENTER
Town of Huntington, New York

SAFETY MANAGEMENT PROGRAM
SAFETY MANUAL

(Rev. 11/18-pending)

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Disclaimer

This booklet has been developed by Indian Hills Country Club's management team and is for employee informational purposes only. It was designed to provide reasonably accurate information in regard to the subject safety matters covered. The information contained herein has been obtained from sources that we believe to be competent and reliable.

Indian Hills Country Club's management team is aware that this booklet will not fit the operations of all departments and may require periodic updates in response to changing work environments or employment laws and regulations. Applicable state/federal statutes must supersede any conflicting statements made or referred to in this booklet.

Indian Hills Country Club's management team cannot be held responsible or liable for any damages, direct or indirect, which may arise, in part or in whole, from the use of this booklet or from any representation or misrepresentation contained therein. Also, it cannot be assumed that all acceptable safety and health measures are listed in this booklet.

Indian Hills Country Club's management directs all employees that have an immediate concern for safety to: STOP ALL WORK and NOTIFY your SUPERVISOR immediately.

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Section I – Introduction

One of the most valuable assets any company has is its employees. This is true if the company is a small business, a large corporation, or government agency. Therefore, it follows that investing in a workplace injury and illness prevention program is one way of protecting your assets, both physical and human.

It is well known that the direct costs of work injuries are substantial. Also, there are many indirect or hidden costs of injuries, which are often three-to-four times greater than the direct costs. Many of these costs are associated with – productive time lost by an injured employee – productive time lost by employees and supervisors attending the accident victim – time and cost to start up operations interrupted by the accident – time and cost to hire or retrain other individuals to replace the injured worker until his/her return to work – time and cost for repair or replacement of any damaged equipment or materials – cost of continuing all or part of the employee's wages, in addition to the incurred medical costs – reduced morale among your employees and perhaps lower efficiency – increased insurance premiums – administrative costs generated by the incidents – overtime costs – adverse publicity. By developing a Safety Program, it will enable you to avoid possible losses in the future.

A formal safety program will also assist your company in complying with Federal and State safety, health, and environmental laws. Lack of compliance with these laws can result in citations, fines, unfavorable publicity and, in some cases, civil suits.

Establishing a quality safety program at your place of business will take some time and involve some resources. However, you should be pleasantly surprised with the results. You will have happier employees, as they will know you are committed to safety on the job. The reward you receive will surely exceed the cost of your investment in safety protection.

The objectives of any safety program is to reduce the frequency and severity of accidents, to comply with State and Federal OSHA regulations, and to provide a safe and healthful workplace.

SAFETY POLICY STATEMENT

A company that attempts to prevent accidents without a definite guiding policy, one that is planned, publicized, and promoted, will find it difficult to prevent accidents. If Management wants acceptable safe performance, it must first write a safety policy statement. This policy statement should be brief, to the point, and define Management's attitude.

In order for your safety policy statement to be effective, you must clearly communicate it to all your employees by both explanation and by example.

Your policy statement should be typed and displayed within your place of business at a prominent location for employees and the general public to observe.

The company policy statement should be reviewed with all employees, and they should sign a document indicating they have read and understand the company safety policy statement.

See Section II and Appendix A on Model Safety Policy Statement development.

SAFETY PROGRAM FOR THE ORGANIZATION

The safety policy statement is a beginning, but certainly not a complete program. A comprehensive **Safety Program** should be developed for your organization. Also, irregularly executed inspections or safety meetings and brief spurts of executive interest are no substitute for pro-active, consistent, and visible management support and leadership for a well planned and executed safety program.

Top management needs to lead and set a positive example. If the safety program is a "low priority" for the CEO, it will likely be a "low priority" for employees. Low priority will mean inadequate attention, and that will sooner or later result in an accident, or accidents that can disable, maim, or kill.

OSHA's "General Industry Digest" notes that management commitment and employee involvement are "complimentary and form the core" of any safety program. The book provides several recommendations for achieving these two goals. Recommended actions that bear directly on drafting the safety policy include:

- Stating the worksite policies on safety and health clearly.
- Establishing and communicating safety goals and defining objectives to meet that goal.

- Assigning and communicating responsibility for all aspects of the program.
- Reviewing program operations at least once a year so that deficiencies can be identified and revised as necessary.

Make sure your program assigns responsibility and accountability to all employees in your organization. A good safety program makes it clear that every employee from you through the supervisory level to the line worker is responsible for his or her part in the program. You should make their safety and health duties clear and each of them should be held accountable for his or her safety and health related duties. Accountability should be built into job descriptions, performance reviews, and daily interaction in the workplace.

Management at all levels should accept responsibility for the organization's injury rate and should provide pro-active, visible leadership on safety management. They should also provide the resources required to design and implement a safety program that meets at least the legal requirements at the state and federal level.

- For employees, accountability should include adherence to safety rules and procedures, and prompt reporting of any hazard.

Employees must be involved in all aspects of the program from the beginning. They are the people most in contact with the potential and actual safety hazards at the worksite. They will have constructive input into the development of your safety program. The ultimate success will depend upon their support - support that will be more forthcoming for a program which they have had meaningful input.

Your safety policy should be tailored to fit your organization's corporate philosophy, needs, and culture.

See Section II for Development of Safety Program.

SAFETY DIRECTOR

Management is ultimately responsible for ensuring that a safety program is implemented and maintained. Management needs to provide the commitment, leadership, and resources. However, it is common and practical to delegate some implementation duty to an appointed safety director, while maintaining overall control and monitoring the performance of the safety program.

The safety director or designee should meet the following criteria.

- conceptually committed to safety and health in the workplace
- has or is given the time to develop and implement the program
- has or is given sufficient authority to develop and implement the program
- is supported by adequate resources to develop and implement the program
- sincerely cares about employee welfare
- has a high degree of credibility with the employees

In some situations, the safety director function can be added to an existing position. In larger companies or companies with high accident frequencies or severities or inherently hazardous processes, a full-time person is often required.

The success of your program hinges on the success of the individual you choose, and he or she cannot succeed without your full cooperation and support. Remember, that when you appoint someone as your safety director and delegate the authority to manage the program, the ultimate responsibility for safety in your workplace rests with you.

See Section II – C.2. for Safety Director Program Responsibilities.

EMPLOYEE TRAINING

As an Owner or Manager you must ensure that all employees know about the material and equipment they work with, what known hazards are in the operation, and how you are controlling the hazards.

Each employee needs to know the following:

- No employee is expected to undertake a job until he or she has received job instructions on how to do it properly and has been authorized to perform that job.
- No employee should undertake a job that appears unsafe.

Combine safety training with other training, the result you want is everyone knowing what they need to know to keep themselves and fellow workers safe and healthy.

During employee orientation, they should be given a copy of the company's Safety Policy Statement, and the company's Safety Program should be discussed with them.

After the initial employee orientation, and for existing employees, your safety program can be communicated by a variety of techniques and methods. Regular meetings could be scheduled during which safety is openly discussed. Attendance should be required for all employees. If properly planned, effective safety meetings can be held in a 15-20 minute time frame. Other methods could be posters on bulletin boards, safety and health booklets, safety signs, newsletters, safety banners, safety films/videos, etc. See Appendix D for a list of safety films/videos.

As changes are made to your safety program, keep your employees informed. The more you do to keep them informed of the changes and improvements you are making, the greater are the chances for your success.

All safety training meetings should be documented. The date of the meeting, name of the instructor, subject discussed, and the names of the employees attending the meeting should be documented on an attendance form.

See Section III for an example of a New Employee Safety Checklist.

EMERGENCY ACTION PLANNING

Planning and training for an emergency is essential in order to minimize the harmful consequences of an emergency incident. If personnel are not thoroughly trained for emergencies so their response is immediate and precise, they may expose themselves and others to greater danger, rather than reduce their exposure. The types of emergencies that may arise at your work site depend on the nature of your operation and its geographical location. They could include fire, severe weather, chemical spills, earthquakes and bomb threats. The extent to which training and drills are needed will depend upon the potential severity and complexity of the emergency. You should have an emergency procedure for handling injuries, transporting ill or injured workers, and notifying medical facilities, with a minimum of confusion. The procedures for reporting injuries and illnesses should be understood by all employees.

Emergency phone numbers should be posted. They should include at least the fire department, hospital emergency room, ambulance, and law enforcement.

See Section IV – A for additional information on Emergency and Evacuation Procedures and see Appendix B for Planning for Emergencies Sample Checklist.

ACCIDENT INVESTIGATION

Management can gain valuable information from a thorough investigation of accidents, occupational health problems and near-miss incidents. Variances from or defects in present operating procedures, unsafe work practices, and even environmental hazards may be determined.

Determining the causes of accidents – and doing something about them – will reduce accident incidence, lower workers' compensation costs, and enhance employee morale, because workers will feel they are working with a management and company that cares and wants to correct hazards and unsafe work procedures.

REMEMBER, AN ACCIDENT INVESTIGATION IS NOT DESIGNED TO FIND FAULT OR BLAME, IT IS AN ANALYSIS TO DETERMINE CAUSES THAT CAN BE CONTROLLED OR ELIMINATED.

See Section V for assistance in developing an Accident Investigation Program and sample accident investigation forms.

SELF INSPECTION/HAZARD IDENTIFICATION

The assessment of your workplace should be conducted by the person responsible for the safety program and/or a professional safety and health consultant.

Conduct a comprehensive safety and health survey of your entire facility that is designed to identify any existing or potential safety and health hazards. This initial survey should focus on evaluating workplace conditions with respect to safety and health regulations and generally recognized safe and healthful work practices. It should include checking on the use of any hazardous materials, observing employee work habits and practices, and discussing safety and health problems with employees.

Create the systems and procedures necessary to **Prevent and Control the Hazards** that have been identified through your worksite analysis. These control procedures will be your basic means for preventing accidents. The OSHA standards that have been promulgated can be of great assistance to you since they address controls in order of effectiveness and preference. Where no standard exists, creative problem solving and consultant resources should help you create effective controls. The basic formula OSHA follows is, in order of preference:

1. **Eliminating the hazard** from the machine, the method, the material or the plant structure.
2. **Abating the hazard** by limiting exposure or controlling it at its source.
3. **Training personnel** to be aware of the hazard and to follow safe work procedures to avoid it.
4. Prescribing **personal protective equipment** for protecting employees against the hazard.

See Appendix C for Self-Inspection Checklist, to help you get a good start on creating this initial survey.

Section II – Safety Foundation

A. Company Safety Policy Statement

INDIAN HILLS COUNTRY CLUB is dedicated to providing a safe and healthy work environment for all of our employees and customers. The Company shall follow operating practices that will safeguard employees, the public, and Company operations. **We believe all accidents are preventable.** Therefore, we will make every effort to prevent accidents and comply with all established safety and health laws and regulations.

B. Management Commitment to Safety

Management is concerned about employee and guest safety. Accidents, unsafe working conditions, and unsafe acts jeopardize employees, customers, and Company resources. Injuries and illnesses result in discomfort, inconvenience and possibly reduced income for the employee. Costs to the Company include direct expenses (workers' compensation premiums, damaged equipment or materials, and medical care) and indirect expenses (loss of production, reduced efficiency, employee morale problems, etc.). These indirect costs are reported to cost 4-10 times more than the insured costs of an accident. Accordingly, Management will provide sufficient staffing, funds, time, and equipment so that employees can work safely and efficiently.

C. Assignment of Responsibilities

Safety is everyone's responsibility. Everyone should have a safe attitude and practice safe behavior at all times. To best administer and monitor our safety policies, the following responsibilities are delegated. This list should not be construed as all-inclusive and is subject to change as needed.

1. INDIAN HILLS COUNTRY CLUB's management team will:
 - a. Provide sufficient staffing, funds, time, and equipment so that employees can work safely and efficiently.
 - b. Demand safe performance from each employee and express this demand periodically and whenever the opportunity presents itself.
 - c. Delegate the responsibility for a safe performance to the Manager, Supervisors, and employees, as appropriate.
 - d. Hold every employee accountable for safety and evaluate performance accordingly.
 - e. Periodically review the Safety Program effectiveness and results.
2. INDIAN HILLS COUNTRY CLUB's Safety Director will:
 - a. Provide the resources, direction, and audits to integrate safety into the management system.
 - b. Establish and maintain a safety education and training program.
 - c. Periodically conduct safety surveys, meetings, and inspections.
 - d. Advise Supervisors and employees on safety policies and procedures.
 - e. Assure that all newly hired employees have been given a thorough orientation concerning the Company's Safety Program.
 - f. Prepare and maintain safety records, analysis, evaluations, and reports to improve the Company's safety performance and comply with all government agencies, insurance carriers, and internal procedures.
 - g. Work with management, supervisors and employees to maintain and implement new and ongoing safety programs and comply with recommendations provided by outside consultants, OSHA inspectors, and insurance companies.
 - h. Make available all necessary personal protective equipment, job safety material, and first-aid equipment.
 - i. Review all accidents with Management, Supervisors, and/or employees and ensure that corrective action is taken immediately.
 - j. File all workers' compensation claims immediately and work with the workers' compensation carrier to ensure proper medical treatment is provided to injured workers and they are returned to work as quickly as medically possible.

3. Supervisors

Each employee who is in charge of a specific work area, supervises the work of others, or to whom an employee is assigned for a specific task or project, is responsible and accountable for their safety. Supervisors will:

- a. Establish and maintain safe working conditions, practices, and processes through:
 - (1) Safety Meetings
 - (2) Safety Training
- b. Observe work activities to detect and correct unsafe actions.
- c. Ensure that all injuries are reported promptly and cared for properly. Make available first aid treatment.
- d. Investigate all accidents promptly. Complete an accident report and provide it to the Manager or Supervisor the same day the accident occurs. Review all accidents with the employees and correct the causes immediately.
- e. Assist in the review of employment applications and personnel files to determine physical qualifications for specified job classifications.
- f. Consistently enforce safety rules/regulations, programs, and protective measures (i.e. use of personal protective equipment, machine guarding, proper clothing, etc.).
- g. Post signs, notices, and instructions as needed or required.
- h. Brief employees of any new hazards before they start work and weekly and/or monthly host brief safety meetings to discuss safety practices related to job hazards and general safe work behavior.
- i. Work with top management and employees to maintain and implement new and ongoing safety programs and comply with recommendations provided by outside consultants, OSHA inspectors, and insurance companies.

4. Employees

Each employee is responsible for his/her own safety. No task should be completed unless it can be completed safely. Employees will:

- a. Comply with all company safety programs, rules, regulations, procedures, and instructions that are applicable to his/her position with this organization.
- b. Refrain from any unsafe act that might endanger him/her self or fellow workers.
- c. Use all safety devices and personal protective equipment provided for his/her protection.
- d. Report all hazards, incidents, and near-miss occurrences to their Manager or Supervisor, regardless of whether or not injury or property damage was involved.
- e. Promptly report all injuries and suspected work related illnesses, however slight, to his/her immediate Supervisor or Manager.
- f. Participate in safety meetings, training sessions, and surveys as requested and provide input into how to improve safety.
- g. Notify the Manager or Supervisor immediately of any change in physical or mental condition or use of prescription drugs that would affect the employee's job performance or the safety of him/her self or others.
- h. Notify the Human Resources Manager or General Manager within five days of any serious driving, drug/alcohol, or criminal convictions.
- i. Be a safe worker on (and off) the job. Help coworkers do their job safely. Come to work everyday with a safe attitude.

D. Accountability for Safety

Everyone is accountable for safety. The general manager will establish safety objectives and develop and direct accident prevention activities. All employees should strive to reach those objectives and will be evaluated accordingly. All Managers and Supervisors annual appraisals will include safety (results to objectives in their area and companywide) as well as an audit of their performance of their safety responsibilities. All employee salary reviews will be affected by the company's safety performance record. Appraisals, which include safety records, will also be performed on all employees seeking a promotion.

E. Opinion Survey

The INDIAN HILLS COUNTRY CLUB management team requests ongoing comments and feedback from all employees. In addition, annually, the company may request all employees' opinions and input on the company's safety program through an opinion survey. Be honest. You know your job better than anyone else does. Therefore, you can provide valuable input into performing the job safely. Changes to existing safety programs, rules, procedures, etc. may be influenced by your responses. Full cooperation of all employees is expected.

F. Employee Suggestions

Safety suggestions from employees are welcomed and encouraged. To make a safety suggestion, complete the employee safety suggestion form on the following page and provide it to your immediate superior. The suggestion(s) will be reviewed by management personnel at the next Manager's meeting. Responses to suggestions will be discussed with the individual and posted where applicable on the company's bulletin board.

EMPLOYEE SAFETY SUGGESTION FORM

Employee Name (optional): _____ Date: _____

Supervisor Name: _____

Current Practice Or Condition

Suggestion

Benefits Expected From Change

(FOR SAFETY COMMITTEE USE, If applicable)

Year: _____ Number: _____

Suggestion Implemented? Yes – as submitted Yes - with changes No

Implementation Date: _____

Comments/Changes Made/Reason for change or not implemented:

Section III – Safety Training

A. New Employee Safety

The INDIAN HILLS COUNTRY CLUB's management provides safety training to all newly hired employees. Each new employee will be given a copy of the safety manual.

1. **General safety orientation** containing information common to all employees should be reviewed, ***before beginning their regular job duties***. Recommendations include (at a minimum):
 - a. Review the Safety Manual, with extra time spent on: accident and hazard reporting procedures, emergency procedures, first aid, and special emphasis programs which are included within this program.
 - b. Encourage and motivate employee involvement in safety. Make each employee accountable for their safety and the safety of their coworkers.
 - c. Review any known workplace hazards.
 - d. Conduct training on any topics that are not scheduled to be addressed within a reasonable timeframe and are relevant to the employee's job.
2. **Job-specific training provided before performing the task** should include:
 - a. Specific safety rules, procedures, hazards, and special emphasis programs (Chemical Handling Procedures/Hazard Communication Program, Personal Protective Equipment, Smoking Policy, Violence Prevention Program, Lockout/Tagout) that will impact them as they complete their job with the organization.
 - b. Identify employee's and employer's responsibilities.

Continual training should be provided to new hires. Each new hire should be assigned to work with an experienced employee for at least 6 months. The senior employee should act as a mentor and ensure that the new employee is working safely and exhibits a positive safe attitude.

The supervisor will complete the New Employee Safety Checklist for each new employee during their safety training.

B. Safety Meetings/Training

Supervisors should hold a minimum of **one** safety meetings per month. Safety meetings will begin at **10:00 am on the second Tuesday of each month from March through November**.

1. All employees are required to attend safety training meetings if they are present at work the day of the meeting. Exceptions should be cleared in writing with your immediate Supervisor the first full workday preceding the day of the safety meeting. Employees and Supervisors should offer comments and safety suggestions at the safety meeting and regularly throughout the work week as needed.
2. Safety training will be conducted on a topic announced in advance of the meeting.
3. Supervisors should update employees on any changes in procedures, new equipment, and general safety issues.
4. Emergency procedures will be periodically reviewed.
5. Employees are reminded to put safety first and look out for their coworker.
6. Employees with outstanding safety records will be recognized during these meetings. Quizzes and surveys may be administered after safety training or meetings.
7. Supervisors should provide a summary of the safety issue(s) discussed and verbally review the information with all employees that may have been absent from that month's safety meeting.
8. The Safety Training Log should be completed following every safety meeting/training session and maintained by the Manager or the Department Supervisor.

C. Golf Course Safety Training

Training is a critical component of our safety program. It is important to the Management of our organization that all employees are aware of the hazards they may encounter and the proper procedures to control or eliminate them. Employees will not be permitted to perform any job unless that employee has received proper instructions on how to perform the task properly and safely.

Our training program will include a review of operations, procedures, job hazards, and safety rules. Training topics for new and existing employees will include:

- Customer Safety

- Prevention of Burns

- Prevention of Slips, Trips and Falls

- Prevention of Lifting Injuries

- Prevention of Cuts

- Fire Prevention

- Electrical Safety

- Hazard Communication

- Security and Crime Control

Each of these is addressed within this safety program in "General Safety," "Special Emphasis Programs" and/or Appendix D.

NEW EMPLOYEE SAFETY CHECKLIST

Employee Name: _____ ID: _____
Date Employed: _____ Date Checklist Completed: _____
Checklist completed by: _____
Department Assigned: _____ Type of Work: _____
Summary of Work Experience: _____
Supervisor: _____

Ask Employee: Do you have any physical conditions or handicaps which might limit your ability to perform this job?

If so, what reasonable accommodation can be made by us? _____

Did the employee have a pre-employment drug test? Yes No Physical? Yes No

Any work restrictions indicated from the physical? _____

The Supervisor and new employee should review the following safety concerns. Check and discuss all that apply. Provide the employee with a copy of the Safety Manual.

- Company safety policies and programs _____
- Safety rules (general and specific to job) _____
- Safety rule enforcement _____
- Materials handling _____
- Accident and Hazard Reporting Procedures _____
- Housekeeping _____
- Special hazards of the job _____
- Emergency Procedures _____
- Employee Responsibilities/Accountability _____
- Hazardous materials _____
- Location of First Aid Kits _____
- Where to go for medical treatment _____
- Other: _____

Employee shall receive additional training from: _____

Probationary period is from _____ **to** _____

Performance (including safety) will be reviewed formally on _____

Employee agrees to cooperate fully with the safety efforts of the employer, follow all safety rules, and use good judgment concerning safe work behavior. Yes No (Have employee sign for manual)

Comments: _____

Signed: _____ Signed: _____
Trainer Employee

SAFETY TRAINING LOG

Company Name: _____

Date of Meeting: _____ Instructor: _____

Attending Employees

Print Name	Signature
1 _____	_____
2 _____	_____
3 _____	_____
4 _____	_____
5 _____	_____
6 _____	_____
7 _____	_____
8 _____	_____
9 _____	_____
10 _____	_____
11 _____	_____
12 _____	_____
13 _____	_____
14 _____	_____
15 _____	_____
16 _____	_____

Safety Topics Covered:

- Housekeeping
- Accident Reporting
- Injuries or Accidents Review
- Accident Investigation
- Emergency Procedures
- Materials Handling/Back Safety
- Fire Protection
- Other _____

Comments:

Section IV – General Safety

A. Emergency and Evacuation Procedures

Our goal is to provide prompt and immediate action in an emergency to protect life, property, and equipment.

1. Emergency Procedures

In case of emergency, the employee nearest the stricken person should call 911 (or the emergency phone number posted in your area) and direct a fellow employee to:

- a. Notify the nearest Supervisor to come to the scene; and
- b. Simultaneously dispatch available employees to quickly retrieve the first aid kit.
- c. An individual trained in first-aid should apply emergency rescue procedures until medical assistance arrives.

The Manager or the Department Supervisor should be notified. The President, Manager or the Department Supervisor (in that order) or their designees will decide whether or not to evacuate, inspect or shut down a facility.

2. Evacuation Procedures

- a. Each area will be assigned a primary and an alternate Evacuation Coordinator by the Manager or the Department Supervisor. They will be responsible for the effective evacuation of all persons. If neither is available, the Supervisor is then responsible for evacuation.
- b. When alerted by alarm or by the Evacuation Coordinator(s) to evacuate, employees should:
 1. Properly secure all classified materials in your possession and assure all classified containers and areas are properly locked.
 2. Proceed to the nearest designated area of safety (i.e. fire – exit building, tornado – interior corridor – away from exterior windows and/or lowest level at the building) and assemble in the designated area.
 3. Remain in the designated area, until instructions are provided.

See Appendix B for a Sample Checklist – Planning for Emergencies.

B. Safe Operating Procedures

All employees are responsible for safety. The following safe operating procedures apply to all employees working within this organization.

1. Rules/Regulations

- a. Emergency telephone numbers should be posted on at least one telephone on each level within the building. Emergency phone numbers would include: ambulance service, local hospital/medical facility, fire, law enforcement, poison control center, etc.
- b. Comply with all established safety rules, regulations, procedures, and instructions which are applicable to you as a member of this organization.
- c. Promptly report all accidents, hazards, incidents, and near-miss occurrences to your immediate supervisor, regardless of whether or not injury or property damage was involved.
- d. Do not visit, talk to, or distract another employee who is operating equipment, or who is engaged in a work activity where the possibility of injury exists.
- e. Do not participate in horseplay, scuffling, pushing, fighting, throwing things, or practical jokes.
- f. Observe all no-smoking signs and regulations.
- g. Do not run on company premises.
- h. Use handrails on steps, elevated platforms, scaffolds, or other elevations.
- i. Assist others and ask for assistance in lifting and carrying heavy or awkward objects.
- j. Firearms, ammunition, and explosives are prohibited on INDIAN HILLS COUNTRY CLUB premises.
- k. Personal stereos with headphones are not to be worn in the workplace.
- l. Alcohol and drug use and possession on INDIAN HILLS COUNTRY CLUB property of these substances are

strictly prohibited.

- m. Seat belts must be worn at all times while operating or riding in a company vehicle, (including tractors and utility vehicles or in a vehicle (employee owned or course owned) when on INDIAN HILLS COUNTRY CLUB property or when traveling within a vehicle (employee owned or course owned) on INDIAN HILLS COUNTRY CLUB business off property.

2. Housekeeping

- a. Practice good housekeeping by keeping the work area, aisles, walkways, stairways, roads, or other points of egress clean and clear of all hazards.
- b. Store and/or return parts, materials, tools, and equipment so as not to create a tripping hazard.
- c. Clean-up scrap materials, debris, and other excess materials. Place oil soaked rags, trash, and scrap in proper waste containers.
- d. Keep work area floors clean, dry, and free of oils, grease and liquids. Clean up all spills immediately.
- e. Store parts, materials, or equipment with protruding sharp ends or edges where personnel can not accidentally bump into them.
- f. Materials and equipment are not to be stored in the aisles or near exits. Permission in writing from your immediate supervisor must be obtained for temporary or permanent storage of any materials or equipment in aisles or near exits.

3. Material Handling and Back Safety

- a. Know the approximate weight of your load and make certain any material handling equipment you may operate to move materials is rated to handle the weight of the load. (Never exceed the manufacturer's recommended safe working load for any material handling equipment. Doing so increases the probability of equipment failure, dumping of the load, personal injuries and/or damage to materials, the facility, etc).
- b. Lift heavy objects as instructed, with the leg muscles and not with the back. On average, do not manually lift over 50 pounds.
- c. Call for assistance as needed for handling heavy or bulky objects or materials.
- d. Use an appropriate, approved lifting device (i.e. special trucks, racks, hoists, and other devices) for lifting very heavy, bulky, large or unyielding objects.
- e. All ropes, chains, cables, slings, etc., and other hoisting equipment must be inspected prior to each use.
- f. A load should never be lifted and left unattended.
- g. Wear safety gloves when handling materials that pose cutting exposures.
- h. Properly stack and secure all materials prior to lifting or moving to prevent sliding, falling, or collapse.
- i. Avoid moving or lifting loads by hand whenever possible.

Tips for manual lifting:

- (1) Get a good footing.
- (2) Place feet about shoulder width apart.
- (3) Bend at the knees to grasp the weight.
- (4) Keep back as straight as possible.
- (5) Get a firm hold.
- (6) Lift gradually by straightening the legs.
- (7) Don't twist your back to turn. Move your feet.
- (8) When the weight is too heavy or bulky for you to comfortably lift - GET HELP.
- (9) When putting the load down, reverse the above steps.

Note: If lifting stacked materials, materials should be carefully piled and stable. Piles should not be stacked as to impair your vision or unbalance the load. Materials should not be stacked on any object (i.e. floor, shelving units, ladders, scaffolds, etc.) until the strength of the supporting members has been checked.

4. Office Safety

- a. Practice good housekeeping throughout the office area. Do not leave materials or position telephone or electrical cords in the aisles.
- b. Report or correct any obvious hazards as soon as they are discovered.
- c. Do not carry articles weighing more than 20 pounds when ascending or descending stairs that rise more than 5 feet.
- d. Close files and desk drawers. Arrange heavy or large files in the rear of file cabinet drawers to prevent tipping when draws are open. Always store heavy materials in the lower drawers and light objects on upper shelves. Do not open more than one drawer at a time, as tipping of the cabinet or desk may occur. Secure cabinets to each other and/or to building structural members to improve stability.
- e. Report damaged furniture and broken veneer surfaces immediately.
- f. Do not carry pointed or sharp objects in hand, pockets, or attached to clothing with points or blades exposed.
- g. Do not leave paper cutters with the blade in the open or upright position.
- h. Remove, secure, or arrange material on file cabinets and desks to prevent materials from falling from office furniture.
- i. Do not stand on chairs, desks, boxes, wastebaskets, or any other furniture or object. These items are not be used as substitutes for an approved step-stand or stepladder.
- j. Report slippery floor surfaces to your Supervisor immediately.
- k. Clean up spills on floors immediately.
- l. Position desks and files so that drawers do not extend into the aisle or walkway when open.

5. Clothing

- a. **Clothing:** Wear safe and practical working apparel. Be sure that any clothing you wear is not highly flammable. Neckties and loose, torn or ragged clothing should not be worn while operating machines with revolving spindles or cutting tools.
- b. **Shoes:** Low-heeled, closed-toe shoes, or proper work boots with sufficient heavy soles must be worn in areas where foot/toe injuries are likely to occur.
- c. **Jewelry:** Do not wear rings or any form of jewelry or ornamentation when working around machinery or exposed electrical equipment.

6. Fire Prevention

- a. Good housekeeping is the first rule of fire prevention. Oily rags, paper shavings, trim, and miscellaneous scrap materials should be cleaned up and placed in trash receptacles.
- b. All flammable liquids should be stored in an approved manner and dispensed from a UL Listed or Factory Mutual Approved portable flammable liquid safety containers.
- c. Liquefied Petroleum (LP) Gas presents special fire and explosion hazards. Only qualified persons are to handle LP gas. LP gas equipment should be inspected daily for leaks, etc.
- d. Open fires of any kind are not permitted.
- e. Combustible materials or equipment in combustible containers should be stored properly.
- f. Fire extinguishers should be located near an exit door.
- g. Fire extinguishers should be recharged and inspected regularly. A tag indicating the date the unit was recharged should be affixed to each extinguisher.
- h. Access to fire hydrants should be maintained at all times. Fire hydrants should never be blocked or obstructed in any way.
- i. All combustible waste materials, rubbish, and debris should be disposed of daily.
- j. Smoking is prohibited in any hazardous area and "No Smoking" signs should be posted in these areas.
- k. Compressed gas cylinders should be transported and stored in an upright position.
- l. Compressed gas fuel cylinders should be separated from oxygen cylinders by at least 20 feet or by a 5 foot high ½-hour fire rated wall.
- m. No material should be stored within 3 feet of an electrical panel, outlet, or fire suppression equipment.

7. Customer Safety

Protecting our customers from injury is a top priority for our organization. Proper maintenance and housekeeping of all public areas should be a top priority for all employees. Customers must also be protected against hazards presented by food and broken utensils. Some items to evaluate on a daily basis by each department head/supervisor should include:

- a. Parking lots, sidewalks and steps should be well maintained.
- b. Adequate interior and exterior lighting should be evaluated and deficiencies should be corrected as soon as possible within all areas of this facility.
- c. Prompt removal of snow and ice.
- d. Chair, tables and booths must be inspected and maintained in good condition.
- e. Carpet and floors should be kept clean and in good condition.
- f. Mats and rugs should lie flat and be in good repair.
- g. Wet floors should be posted with wet floor warning signs.
- h. An Inspection of utensils, dishes and glasses should be conducted prior to placing these items within a dishwasher, after removing them from the dishwasher and prior to assembling place settings.
- i. Patrons should be warned of hot dishes and food.
- j. Employees within all departments should be trained on how to assist a choking victim.
- k. Safe food handling procedures should be followed at all times.

8. Safe Food Handling

a. Exposures

Preparing and serving food to the within INDIAN HILLS COUNTRY CLUB's lunch area carries with it a great responsibility. Increased incidences of foodborne illnesses highlight the need for effective safe food handling procedures. An evaluation of all potential exposures should be conducted on a daily basis by the Supervisor within each Department. Please review the following items to identify possible exposures to food handling losses and safety controls which may help to reduce the probability of food handling losses.

b. Possible Exposures

- (1) Foreign objects in food.
- (2) Food poisoning as a result of spoilage, contamination, or deterioration of food; food stored improperly; improper temperature in the food storage facilities.
- (3) Lack of adequate housekeeping and cleanliness in the food preparation area.
- (4) Expired shelf-life products.
- (5) Improper storage of cleaning materials and pest control chemicals.
- (6) Insufficient supply of hot water for the dishwasher.
- (7) Rodents and pests.

c. Controls

- (1) Develop and enforce strict hand washing procedures
- (2) Sanitize serving equipment, counters, and table surfaces often.
- (3) Refrigerate food promptly.
- (4) Establish a pest control program.
- (5) Refrain from bare-hand contact with ready-to-eat foods.
- (6) Wash fresh fruits and vegetables thoroughly.
- (7) Use meat thermometers to ensure proper cooking temperatures-even if microwaved.

9. Prevention of Burns

Unsafe actions by employees could lead to contact with hot surfaces including cooking and turf equipment. Although not all inclusive, the following is a partial list of safety procedures to help reduce the probability of employee injuries due to burns.

a. Safety Procedures to Prevent Burns

- (1) Employees must call out “Behind You!” when passing employees who are carrying hot items.
- (2) Do not use wet towels as hot pads.
- (3) If you do not know if something is hot, assume that it is.
- (4) The use of potholders or oven mittens should be strictly enforced whenever removing items from cooking appliances or when there is a high probability the pan or container is hot.
- (5) Alert customers of hot equipment.
- (6) Use care when pouring hot liquids.
- (7) Keep pot handles turned inward so that they do not protrude over the edge of range, table, or counter.
- (8) When adding ingredients to hot liquids, add small portions at a time to prevent splashing.
- (9) Use the release valve to release pressure before opening pressurized steam systems.
- (10) Transport hot liquids in closed containers.
- (11) Use carts for moving large hot items.

10. Prevention of Slips, Trips and Falls

The most common cause of employee injuries in food service businesses is falls. Twenty percent of all serious injuries are caused by falls in the workplace. Fortunately, slips, trips, and falls are highly preventable through hazard identification procedures and adherence to some fairly simple control guidelines.

a. Hazards That Cause Slips, Trips and Falls

- (1) Small items in the walkway, such as golf balls and clubs.
- (2) Loose carpet or tile.
- (3) Wet and slippery floors, caused by spilled liquids or snow tracked in during inclement weather.
- (4) Changes in floor elevations.
- (5) Poor lighting.
- (6) Snow and ice-covered parking lot surfaces.
- (7) Potholes in parking areas.

b. Controls

- (1) Keep floors clean and dry.
- (2) Use “Caution-Wet Floor” signs when mopping the floor, and leave the sign in place until the floor is completely dry.
- (3) Flooring should be inspected regularly for cracked or uneven surfaces.
- (4) Daily cleaning of kitchen floors, using heavy-duty cleaners and degreasers.
- (5) Clean up spills immediately.
- (6) Repair defects in the parking lot, sidewalks, floors, and carpets.
- (7) Employees should wear shoes with good traction and closed toes.
- (8) Use grid-pattern rubber floor mats or special floor treatments in the kitchen.
- (9) Place trash in proper waste containers.

- (10) All employees should exercise good housekeeping practices and clean as they go.
- (11) Repair tears in carpeting as soon as possible. Tape can be used temporarily.
- (12) Use floor mats at all entryways.
- (13) Make sure the drink station floor remains free of spilled ice.
- (14) Do not store or leave items on stairways.
- (15) Straighten or remove rugs and mats that do not lie flat on the floor.

11. Prevention of Cuts

Cuts are one of the most common injuries in food service businesses. They arise mainly from knives and broken glass. Other potential sources of cuts are from handling box cutters, hack saws, cutting bars, and opening cans.

a. Safety Procedures to Prevent Cuts

- (1) All employees should be trained in the safe use of knives.
- (2) Use retractable safety razors for opening boxes. Never use a knife for this purpose.
- (3) Place can lids into the empty can before disposing of the can.
- (4) Use the correct knife for the job. Use knives for cutting, slicing and dicing. Do not use knives as screw-drivers or ice picks.
- (5) Carry the knife with the point down.
- (6) Always use a solid cutting surface.
- (7) Cut away from your body and do not "hack" at the piece.
- (8) Never try to catch a falling knife.
- (9) Wash knives and cutting tools by themselves.
- (10) When not in use, store knives in drawers or racks.
- (11) Use a broom and dust pan or damp towel to pick up broken glass. Never use your bare hands - even to pick up the larger pieces.
- (12) Set up a labeled container in the shop in which to store only broken glass.
- (13) All employees should be trained on how to safely open packages.
- (14) Keep knives sharp. A sharp knife is safer than a dull knife. Dull blades require more force and may be more likely to slip, cutting you rather than the items.
- (15) Do not place drinking glasses inside each other.
- (16) Visually inspect all windshields for cracks or chips. If chips or cracks are found notify the supervisor.
- (17) Do not use a drinking glass to scoop materials. Use a metal scoop or plastic scoop.
- (18) Always keep your eyes on your work while you are using a cutter or saw.
- (19) Do not place your hand on top of the blade guard while operating a saw or knife to force the cut.

12. PROHIBITION of Alcoholic Beverages

NO ALCOHOLIC BEVERAGES ARE PERMITTED AT INDIAN HILLS COUNTRY CLUB.

13. Security and Crime Control

- a. Due to cash transactions, food service businesses are attractive targets for robberies. But there are ways to prevent robberies and minimize the risk of danger to our employees and customers in the event of a hold-up. There are also cash control procedures that will help us prevent theft.

The following guidelines may help us reduce the chance of employees and customers becoming crime victims.

- (1) Make sure all employees are trained in how to recognize suspicious activities.
 - (2) All exterior door locks will be change after each management change.
 - (3) Keep the back door locked at all times.
 - (4) Try to use the front doors for late food supplier deliveries.
 - (5) Proper lighting and visibility can deter crime outside and inside the clubhouse.
 - (6) Exterior lights should be turned on at dusk and during bad weather.
 - (7) Floodlights should illuminate the sidewalks, back door, and front door.
 - (8) Burned out lights should be replaced immediately.
- b. All employees should adhere to the following procedures:
- (1) Do not panic during a robbery.
 - (2) Do not argue with the robber.
 - (3) Be observant. Note as many details as possible about the robber(s).
 - (4) Know how to set off the silent alarm, but ***only*** if it can be done without risk.
 - (5) Do not lie to the robber. Do not volunteer information, but if asked a question, always tell the truth.
 - (6) Do not surprise the robber or do anything to excite or confuse him.
 - (7) Do not chase after or use weapons against the robber. That is the responsibility of the police.
 - (8) Call the police immediately after the robber leaves. Lock the doors. Do not touch evidence or discuss the robbery with other employees. If customers or witnesses will not wait for the police to arrive, get their names and addresses for the police.
 - (9) Cooperate and answer all questions that police ask about the robbery.
 - (10) ***Never*** give statements to the media.
 - (11) Perform cash counts prior to opening and at shift change.
 - (12) Keep less than \$150 in the register, if possible.
 - (13) All cash should be removed from the register and make frequent drops into the safe.
 - (14) Bank deposits should be made at varying times.
 - (15) Take different routes to the bank.
 - (16) Know how to detect counterfeit bills.

RESERVED FOR FUTURE USE

Section V – Accident Management

A. Accident and Near Miss Reporting Procedures

If you or a customer has a near-miss situation while working, notify your Supervisor immediately. The situation will be investigated and corrective action implemented to prevent future injury. Employees and witnesses must fully cooperate in the investigation.

If you are injured on the job:

1. Contact your Supervisor, or the nearest coworker (who should notify a Supervisor) if you are unable to contact your Supervisor due to the severity of your injury.
2. The designated employee who is trained in first-aid and/or CPR should be immediately notified to assist in the situation.
3. First aid kits, which are prominently displayed throughout the workplace, should be made available and medical supplies promptly refilled (by the Manager).
4. If needed, the Supervisor or his/her authorized representative should transport the injured worker to the company's designated medical facility to receive appropriate medical attention.
5. If rescue personnel are summoned, the Supervisor should delegate an individual to wait for the rescue team and escort them to the injured employee.
6. All witnesses to the accident should be available to speak with the Management and/or Supervisor and cooperate in all accident investigations.
7. The Manager or immediate Supervisor should immediately notify the insurance company of the accident and file a workers' compensation claim.

Every accident or near-miss situation should be reported immediately. Injured employees and witnesses to the accident will assist the Supervisor in completing an accident investigation. Injured employees must comply with the medical treatment provided by the treating physician and cooperate with the insurance company and its designees.

B. Accident Investigation

When an accident occurs, it is an indication that something has gone wrong. Accidents don't just happen, they are caused. The basic cause(s) of accidents are unsafe acts and/or conditions. The Supervisor must investigate every accident to determine the cause and to initiate corrective action to assure that similar type accidents will not reoccur from the same causes.

Supervisors should complete the Supervisors Accident Investigation Report and submit a copy to the INDIAN HILLS COUNTRY CLUB General Manager for review. The General Manager should evaluate the corrective action(s) taken or suggested by the Supervisor and instruct if additional changes should be made.

Tips on accident investigations:

1. Every accident is caused. Carelessness is not a cause, but the result of some deficiency. Telling employees to be more careful will not eliminate the real accident cause.
2. An accident investigation is not a trial to find fault or to place blame. Its purpose is to find accident causes so that corrective measures may be taken to prevent future accidents.
3. Most accidents result from a combination of human error (unsafe behavior) and a physical hazard (unsafe condition). Do not overlook the possibility of multiple errors and hazards.
4. Don't stop at the obvious answer. For instance, a fall on greasy floor surface does not happen because someone slipped. The accident happened because the grease was allowed to remain on the floor and the worker walked onto it. Determine why the operator did this and why the grease was not cleaned up. Only by correcting both problems can you prevent future accidents.
5. The accident investigation should be conducted as soon after the accident as possible. Facts should be gathered while the accident is fresh in the minds of those involved. If possible, question every employee who was involved, or witnessed, the incident. Delay interviewing injured employees until after medical treatment has been received.
6. Other employees who did not witness the accident, but work in the area, may contribute information regarding the injured worker's activities prior to the accident and conditions at the time of the accident.

7. The accuracy and completeness of the information received from the injured worker(s) and witness(es) depends on how well the interview is conducted. Supervisors should:
 - a. Put employees at ease.
 - b. Ask what happened and how it happened.
 - c. Permit employees to answer without interruptions.
 - d. Show concern.
 - e. Remember, nothing is gained with criticism or ridicule.
 - f. Ask “why” questions, only to clarify the story.
 - g. Repeat the story, as you understand it.
 - h. Give the employee the chance to correct any misunderstandings that you may have.
 - i. Photographs of the conditions as they exist immediately following the accident, including photos of the damaged equipment, are very helpful.
 - j. Damaged equipment should be removed or secured for future testing and used as evidence.
 - k. Employees should not be permitted, under any circumstances, to operate machines or equipment that was damaged in an accident until all necessary repairs have been completed and all damaged parts have been repaired or replaced.
 - l. Take immediate action to correct any obvious unsafe conditions. Determine the basic accident causes and correct or recommend action to prevent reoccurrence.
8. In addition to employee accidents/injuries, customer reported incidents should be documented to assist management, and our insurance carrier should a claim be filed, to thoroughly investigate the reported incident. If a customer incident of any type is reported to you, the following procedures should be followed:
 - a. If you are not a Supervisor or member of Management, your superior should be contacted to speak with the customer.
 - b. If you are a Supervisor or you are a member of management and an incident is being reported to you by a customer, NEVER admit guilt but complete the attached applicable customer incident report form (i.e. if a food incident, please complete the Food Incident Investigation Report. If this is NOT an alleged food incident, the general Customer Incident Report form should be completed).
 - c. All instructions on the incident report forms should be closely followed and the completed forms should be forwarded to the Manager/owner of this business for further investigation and/or action.

SUPERVISOR'S ACCIDENT INVESTIGATION REPORT

(Completed by Supervisor of Injured Employee)

Company		Address	
Name of Injured Employee		Dept	Position
		How long in position?	
Date of Accident	Time of Accident		Nature of Injury
Injury Resulted in: <input type="checkbox"/> Injury <input type="checkbox"/> Fatality <input type="checkbox"/> Property Damage (specify)			
Medical Treatment <input type="checkbox"/> None <input type="checkbox"/> First Aid <input type="checkbox"/> EMT or Paramedic <input type="checkbox"/> Doctor or Clinic <input type="checkbox"/> Hospital			Days Lost Time?
Drug Tested? <input type="checkbox"/> Yes <input type="checkbox"/> No Alcohol Tested? <input type="checkbox"/> Yes <input type="checkbox"/> No			
What was the injured employee doing at the time of the accident?			
How did the accident occur (brief description)?			
What environmental factors (unsafe conditions) contributed to the accident? (See next page for examples)			
What behavioral factors (unsafe acts) contributed to the accident? (See next page for examples)			
What corrective actions can be taken to prevent recurrence? (See next page for examples)			
What corrective actions have been taken to prevent recurrence?			
Names of Witnesses			
Supervisor	Date	Reviewed by:	Date

Supplemental Information for completing the Accident Investigation Report

Note: Each accident will involve at least one of the following conditions as a contributing factor.

Environmental Factors (Unsafe Conditions)		
Conditions	Definition of Condition	Suggested Corrective Action
Unsafe procedures	<i>Hazardous Process. Management failed to make adequate plans for safety.</i>	A. Formulation of safe working procedures
Improperly guarded	<i>Work areas, machines, or equipment that are unguarded or inadequately guarded.</i>	A. Inspection B. Checking plans, blueprints, purchase orders, contracts, and materials for safety C. Include guards in original design, order, and contract D. Provide guards for existing hazards
Defective through use	<i>Buildings, machines, or equipment that have become rough, slippery, sharp edged, worn, cracked, broken, or otherwise defective through use or abuse.</i>	A. Inspection B. Proper Maintenance
Defective through design	<i>Failure to provide for safety in the design, construction, and installation of buildings, machinery, and equipment. Too large, too small, not strong enough.</i>	A. Source of supply must be reliable B. Checking plans, blueprints, purchase orders, contracts, and materials for safety C. Correction of defects
Unsafe clothing or personal protective equipment	<i>Management's failure to provide or specify the use of goggles, respirators, safety shoes, hard hats, and other articles of safe dress or apparel.</i>	A. Provide safe apparel or personal protective equipment. B. Specify the use or non-use of certain apparel or protective equipment on certain jobs.
Unsafe housekeeping facilities	<i>Unsuitable layout or lack of equipment necessary for good housekeeping (i.e. shelves, boxes, bins, aisle markers, etc.)</i>	A. Provide suitable layout and equipment necessary for good housekeeping.
Improper ventilation	<i>Poorly or not ventilated area</i>	A. Improve ventilation
Improper illumination	<i>Poorly or not illuminated area</i>	A. Improve illumination

Behavioral Factors (Unsafe Acts)		
Factor	Definition of Factor	Suggested Corrective Action
Lack of knowledge or skill	<i>Unaware of safe practice; Unskilled. Not properly instructed or trained.</i>	A. Job training B. Improved hiring practices
Improper attitude	<i>Worker was properly trained and instructed, but failed to follow instructions.</i>	A. Supervision B. Discipline C. Improved hiring practices
Physical Deficiencies	<i>Worker has impaired eyesight or hearing, heart trouble, hernia, previous injuries, etc.</i>	A. Pre-employment physicals B. Periodic physicals C. Proper placement of workers D. Identification of workers with temporary physical deficiencies
Substance Abuse	<i>Worker was under the influence of (illegal or prescribed) drugs or alcohol while completing task</i>	A. Drug-Free Workplace Policy with drug/alcohol testing B. Discipline C. Rehabilitation

CUSTOMER INCIDENT INVESTIGATION REPORT

Please complete this form in the event of a customer incident. Be courteous and supportive. Do not admit any fault. If necessary, call an ambulance. Do not transport customer to the hospital. Gather as much information as possible. Maintain this completed report with your accident records for analysis.

Business Name: _____ Phone: _____

Manager: _____

Person Involved

Name of Customer: _____ Date of Birth: _____ Sex: M F

Address _____ City/State/Zip: _____

Home Phone: _____ Work Phone: _____

Nature of Injury or Property Damage (Body parts affected: broken, strained; or left, front fender dented, etc.)

Assistance Provided? (Describe what and by whom, i.e., first aid, medical center, hospital, etc.) _____

Transported by: Ambulance Private Vehicle Other _____

Accompanied by: (Name/relationship) _____

Incident Description

Location of Incident (Be specific): _____

Date Occurred: _____ Time Occurred: _____ A.M. P.M.

Description of Incident by Customer: _____

Description of Incident by Employee (if present at time): _____

Non-Employee Witnesses

Were there any witnesses? (List name/address/phone number). Report all statements of witnesses on supplemental form:

CUSTOMER INCIDENT INVESTIGATION REPORT

Employee Witnesses

Provide names of all employees in the vicinity of the area. Attach written statements to this report. _____

Any additional comments made by customer which may be pertinent. **THIS IS NOT TO BE COMPLETED BY CUSTOMER.**

When/where were comments made? To whom? _____

Customer's Attitude: Hostile Neutral Cooperative Other _____

Did customer appear intoxicated? Yes No

Falls

Description of weather at time of incident (Examples: sunny, rainy, snowing, drizzle, clear.) Note any precautions taken to prevent potential slip/falls (i.e. ice melt, "wet floor" signs, etc.) _____

Description of surfaces involved (i.e cracked sidewalk, uneven sidewalk, uneven floor, smooth walking surface, torn carpeting, etc.) Also include any foreign substances believed to be on surface.) _____

Describe item(s) customer was carrying and how item was carried. Was item being carried such that it was blocking vision? _____

Type of footwear and clothing customer was wearing: _____

Were photos taken? Yes No If yes: Date taken: _____ Time: _____

By Whom: _____ Number: _____ Attach photos to report.

Report prepared by: _____ Date: _____

Reviewed by: _____ Date: _____

FOOD INCIDENT INVESTIGATION REPORT (Camps)

Please complete this form in the event of a food incident. Be courteous and supportive. Do not admit any fault. If necessary, call an ambulance. Do not transport customer to the hospital. Gather as much information as possible. Maintain this completed report with your accident records for analysis.

Business Name: _____ Phone: _____

Manager: _____

Person Involved

Name of Customer: _____ Date of Birth: _____ Sex: M F

Address _____ City/State/Zip: _____

Home Phone: _____ Work Phone: _____

Nature of food incident (i.e. customer alleged broken tooth on food served, foreign object in food, illness following meal, etc.) _____

Assistance Provided? Describe what and by whom (i.e. first aid, medical center, hospital, etc.) _____

Transported by: Ambulance Private Vehicle Other _____

Accompanied by: (Name/relationship) _____

Customer Witnesses

Provide names, phone number, address and relationship to customer (i.e. unknown witness, family member of customer, friend dining with customer, etc.) _____

Comments made by witnesses (Attach written statements to this report.) _____

FOOD INCIDENT INVESTIGATION REPORT (Camps)

Employee Witnesses

Provide names of all employees in the vicinity of the area. Attach written statements to this report. _____

Any additional comments made by customer which may be pertinent. **THIS IS NOT TO BE COMPLETED BY CUSTOMER.**

When/where were comments made? To whom? _____

Customer's Attitude: Hostile Neutral Cooperative Other _____

Did customer appear intoxicated? Yes No

Were photos taken? Yes No If yes: Date taken: _____ Time: _____

By Whom: _____ Number: _____ Attach photos to report.

Food Incident

Describe food product(s) involved: _____

Foreign objects? _____

Food retained? ? Yes No Object retained? Yes No

Food preparers: _____

Supplies received from: _____ Date: _____

Purchase Order Number: _____

Any other pertinent information? _____

Report prepared by: _____ Date: _____

Reviewed by: _____ Date: _____

Section VI – Safety Violation

PRIOR TO IMPLEMENTING ANY EMPLOYEE DISCIPLINARY PROCEDURE, THE ENTIRE PROGRAM INCLUDING THE ACTIONS THAT WILL BE TAKEN SHOULD THE EMPLOYEE VIOLATE SAFETY RELATED POLICIES, SHOULD BE REVIEWED WITH YOUR COMPANY'S LEGAL COUNSEL.

Should any employee commit an unsafe act, intentional or not, this action should be addressed by the immediate Supervisor and reviewed by the Business Owner or Manager. The Company reserves the right to use disciplinary actions, depending upon the seriousness of the violation and the impact of the violation upon the conduct of Company business. It is not required to complete all steps of the disciplinary procedure in every case. Discipline may begin at any step appropriate to the situation. Discipline includes, but is not limited to:

1. **Verbal Reprimand**
2. **Written Reprimand**
3. **Suspension**
4. **Termination of Employment**

The "**Safety Violation Notice**" form should be completed for all written reprimands. A copy should be maintained in the employee's personnel file and submitted to the Manager, if corrective action(s) is required.

SAFETY VIOLATION NOTICE

Employee Name: _____

Department: _____ Violation Date: _____

A safety and health survey of your operation has revealed non-compliance of certain safety rules, procedures, programs, and/or local, state, or federal regulations. As a condition of the company's safety policy, you are required to maintain a safe work environment and to prevent unsafe actions of yourself, co-workers, and/or your employees.

This warning is for your protection and safety. The violation(s) noted and corrective action(s) are indicated below.

Rule Violated	Violation Description	Corrective Action Required*
1)		
2)		
3)		

Corrective Action Required*

- 1 = Cease operation until corrective action is complete
- 2 = Warn personnel and instruct them on proper safety procedures
- 3 = Provide proper personal protective equipment
- 4 = Change procedure/work method
- 5 = Initiate and complete corrective action (include date)
- 6 = Other (specify above)

Comments: _____

Disciplinary Action Imposed

- Verbal Reprimand along with this notice
- Written Reprimand with a last chance warning
- Suspension (from _____ to _____)
- Termination of Employment

Date: _____ Supervisor: _____

Section VII – Special Emphasis Programs

A. Chemical Handling Procedures/Hazard Communications Program

1. Purpose:

To ensure that information about the dangers of all chemicals/hazardous materials used at INDIAN HILLS COUNTRY CLUB are known by all affected employees. A secondary purpose is to comply with the requirements of the OSHA Hazard Communication Standard and corresponding state laws.

2. Responsibility:

All employees of the company will participate in the hazard communication program and comply with all provisions of this policy. The INDIAN HILLS COUNTRY CLUB management is responsible for maintaining this program and ensuring compliance with all local, state, and federal laws.

3. Scope:

This program covers container labeling, material safety data sheets, employee training and information, hazardous non-routine tasks, list of hazardous chemicals (i.e. cleaning chemicals, re-fueling chemicals, lawncare chemicals, office chemicals, etc.), chemicals in unlabeled pipes and safety procedures.

4. Program:

a. Container Labeling

- (1) The INDIAN HILLS COUNTRY CLUB management will verify that all containers received for use will be clearly labeled with the following: 1) contents, 2) the appropriate hazard warning (i.e. flammable, toxic, etc.), and 3) the name and address of the manufacturer. Existing labels will not be removed or defaced on incoming containers.
- (2) All materials on site are to be stored in their original container with the label attached.
- (3) Any material with a label missing or illegible should be reported to the Supervisor immediately for proper labeling and/or disposal in accordance with the Material Safety Data Sheet.
- (4) Stationary, secondary, or portable containers should be clearly labeled with either an extra copy of the original manufacturer's label or with generic labels which have a block for identification and blocks for the hazard warning.
- (5) Signs, placards, or other written materials that convey specific hazard information may be used in place of individual container labels if there are a number of stationary process containers within a work area which store similar materials.
- (6) Portable containers do not need to be labeled if the chemicals are transferred to labeled containers and used by the employee making the transfer during that shift. No unmarked containers of any size shall be left unattended in the work area.

b. Material Safety Data Sheets (MSDS)

- (1) Any product having a hazardous warning on its label requires a MSDS.
- (2) The manufacturer, distributor, or vendor shall provide the MSDS for the hazardous product.
- (3) All MSDS's shall be forwarded to the Business Owner or Manager and reviewed by this individual and employees using the product to determine safe work practices and to determine what if any personal protective equipment may be needed. The MSDS's will be maintained and kept at the following location:
_____.
- (4) The MSDS provides:
 - (a) chemical information
 - (b) hazardous ingredients
 - (c) physical data, such as the potential for fire, explosion, and reactivity
 - (d) health hazards
 - (e) spill or leak procedures

- (f) special protection and precautions
- (g) personal protective equipment needed
- (h) name, address, and phone of MSDS preparer or distributor

b. Employee Training and Information

- (1) The INDIAN HILLS COUNTRY CLUB management will provide training to employees when hired, prior to handling chemicals for the first time within work area (i.e. due to chemical substitution, job reassignment) and routinely thereafter on the hazardous nature of chemical products. Training will include:
 - (a) The Hazard Communication Policy
 - (b) Chemicals present in workplace operations
 - (c) Physical and health effects of the hazardous chemicals
 - (d) Appropriate work practices and controls when using chemicals
 - (e) Emergency and first-aid procedures
 - (f) How to read labels and review an MSDS to obtain appropriate hazard information
 - (g) Location of the MSDS file and written hazard communications program
- (2) After attending the training class, each employee will sign a form to verify that they attended the training, received the written materials, and understand the company's policies on Hazard Communication. See the Training Documentation for Chemical Handling Procedures/Hazard Communication Program.

c. Hazardous Non-Routine Tasks

- (1) Periodically, employees are required to perform hazardous non-routine tasks.
- (2) Prior to starting work on such projects, each affected employee will be given information by the INDIAN HILLS COUNTRY CLUB management about the hazardous chemical he/she may encounter during such an activity. This information will include specific chemical hazards, protective safety measures the employee can use, and measures the company has taken to lessen the hazards including ventilation, respirators, presence of other employees, and emergency procedures.

d. Informing Contractors and Others

- (1) The INDIAN HILLS COUNTRY CLUB management shall advise contractors that may work at our facility and other clients of our Hazard Communication Program.
- (2) Copies of the MSDS's for all materials brought onto the site will be made available upon request to each client, contractor or visitor to the facility by the INDIAN HILLS COUNTRY CLUB management.
- (3) The INDIAN HILLS COUNTRY CLUB management will also obtain chemical information from contractors that may expose our employees to hazardous chemicals which they bring into our workplace.

e. List of Hazardous Chemicals

Attached is a list of all known hazardous substances presently being used (see sample form "List of Hazardous Chemicals"). Listed chemicals are denoted as **EX** for explosive, **HT** for highly toxic, **C-R** for corrosive or irritant, and **CAR** for proven or suspected carcinogen-mutagen in humans or animals. Further information on each chemical can be found by reviewing the MSDS sheet on that chemical.

f. Chemicals in Unlabeled Pipes

- (1) Work activities are often performed by employees in areas where chemicals are transferred through unlabeled pipes.
- (2) Prior to starting work in these areas, the employee shall contact the INDIAN HILLS COUNTRY CLUB management for information regarding:
 - (a) The chemical in the pipes.
 - (b) Potential hazards.
 - (c) Safety precautions which should be taken.

g. Safety Procedures and Recommendations

(1) Work Habits

- (a)** Never work alone, eat, drink or use tobacco products within an area where chemicals are handled or within a chemical storage room. Do not store food or beverages in such an area.
- (b)** Wash hands before and after working within a chemical handling area, and after spill cleanups.
- (c)** Restrain loose clothing, long hair, and dangling jewelry.
- (d)** Never leave heat sources unattended.
- (e)** Never place reactive chemical containers near the edge of a table, bench, etc. where they may fall and break, thus releasing chemical vapors into the room and/or come into contact with other chemicals causing an unsafe reaction.
- (f)** Use a fume hood when working with volatile substances.
- (g)** Obtain and read the MSDS for each chemical before handling/dispensing any chemicals.
- (h)** Analyze new chemical handling procedures in advance to pinpoint hazardous areas.
- (i)** Analyze accidents to prevent repeat performances.
- (j)** Protection should be provided for not only the employees working within the chemical handling/processing room, but also for any visitors to the area.
- (k)** Do not mix chemicals in the sink.
- (l)** Always inform co-workers of plans to carry out hazardous work.
- (m)** Carry out regular fire or emergency drills with critical reviews of the results.
- (n)** Have actions pre-planned in case of an emergency (i.e. gas shut-off location, escape routes posted, meeting places).

(2) Safety Wear

- (a)** ANSI approved eye or face protection should be worn at all times within those work areas where eye injuries could be expected if appropriate eye protection is not worn.
- (b)** Gloves, which will resist penetration by the chemical being handled and have been checked for pin holes, tears, or rips, should be worn.
- (c)** Footwear should cover feet completely; no open-toed shoes or sandals.

(3) Facilities and Equipment

- (a)** Have separate container for trash and broken glass.
- (b)** Never block any escape routes, and plan alternate escape routes.
- (c)** Never block a fire door open.
- (d)** Never store materials in storage aisles.
- (e)** All moving belts and pulleys should have safety guards.
- (f)** Ensure that eye-wash fountains will supply at least 15 minutes of water flow.
- (g)** Regularly inspect safety showers and eye-wash fountains and keep records of inspections.
- (h)** Keep up-to-date emergency phone numbers posted next to the phone.
- (i)** Place fire extinguishers near an escape route, not in a "dead end" corridor.
- (j)** Regularly maintain fire extinguishers, maintain records, and train personnel in the proper use of extinguishers.
- (k)** Acquaint personnel with the meaning of "Class A fire", "Class B fire", etc., and how they relate to fire extinguisher use.

- (l) Secure all compressed gas cylinders when in use and transport them secured on a hand truck.
- (m) Install chemical storage shelves with lips, and never use stacked boxes in lieu of shelves.
- (n) Replace appropriate equipment and materials for spill control when they become dated.

(4) Chemical Storage

- (a) Do not store materials on the floor.
- (b) Separately store organic and inorganic chemicals.
- (c) No above eye level chemical shelf storage should be permitted.
- (d) Shelf assemblies should be firmly secured to walls.
- (e) Store acids, poisons, and flammable liquids in separate dedicated cabinets.

(5) Purchasing, Use, and Disposal

- (a) If possible, purchase chemicals in class-size quantities only. Label all chemicals accurately with date of receipt, or preparation, initialed by the person responsible, and pertinent precautionary information on handling.
- (b) Follow all directions for disposing of residues and unused chemicals.
- (c) Properly store flammable liquids in small quantities in containers with a provision for bonding to receiving vessels when the liquid is transferred.
- (d) Have a Material Safety Data Sheet on hand before using a chemical.
- (e) Prepare a complete list of chemicals of which you wish to dispose.
- (f) Classify each of the chemicals on the disposal list into a hazardous or non-hazardous waste chemical. (Check with the local environmental agency office for details.)

(6) Substitutions

- (a) Reduce risk by diluting substances instead of using concentrates.
- (b) When conducting training involving chemical handling, use handouts, films, videotapes, and other methods rather than experiments involving hazardous substances.
- (c) Undertake all substitutions with extreme caution.

TRAINING DOCUMENTATION FOR CHEMICAL HANDLING PROCEDURES/HAZARD COMMUNICATION PROGRAM

I have received training and understand how to read the Materials Safety Data Sheets (MSDS) and container labels regarding hazardous products.

I have received general training on the hazardous chemicals in which I might be exposed.

I understand that I am required to review MSDS's for any material I am using for the first time.

I know where the MSDS's for my work area are kept and understand that they are available for my review.

I understand that I am required to follow the necessary precautions outlined in the Chemical Handling Procedures/Hazard Communication Program and MSDS's, including use of personal protective equipment and/or apparel.

I know the location of emergency phone numbers, the location and method of operating communications systems (i.e. cell phone, 2-way radio system, etc), the location of medical, fire, and other emergency supplies.

I am aware of my right to obtain copies of the Hazardous Chemical list, written Chemical Handling Procedures/Hazard Communication Program, and MSDS's at my request.

Employee Name: _____

Signature: _____ Date: _____

B. Personal Protective Equipment

1. Purpose

To provide guidelines concerning the proper use of Personal Protective Equipment and to comply with OSHA standards outlined in Title 29, Code of Federal Regulations (CFR), parts 1900-1999.

2. Definition

PPE includes clothing and other accessories designed to create a barrier between the user and workplace hazards. It should be used in conjunction with engineering, work practice and/or administrative controls to provide maximum employee safety and health in the workplace.

3. Responsibility

All employees should use protective equipment described by local, state, federal, and company rules and regulations to control or eliminate any hazard or other exposure to illness or injury.

4. Training

Proper employee training on the correct usage of PPE will likely eliminate many accidents and injuries from occurring. Before performing any work that requires the use of PPE, the Business Owner or Manager, or his/her delegate, must train employees on the following:

- a. When and what types of PPE are necessary;
- b. How the PPE is to be used;
- c. What the PPE's limitations are; and
- d. How PPE should be handled, maintained and stored in accordance with the PPE manufacturer's recommendations.

In many cases, more than one type of PPE will provide adequate protection. In such cases, employees should have their choice of which type of protection they would like to use.

The company is required to document in writing that training has been performed and that employees understand all trained materials. Written certifications should contain the names of all employees trained, the date(s) of training, and the PPE requirements.

An example of Training Documentation for Personal Protective Equipment follows.

5. Types of Protection

- a. **Eye and Face Protection** – Safety glasses with side shields should be provided by Manager or Supervisor and use of such equipment should be mandatory for all employees and visitors in those areas where eye injuries are likely to occur if appropriate eye protection is not worn.

(1) All construction areas require 100% eye protection at all times. Minimum eye protection includes approved safety glasses with side shields or mono-goggles meeting the standards specified in ANSI Z87.1-1968.

(2) Additional eye and face protection should be used by employees when:

- (a) Welding, burning, or using cutting torches
- (b) Using grinding equipment
- (c) Operating saws, drills, cutting tools
- (d) Working with any materials subject to scaling, flaking, or chipping
- (e) Sanding or water blasting
- (f) Working with compressed air or other gases
- (g) Working with chemicals or other hazardous materials
- (h) Working near any of the above named operations

(3) **Selection**

There are different types of eye and face protection designed for particular hazards. In selecting protection, consider type and degree of hazard. Where a choice of protection is given, worker comfort should be the deciding factor in selecting eye protection.

Employees who use corrective eye glasses should wear face shields, goggles, or spectacles of one of the following types:

- (a) Spectacles with protective lenses providing optical correction;
- (b) Goggles or face shields worn over corrective spectacles without disturbing the adjustment of the spectacles; or
- (c) Goggles over contact lenses. (Exception: If handling chemicals and the Material Safety Data Sheet on the chemical indicates "contact lenses should not be worn when handling this chemical", employee should be required to follow (a) or (b) above).

(4) Fit

Skilled persons should fit all employees with goggles or safety spectacles. Prescription safety glasses should be fitted by qualified optical personnel.

(5) Inspection and Maintenance

Eye protection lenses should be kept clean at all times. Continuous vision through dirty lenses can cause eye strain. Daily inspection and cleaning of eye protection with hot, soapy water is also recommended. Pitted lenses should also be replaced immediately as they can be a source of reduced vision. Deeply scratched or excessively pitted lenses are also more likely to break. Employees are responsible for taking care of their eye protection. They are also responsible for turning in eye protection that is in poor shape to their immediate supervisor.

- b. Respiratory Protection** – Respiratory protection devices, approved by the U.S. Bureau of Mines, should be worn by employees exposed to hazardous concentrations of toxic or noxious dust, fumes or mists as required by OSHA. The Hazard Communications Program should include respiratory protection programs.
- c. Foot and Leg Protection** – Workshoes/boots are to be worn by all employees handling heavy materials which are likely to cause foot/toe injuries if dropped. Tennis shoes, sandals, docksiders, hush puppies, steel toed sneakers and bare feet are prohibited.
- d. Glove and Hand Protection** – Gloves provided by the Company should be worn when handling objects or substances that could cut, tear, burn, or otherwise injure the hand. Gloves should not be used when operating machinery.
- e. Clothing** – Wear safe and practical working apparel. Be sure that any clothing you wear is not highly flammable. Neckties and loose, torn or ragged clothing should not be worn while operating tools or equipment. Jewelry of any kind should not be worn when working around machinery or exposed electrical equipment.
- f. Other Personal Protective Equipment** – Other required equipment to be used under unusual circumstances such as high temperature work, handling corrosive liquids, etc., not specifically covered in this section should be reviewed by the Business Owner or Manager and furnished by the Company when required.

A sample Hazard Assessment Form to assist you in determining the PPE needed by your employees follows.

HAZARD ASSESSMENT FORM

Date: _____ Location: _____

Assessment Conducted By: _____

Specific Tasks Performed at this Location: _____

Hazard Assessment and Selection of Personal Protective Equipment

I. Overhead Hazards –

Hazards to consider include:

- Suspended loads that could fall
- Overhead beams or loads that could be hit against
- Energized wires or equipment that could be hit against
- Employees work at elevated site who could drop objects on others below
- Sharp objects or corners at head level

Specific Hazards Identified at this location which require Head Protection: _____

Head Protection

Hard Hat Needed: Yes No

If yes, type:

- Type A** (impact and penetration resistance, plus low-voltage electrical insulation)
- Type B** (impact and penetration resistance, plus high-voltage electrical insulation)
- Type C** (impact and penetration resistance)

II. Eye and Face Hazards –

Hazards to consider include:

- Chemical splashes
- Dust
- Smoke and fumes
- Welding operations
- Lasers/optical radiation
- Bioaerosols
- Projectiles

Specific Hazards at this location identified which require eye and/or face protection: _____

Eye Protection

Safety glasses or goggles needed? Yes No

Face shield needed? Yes No

III. Hand Hazards –

Hazards to consider include:

- Chemicals
- Sharp edges, splinters, etc.
- Temperature extremes
- Biological agents

Hazards to consider include: **(Cont'd)**

- Exposed electrical wires
- Sharp tools, machine parts, etc.
- Material handling

Specific hazards identified at this location which require Hand Protection: _____

Hand Protection

Type of Gloves Needed? Yes No

- Chemical resistant
- Temperature resistant
- Abrasion resistant
- Other (Explain) _____

IV. Foot Hazards –

Hazards to consider include:

- Heavy materials handled by employees
- Sharp edges or points (puncture risk)
- Exposed electrical wires
- Unusually slippery conditions
- Wet conditions
- Construction/demolition

Specific hazards identified at this location which require foot protection: _____

Foot Protection

Safety shoes Yes No

Type Needed based on Hazards Identified

- Toe protection
- Puncture resistant
- Electrical insulation
- Other (Explain) _____

V. Other Identified Safety and/or Health Hazards:

Hazard	Recommended Protection
_____	_____
_____	_____
_____	_____
_____	_____

I certify that the above inspection was performed to the best of my knowledge and ability, based on the hazards present on

_____ .

(Signature)

TRAINING DOCUMENTATION FOR PERSONAL PROTECTIVE EQUIPMENT

I have received training on the details of my company's Personal Protective Equipment Program.

I understand that I am required to follow all necessary precautions outlined in the Personal Protective Equipment Program.

I know the location of emergency phone numbers and communications systems, and the location of medical, fire, and other emergency supplies.

Employee Name: _____

Signature: _____ Date: _____

C. Smoking Policy

1. Purpose

To establish guidelines whereby the INDIAN HILLS COUNTRY CLUB provides a smoke-free work environment for our employees and is in compliance with all federal and state Indoor Clean Air Acts.

2. Scope

This policy applies to all employees, vendors, visitors, and contractors.

3. Policy

- a. Smoking is **prohibited throughout the building**, unless clearly posted as a "Smoking Permitted" area.
- b. Employees will refrain from smoking in any company vehicle.

4. Discipline

All employees share in the responsibility for adhering to and enforcing the policy. In all cases, the right of the non-smoker to protect his/her health and comfort will take precedence over an employee's desire to smoke. Employees who violate this policy will be subject to the company's Disciplinary Action Program.

D. Violence Prevention Program

1. Purpose

To establish guidelines to protect employees against workplace violence.

2. Policy

Nothing is more important to the Management of INDIAN HILLS COUNTRY CLUB than the safety and well being of our employees. Threats, threatening behavior, or acts of violence against employees, visitors, guests, or other individuals by anyone on company property will not be tolerated. Violations of this policy will lead to disciplinary action, which may include dismissal, arrest, and prosecution.

Any person who makes substantial threats, exhibits threatening behavior, engages in violent acts, or brings a weapon onto INDIAN HILLS COUNTRY CLUB property shall be removed from the premises as quickly as safety permits and shall remain off premises pending the outcome of an investigation. The INDIAN HILLS COUNTRY CLUB management will initiate an appropriate response, including but not limited to suspension, reassignment of duties, termination of employment and/or business relationship, and/or criminal prosecution of the person(s) involved.

No existing policy, practice, or procedure should be interpreted to prohibit decisions designed to prevent a threat from being carried out, a violent act from occurring, or a life-threatening situation from developing.

All personnel are responsible for notifying their supervisor or the management representative(s) designated below of any threats that they have witnessed, received, or have been told that another person has witnessed or received. Even without an actual threat, personnel should also report any behavior they have witnessed which they regard as threatening or violent, when that behavior is job related or might be carried out on company property. Employees are responsible for making this report regardless of the relationship between the individual initiating the threat or threatening behavior and the person(s) receiving the threat, including domestic problems which they fear may result in violent acts against them or a coworker.

All individuals who apply for or obtain a protective or restraining order which lists the company locations as protected areas must provide a copy of the petition used to obtain the order, as well as a copy of the protective or restraining order which was granted, to their immediate supervisor or the designated representative(s) listed below.

The company understands the sensitivity of the information requested and has developed confidentiality procedures that recognize and respect the privacy of the reporting employee(s).

The designated management representative(s):

Name: _____

Title: _____ Dept: _____

Location: _____ Telephone: _____

THIS IS A DRAFT ONLY. OUR LEGAL COUNSEL IS REVIEWING OUR POLICY AND ACKNOWLEDGEMENT FORM PRIOR TO DISTRIBUTION.

E. Lockout/Tagout

1. Purpose

To establish a procedure to protect and prevent personnel from injury by 1) accidental activation of any powered or damaged equipment, and 2) the uncontrolled release of electrical energy. A secondary purpose is to remain in compliance with OSHA regulations, 29 CFR 1910.147.

2. Responsibility

The Manager is responsible for compliance. The Manager shall train Supervisors on proper lockout/tagout procedures, audit and/or oversee the application of the procedures, ensure corrective actions are taken when problems arise, and conduct an annual inspection/evaluation. Supervisors are responsible for training effected and authorized employees on the purpose and use of these procedures. The Manager should periodically monitor training activities and assist, as required, to ensure compliance with OSHA regulations and company goals. All effected and authorized employees involved in lockout/tagout procedures must receive annual training. A list of authorized, trained individuals will be maintained by the Manager. (See the attached List of Authorized Lockout/Tagout Individuals form.)

3. Scope

This procedure applies to all INDIAN HILLS COUNTRY CLUB personnel and contract employees. Lockout/tagout procedures will be enforced during installation, cleaning, servicing, maintenance, or inspection work performed on any powered equipment. This procedure does not apply to adjustment or other activities, which require the equipment be operating at the time of service. Other protective measures must be in place to protect employees during adjustment or "inching" work.

4. Definitions

- a. **Lockout:** *The application of a lock, chains, or other appropriate apparatus, and a danger identification tag to de-energize electrical equipment and/or process system to ensure that the equipment or system cannot be activated. **Note:** OSHA regulations require that locks be used to secure equipment whenever possible. Chains can be wrapped around valve handles and then locked in such a way that the valve cannot be operated. Tags alone can be used when it is not possible to use a lock.*
- b. **Tagout:** *The application of a danger identification tag when a physical lockout or de-energizing is not feasible or a lock has already been applied. Tags should bear the name of the employee applying the tag, the date of application, and a brief description of the work needed.*
- c. **Energy Source:** *The switch or valve through which energy is controlled to the unit (e.g. motor control center disconnect switches, circuit breaker panel switches, valves, locking pins, etc.). This energy may be: 1) electric power, 2) mechanical power, 3) hydraulic power, 4) pneumatic energy, 5) chemical system, or 6) thermal energy.*
- d. **Authorized Employees:** *A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment.*
- e. **Effected Employees:** *An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed. An effected employee becomes an authorized employee when the effected employees' duties include servicing or maintenance.*

5. Lockout/Tagout Procedures

- a. Each piece of equipment or system must be evaluated to identify all energy sources to be locked or tagged out. The evaluation should be done periodically by a Supervisor or an authorized employee with familiarity with the equipment/system, using the attached Energy Source Determination Checklist.
- b. If the machine is determined by OSHA that formal lockout/tagout procedures are required, this should be done by an authorized employee and logged on the attached form List of Lockout/Tagout Procedures. These procedures should then be followed. If no specific procedures are required, or provided by the equipment manufacturer, complete the following tasks:
 - (1) Deactivate (turn off) and secure the equipment/system at the energy source. Relieve pressure, release stored energy from all systems, and restrain or block them. (Operators must tag the appropriate switches or controls inside the control room as part of this step).
 - (2) Attach a lock to each isolation device and a tag to the lock. Sign and date the tag, along with providing pertinent information.

- (3) Check to ensure that no personnel are exposed to the equipment/system, then attempt to activate the normal operating controls to ensure proper lockout/tagout. A voltmeter can be used to check the switch.

CAUTION: Always return the operating control to the “neutral” or “off” position after completing this test. The equipment/system is now locked and tagged out.

6. Lockout/Tagout Removal Procedures

- a. After installation, servicing, maintenance, inspection, or cleaning is complete, verify that all tools have been removed, all guards have been reinstalled, the area is clean and orderly, and the equipment is safe to operate.
- b. Ensure that employees are not exposed to the equipment and all employees are aware of the removal of the lock and tag.
- c. The locks and tags should be removed only by the employee who applied them, the Supervisor, or the Manager. Locks and tags may be removed by the Supervisor or Manager only after receiving approval from the employee who locked out/tagged out, and/or confirmation that the necessary repair has been completed. The tags should be signed and dated and submitted to the Manager.
- d. Activate energy source as required.

7. Procedures Involving More Than One Person

If more than one individual is required to lockout or tagout equipment, each shall use his/her own assigned lockout/tagout device on the energy source. When the energy source cannot accept multiple locks or tags, a multiple lockout/tagout device (hasp) should be used. A single key should be used to lockout the equipment/system, with the key being placed in a lockout box or cabinet. This cabinet or lockout box must allow multiple locks to secure it. Each employee will then use his/her own lock to secure the box or cabinet. As each person no longer needs to maintain the lockout protection, that person will remove his/her lock from the cabinet. Proper removal procedures should be followed.

8. Annual Inspection/Evaluation of Lockout/Tagout Program

The Lockout/Tagout Program should be reviewed on an annual basis to determine if changes in the program are needed. These changes may be due to additions of machinery/equipment, revisions in the way specific machines are locked out or tagged out, machinery has been removed from the premises, etc. The attached Lockout/Tagout Annual Inspection/Evaluation Report form may be of assistance in completing this very important procedure.

9. Training Documentation

All lockout/tagout training should be properly documented. Documentation forms should be kept on file within each Manager or Supervisor's office. Updated training should be provided when lockout/tagout procedure changes occur. Training documentation forms should be updated following each lockout/tagout training class. The attached Training Documentation for Lockout/Tagout Program form should assist you in maintaining proper documentation of your training procedures.

LOCKOUT/TAGOUT ANNUAL INSPECTION/EVALUATION REPORT

Date of Evaluation: _____

Evaluation was made by: _____

Policy has been reviewed: Yes No

Comments on policy: _____

The following procedures have been reviewed: _____

The following procedures were modified: _____

The following procedures were added: _____

A review of the OSHA log 300, associated accident reports, and OSHA Form 301 were conducted? Yes No

The following injuries resulted from lockout/tagout:

Injury	Procedure Number for Applicable Equipment	Process or Machinery

Comments: _____

Signature

Date

ENERGY SOURCE DETERMINATION CHECKLIST

Date: _____ Company Name: _____

Instructions: In order to determine all energy sources for each piece of equipment, all questions must be answered. If the question does not apply, write N/A.

Location: _____ Work Center: _____

Equipment Name: _____ Equipment #: _____

Serial: _____ Lockout/Tagout Procedure #: _____

1. Does this equipment have:

a. **Electric power** (including battery)? Yes No N/A

If yes, Motor Control Center (MCC) or power panel and breaker number: _____

Does it have a lockout device? Yes No N/A

Battery location: _____

Battery disconnect location: _____

b. **Mechanical power**? Yes No N/A

Mark each type of energy source that applies:

(1) Engine driven? Yes No N/A

If yes, switch or key location: _____

Is lockout device installed? Yes No N/A

If no, method of preventing operation: _____

(2) Spring loaded? Yes No N/A

If yes, is there a method of preventing spring activation? Yes No

If no, how can spring tension be safely released or secured? _____

(3) Counter weight(s)? Yes No N/A

If yes, is there a method of preventing movement? Yes No

If yes, can it be locked? Yes No

If no, how can it be safely secured? _____

(4) Flywheel? Yes No N/A

If yes, is there a method of preventing movement? Yes No

If yes, can it be locked? Yes No

If no, how can it be safely secured? _____

ENERGY SOURCE DETERMINATION CHECKLIST (Page 2)

1. Does this equipment have: (continued)

c. **Hydraulic Power?** Yes No N/A

If yes, location of main control/shut-off valve: _____

Can control/shut-off valve be locked in the "OFF" position? Yes No

If no, location of closest manual shut-off valve: _____

Does manual shut-off valve have a lockout device? Yes No

If no, what is needed to lock valve closed? _____

Is there a bleed or drain valve to reduce pressure to zero? Yes No

If no, what will be required to bleed off pressure? _____

d. **Pneumatic Energy?** Yes No N/A

If yes, location of main control/shut-off valve: _____

Can control/shut-off valve be locked in the "OFF" position? Yes No

If no, location of closest manual shut-off valve: _____

Does manual shut-off valve have a lockout device? Yes No

If no, what is needed to lock valve closed? _____

Is there a bleed or drain valve to reduce pressure to zero? Yes No

If no, what will be required to bleed off pressure? _____

e. **Chemical System?** Yes No N/A

If yes, location of main control/shut-off valve: _____

Can control/shut-off valve be locked in the "OFF" or closed position? Yes No

If no, location of closest manual shut-off valve: _____

Is there a bleed or drain valve to safely reduce system pressure and drain system of chemicals? Yes No

If no, how can the system be drained and neutralized? _____

What personal protective clothing or equipment is needed for this equipment? _____

ENERGY SOURCE DETERMINATION CHECKLIST (Page 3)

f. **Thermal Energy?** Yes No N/A

If yes, location of main control/shut-off valve: _____

Can control/shut-off valve be locked in the "OFF" or closed position? Yes No

If no, location of closest manual shut-off valve: _____

Does manual shut-off valve have a lock valve? Yes No

Is there a bleed or drain valve to safely reduce system pressure and temperature and drain system chemicals?
 Yes No

If no, how can the system be drained and neutralized? _____

What personal protective clothing or equipment is needed for this equipment? _____

Special precautions not noted above (i.e. fire hazards, chemical reactions, required cool down periods, etc.): _____

Recommendations or Comments: _____

Completed by: _____

Reviewed by: _____

Approved by: _____

TRAINING DOCUMENTATION FOR LOCKOUT/TAGOUT PROGRAM

I have received training and understand all rules and regulations regarding the lockout/tagout program.

I understand that I am required to follow the necessary precautions outlined in the lockout/tagout program.

I know the location of emergency phone numbers and communications systems, and the location of medical, fire, and other emergency supplies.

Employee Name: _____

Signature: _____ Date: _____

Department _____

F. Fleet Safety Rules/Regulations

1. All employees who drive a company car or delivery vehicle must abide by the following safety rules:
 - a. Employees are required to inspect their assigned vehicle (before taking it on the road) to ensure that it is in safe working condition. This includes properly working brakes, horns, and back-up alarms. The attached inspection form should be used.
 - b. Any defects in the company vehicle should be reported promptly.
 - c. Employees are required to obey all state, local, and company traffic regulations.
 - d. Engines are to be stopped and ignition keys removed when parking, refueling, or leaving the company vehicles.
 - e. Employees are not permitted to use personal cars or motorcycles for company business, unless specifically authorized by the supervisor. If personal vehicles are driven on company business, proof of personal auto coverage (i.e. copy of personal auto Declarations Page or copy of the Insurance Card from the vehicle) will be requested on an annual unannounced basis from all employees that operate their own vehicles on company business. Those unable to supply proof of insurance within 24 hours of the time requested, will not be permitted to drive their own vehicle on company business in the future.
 - f. Passengers not employed by the company are not permitted, unless authorized by the supervisor.
 - g. Employees should drive safely. Defensive driving must be practiced by all employees.
 - h. Seat belts and shoulder harnesses are to be worn at all times.
 - i. Vehicles must be locked when unattended to avoid criminal misconduct.
 - j. Vehicles must be parked in legal spaces and must not obstruct traffic.
 - k. Employees should park their vehicles in well-lighted areas at or near entrances to avoid criminal misconduct.
 - l. Employees should keep their headlights on at all times when driving a vehicle.
 - m. A vehicle, when loaded with any material extending 4 feet or more beyond its rear, shall have a red flag or cloth 12 inches square attached by day or a red light visible for 300 feet by night on the extreme end of the load.
 - n. Articles, tools, equipment, etc. placed in cars or truck cabs are to be hung or stored in such a manner as not to impair vision or in any way interfere with proper operation of the vehicle.
 - o. When you can not see behind your vehicle (truck), the driver should walk behind the truck prior to backing.
 - p. Personal use of company vehicles is not permitted without written approval from the Management of this organization. Family members of employees that are provided with a company vehicle are prohibited from driving a company vehicles at any time unless prior written approval has been obtained from the Manager of your department. (Exception: in case of an emergency where the employee is not able to operate the company vehicle, no prior written approval is required). Violation of this policy may result in disciplinary action which may include termination of employment.
 - q. Operating a company vehicle while under the influence of alcohol and other drugs is prohibited. Violators are subject to termination of employment.
 - r. Every accident should be reported to general manager. The general manager should investigate all accidents and review them with the Supervisor and employees.
 - s. All subcontractor personal vehicles must be parked in areas designated as contractor parking.
 - t. When operating vehicles within company parking areas or at job sites, speeds must not exceed 5 M.P.H.

2. Accident Reporting

a. Driver Conduct at the Scene of the Accident

- (1) Take immediate action to prevent further damage or injury.
 - (a) Pull onto the shoulder or side of the road.
 - (b) Activate hazard lights (flashers) and place warning signs promptly.
 - (c) Assist any injured person, but don't move them unless they are in danger of further injury.
- (2) Call the Police
 - (a) If someone is injured, request medical assistance.
 - (b) If you are near a phone, write a note giving the location and seriousness of the accident and give it to a "reliable" motorist and ask him/her to contact the police.
- (3) The vehicle should not be left unattended, except in an extreme emergency.
- (4) Exchange identifying information with the other driver. **Make no comments about assuming responsibility.**
- (5) Secure names, addresses, and phone numbers of all witnesses, or the first person on the scene if no one witnessed the accident.
- (6) Call the company immediately and report the accident to the Manager or Supervisor.

b. Complete the Vehicle Accident Report Form

- (1) Complete the Vehicle Accident Report Form. A copy can be obtained from the general manager and provide it to the general manager. Write legibly. Answer all questions completely or mark "not known." Use additional sheets of paper as needed to provide pertinent information.

3. Inspection Records and Preventative Maintenance

All drivers must regularly inspect, repair, and maintain their company vehicle. All vehicle parts and accessories must be in a safe and proper working order at all times. The following apply:

- a. All truck drivers must complete the vehicle inspection report at the end of each day. Drivers of company cars should complete the vehicle inspection report semi-annually. Notify the general manager of any unsafe conditions or defective parts immediately.
- b. Before the vehicle is driven again, any safety defects must be repaired.
- c. A copy of the last vehicle inspection report must be kept in the vehicle for at least 3 months.
- d. Quarterly preventative maintenance must be conducted on each vehicle.
- e. Maintenance and inspection records must be kept at the company for 1 year or for 6 months after the vehicle leaves the company's ownership.
- f. All vehicles are subject to a search at any time.

VEHICLE INSPECTION REPORT

(Use your safety belt)

Date: _____

Company _____ Location (City, State) _____ Vehicle Number _____

Driver Name _____ Driver Signature _____

Instructions: Drivers will perform necessary inspections. A (√) indicates satisfactory condition. An (X) indicates unsafe or improper conditions. An (O) indicates condition does not apply. Corrected deficiencies should be circled by management certifier.

INSIDE

- Parking brake (apply)
- Release trailer emergency brakes
- Apply service brake (air loss should not exceed 3 psi/min on single vehicles, 4 psi/min on combinations)

START ENGINE

- Oil Pressure (light or gauge)
- Air Pressure or Vacuum (gauge)
- Low air or vacuum warning device (air pressure below 40 psi check on pressure build-up. Air pressure above 60 psi deplete air until warning device works. Vacuum below 8 inches Hg, check on build-up. Above 8 inches Hg. Deplete vacuum until device works.)
- Instrument panel (telltale lights, buzzer, gauges)
- Horn
- Windshield Wiper and Washer
- Heater-defroster
- Mirrors
- Steering wheel (excess play)
- Apply trailer brakes in EMERGENCY
- Turn on all lights including 4-way flasher
- Starts properly

EMERGENCY EQUIPMENT

- Fire extinguishers
- Flags, standards, warning lights
- Spare fuses
- Spare bulbs
- Chains in season
- First-aid kit

FRONT

- Headlights
- Clearance lights
- Identification lights
- Turn signals and 4-way flasher
- Tires and wheels-lugs and serviceability

SIDE

- | (Left) | (Right) | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Fuel Tank and Cap |
| <input type="checkbox"/> | <input type="checkbox"/> | Sidemarkers lights |
| <input type="checkbox"/> | <input type="checkbox"/> | Reflectors |
| <input type="checkbox"/> | <input type="checkbox"/> | Tires and wheels-lugs and serviceability |
| <input type="checkbox"/> | <input type="checkbox"/> | Cargo tie-downs or doors |

REAR

- Tail lights
- Stop light
- Turn signals and 4-way flasher
- Clearance lights
- Identification lights
- Reflectors
- Tires and wheels, lugs and serviceability
- Rear end protection (bumper)
- Cargo tie-downs/doors

MECHANICAL OPERATION

- Engine knocks, misses, overheats, etc.
- Clutch skips, grabs, other
- Transmission noisy, hard shifting, jumps out of gear, other:
- Axles – noisy, other:
- Steering loose, shimmy, hard, other:
- Air, oil, water, leaks
- Springs broken, other:
- Brakes noisy, pulls soft, other:
- Speedometer, tachometer
- Tachograph, speed control devices

ON COMBINATIONS

- Hoses, connections
- Couplings (fifth wheel, tow bar, safety chains, locking devices)

OTHER

- _____
- _____
- Equipment inspection enroute (yes no)
 - Cargo securing devices (yes no)

Start time: _____ Mileage: _____ End time: _____ Mileage: _____

Remarks/Other Defects:

Defects corrected (initial)

- Yes No

Defect correction unnecessary (initial)

Certified by: _____ Date _____

PREVENTATIVE MAINTENANCE REPORT

Date/Time _____ Company _____ Location _____

Inspected by: _____ Employee I.D. Number _____

Vehicle License _____ Vehicle Number _____

	Satisfactory	Needs Attention
Brakes:		
Brake adjustment: <input type="checkbox"/> Left <input type="checkbox"/> Right		
Brake hoses		
Brake drums		
Brake shoes		
Parking brake		
Brake pedal travel		
Steering		
Steering suspension		
Change in steering action		
Steering components		
Tires		
Wear/Defect		
Overloading		
Groove depth 2/32" minimum		
Wheels		
Cracks		
Loose Nuts		
Rims		
Windows		
Windows and Windshields		
Wipers and Washers		
Lights		
Headlights		
Taillights		
Turn signals		
Reflectors		
Mirrors		
Horn		
Instruments/Gauges		
Seat belts		
Battery		
Radiator and Hoses		
Exhaust system		
Suspension		
Fuel system		
Oil/Water leaks		
Oil level		
Water level		
Transmission		
Engine performance		
General condition of body and interior		

Comments:

SUPERVISOR'S MOTOR VEHICLE ACCIDENT INVESTIGATION REPORT

DRIVER	VEHICLE	DATE OF ACCIDENT										
LOCATION OF ACCIDENT		TIME OF ACCIDENT										
DESCRIPTION OF ACCIDENT: (What happened?)												
SEAT BELT WORN?												
CAUSES OF ACCIDENT: (Why did it happen?)												
RECOMMENDATIONS FOR PREVENTION OF A RECURRENCE: (What should be done?)												
FOLLOW UP: (What actions were taken? Were they effective?)												
<ul style="list-style-type: none"> - INDICATE WITH DIAGRAM WHAT HAPPENED - SHOW POSITION OF VEHICLES - INDICATE DIRECTION (NORTH, SOUTH, EAST, WEST) WITH ARROWS 	<p style="text-align: center;">CLASSIFICATION OF ACCIDENT REVIEW</p> <p style="text-align: center;"><input type="checkbox"/> PREVENTABLE <input type="checkbox"/> NON-PREVENTABLE</p> <hr/> <p style="text-align: center;">ACCIDENTS USUALLY PREVENTABLE</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Intersection</td> <td style="width: 50%;">Cut In or Out</td> </tr> <tr> <td>Backing</td> <td>Pulled from Curb</td> </tr> <tr> <td>Hit Other in Rear</td> <td>Hit Stationary Object</td> </tr> <tr> <td>Skidded</td> <td>Hit Pedestrian</td> </tr> </table> <hr/> <p style="text-align: center;">ACCIDENTS USUALLY NON-PREVENTABLE</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Hit in Rear</td> <td style="width: 50%;">Hit When Properly Parked</td> </tr> </table>		Intersection	Cut In or Out	Backing	Pulled from Curb	Hit Other in Rear	Hit Stationary Object	Skidded	Hit Pedestrian	Hit in Rear	Hit When Properly Parked
Intersection	Cut In or Out											
Backing	Pulled from Curb											
Hit Other in Rear	Hit Stationary Object											
Skidded	Hit Pedestrian											
Hit in Rear	Hit When Properly Parked											

Investigating Supervisor's Signature

Manager's Signature

Date Of Report

Reviewed By Manager

Date

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Section VIII – Inspections

Periodic inspections will be conducted to identify hazardous conditions and unsafe behavior. The Manager or Supervisor within each department will conduct inspections and may request employees to participate. The inspector should look for unsafe practices and conditions that can cause an accident and take corrective action immediately. Other individuals, not employed by our company, such as OSHA representatives, insurance companies, local fire department representative, etc. may decide to make an inspection of our facility. All employees of our company are asked to treat these onsite visitors with the same courtesy, cooperation, and respect as you would any visitor to our company.

Every month, a facility inspection should be completed and provided to the general manager. The general manager will review the report, take any corrective action needed, and maintain a file of inspections.

Periodically top management, supervisors and/or designated employees will complete inspections on a safety-sensitive or non-routine job to ensure compliance with safety procedures. If unsafe acts or unsafe conditions are detected within an area of the organization, additional training may be provided, as needed.

Examples of the Self-Inspection Checklist can be found in Appendix C.

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SECTION IX – OSHA (Occupational Safety and Health Administration)

A. OSHA Records Requirements

Copies of required accident investigations and certification of employee safety training shall be maintained by the Manager. A written report will be maintained on each accident, injury, or on-the-job illness requiring medical treatment. A record of each such injury or illness is recorded on OSHA Log and Summary of Occupational Injuries Form 300 according to instructions provided in the web site shown below. Supplemental records of each injury are maintained on OSHA Form 301. Every year, a summary of all reported injuries or illnesses is posted no later than February 1, for two months, until April 1, on OSHA Form 300. These records are maintained for five years from the date of preparation.

A copy of the OSHA 300 Log, the OSHA 300A Summary Form, and the OSHA 301 Injury and Illness Report Forms, and instructions on how to complete these forms, can be obtained by double clicking on:

<http://www.osha.gov/recordkeeping/new-osha300form1-1-04.pdf>

B. OSHA Inspection: What you can expect during an OSHA inspection

1. Arrival of the Compliance Officer (OSHA Inspector)

- a. Request to see credentials.
- b. Record his name, identification number, the name of his/her supervisor, and office location.
- c. Notify the Manager or your immediate Supervisor. If neither individual is available, ask the OSHA Compliance Officer to wait until the Manager or Supervisor arrive. If he/she cannot wait, the lead person at the property should accompany the Compliance Officer on his/her inspection.
- d. Do not volunteer any information, only answer questions.

2. Opening Conference

- a. The scope of the inspection will be discussed.
- b. The Officer will explain the reason for the inspection (i.e. employee complaint, scheduled inspection, etc.)
- c. If the reason for the inspection is an employee complaint, request a copy of the complaint.
- d. Take comprehensive notes and request to record the meeting and walk-around.

3. The Walk-Around (inspection)

- a. The Company representative should accompany the Compliance Officer throughout the inspection.
- b. The Officer may ask to interview employees. Employees should cooperate. The Company representative should attempt to participate in the interview.
- c. The Company representative should be prepared to show the Officer: 1) the Safety Manual, 2) Hazard Communication Program, 3) OSHA poster, 4) OSHA 300 Log
- d. If at all possible, correct any violations immediately as the Compliance Officer points them out.
- e. Take photographs of the same items or areas that are photographed by the Compliance Officer.
- f. Take notes. Write down every possible violation, standards cited, corrective action needed, and a deadline date.

4. Closing Conference

- a. The Compliance Officer will review any violations discovered during the inspection. Compare these to the notes you took during the inspection. Point out any discrepancies and areas already corrected.
- b. Be polite. Do not argue or get defensive with the Compliance Officer.
- c. If you are not clear on something, ask questions.
- d. This is a good opportunity to produce records of compliance efforts and other safety practices.

5. Citations and Penalties

- a.** Our goal is to provide a safe and healthy work environment. If the company is cited for OSHA violations, corrective action will be completed before the deadline provided by OSHA and as quickly as possible. It will be Management's decision to appeal any citations.

OSHA

OSHA

OSHA

OSHA

OSHA

OSHA

OSHA

OSHA

Section X – Acknowledgment Form

The rules, programs, and procedures stated within Indian Hills Country Club's Safety Program are not intended to cover all the possible situations you will be faced with on the job. The Company encourages you to act in a safe and responsible manner at all times, both on and off the job.

I have read Indian Hills Country Club's Safety Program, understand it, and agree to abide by it. I understand that violation of these rules may lead to dismissal.

Print Name: _____

Signature: _____

Date _____

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APPENDIX A – Sample Safety Policy Statements

“The Occupational Safety and Health Act of 1970 clearly states our common goal of safe and healthful working conditions. The safety and health of our employees continues to be the first consideration in the operation of this business.”

“Safety and health in our business must be a part of every operation. Without question it is every employee's responsibility at all levels.”

“It is the intent of this company to comply with all laws. To do this we must constantly be aware of conditions in all work areas that can produce injuries. No employee is required to work at a job he or she knows is not safe or healthful. Your cooperation in detecting hazards and, in turn, controlling them is a condition of your employment. Inform your supervisor immediately of any situation beyond your ability or authority to correct.”

“The personal safety and health of each employee of this company is of primary importance. The prevention of occupationally-induced injuries and illnesses is of such consequence that it will be given precedence over operating productivity whenever necessary. To the greatest degree possible, management will provide all mechanical and physical facilities required for personal safety and health in keeping with the highest standards.”

“We will maintain a safety and health program conforming to the best practices of organizations of this type. To be successful, such a program must embody the proper attitudes toward injury and illness prevention on the part of management and employees. It also requires cooperation in all safety and health matters, not only between supervisor and employee, but also between each employee and his or her co-workers. Only through such a cooperative effort can a safety program in the best interest of all be established and preserved.”

“Our objective is a safety and health program that will reduce the number of injuries and illnesses to an absolute minimum, not merely in keeping with, but surpassing, the best experience of operations similar to ours. Our goal is zero accidents and injuries.”

“Our safety and health program will include:

- Providing mechanical and physical safeguards to the maximum extent possible.
- Conducting a program of safety and health inspections to find and eliminate unsafe working conditions or practices, to control health hazards, and to comply fully with the safety and health standards for every job.
- Training all employees in good safety and health practices.
- Providing necessary personal protective equipment and instructions for its use and care.
- Developing and enforcing safety and health rules and requiring that employees cooperate with these rules as a condition of employment.
- Investigating, promptly and thoroughly, every accident to find out what caused it and to correct the problem so that it won't happen again.
- Setting up a system of recognition and awards for outstanding safety service or performance.”

“We recognize that the responsibilities for safety and health are shared:

- The employer accepts the responsibility for leadership of the safety and health program, for its effectiveness and improvement, and for providing the safeguards required to ensure safe conditions.
- Supervisors are responsible for developing the proper attitudes toward safety and health in themselves and in those they supervise, and for ensuring that all operations are performed with the utmost regard for the safety and health of all personnel involved, including themselves.
- Employees are responsible for “wholehearted, genuine cooperation with all aspects of the safety and health program, including compliance with all rules and regulations and for continuously practicing safety while performing their duties”.

“It is the policy of this company that every employee is entitled to a safe and healthful place in which to work. To this end, every reasonable effort will be made in the interest of accident prevention, fire protection, and health preservation.”

“The safety of our employees is a major consideration in the operation of our organization. Management and supervisory personnel will be accountable for the safety of the employees working under their supervision and will be expected to conduct operations in a safe manner at all times. Management will also be responsible for establishing safe working conditions and promoting the health and safety of employees.”

“It is the desire of INDIAN HILLS COUNTRY CLUB to comply with state and federal laws and to provide a safe working environment for its employees. The Company, however, recognizes that the responsibilities for safety and health are shared:

- The Company accepts the responsibility for leadership of the safety and health program, for its effectiveness and improvement, and for providing the safeguards required to ensure safe conditions.
- Supervisors are responsible for developing the proper attitude toward safety and health in themselves and in those they supervise. They are also responsible for ensuring that all operations are performed with the utmost regard for safety and health of all personnel involved, including themselves. When safety practices are necessary, the supervisor shall communicate them to the employee on his/her first day of employment. If safety procedures are not being followed, disciplinary action will be taken. This action might include, but is not limited to, reprimand, suspension, or dismissal of the employee. Periodic review of this policy with employees will be done by the supervisor.
- Employees are responsible for wholehearted cooperation in all aspects of the safety and health program including compliance with all rules and regulations – and for continuously practicing safety while performing their job functions.”

STATEMENT OF SAFETY POLICY

It is the policy of _____ to strive for the highest safety standards for its employees. Safety does not occur by chance. It is the result of careful attention to our work by all those involved. Managers, supervisors, and employees share the responsibility of maintaining a safe workplace.

This safety program has been developed to assure compliance with all State and Federal OSHA regulations. Regard for the safety of all employees, the general public, and subcontractors in our facilities is of great importance to _____ company. Accidents can be prevented and the safety of all is the goal we want to achieve.

Providing a safe place to work, the proper protective equipment and a work environment conducive to safe work practices and policies is a primary and a major concern for the management of this company.

President

Appendix B – Sample Checklist – Planning for Emergencies

1. Has a contingency analysis been conducted to determine what emergencies might arise?
2. Have emergency plans and procedures been developed for potentially catastrophic events such as:
 - a. Fires
 - b. Explosions
 - c. Leaks and spills
 - d. Severe weather
 - e. Floods
 - f. Earthquakes
 - g. Bomb threats
 - h. Employee Violence
 - i. Theft/Robbery Attempts
 - j. Other
3. Do these plans provide for procedures for extinguishing different types of fires which might occur?
4. Do these plans have adequate evacuation and recovery procedures for each type of emergency?
5. Have responsibilities been assigned in the plan to specific personnel to direct operations and to respond to emergencies? Are these persons aware of their responsibilities? Are they qualified to lead in the necessary actions which might be required?
6. Are emergency crews qualified, designated and on site?
7. Are different communications channels assigned to support emergency operations?
8. Are there plans to evacuate personnel from each work site in the event of emergencies?
9. Are evacuation route and warning signals information posted in each work area? Are the evacuation routes and exits marked?
10. Can egress routes from work areas be followed by personnel in the dark or in smoke?
11. Are the emergency plans and procedures posted in prominent areas?
12. Have personnel received training in emergency procedures?
 - a. Workers
 - b. Supervisory personnel
 - c. Firefighters
 - d. Medical personnel
 - e. Communications personnel
13. Are there drills on simulated emergencies being conducted periodically for personnel?
14. Is there a procedure to ensure that all personnel have been alerted to the emergency and those who will not combat it have been evacuated?
15. Are the egress provisions adequate (i.e., doors, stairways, elevators) for the evacuation in the event of an emergency?
16. Do all doors open in the proper direction to facilitate egress of personnel in emergencies?
17. Are there procedures to preclude obstructions to personnel or equipment in critical evacuation or emergency equipment access routes or areas?
18. Is the emergency equipment called for in the emergency procedures available at the facility, and is it operational? Can the equipment be reached easily if an emergency occurs?
19. Are warning systems installed (sirens, loudspeakers, etc.) and are they tested periodically? Are all personnel familiar with the meanings of warning signals and required action to be taken?
20. Is there a fire detection system at each facility? Are fire extinguishers sized, located, and of the types required by standards, and are they suitable for the types of fires which might occur?
21. Is there fire-fighting equipment located near flammables or hazardous areas?
22. Are emergency telephone numbers posted for the fire department, ambulance, hospital emergency room, law enforcement, and others?

RESERVED FOR FUTURE USE

Appendix C – Self-Inspection Checklist

The most widely accepted way to identify hazards is to conduct safety and health inspections. The only way you can be certain of the actual situation is for you to look at it from time to time.

Make a Self-Inspection of Your Business

Begin a program of self-inspection in your own workplace. Self-inspection is a must if you are to know where probable hazards exist and whether they are under control.

Later in this Section, you will find checklists designed to assist you in this fact-finding. They will give you some indication of where you should begin action to make your business safer and more healthful for all of your employees.

These checklists are by no means all inclusive. You may wish to add to them or delete portions that do not apply to your business. Consider carefully each item as you come to it and then make your decision.

Don't spend time with items that obviously have no application to your business. Make sure each item is seen by you or your designee, and leave nothing to memory or chance. Write down what you see, or don't see, and what you think you should do about it.

When you have completed the checklists, add this material to your injury information, your employee information, and your process and equipment information. You will now possess many facts that will help you determine what problems exist. Then, if you use the OSHA standards in your problem-solving process, it will be much easier for you to determine the action needed to solve these problems.

Once the hazards have been identified, you can institute control procedures.

Technical assistance in self-inspection may be available to you as a small business owner or manager through your insurance carrier, the local safety council and many local, state, and federal agencies, including the state consultation programs and OSHA Area Offices. Additional checklists are available from the National Safety Council, trade associations, insurance companies and other similar service organizations. Note the following self-inspection checklists taken from OSHA's publication entitled *OSHA Handbook for Small Businesses*.

Self-Inspection Scope

The scope of your self-inspections should include the following:

- **Processing, Receiving, Shipping and Storage** — equipment, job planning, layout, heights, floor loads, projection of materials, materials-handling and storage methods.
- **Building and Grounds Conditions** — floors, walls, ceilings, exits, stairs, walkways, ramps, platforms, driveways, aisles.
- **Housekeeping Program** — waste disposal, tools, objects, materials, leakage and spillage, cleaning methods, schedules, work areas, remote areas, storage areas.
- **Electricity** — equipment, switches, breakers, fuses, switch-boxes, junctions, special fixtures, circuits, insulation, extensions, tools, motors, grounding, NEC compliance.
- **Lighting** — type, intensity, controls, conditions, diffusion, location, glare and shadow control.
- **Heating and Ventilation** — type, effectiveness, temperature, humidity, controls, natural and artificial ventilation and exhausting.

- **Personnel** — training, experience, methods of checking machines before use, type clothing, personal protective equipment, use of guards, tool storage, work practices, method of cleaning, oiling, or adjusting machinery.
- **Kitchen Equipment** — purchasing standards, inspection, storage, repair, types, maintenance, grounding, use and handling.
- **Chemicals** — storage, handling, transportation, spills, disposals, amounts used, toxicity or other harmful effects, warning signs, supervision, training, protective clothing and equipment.
- **Fire Prevention** — extinguishers, alarms, sprinklers, smoking rules, exits, personnel assigned, separation of flammable materials and dangerous operations, waste disposal.
- **Maintenance** — regularity, effectiveness, training of personnel, materials and equipment used, records maintained, method of locking out machinery, general methods.
- **Personal Protective Equipment** — type, size, maintenance, repair, storage, assignment of responsibility, purchasing methods, standards observed, training in care and use, rules of use, method of assignment.

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SELF-INSPECTION CHECKLISTS

These check lists are by no means all-inclusive. You should add to them or delete portions or items that do not apply to your operations: however, carefully consider each item as you come to it and then make your decision. You also will need to refer to OSHA standards for complete and specific standards that may apply to your work situation.

EMPLOYER POSTING

- Is the required OSHA workplace poster displayed in a prominent location where all employees are likely to see it?
- Are emergency telephone numbers posted where they can be readily found in case of emergency?
- Where employees may be exposed to any toxic substances or harmful physical agents, has appropriate information concerning employee access to medical and exposure records and "Material Safety Data Sheets" been posted or otherwise made readily available to affected employees?
- Are signs concerning "Exiting from buildings," room capacities, floor loading, biohazards, exposures to x-ray, microwave, or other harmful radiation or substances posted where appropriate?
- Is the Summary of Occupational Illnesses and Injuries posted in the month of February?

RECORDKEEPING

- Are all occupational injury or illnesses, except minor injuries requiring only first aid, being recorded as required on the OSHA 300 log?
- Are employee medical records and records of employee exposure to hazardous substances or harmful physical agents up-to-date and in compliance with current OSHA standards?
- Are employee training records kept and accessible for review by employees, when required by OSHA standards?
- Have arrangements been made to maintain required records for the legal period of time for each specific type record? (Some records must be maintained for at least 40 years.)
- Are operating permits and records up-to-date for such items as elevators, air pressure tanks, liquefied petroleum gas tanks, etc.?

SAFETY AND HEALTH PROGRAM

- Do you have an active safety and health program in operation that deals with general safety and health program elements as well as the management of hazards specific to your worksite?
- Is one person clearly responsible for the overall activities of the safety and health program?
- Do you have a safety committee or group made up of management and labor representatives that meets regularly and report in writing on its activities?
- Do you have a working procedure for handling in-house employee complaints regarding safety and health?
- Are you keeping your employees advised of the successful effort and accomplishments you and/or your safety committee have made in assuring they will have a workplace that is safe and healthful?

MEDICAL SERVICES AND FIRST-AID

- Is there a hospital, clinic, or infirmary for medical care in proximity of your workplace?
- If medical and first-aid facilities are not in proximity of your workplace, is at least one employee on each shift currently qualified to render first aid?
- Have all employees who are expected to respond to medical emergencies as part of their work *
 - (1) received first-aid training; (2) had hepatitis B vaccination made available to them; (3) had appropriate training on procedures to protect them from bloodborne pathogens, including universal precautions; and (4) have available and understand how to use appropriate personal protective equipment to protect against exposure to bloodborne diseases?
- Where employees have had an exposure incident involving bloodborne pathogens, did you provide an immediate post-exposure medical evaluation and follow-up?
- Are medical personnel readily available for advice and consultation on matters of employees' health?
- Are emergency phone numbers posted?
- Are first-aid kits easily accessible to each work area, with necessary supplies available, periodically inspected and replenished as needed?
- Have first-aid kit supplies been approved by a physician, indicating that they are adequate for a particular area or operation?
- Are means provided for quick drenching or flushing of the eyes and body in areas where corrosive liquids or materials are handled?

*Pursuant to an OSHA memorandum July 1, 1992, employees who render first aid only as a collateral duty do not have to be offered preexposure hepatitis B vaccine only if the employer puts the following requirements into his/her exposure control plan and implements them: (1) the employer must record all first-aid incidents involving the presence of blood or other potentially infectious materials before the end of the work shift during which the first-aid incident occurred; (2) the employer must comply with post-exposure evaluation, prophylaxis, and follow-up requirements of the standard with respect to "exposure incidents," as defined by the standard; (3) the employer must train designated first-aid providers about the reporting procedure; (4) the employer must offer to initiate the hepatitis B vaccination series within 24 hours to all unvaccinated first-aid providers who have rendered assistance in any situation involving the presence of blood or other potentially infectious materials.

GROUND'S AROUND THE BUILDING

- Parking areas free of potholes, litter and major cracks
- Parking areas lit adequately and free of hidden areas
- Sidewalks clear and in good condition
- Ice and snow are removed and area is kept sanded and salted

PLAYGROUNDS

- Fenced and gated
- Playground surfaces well maintained
- Equipment clean, maintained and secured
- Regulations conspicuously posted

DINING ROOM AND ENTRY

- Fire exits visible, well-marked, unobstructed and unlocked
- Tables arranged so none block emergency exits
- Aisles are kept clear
- Exit doors are equipped with panic hardware
- Signs are used to warn customers of wet floors
- Floors, mats, and carpets are in good repair
- Workers are trained in first aid procedures
- First aid kit is available, maintained, and placed in conspicuous area
- CPR/choke charts are posted
- Emergency telephone numbers are posted
- Areas well lighted

- Chairs and tables well maintained
- Smoking regulations posted
- Emergency lighting equipment functional

KITCHEN

- Cooking equipment protected by a fixed extinguishing system
- Extinguishing system inspected and tagged semi-annually
- Fire control manual release visible
- Hoods, vents and fans maintained free of grease and serviced regularly
- Sprinkler system in working order and periodically inspected and tested
- No storage within 18 inches of sprinkler heads
- Fire alarm and smoke detector equipment in working order
- Temperature limit controls in place
- Listed grease filters and other grease removal devices of approved type
- Fire extinguishers visible, mounted properly, of proper type, tagged, inspected annually
- Workers wear slip-resistant footwear
- Flooring near sinks protected by non-slip surfaces
- Flooring free of grease, puddles and debris
- Powered cutting machines equipped with guards
- Mixing machines provided with guards
- Air compressors equipped with guards
- Machines are disconnected before removing food and before cleaning
- Plunger is used to feed foods into chopper and grinder
- Broken glass is removed safely and promptly
- Workers are trained to use equipment and chemicals safely
- Knives are properly maintained, used, and stored

FOOD STORAGE

- Walk-in refrigerators well maintain and equipped with devices for opening the door from the inside
- Food stored on pallets or shelves
- Ice storage is covered
- Cold storage floor surfaces free of ice
- Equipment is properly grounded

- Emergency interior door latch is in good repair
- Detergents, sanitizers, and drying agents are separated from other chemicals and stored away from food and dishes
- Material safety data sheets are readily available for employees' use
- Pest control certificates available

FIRE PROTECTION

- Is your local fire department well acquainted with your facilities, its location and specific hazards?
- If you have a fire alarm system, is it certified as required?
- If you have a fire alarm system, is it tested at least annually?
- If you have interior stand pipes and valves, are they inspected regularly?
- If you have outside private fire hydrants, are they flushed at least once a year and on a routine preventive maintenance schedule?
- Are fire doors and shutters in good operating condition?
- Are fire doors and shutters unobstructed and protected against obstructions, including their counterweights?
- Are fire door and shutter fusible links in place?
- Are automatic sprinkler system water control valves, air and water pressure checked weekly/periodically as required?
- Is the maintenance of automatic sprinkler systems assigned to responsible persons or to a sprinkler contractor?
- Are sprinkler heads protected by metal guards, when exposed to physical damage?
- Is proper clearance maintained below sprinkler heads?
- Are portable fire extinguishers provided in adequate number and type?
- Are fire extinguishers mounted in readily accessible locations?
- Are fire extinguishers recharged regularly and noted on the inspection tag?
- Are employees periodically instructed in the use of extinguishers and fire protection procedures?

PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING

- Are protective goggles or face shields provided and worn where there is any danger of flying particles or corrosive materials?
- Are approved safety glasses required to be worn at all times in areas where there is a risk of eye injuries such as punctures, abrasions, contusions or burns?
- Are employees who need corrective lenses (glasses or contacts) in working environments having harmful exposures, required to wear *only* approved safety glasses, protective goggles, or use other medically approved precautionary procedures.
- Are protective gloves, aprons, shields, or other means provided and required where employees could be cut or where there is reasonably anticipated exposure to corrosive liquids, chemicals, blood, or other potentially infectious materials. See OSHA 29 CFR 1910.1030(b) for the definition of "other potentially infectious materials."
- Is appropriate foot protection required where there is the risk of foot injuries from hot, corrosive, poisonous substances, falling objects, crushing or penetrating actions?
- Are approved respirators provided for regular or emergency use where needed?
- Is all protective equipment maintained in a sanitary condition and ready for use?
- Do you have eye wash facilities and a quick Drench Shower within the work area where employees are exposed to injurious corrosive materials?
- Where special equipment is needed for electrical workers, is it available?
- Where food or beverages are consumed on the premises, are they consumed in areas where there is no exposure to toxic material, blood, or other potentially infectious materials.
- Is protection against the effects of occupational noise exposure provided when sound levels exceed those of the OSHA noise standard?
- Are adequate work procedures, protective clothing and equipment provided and used when cleaning up spilled toxic or otherwise hazardous materials or liquids?
- Are there appropriate procedures in place for disposing of or decontaminating personal protective equipment contaminated with, or reasonably anticipated to be contaminated with, blood or other potentially infectious materials?

GENERAL WORK ENVIRONMENT

- Are all worksites clean, sanitary, and orderly?
- Are work surfaces kept dry or appropriate means taken to assure the surfaces are slip-resistant?
- Are all spilled hazardous materials or liquids, including blood and other potentially infectious materials, cleaned up immediately and according to proper procedures?
- Is combustible scrap, debris and waste stored safely and removed from the worksite promptly?
- Is all regulated waste, as defined in the OSHA blood-borne pathogens standard (29 CFR 1910.1030), discarded according to federal, state, and local regulations?
- Is combustible dust cleaned up with a vacuum system to prevent the dust going into suspension?
- Are covered metal waste cans used for oily and paint-soaked waste?
- Are all oil and gas fired devices equipped with flame failure controls that will prevent flow of fuel if pilots or main burners are not working?
- Are all toilets and washing facilities clean and sanitary?
- Are all work areas adequately illuminated?

WALKWAYS

- Are aisles and passageways kept clear?
- Are aisles and walkways marked as appropriate?
- Are wet surfaces covered with nonslip materials?
- Are holes in the floor, sidewalk, or other walking surface repaired properly, covered or otherwise made safe?
- Are materials or equipment stored in such a way that sharp projectives will not interfere with the walkway?
- Are spilled materials cleaned up immediately?
- Are changes of direction or elevations readily identifiable?

FLOOR AND WALL OPENINGS

- Are skylight screens of such construction and mounting that they will withstand a load of at least 200 pounds?
- Is the glass in the windows, doors, glass walls, etc., which are subject to human impact, of sufficient thickness and type for the condition of use?
- Are grates or similar type covers over floor openings such as floor drains of such design that foot traffic or rolling equipment will not be affected by the grate spacing?

STAIRS AND STAIRWAYS

- Are standard stair rails or handrails on all stairways having four or more risers?
- Are all stairways at least 22 inches wide?
- Do stairs have landing platforms not less than 30 inches in the direction of travel and extend 22 inches in width at every 12 feet or less of vertical rise?
- Do stairs angle no more than 50 and no less than 30 degrees?
- Are stairs of hollow-pan type treads and landings filled to the top edge of the pan with solid material?
- Are step risers on stairs uniform from top to bottom?
- Are steps on stairs and stairways designed or provided with a surface that renders them slip resistant?
- Are stairway handrails located between 30 and 34 inches above the leading edge of stair treads?
- Do stairway handrails have at least 3 inches of clearance between the handrails and the wall or surface they are mounted on?
- Where doors or gates open directly on a stairway, is there a platform provided so the swing of the door does not reduce the width of the platform to less than 21 inches?
- Are stairway handrails capable of withstanding a load of 200 pounds, applied within 2 inches of the top edge, in any downward or outward direction?
- Where stairs or stairways exit directly into any area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?
- Do stairway landings have a dimension measured in the direction of travel, at least equal to the width of the stairway?
- Is the vertical distance between stairway landings limited to 12 feet or less?

ELEVATED SURFACES

- Are signs posted, when appropriate, showing the elevated surface load capacity?
- Are surfaces elevated more than 30 inches above the floor or ground provided with standard guardrails?
- Are all elevated surfaces (beneath which people or machinery could be exposed to falling objects) provided with standard 4-inch toeboards?
- Is a permanent means of access and egress provided to elevated storage and work surfaces?
- Is required headroom provided where necessary?

- Is material on elevated surfaces piled, stacked or racked in a manner to prevent it from tripping, falling, collapsing, rolling or spreading?
- Are dock boards or bridge plates used when transferring materials between docks and trucks or rail cars?

EXITING OR EGRESS

- Are the directions to exits, when not immediately apparent, marked with visible signs?
- Are doors, passageways or stairways that are neither exits nor access to exits and which could be mistaken for exits, appropriately marked "NOT AN EXIT," "TO BASEMENT," "STOREROOM," etc.?
- Are exit signs provided with the word "EXIT," in lettering at least 5 inches high and the stroke of the lettering at least ½-inch wide?
- Are all exits kept free of obstructions?
- Are there sufficient exits to permit prompt escape in case of emergency?
- Are special precautions taken to protect employees during construction and repair operations?
- Is the number of exits from each floor of a building and the number of exits from the building itself, appropriate for the building occupancy load?
- Are exit stairways which are required to be separated from other parts of a building, enclosed by at least 2-hour fire-resistive construction in buildings more than four stories in height, and not less than 1-hour fire-resistive construction elsewhere?
- Where ramps are used as part of required exiting from a building, is the ramp slope limited to 1 ft. vertical and 12 ft. horizontal?
- Where exiting will be through frameless glass doors, glass exit doors, storm doors, etc., are the doors fully tempered and meet the safety requirements for human impact?

EXIT DOORS

- Are doors which are required to serve as exits designed and constructed so that the way of exit travel is obvious and direct?
- Are windows which could be mistaken for exit doors, made inaccessible by means of barriers or railings?
- Are exit doors openable from the direction of exit travel without the use of a key or any special knowledge or effort when the building is occupied?
- Is a revolving, sliding or overhead door prohibited from serving as a required exit door?
- Where panic hardware is installed on a required exit door, will it allow the door to open by applying a force of 15 pounds or less in the direction of the exit traffic?

- Are doors on cold storage rooms provided with an inside release mechanism which will release the latch and open the door even if it's padlocked or otherwise locked on the outside?
- Where exit doors open directly onto any street, alley or other area where vehicles may be operated, are adequate barriers and warnings provided to prevent employees stepping into the path of traffic?
- Are doors that swing in both directions and are located between rooms where there is frequent traffic, provided with viewing panels in each door?

PORTABLE LADDERS

- Are all ladders maintained in good condition, joints between steps and side rails tight, all hardware and fittings securely attached and moveable parts operating freely without binding or undue play?
- Are non-slip safety feet provided on each ladder?
- Are non-slip safety feet provided on each metal or rung ladder?
- Are ladder rungs and steps free of grease and oil?
- Is it prohibited to place a ladder in front of doors opening toward the ladder except when the door is blocked open, locked or guarded?
- Is it prohibited to place ladders on boxes, barrels, or other unstable bases to obtain additional height?
- Are employees instructed to face the ladder when ascending or descending?
- Are employees prohibited from using ladders that are broken, missing steps, rungs, or cleats, broken side rails or other faulty equipment?
- Are employees instructed not to use the top step of ordinary stepladders as a step?
- When portable rung ladders are used to gain access to elevated platforms, roofs, etc., does the ladder always extend at least 3 feet above the elevated surface?
- Is it required that when portable rung or cleat type ladders are used, the base is so placed that slipping will not occur, or it is lashed or otherwise held in place?
- Are portable metal ladders legibly marked with signs reading "CAUTION" – Do Not Use Around Electrical Equipment" or equivalent wording?
- Are employees instructed to only adjust extension ladders while standing at a base (not while standing on the ladder or from a position above the ladder)?
- Are metal ladders inspected for damage?
- Are the rungs of ladders uniformly spaced at 12 inches, center to center?

HAND TOOLS AND EQUIPMENT

- Are all tools and equipment (both company and employee-owned) used by employees at their workplace in good condition?
- Are employees made aware of the hazards caused by faulty or improperly used hand tools?
- Are appropriate safety glasses, face shields, etc. used while using hand tools or equipment which might produce flying materials or be subject to breakage?
- Are tool cutting edges kept sharp so the tool will move smoothly without binding or skipping?
- Are tools stored in dry, secure location where they won't be tampered with?

PORTABLE (POWER OPERATED) TOOLS AND EQUIPMENT

- Are rotating or moving parts of equipment guarded to prevent physical contact?
- Are all cord-connected, electrically-operated tools and equipment effectively grounded or of the approved double insulated type?
- Are effective guards in place over belts, pulleys, chains, sprockets, on equipment?
- Are portable fans provided with full guards or screens having openings ½ inch or less?
- Are ground-fault circuit interrupters provided on all temporary electrical 15 and 20 ampere circuits, used during periods of construction and remodeling?

MACHINE GUARDING

- Is there a training program to instruct employees on safe methods of machine operation?
- Is there adequate supervision to ensure that employees are following safe machine operating procedures?
- Is there a regular program of safety inspection of machinery and equipment?
- Is all machinery and equipment kept clean and properly maintained?
- Can electric power to each machine be locked out for maintenance, repair, or security?
- Are the noncurrent-carrying metal parts of electrically operated machines bonded and grounded?
- Are manually operated valves and switches controlling the operation of equipment and machines clearly identified and readily accessible?
- Are all emergency stop buttons colored red?
- Are all pulleys and belts that are within 7 feet of the floor or working level properly guarded?

- Are machinery guards secure and so arranged that they do not offer a hazard in their use?
- Are provisions made to prevent machines from automatically starting when power is restored after a power failure or shutdown?
- If machinery is cleaned with compressed air, is air pressure controlled and personal protective equipment or other safeguards utilized to protect operators and other workers from eye and body injury?
- Are fan blades protected with a guard having openings no larger than ½ inch, when operating within 7 feet of the floor?

LOCKOUT TAGOUT PROCEDURES

- Is all machinery or equipment capable of movement, required to be de-energized or disengaged and tagged or locked-out during cleaning, servicing, adjusting or setting up operations, whenever required?
- Where the power disconnecting means for equipment does not also disconnect the electrical control circuit:
Are the appropriate electrical enclosures identified?
Is means provided to assure the control circuit can also be disconnected and locked-out?
- Is the locking-out of control circuits in lieu of locking-out main power disconnects prohibited?
- Are all equipment control valve handles provided with a means for locking-out?
- Does the lock-out procedure require that stored energy (mechanical, hydraulic, air, etc.) be released or blocked before equipment is locked-out for repairs?
- Are appropriate employees provided with individually keyed personal safety locks?
- Are employees required to keep personal control of their key(s) while they have safety locks in use?
- Is it required that only the employee exposed to the hazard, place or remove the safety lock?
- Is it required that employees check the safety of the lockout by attempting a start up after making sure no one is exposed?
- Are employees instructed to always push the control circuit stop button prior to re-energizing the main power switch?
- Is there a means provided to identify any or all employees who are working on locked-out equipment by their locks or accompanying tags?
- Are a sufficient number of accident preventive signs or tags and safety padlocks provided for any reasonably foreseeable repair emergency?
- In the event that equipment or lines cannot be shut down, locked-out and tagged, is a safe job procedure established and rigidly followed?

COMPRESSED GAS CYLINDERS

- Are cylinders with a water weight capacity over 30 pounds, equipped with means for connecting a valve protector device, or with a collar or recess to protect the valve?
- Are cylinders legibly marked to clearly identify the gas contained?
- Are compressed gas cylinders stored in areas which are protected from external heat sources such as flame impingement, intense radiant heat, electric arcs, or high temperature lines?
- Are cylinders located or stored in areas where they will not be damaged by passing or falling objects or subjects to tampering by unauthorized persons?
- Are cylinders stored or transported in a manner to prevent them from creating a hazard by tipping, falling or rolling?
- Are cylinders containing liquefied fuel gas, stored or transported in a position so that the safety relief device is always in direct contact with the vapor space in the cylinder?
- Are valve protectors always placed on cylinders when the cylinders are not in use or connected for use?
- Are all valves closed off before a cylinder is moved, when the cylinder is empty, and at the completion of each job?

ENVIRONMENTAL CONTROLS

- Are all work areas properly illuminated?
- Are employees instructed in proper first-aid and other emergency procedures?
- Are hazardous substances, blood, and other potentially infectious materials identified, which may cause harm by inhalation, ingestion, or skin absorption or contact?
- Are employees aware of the hazards involved with the various chemicals they may be exposed to in their work environment, such as ammonia, chlorine, epoxies, caustics, etc.?
- Is employee exposure to chemicals in the workplace kept within acceptable levels?
- Can a less harmful method or product be used?
- Is the work area's ventilation system appropriate for the work being performed?
- Are caution labels and signs used to warn of hazardous substances (e.g., asbestos) and biohazards (e.g., bloodborne pathogens)?
- Is vacuuming with appropriate equipment used whenever possible rather than blowing or sweeping dust?

- Are all local exhaust ventilation systems designed and operating properly such as air flow and volume necessary for the application, ducts not plugged or belts slipping?
- Is personal protective equipment provided, used and maintained wherever required?
- Are there written standard operating procedures for the selection and use of respirators where needed?
- Are restrooms and washrooms kept clean and sanitary?
- Is all water provided for drinking, washing, and cooking potable?
- Are all outlets for water not suitable for drinking clearly identified?
- Are employees' physical capacities assessed before being assigned to jobs requiring heavy work?
- Are employees instructed in the proper manner of lifting heavy objects?
- Where heat is a problem, have all fixed work areas been provided with spot cooling or air conditioning?
- Are employees screened before assignment to areas of high heat to determine if their health condition might make them more susceptible to having an adverse reaction?
- Are exhaust stacks and air intakes so located that contaminated air will not be recirculated within a building or other enclosed area?
- Are universal precautions observed where occupational exposure to blood or other potentially infectious materials can occur and in all instances where differentiation of types of body fluids or potentially infectious materials is difficult or impossible?

FLAMMABLE AND COMBUSTIBLE MATERIALS

- Are combustible scrap, debris and waste materials (oily rags, etc.) stored in covered metal receptacles and removed from the worksite promptly?
- Is proper storage practiced to minimize the risk of fire including spontaneous combustion?
- Are approved containers and tanks used for the storage and handling of flammable and combustible liquids?
- Is liquefied petroleum gas stored, handled, and used in accordance with safe practices and standards?
- Are no smoking signs posted on liquefied petroleum gas tanks?
- Are liquefied petroleum storage stands guarded to prevent damage from vehicles?
- Is vacuuming used whenever possible rather than blowing or sweeping combustible dust?

- Are fuel gas cylinders and oxygen cylinders separated by distance, fire resistant barriers, etc. while in storage?
- Are fire extinguishers selected and provided for the types of materials in areas where they are to be used?
 - Class A Ordinary combustible material fires.
 - Class B Flammable liquid, gas or grease fires.
 - Class C Energized-electrical equipment fires.
- Are appropriate fire extinguishers mounted within 75 feet of outside areas containing flammable liquids, and within 10 feet of any inside storage area for such materials?
- Are extinguishers free from obstructions or blockage?
- Are all extinguishers serviced, maintained and tagged at intervals not to exceed one year?
- Are all extinguishers fully charged and in their designated places?
- Where sprinkler systems are permanently installed, are the nozzle heads so directed or arranged that water will not be sprayed into operating electrical switch boards and equipment?
- Are "NO SMOKING" signs posted where appropriate in areas where flammable or combustible materials are used or stored?
- Are safety cans used for dispensing flammable or combustible liquids at a point of use?
- Are all spills of flammable or combustible liquids cleaned up promptly?
- Are "NO SMOKING" rules enforced in areas involving storage and use of hazardous materials?

HAZARDOUS CHEMICAL EXPOSURE

- Are employees trained in the safe handling practices of hazardous chemicals such as acids, caustics, etc.?
- Are employees aware of the potential hazards involving various chemicals stored or used in the workplace such as acids, bases, caustics, epoxies, phenols, etc.?
- Is employee exposure to chemicals kept within acceptable levels?
- Are eye wash fountains and safety showers provided in areas where corrosive chemicals are handled?
- Are all employees required to use personal protective clothing and equipment when handling chemicals (gloves, eye protection, respirators, etc.)?
- Are flammable or toxic chemicals kept in closed containers when not in use?
- Have standard operating procedures been established and are they being followed when cleaning up chemical spills?

- Where needed for emergency use, are respirators stored in a convenient, clean, and sanitary location?
- Are respirators intended for emergency use adequate for the various uses for which they may be needed?
- Are employees prohibited from eating in areas where hazardous chemicals are present?
- Is personal protective equipment provided, used and maintained whenever necessary?
- Do employees complain about dizziness, headaches, nausea, irritation, or other factors of discomfort when they use solvents or other chemicals?
- Is there a dermatitis problem? Do employees complain about dryness, irritation, or sensitization of the skin?
- If internal combustion engines are used, is carbon monoxide kept within acceptable levels?
- Is vacuuming used, rather than blowing or sweeping dusts whenever possible for clean-up?

HAZARDOUS SUBSTANCES COMMUNICATION

- Is there a list of hazardous substances used in your workplace?
- Is there a current written exposure control plan for occupational exposure to bloodborne pathogens and other potentially infectious materials, where applicable?
- Is there a written hazard communication program dealing with Material Safety Data Sheets (MSDS), labeling, and employee training?
- Is each container for a hazardous substance (i.e., vats, bottles, storage tanks, etc.) labeled with product identity and a hazard warning (communication of the specific health hazards and physical hazards)?
- Is there a Material Safety Data Sheet readily available for each hazardous substance used?
- Is there an employee training program for hazardous substances?
 - Does this program include:
 - (1) An explanation of what an MSDS is and how to use and obtain one.
 - (2) MSDS contents for each hazardous substance or class of substances.
 - (3) Explanation of "Right to Know."
 - (4) Identification of where an employee can see the employer's written hazard communication program and where hazardous substances are present in their work areas.
 - (5) The physical and health hazards of substances in the work area, and specific protective measures to be used.

- (6) Details of the hazard communication program, including how to use the labeling system and MSDS's.
- Does the employee training program on the bloodborne pathogens standard contain the following elements:
 - (1) an accessible copy of the standard and an explanation of its contents; (2) a general explanation of the epidemiology and symptoms of bloodborne diseases; (3) an explanation of the modes of transmission of bloodborne pathogens; (4) an explanation of the employer's exposure control plan and the means by which employees can obtain a copy of the written plan; (5) an explanation of the appropriate methods for recognizing tasks and the other activities that may involve exposure to blood and other potentially infectious materials; (6) an explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment; (7) information on the types, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment; (8) an explanation of the basis for selection of personal protective equipment; (9) information on the hepatitis B vaccine; (10) information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials; (11) an explanation of the procedure to follow if an exposure incident occurs, including the methods of reporting the incident and the medical follow-up that will be made available; and (12) information on post-exposure evaluations and follow-up; (13) an explanation of signs, labels, and color coding?
- Are employees trained in the following:
 - How to recognize tasks that might result in occupational exposure?
 - How to use work practice and engineering controls and personal protective equipment and to know their limitations?
 - How to obtain information on the types, selection, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment.
 - Who to contact and what to do in an emergency?

ELECTRICAL

- Do you specify compliance with OSHA for all contract electrical work?
- Are all employees required to report as soon as practicable any obvious hazard to life or property observed in connection with electrical equipment or lines?
- Are employees instructed to make preliminary inspections and/or appropriate tests to determine what conditions exist before starting work on electrical equipment or lines?
- When electrical equipment or lines are to be serviced, maintained or adjusted, are necessary switches opened, locked out and tagged whenever possible?
- Are portable electrical tools and equipment grounded or of the double insulated type?
- Are electrical appliances such as vacuum cleaners, polishers, vending machines, etc., grounded?
- Do extension cords being used have a grounding conductor?
- Are multiple plug adapters prohibited?
- Is exposed wiring and cords with frayed or deteriorated insulation repaired or replaced promptly?
- Are flexible cords and cables free of splices or taps?
- Are clamps or other securing means provided on flexible cords or cables at plugs, receptacles, tools, equipment, etc., and is the cord jacket securely held in place?
- Are all cord, cable and raceway connections intact and secure?
- In wet or damp locations, are electrical tools and equipment appropriate for the use or location or otherwise protected?
- Is the location of electrical power lines and cables (overhead, underground, underfloor, other side of walls, etc.) determined before digging, drilling or similar work is begun?
- Is the use of metal ladders prohibited in areas where the ladder or the person using the ladder could come in contact with energized parts of equipment, fixtures or circuit conductors?
- Are all disconnecting switches and circuit breakers labeled to indicate their use or equipment served?
- Are disconnecting means always opened before fuses are replaced?
- Do all interior wiring systems include provisions for grounding metal parts of electrical raceways, equipment and enclosures?
- Are all electrical raceways and enclosures securely fastened in place?
- Are all energized parts of electrical circuits and equipment guarded against accidental contact by approved cabinets or enclosures?
- Is sufficient access and working space provided and maintained about all electrical equipment to permit ready and safe operations and maintenance?
- Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs or plates?
- Are electrical enclosures such as switches, receptacles, junction boxes, etc., provided with tight-fitting covers or plates?

- Are disconnecting switches for electrical motors in excess of two horsepower, capable of opening the circuit when the motor is in a stalled condition, without exploding? (Switches must be horsepower rated equal to or in excess of the motor hp rating.)?
- Is low voltage protection provided in the control device of motors driving machines or equipment which could cause probable injury from inadvertent starting?
- Is each motor disconnecting switch or circuit breaker located within sight of the motor control device?
- Is each motor located within sight of its controller or the controller disconnecting means capable of being locked in the open position or is a separate disconnecting means installed in the circuit within sight of the motor?
- Is the controller for each motor in excess of two horsepower, rated in horsepower equal to or in excess of the rating of the motor it serves?
- Are employees who regularly work on or around energized electrical equipment or lines instructed in the cardio-pulmonary resuscitation (CPR) methods?

FUELING

- Is it prohibited to fuel an internal combustion engine with a flammable liquid while the engine is running?
- Are fueling operations done in such a manner that likelihood of spillage will be minimal?
- When spillage occurs during fueling operations, is the spilled fuel washed away completely, evaporated, or other measures taken to control vapors before restarting the engine?
- Are fuel tank caps replaced and secured before starting the engine?
- In fueling operations, is there always metal contact between the container and the fuel tank?
- Are fueling hoses of a type designed to handle the specific type of fuel?
- Is it prohibited to handle or transfer gasoline in open containers?
- Are open lights, open flames, or sparking, or arcing equipment prohibited near fueling or transfer of fuel operations?
- Is smoking prohibited in the vicinity of fueling operations?
- Are fueling operations prohibited in building or other enclosed areas that are not specifically ventilated for this purpose?
- Where fueling or transfer of fuel is done through a gravity flow system, are the nozzles of the self-closing type?

MATERIAL HANDLING

- Is there safe clearance for equipment through aisles and doorways?
- Are aisleways designated, permanently marked, and kept clear to allow unhindered passage?
- Are motorized vehicles and mechanized equipment inspected daily or prior to use?
- Are vehicles shut off and brakes set prior to loading or unloading?
- Are containers of combustibles or flammables, when stacked while being moved, always separated by dunnage sufficient to provide stability?
- Are hand trucks maintained in safe operating condition?

TRANSPORTING EMPLOYEES AND MATERIALS

- Do employees who operate vehicles on public thoroughfares have valid operator's licenses?
- When seven or more employees are regularly transported in a van, bus or truck, is the operator's license appropriate for the class of vehicle being driven?
- Is each van, bus or truck used regularly to transport employees, equipped with an adequate number of seats?
- Are vehicles used to transport employees equipped with lamps, brakes, horns, mirrors, windshields and turn signals in good repair?
- Is a full charged fire extinguisher, in good condition, with at least 4 B:C rating maintained in each employee transport vehicle?

CONTROL OF HARMFUL SUBSTANCES BY VENTILATION

- Is the volume and velocity of air in each exhaust system sufficient to gather the dusts, fumes, mists, vapors or gases to be controlled, and to convey them to a suitable point of disposal?
- Are exhaust inlets, ducts and plenums designed, constructed, and supported to prevent collapse or failure of any part of the system?
- Are clean-out ports or doors provided at intervals not to exceed 12 feet in all horizontal runs of exhaust ducts?
- Is adequate makeup air provided to areas where exhaust systems are operating?

- Is the source point for makeup air located so that only clean, fresh air, which is free of contaminants, will enter the work environment?
- Where two or more ventilation systems are serving a work area, is their operation such that one will not offset the functions of the other?

SANITIZING EQUIPMENT AND CLOTHING

- Is personal protective clothing or equipment that employees are required to wear or use, of a type capable of being cleaned easily and disinfected?
- Are employees prohibited from interchanging personal protective clothing or equipment, unless it has been properly cleaned?
- Are machines and equipment, which process, handle or apply materials that could be injurious to employees, cleaned and/or decontaminated before being overhauled or placed in storage?
- Are employees prohibited from smoking or eating in any area where contaminants that could be injurious if ingested are present?

Appendix D – Golf Course Safety Talks

The following pages contain Pre-written Safety Talks, which can be useful as supervisors within our organization provide training to new and existing employees. The Safety Talks are written such that supervisors, or their subordinates, can conduct a safety meeting using these Safety Talks. Improving safety education throughout all departments should help reduce employee injuries, customer injuries, property losses due to fire, etc.

KITCHEN HAZARDS

The major area where food service related businesses are involved in on-the-job injuries is, of course, the kitchen.

Perhaps the greatest offenders causing both major and minor injuries are knives, cleavers, peelers and graters. It goes without saying that caution should be taken at all times. It's also a good idea to warn co-workers when you put anything sharp in wash water. "Knife in the water" is a common warning in many kitchen areas. Those four words can help prevent serious cuts and puncture wounds.

Spills and liquids on the floor cannot always be avoided, but there is no excuse for not wiping up spills or putting down an anti-slip rug to lessen the danger of falls. When floors are being mopped, put a warning sign or barrier nearby. Slips and falls have caused many permanent injuries.

Food grinders are also hazardous. Never feed anything into them with your hands – use a pusher. Garbage disposals can present the same hazard. Don't reach into the disposal if it is stalled, without taking steps to prevent it from being turned on.

Meat and cheese slicers are particularly dangerous, and the temptation to hand feed, especially at the end of a piece of food, must be avoided.

Modern kitchen equipment is typically electrically operated. Be sure the equipment is properly grounded or double insulated especially in kitchens, where water and moisture are plentiful. An electric shock can be serious or even fatal.

Meat band saws can be guarded up to a point. Use what guarding is provided and exercise extreme care and alertness when approaching the blade.

Kitchens would be of little use without heat, and heat is provided by stove burners, ovens, steam-jacketed kettles and pressure cookers. All, of course, are capable of causing severe and painful burns and scalds. Caution must be used around these heat sources.

However, when using pressure and steam, you must be doubly cautious. You're exposed not only to heat but also escaping steam and the possibility of explosion from built-up pressure. Injuries may even involve internal damage – inhaling live steam for example. When operating pressure cookers or steam-jacketed equipment, follow the manufacturer's instructions.

When carrying hot liquids, be alert for slips and falls, and warn others of your approach. Yell "hot stuff" or "heads up." It may prevent a lot of pain.

Some doors swing one way, while others swing both ways. In either case, the door should be approached with caution.

An ever-present problem in kitchens is broken glass and the sharp edges of opened tin cans. Never attempt to pick up broken glass with your bare hands – always sweep it up and use a dustpan or clean up slivers with a wet paper towel.

Observe rules established in kitchens, especially those applying to rush period traffic patterns. It makes good sense. Play it safe – that's food for thought.

NOTE

Use this space to list specific points or problems you wish to discuss during the safety meeting.

DISCUSSION LEADER _____ DATE _____

THE UNDERSIGNED CERTIFY THAT THEY HAVE ATTENDED THIS SAFETY MEETING AND UNDERSTAND THE HAZARDS AND INSTRUCTIONS IT COVERED.

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HANDLE MATERIALS SAFELY WITHIN A KITCHEN OR FOOD PREP AREA

More workers are injured on the job from the manual handling of materials than for any other reason. One out of every four work injuries, and one out of seven fatalities, results from the manual handling of some article or material. The trained, skilled and experienced employee can do much to further his own safety and that of others by adhering to the following simple practices:

1. **STOP, LOOK AND LISTEN** before starting a job. Identify the hazards involved and plan for their elimination or control.
2. Substitute mechanical handling or get someone to help you when materials are too heavy, bulky, or require prolonged or repeated lifting.
3. Wear gloves when handling rough, hot or sharp materials and equipment.
4. Wear shoes with slip resistant soles within the kitchen area.
5. Clean up, wipe up and pick up. Eliminate fall hazards.
6. Store materials so they do not project in aisles. Protect sharp edges.
7. Wear prescribed protective clothing and use proper containers when handling cleaning chemicals and materials.
8. When exposed to eye hazards, wear safety glasses.
9. When LIFTING, stoop and bend your knees. Keep your feet close to the load. Lift with your legs. Keep your back straight.
10. Wash thoroughly and carefully after handling dusty, dirty or skin irritating materials or cleaning compounds.

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ELECTRICAL SHOCK PREVENTION AT RESTAURANTS AND GOLF COURSES

Electrical shock kills and injures thousands of employees each year. Most of these accidents happen because people don't look, don't think or just don't understand the shocking power of electricity.

Voltage, current and resistance are the basic terms used when talking about electricity. Voltage is the force that causes the current to flow. Current (amperage) refers to the amount of electricity that is flowing. Resistance denotes the restrictions that try to slow down or stop the flow.

Electrical shock can only occur when a part of the body completes a circuit between a conductor and another conductor or a grounding source.

Death or injury is not caused by the voltage; the damage is done by the amount of current that flows through the body when the contact is made. Of course, the higher the voltage the greater the amount of current. Some people have survived shocks of several thousand volts, while others have been killed by voltages as low as 12.

The dry outer skin of the human body offers extremely high resistance to electrical flow. However, this resistance is reduced to almost zero when the skin is wet, especially if the skin is wet because of perspiration.

Electricity and proper grounding work together for safety. A ground is a conducting connection between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

If your body is sweaty or damp, an oversensitive ground within it is created, which easily causes electrical shock. One way to keep the body's resistance high is to keep it dry, particularly the hands and feet, which might make the contacts and be instrumental in completing the circuit. This can be accomplished by wearing rubber gloves, boots, drying your hands after washing hands or preparing foods within the kitchen.

Effects of electrical shock depend mainly on the total amount of current flow and the path of the current through the victim's body. To prevent electrical shock, which can cause several types of injuries, make sure that your body cannot become part of the electrical flow and the path of the current.

An important phase of electrical safety is knowing how to help an electrical shock victim. First, stop the current flowing from the circuit through the victim's body, if it hasn't already been done. Often, particularly in cases of low-voltage shock, victims are unable to pull away from the source of current. If the victim is still in contact with the current, disconnect or de-energize the circuit (i.e. at the Fuse Box or Circuit Breaker Box), if possible. If this cannot be accomplished, obtain a non-conductive item, such as dry clothing, dry rope or a dry stick, and remove the victim from the source of the current.

Then call or send for help. Next, check to see if the victim's heart or breathing has stopped. Give the required first aid until professional help arrives.

We can reduce the risk of accidents in our workplace by keeping in mind these guidelines:

1. Never use water to put out an electrical fire; water can cause a fatal shock. Use a Class C-rated fire extinguisher for electrical fires; shut off the source of power as quickly as possible.
2. Inspect the area you're working in for electrical hazards.
3. Don't overload circuits.
4. Keep electrical equipment away from water and dampness.
5. Check electrical cords before, during and after each use for fraying and other signs of wear and defects.
6. Extension cords are designed for short term use only. If necessary to use an extension cord for a microwave, a kitchen appliance, etc. permanent wiring and an approved receptacle should be installed in the area by a licensed electrician.
7. Be sure to tagout/lockout power sources when working on equipment.
8. Do not plug in an appliance, portable tools, etc. into an electrical receptacle within an unfinished basement, damp location, within 6 feet of a sink or water faucet unless the electrical receptacle is a GFCI (i.e. Ground Fault Circuit Interrupter) receptacle. This type of receptacle will help to reduce potential electric shock.

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FIRE EXTINGUISHERS WITHIN OCCUPANCIES WHERE COMMERCIAL COOKING OCCURS

Each year we observe National Fire Prevention Week as a reminder to all of us that we need to practice fire prevention and fire safety. If prevention fails and a fire starts, we need to know how to put it out. So let's take a few minutes to learn about fire extinguishers and how to use them effectively.

Do you know where the fire extinguisher is in your work area? If not, find out today! Within a dining room or reception area an extinguisher rated not less than 2A is required every 3000 square feet, however, the travel distance to reach this extinguisher must never be more than 100 feet. In multi-story buildings, at least one such extinguisher on each floor must be located adjacent to stairways. Take a moment to look around your workplace to find the location of the nearest fire extinguisher.

There are three common categories of fires:

1. Class A – ordinary combustibles, like paper, wood, and trash
2. Class B – flammable liquids, greases, or gases
3. Class C – energized electrical equipment

The three above classes of fire extinguishers are the traditional types of fire extinguishers which were built to extinguish one or more classes of fires.

A fourth type of extinguisher can be found within most commercial kitchens today. This fourth type is a Class K Wet Chemical fire extinguisher. This type is recommended for use on grease fires within commercial kitchens. This extinguisher is the type recommended for use within kitchens where a UL 300 Wet Chemical Automatic extinguishing system may be present within the hood over commercial cooking equipment in restaurants and golf course club house kitchens. The use of a Class A fire extinguisher or the use of water within a kitchen near a grease fire will tend to splatter the grease and increase the probability of spreading the fire rather than extinguishing it. The Class BC fire extinguisher (the type frequently found within commercial kitchens in the past prior to the development of the UL 300 Automatic Extinguishing system) is a dry chemical fire extinguisher and the use of a dry chemical fire extinguisher within a kitchen may counteract the effectiveness of the UL 300 wet chemical automatic extinguishing system. Within kitchens near grease producing appliances only use the Class K wet chemical portable fire extinguisher.

If a Class K Wet Chemical portable fire extinguisher is present within the building, point out the differences between this extinguisher and the other extinguishers which you may have within other sections of the building outside the kitchen. This should help the employees to remember to use only the Class K wet chemical extinguisher within the kitchen area near the commercial cooking equipment.

Never attempt to fight even a small fire until the fire department has been called and everyone has been evacuated. Do not fight the fire if you are unsure about the type of extinguisher, unsure how to use it, or if the fire is spreading or blocking your escape. If you can no longer safely fight the fire, leave the area immediately!

When using an extinguisher think of the acronym PASS — P.A.S.S. The “P” stands for **P**ull the pin, the “A” stands for **A**im the extinguisher nozzle at the base of the flames, the “S” stands for **S**queeze the trigger while holding the extinguisher upright, and the second “S” stands for **S**weep from side to side, covering the base of the fire with the extinguishing agent. Let's review this one more time. Remember to PASS: **P**ull, **A**im, **S**queeze, and **S**weep!

Even though we try to prevent fires, occasionally one may start and we must be prepared. If noticed quickly, and a fire extinguisher is available, the fire can be extinguished and property damage can be minimized. Make sure fire extinguishers are inspected on an annual basis by a fire extinguishing service contractor and confirm that the automatic extinguishing system within the hood over the cooking equipment is serviced by a fire extinguishing service contractor on a semi annual basis in accordance with National Fire Protection Association Standards.

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FIRE PREVENTION AT GOLF COURSES

A fire caused by poor housekeeping, carelessness or failure to follow instructions can destroy your clubhouse, your income, and even your life. But the chance of a fire can be reduced if everyone makes an effort to practice daily fire prevention measures.

Follow these fire safety tips:

1. Don't allow trash and litter to accumulate unnecessarily.
2. Keep the office, kitchen, dining areas and all storage rooms neat and clean.
3. Know where fire alarm boxes and extinguishers are located.
4. Make sure you know the different types of fire extinguishers and how to use them.
5. Check portable fire extinguishers periodically to see if they are charged and in good physical condition in well illuminated and easily accessible areas.
6. If present, store hazardous materials and cleaning chemicals within designated areas away from furnaces, electrical boxes and other potential sources of ignition.
7. Keep exit doors unlocked when the building is occupied.
8. Maintain the paths to exits and all exit doors free of obstructions.
9. Make sure there are good connections and effective grounds in the wiring.
10. Smoke only where permitted.
11. Keep equipment clean and use it properly.
12. Handle flammable liquids with caution.
13. Know the proper exits and procedures in case of an emergency.

If you store materials in a safe and orderly manner away from ignition sources, the chances of fire, spills and accidents are greatly reduced. A leaking chemical container can be a fire hazard unless the right precautions are taken. Make sure you know the hazards and proper storage procedures for the chemicals stored within each department. Consult the MSDS (i.e. Material Safety Data Sheet) on the individual chemicals to obtain information on the proper storage/handling procedures which should be followed within the building.

Every department and/or building should have an emergency plan. In case of fire or other emergencies, procedures should outline who is to call the fire department and how the building is to be evacuated.

When a fire or emergency evacuation does occur, don't panic. Keep calm and follow instructions. Know the right fire extinguisher for each type of fire.

Following rules is not just the responsibility of the Manager or Supervisor – it's everyone's responsibility.

Fire prevention is everyone's job.

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COMPRESSED GAS CYLINDERS AT GOLF COURSES

Compressed gas cylinders can be found in almost every kitchen or golf course maintenance shop. Without them, we would have difficulty serving fountain soda or performing work within the shop would be much more difficult; some operations would be impossible. Because they are very common, it's easy to forget how dangerous they can be. Let's review some safety rules for using, storing and working with cylinders.

1. **Never** place cylinders where they could come in contact with an electrical circuit.
2. **Never** place cylinders in locations of extreme heat or near the open flame of a cooking appliance.
3. **Never** use cylinders as rollers.
4. **Never** store cylinders near the edge of a dock or platform where they could be bumped off.
5. **Never** use valve protection caps to lift compressed gas cylinders.
6. **Never** allow compressed gas cylinders to drop, be struck or violently come into contact with each other.
7. **Never** move uncapped cylinders.
8. **Never** use any compressed gas for cleaning anything, especially skin or clothing.
9. **Never** attempt to mix gases in a cylinder.
10. **Whenever possible** use a cylinder hand truck or cart to move cylinders safely.
11. **Always** ensure that there is adequate ventilation in cylinder storage areas.
12. **Always** keep valves closed when cylinders are not in use.
13. **Always** treat empty cylinders as if they are full – even “empty” cylinders can contain residual product.

Cylinders containing flammable gases or oxygen require special care. Smoking is strictly prohibited where flammable gases are used or stored. Oxygen cylinders must be separated from all combustibles, including cylinders containing combustible gases, by at least 20 feet or by a 5-foot-high barrier with a 1-hour rating.

With some common sense and a little attention, it's easy to avoid cylinder accidents!

SAFETY REMINDER: If you find that a cylinder is damaged or defective, tag it and notify your supervisor immediately.

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GOLF COURSE AND FOOD SERVICE OPERATIONS

The food service industry is not without its share of hazards that could injure or disable workers. And those hazards are no less serious than those found in manufacturing, construction and other types of businesses – they are merely different.

Recent figures from the Division of Safety and Hygiene showed that more than 4,200 food service workers were injured during the year. The largest number of injuries was classified as same-level falls caused by work surfaces.

Preventing these injuries involves housekeeping methods and proper clothing. Working and walking surfaces in food service areas can become slippery, particularly in areas where the food is prepared. If you work in these areas, wear shoes with low heels and soles made of rubber or other slip-resistant material.

A good rule to remember is “Pick up the things you drop and wipe up anything you spill.” Grease is especially hazardous on floors, so wipe up the spill immediately and sprinkle some salt over the area. Salt provides extra traction until the floor can be cleaned more thoroughly.

Also, once the floors are mopped, place a “wet floor” sign in plain sight. Floors that have been soaked with warm; soapy water should be dry mopped to remove the excess water.

Falls can also occur on dimly lighted or congested stairways. If the stairs are used for storage, notify your supervisor so the situation can be remedied. When bulbs are burned out or are too dim to provide adequate light, either change the bulb yourself or check with your supervisor.

If these hazards are ignored, they can result in sprains, strains, fractures, contusions and other injuries.

Fire is an ever-constant threat to your health and your job. Grease buildup under range hoods and on stovetops could result in a costly fire. Frequent cleaning will not only help prevent fires but also insure a clean, safe work environment.

Faulty ovens and pilot lights are also fire hazards. Check them regularly and thoroughly. Although most of the new kitchen equipment has systems that automatically control fires with dry chemicals, some of you may remember using baking soda to put out range-top fires. This practice was extremely hazardous because baking powder was often confused with baking soda, with disastrous consequences – baking powder will explode when sprinkled over a flame.

Electrical wiring should also be inspected periodically for wear, as another fire prevention measure.

But if a small fire does occur, you should know what steps to take.

NOTE TO DISCUSSION LEADER:

Demonstrate the type of fire extinguisher used in your work area. List the kinds of fires it can extinguish. Also point out where the escape routes are located and explain how to report a fire. Employees should be able to give fire officials the correct street address, the type of fire, the nearest cross street or other physical or topographical reference, and any other information that may help the firefighters.

Although direct flames are responsible for only a small percentage of burn injuries, other heat sources account for a larger number of these injuries. Nearly 70 percent of the burns sustained in the food service industry in a recent year were caused by hot grease or hot water and steam.

But this kind of injury can be prevented. For example, before stirring the contents of a covered boiling pot, lift the lid so that the steam escapes toward the back of the pot. Steam-cleaning equipment should be treated with the same respect. Wear the correct personal protective equipment when steam cleaning, including gloves and rubber boots.

Handling pots and pans can also be hazardous. Be sure that the handles do not extend over the edge of the stove. Use only dry potholders; wet potholders and towels conduct heat more rapidly. Do not use aprons as potholders, especially if you're working near open flames.

Other serious injuries in the food service business are cuts and punctures. It is important that you use the right knife for the job you're doing. For instance, don't use a boning knife for slicing foods. Never use a knife as a meat cleaver – it could break apart and send flying metal toward your eyes.

Make sure your knives are sharp. A dull knife is more likely to slip because of the extra force being exerted to use it effectively.

Knives should remain in the open while you're using them. Those hidden under towels or potholders could result in a serious cut. In addition, a knife extended over the edge of a sink or stove could also cause a cut or puncture. Avoid horseplay with knives, such as using them for swords in a mock duel.

Broken glass may also be a problem in the kitchen and dishwashing areas. Never pick up broken glass with your bare hands; sweep it up and put it in a separate trash container. Glass slivers can be picked up with several thicknesses of wet paper towels.

Cutting and slicing machines should be used properly.

NOTE TO DISCUSSION LEADER:

You may want to demonstrate proper operation of this type of machine, pointing out some of the associated hazards.

Never force food through a grinder or chopper with your hands – use a plunger or other approved tool. Machines should be turned off before cleaning or performing maintenance. Also disconnect the electrical cord. Before plugging the machine into the socket, make sure the switches are off.

When cleaning the blades of these machines, wipe with a stroking motion away from the blade edges. If you're using a mixer, make sure the attachments are locked into place. Do not remove guards or shields while using these kitchen machines.

Finally, you may be wearing some hazards. For example, your clothing should be tight fitting and all buttons should be fastened. Because of the possibility of catching on machine parts, jewelry should not be worn.

These are some of the hazards to watch for. If you are aware of any others, notify your supervisor. Let's all work together to provide a safer, more healthful working environment.

NOTE

Use this space to list specific points or problems you wish to discuss during the safety meeting.

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HEDGE TRIMMER SAFETY

Select a hedge trimmer appropriate for the work (e.g., consider the size and height of shrubs and hedges being trimmed (e.g., 3 feet or 15 feet, cutter bar length, single- or double-sided blades, weight and balance of the equipment, availability of electrical power source, etc.)

Before operating the equipment, read, understand and follow the manufacturer's operating manual and safety decals on the equipment

Do not use electrical tools in the rain, or on wet grass or shrubs

When using gasoline powered trimmers, ensure air filter and muffler screens are clean prior to use, use the recommended grade of fuel and gasoline/oil mixture

Maintain the blades sharp and ensure the cutter bar bolts are torqued correctly

Wear appropriate eye protection

Keep fingers and hands away from the blades at all times

Check hedges for any foreign objects (e.g., metal posts, wires) before trimming

Keep the power cord of the electric hedge trimmer behind you to avoid snipping it or tripping. Leave enough slack for normal work motions

Use both hands to hold and guide the tool

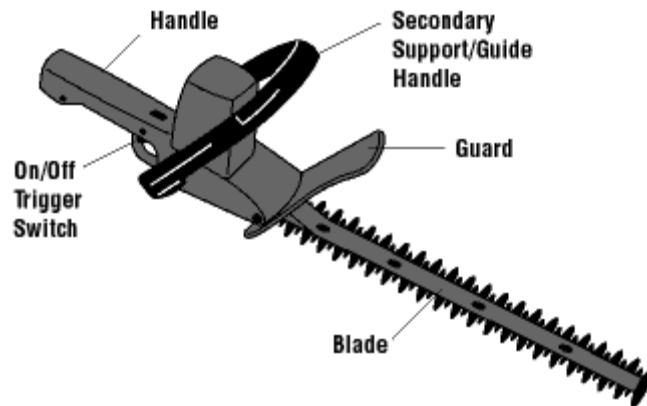
Avoid overreaching during trimming operations

Avoid standing on unstable supports (e.g., chairs or boards on saw horses) or on ladders when using hedge trimmers

Use long-reach or telescoping trimmers for tall hedges and shrubs

Do not force tools to cut something they are not designed to cut

Turn off the power and wait for the blades to stop before cleaning out twigs or grass. To prevent injuries, use a brush or other device to remove material from the knives



NOTE TO DISCUSSION LEADER:

Review injuries, if any, which have occurred as a result of operating this equipment by course maintenance personnel. What changes could have been made by the trimmer operator to avoid this injury? Discuss other potential concerns with operating this equipment in areas where visitors to the club may be walking by employees operating the equipment.

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WEED EATER SAFETY PROCEDURES

All employees should receive training on the specific machine they will be operating in addition to general safety hazards associated with the use of weed eater equipment

All employees should be reminded that rotating cutting tools can throw objects and/or incur injury to the machine operator or others in the area

Read, understand, and follow instructions in the manufacturer's operating manual

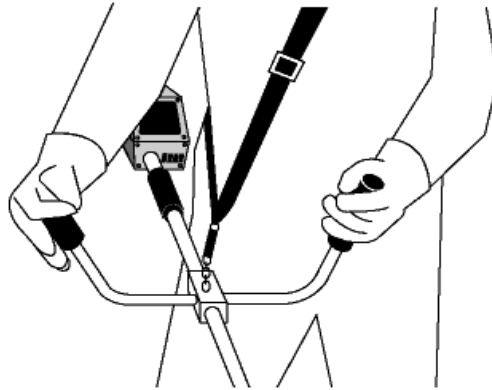
Hold the unit firmly with both hands

Ensure that the cutting part is adjusted properly and is tight

Replace bent, warped, damaged or dull cutting apparatus

Check that the throttle springs back to idle position

Select equipment with anti-vibration components



A. Personal Protective Equipment And Clothing

In an effort to reduce potential employee injuries, the following clothing/PPE (i.e. Personal Protective Equipment) should be worn, without exception, by all weed eater operators:

1. sturdy and well-fitting overalls, jeans or long pants
2. heavy-duty, non-slip gloves
3. safety boots with non-slip soles
4. safety goggles, or face screen and safety glasses
5. hearing protection (muffs or plugs)

B. Safety Procedures for Operating Weed Eaters on the Course

1. Avoid operating the equipment near parking areas and near sidewalks when visitors or vehicles may be present in the immediate area. Frequently rocks may be picked up and thrown 30 feet or more by weed eaters. This may result in injuries to fellow employees, visitors and/or damage to vehicles in the area where grass trimming is being performed
2. Attempt to operate equipment during those hours when course visitors are at their lowest point of the day and/or temporarily divert vehicles and visitors to other parking areas and walkways when weed eaters are being used
3. Check area for stones, glass, metal and debris prior to trimming
4. Refuel the engine before starting work while the engine is cool
5. If refueling is required before the job is completed, wait for the engine to cool to prevent flammable liquid spills, should they occur, from becoming ignited by hot engine parts
6. Make sure that shields, guards, and other safety devices are in place and working properly

7. Replace or tighten all loose or damaged parts or guards
8. Make sure muffler is in good condition
9. If using an electric weed eater, confirm that the extension cord connected to the weed eater is a heavy duty grounded type and the extension cord should be plugged into a GFCI (i.e. Ground Fault Circuit Interrupter) receptacle
10. Operate electric weed eaters with the cord trailing behind the operator so as to prevent potential contact of the rotating cutters with the electrical cord
11. Start the unit on firm ground or other solid surfaces in an open area
12. Maintain good balance and secure footing when operating
13. Adjust harness and hand grip to suit work positions
14. Use unit at ground level only
15. Shut off engine before cleaning out clogged or jammed cutters
16. Stop the engine and allow the cutters to stop rotating before placing the unit on the ground
17. Disconnect the spark plug when the equipment is left unattended
18. Secure the weed eaters with the fuel tank in the upright position prior to transport to prevent fuel spillage and damage to the machine
19. Keep the cutter tool covered with the carrying guard

C. Avoid The Following When Operating Weed Eaters

1. Do not leave a machine running and unattended
2. Do not wear short pants or short sleeves when operating weed eaters
3. Do not use rigid blades in stony areas
4. Do not overreach. Keep proper footing and balance at all times when operating this piece of equipment
5. Do not repair damaged attachments - discard them

NOTE

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DISCUSSION LEADER _____ DATE _____

THE UNDERSIGNED CERTIFY THAT THEY HAVE ATTENDED THIS SAFETY MEETING AND UNDERSTAND THE HAZARDS AND INSTRUCTIONS IT COVERED.

OPERATING A PUSH MOWER SAFELY

A. Pre-Op Safety Checklist Procedures:

1. Read, understand, and will follow the manufacturer's operating manual
2. Know the controls and how to stop the machine quickly
3. Inspect the mower prior to starting. Make certain that the blade is sharp and secured
4. Replace thin or worn blades
5. Make sure the blade stopping controls are effective. Adjust as necessary
6. Make sure that shields and other guards, such as the rear drag shield and the discharge deflector, are in place and working properly
7. Proper Personal Protective Equipment (i.e. wear long pants, non-slip safety toe footwear, eye protection and hearing protection)
8. Keep people away from the work area. A mower can hurl objects in any direction
9. Clear the work area of rocks, bottles and debris that might be thrown by the blades
10. For gasoline or diesel powered mowers, fill the engine when it is cool, not while it is still hot after it has been used. Use a funnel to prevent spillage on the engine when refueling
11. Confirm that all original manufactured safety guards are in place. Any that may have been temporarily removed to perform maintenance on the machine should be reinstalled prior to equipment use
12. Use the recommended grounded extension cord, if using an electric lawn mower
13. Inspect the mower cord and the extension cord for an electric lawn mower prior to each use. If the cord on the mower or the extension cord is damaged, they should be replaced prior to use.
14. The extension cord on an electric lawn mower should be plugged into an exterior GFCI (i.e. Ground Fault Circuit Interrupter) receptacle in an effort to prevent potential electric shock to employees. If a GFCI receptacle is not present within the area where the mowing is being conducted, a flexible GFCI extension cord attachment should be used for employee protection

B. Lawn Mower Safety Operation Procedures

1. Start the lawn mower outdoors
2. Always push the mower in a forward direction. Do not pull the mower backwards as a slip or fall could result in injury should your feet or legs slide under the mower and come into contact with the rotating blades
3. Watch for hidden hazards such as holes, roots, drain pipes and insect nests
4. Cut the throttle to idle and make sure the mower will not roll when stopping to pick up debris
5. Proceed slowly into tall, heavy grass to avoid choking the mower or stalling the motor
6. Set mower at the highest cutting level when operating on rough ground
7. Use caution around low hanging branches and shrubs
8. Operate a "push" mower standing up straight, not bent over
9. Mow across slopes. Your feet are less likely to slide under the mower and the mower cannot roll back. (This method is opposite from operating riding lawn mowers that are driven straight and down inclines)
10. Expose the underside of a mower for maintenance by tipping it by the handle but only, after shutting it off, ensuring the blade has stopped rotating, and disconnecting the spark plug wire (or disconnecting an electric lawn mower)
11. Stop the lawn mower immediately if the blade hits any hard object, inspect the blade, and make the necessary repairs before the machine is returned to use
12. Keep hands away from the blades. Use a stick to unclog or remove grass from the mower (after you have turned off the equipment)
13. Mow away from the power cord if using an electric powered lawn mower
14. Disconnect electric lawn mowers or turn off gas-powered mowers immediately after mowing has been completed

C. Unsafe Activities Which Should Be Avoided

1. Do not mow wet grass (walking on wet grass is a slipping hazard for you and more likely to cause the mower to clog)
2. Do not pull the mower toward you (or your feet)
3. Do not reach under machine. Disconnect the spark plug wire before sharpening, replacing and cleaning the blade or any part of the mower
4. Do not touch hot motor parts of the machine. Allow it to cool prior to touching the equipment
5. Do not spray cold water on a hot engine
6. Do not fuel the mower when engine is hot or while the engine is running
7. Do not make wheel height adjustments while the motor is running
8. Do not lift or tilt the mower while it is running
9. Do not leave blades rotating when crossing a gravel parking area
10. Do not leave a running mower unattended at ANY time
11. Do not remove the grass catcher or unclog the chute while the motor is running

NOTE TO DISCUSSION LEADER:

Although not all inclusive, the above safety procedures for push mowers should help to reduce the probability of employee injuries from operating lawn mower equipment at the golf course. Discuss with employees the specific type of mowers that they operate at the golf course. Include both riders and push mowers in this discussion. What other safety procedures not included above are followed or should be followed at your golf course when operating power mowers. Interaction by employees in this safety discussion increases the probability that they will observe safety practices when operating mower equipment.

NOTE

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RIDING LAWN MOWER SAFETY

A. Pre-Op Safety Checklist

1. Read, understand, and follow the instructions in the manufacturer's operating manual
2. Wear hearing and safety glasses.
3. Clear the work area of debris, sticks, stones, toys, etc. that might be thrown by the blades. Lawn mowers blades can throw out hit material at about 300 feet per second (about 200 miles per hour)
4. Maintain mower and attachments in good operating condition
5. Keep safety devices and guards in place
6. Inspect the mower prior to starting. Make certain that the blade is sharp and secure
7. Set mower at the highest cutting point when operating on rough terrain
8. Disengage all attachment clutches and shift mower into neutral before attempting to start the engine
9. Look behind mower when backing up. Operate in reverse for only very short distances
10. Mow slopes straight up and down rather than sideways for greater stability (unless mower is counter-balanced)
11. Reduce speed on slopes and when making sharp turns to prevent tipping and/or to prevent losing control of the machine
12. Watch for rocks, holes and other hazards
13. Mow only during daylight hours
14. Stop and inspect the blades and shaft if the mower runs into a rock or stump. Allowing the blade to come into contact with a rock or stump can cause the crank shaft to bend, cause excessive vibration of the mower and potential break up of the blade overtime
15. Check the blade-mounting bolts frequently for tightness.
16. Check grass catcher bags for wear. Replace worn bags when a visual inspection indicates damage has occurred

B. Safety Procedures for Equipment Repair/Maintenance Personnel

Disengage power to attachments and stop the motor before leaving operator's seat. The following additional precautions should be taken:

1. Set the brake
2. Place the transmission in park (if an automatic transmission) if stick shift, leave machine in gear prior to shutting off motor
3. Turn off and remove the ignition key

C. Safety Procedures for Riding Lawn Mower Operators

1. Do not use a lawn mower when the ground is wet
2. Do not operate a lawn mower barefoot or when wearing sandals
3. Do not remove grass catcher or unclog chute with the motor running
4. Do not leave mower on a slope
5. Do not carry passengers unless the machine was specifically designed by the manufacturer for such purposes
6. Do not stop or start suddenly when going uphill or downhill
7. Do not run the engine indoors (exception: if absolutely unavoidable when removing the machine from the storage area or returning in to the shop after mowing has been completed and then only for minimal amount of time needed to drive machine in or out of the storage shed/shop building)
8. Do not mount or dismount while the mower is running. There is sufficient space for your toes to pass under the mower housing and be struck by the blade
9. Do not leave a lawn mower unattended if the engine is running (even if the mower blade has been disengaged)
10. Do not touch hot motor parts.

NOTE

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Appendix E – Safety And Health Audio Visuals

Agricultural Safety

A Search for Agricultural Safety, #30-18 (12 min. video) – *Using a model farm, the contents of this video highlight farm safety.*

Driveline Safety...and You (The Agricultural Driveline Manufacturers Association, 20 min. video) – *Discusses the prevention of driveline (PTQ) accidents, and the proper shielding, use, maintenance and safety checks of drivelines.*

Electrical Safety on the Farm (Agricultural Extension Service, University of Minnesota, slide set/cassette, 23 min. film) – *Describes the seriousness of exposure to shock.*

Electrical Wiring for Livestock and Poultry Structures (National Food and Energy Council, 16 min. video) – *Describes the type of electrical wiring materials for use in livestock and poultry buildings.*

Farm and Ranch Electrical Safety (University of Idaho, 19 min. video) – *The dangers of working near power lines and with electrical equipment.*

Farm Safety Training Program Volume 1 – (Agricultural Extension Service, University of Minnesota) *Each has an instructor's guide and slide/tape presentation.*

Farm Accidents – Reducing the Odds (14 ½ min., 80 color slides)

Dangers in the Air When Handling Livestock (14 min., 63 color slides)

Noise – The Invisible Agricultural Hazard (18 ½ min., 58 color slides)

Farm Survey, The, #30-8 (NAMIC less than 20 min. video) – *What hazards to look for when surveying a farm.*

John Deere Safety Programs – *Seven video programs to improve safety operating practices.*

A Positive Safety Attitude (10 min., 30 sec.)

A Mowing Safety Lesson (11 min. film)

Split Seconds, Split Lives (23 min. film)

Accidents Last Forever (5 min. film)

Target: You! Combines Safety (10 min., 30 sec.)

Target: You! Tractor Safety (10 min. film, 30 sec.)

Loss Control in Livestock and Poultry Structures – *Discusses items to consider when building or remodeling a livestock or poultry building to reduce or eliminate fires.*

Electrical – Part I, #33-10 (15 min. video)

Construction – Part II, #33-13 (12 min. video)

Heating – Part III, #33-14 (10 min. video)

Making the Right Choices, (National Safety Council, 23 min. video) – *To help parents become more aware of their children's capabilities on the farm and provide guidance in assigning age appropriate tasks.*

Safe Harvest-Combine, #30-28 (25 min. video) – *Stresses the importance of maintenance before and during harvest.*

Safe Use of Wiring Devices, (The National Safety Council, 12 min. slides/tape set) – *Describes electrical power as a source of energy.*

Safety Orientation for Agricultural Workers – Part 1, (U of AZ, 20 min. video) – *Background information on the agricultural accident and injury problem. Workers are taken on a fast-paced tour of common agricultural situation likely to cause accidents. Tractors, machinery, hazardous materials, livestock, electricity, fire, tools, sun and heat stroke and lifting are covered.*

Safety Orientation for Agricultural Workers – Part 2, (U of AZ, 25 min. video) – *This video covers manufacturer's safety signs and symbols, using hand signals, operating tractors and machinery, handling hazardous materials, using personal protective equipment, working with livestock, operating power tools, preventing heat stress and proper lifting procedures.*

Skid-Steer Loader Safety (Equipment Manufacturers Institute, 10 min. video) – *Describes the basic safety rules and operation of a Skid-Steer Loader.*

Driving Safety

Animal Awareness Driving, #30-29 (15 min. video) – *Learn the proper driving techniques for various road, traffic, and weather conditions.*

Don't Let Up! (Anti-Lock Braking System), #30-26 (8 min. video) – *Contains footage of high school driver education students using ABS for the first time.*

Driving Drunk: Your Choice?, #30-20 (20 min. video) – *Focuses on four real-life situations where someone made the decision to drive drunk and show the long-term effects of those choices. Great video for teenagers.*

Highway Driving Tactics, #30-35 (18 min. video) – *This video gives practical, easy-to-remember and easy-to-use rules, with on-the-road demonstrations, that help make highway driving safer.*

Motor Mania, #30-17 (8 min. video) – *Humorous depiction of the personality changes that can take place behind the wheel. From Disney Educational Productions.*

Safe Driving Tactics, #30-19 (19 min. video) – *This comprehensive program advises viewers on how to react to and avoid dangerous situations involving hydroplaning, rollovers, head-on collisions, highway hypnosis and wind waves caused by passing semi-trucks.*

The National Driving Test – Volume 1, #30-12 (48 min. film) – *Hosted by Christopher Reeves; addresses 25 questions that could save your life while driving your vehicle.*

The National Driving Test – Volume 2, #30-13 (48 min. film) – *Hosted by Robert Ulrich, this video will test your knowledge of the road. The viewer is asked to answer multiple choice questions regarding traffic safety.*

Vehicle Safety: Driving on the Road, #30-25 (17 min. video) – *Covers rules of the road, preparation, parking, vehicle inspection and much more.*

Fire Safety

All About Fire, #31-4 (10 min. video) – *Murphy the cat alerts viewers to home fire hazards.*

Be Cool About Fire Safety, #31-8 (15 min. video) – *Viewers learn the basics about fire hazards and safety precautions.*

Fire Extinguisher Training: Using the P.A.S.S. Technique, #31-10 (15 min. video) – *Using the wrong extinguisher could spread a fire. This program explains basic fire safety, the different classes and which extinguisher to use.*

Fire in the Kitchen, #31-5 (16 min. video) – *Focuses on the risks and potential hazards of this very active household area.*

Fire Power, #31-1 (17 min. video) – *A powerful video documenting what happens as fire develops and spreads throughout a house.*

Fire Safety: Fire Extinguishers, #31-7 (15 min. video) – *Teaches use of right kind of fire extinguishers in the right way on the right kind of fire.*

Home Fire Detectors: It's Your Life (National Fire Protection Association, slide set and cassette tape) – *Fire detectors.*

Insuring Property with a Woodburning Appliance, #33-2 (30 min. video) – *Gives agents, loss control specialists, underwriters and even insureds the security they need to properly inspect and insure dwellings that have woodburning appliances.*

Propane Safety Update, #30-37 (10 min. video) – *Viewers can be informed of proper refilling methods of tanks and cylinders, while learning the properties of propane, escape hazards and protective measures.*

Smush the Fire Out, #31-3 (11 min. video) – *A documentary about children participating in a fire survival program, this film uses original music and the voices of other children to teach the basics of fire survival.*

Teaching Children About Fire (National Fire Protection Association, slide set) – *Training guide for teachers on how to teach children about the dangers of fire.*

Think Safe: Fire, #31-9 (14 min. video) – *Educates on fireplace safety, kitchen fire hazards such as grease fires, miscellaneous hazards such as smoking in bed and space heaters. Also shows the need for smoke detectors and family emergency plans.*

General Safety

Deadly Dust II, #30-7 (30 min. video) – *Demonstrates how primary and secondary dust explosions can occur and stresses the major causes and prevention methods.*

Deadly Dust III, #30-22 (22 min. video) – *Features 2 employees who survived major dust explosions.*

Don't Give a Thief a Free Ride, #33-6 (13 min. video) – *Step-by-step demonstration by crime prevention experts of what car owners can do to help prevent the theft of a vehicle or personal property left inside.*

I'm No Fool With a Bicycle, #30-14 (film) – *Viewers learn the fundamentals of bicycle safety the fun way as Jiminy Cricket introduces this new edition of the popular safety film.*

Lightening: The Silent Destroyer, #33-5 (23 min. video) – *Designed to help agents, adjusters, and loss control staff manage this costly problem.*

Safety and Home: Electricity, #30-32 (20 min. video) – *Learn common electrical dangers within the home and how to protect yourself and your loved ones.*

Surviving the Cold, #30-16 (20 min. film) – *Dramatic re-enactment's of real life cold weather emergencies proved the focus for winter after instruction in this life-saving film that teaches basic winter safety rules and heightens awareness of winter's dangers.*

Think Safe: Accidents, #30-34 (17 min. video) – *Heightens awareness of electrical and fire hazards, chemical storage and safety, trip hazards on stairs, carpet and cords, using fire extinguishers and first aid.*

Think Safe: Home Security, #30-31 (17 min. video) – *Shows how to prevent burglars from knowing you are away, outdoor security such as bushes, lighting and sensors and break-ins when you are home.*

Tornado Warning!, #34-2 (60 min. video) – *Dramatic tornado footage is featured in this video. Also featured is a violent hail storm and severe weather. A brief presentation of severe weather and tornado safety is also included.*

Tornado Warning! 3, #34-4 (60 min. video) – *Footage in this video includes a rare tornado "family" captured as several tornadoes spin around each other.*

Water Safety: The Basics, #30-15 (Film) – *Viewers are instructed in a variety of water safety procedures that can save their lives.*

You Make the Difference: Preventing Home Burglary, #33-8 (20 min. video) – *A step-by-step demonstration on home burglary prevention techniques. Includes an interview with a convicted burglar, who describes how he picked places to rob.*

Health

Basic First Aid, #30-24 (14 min. video) – *Features basic first aid techniques.*

CPR: The Way to Save Lives, #30-23 (72 min. video) – *Informs general public how to perform CPR.*

Fitness & Wellness, #35-1 – *Addresses common health risks & strategies of smoking, stress and blood pressure, nutrition and weight control, alcohol and drug use and exercise.*

Heat Stress, #35-2 (12 min. video) – *Teaches how to protect yourself by means of heat regulation in your body, eating, drinking, dressing to manage heat; and first aid for heat stress and smoke.*

Occupational Exposures to Pesticides (Utah State University, 100 slides and a script) – *Illustrates hazards with the use of pesticides.*

Signs and Symptoms of Pesticide Poisoning (University of Nebraska, 21 min. slide-tape set) – *Hazards of pesticides.*

Personal Safety

- Back Care and Safety, #264** (13 min. video) – *Avoiding back injuries.*
- Back Injury Prevention, #B111** (5 min. video) – *How to properly lift.*
- Construction – Safe Work Practices, #314** (12 min. video) – *Outlines basic safety responsibilities on the job.*
- Ergonomics, #B120** (5 min. video) – *The importance of ergonomics in the work place.*
- Eye Care and Safety, #265** (12 min. video) – *Education video on safeguarding eyes using the correct protective gear for workplace hazards.*
- Eye Protection, #B104** (6 min. video) – *Protecting your eyes in the workplace.*
- Forklift Safety, #B106** (6 min. video) – *Forklift operating requirements and safety tips to prevent accidents.*
- Forklift Safety, #131** (13 min. video) – *Explains OSHA operating requirements and stresses the value of safety.*
- Framer Safety, #342** (12 min. video) – *Meets requirements for training employees in the “general hazards” to which they are exposed. Specifically for orientation or review of framers in their specific safety responsibilities.*
- Ground Fault Circuit Interrupters & Electrical Safety, #309** (12 min. video) – *Brief overview of the principles of avoiding electric shock and the two approved methods for protecting users of power tools on a construction site.*
- Hand & Power Tool Safety, #270** (12 min. video) – *General safety with cutting, striking, and power tools and tool groups.*
- Hand & Power Tool Safety, #B107** (6 min. video) – *General safety in using hand and power tools.*
- Hand & Wrist Injuries, #B117** (6 min. video) – *Preventing hand, finger, and wrist injuries.*
- Hazard Communication, #B108** (5 min. video) – *Handling hazardous material such as chemicals.*
- Hazard Communication – Right to Know** (25 min. video) – *A discussion of OSHA’s Workers Right to Know Program for employees working with ordinary chemicals in the workplace and how they can read and understand a Material Safety Data Sheet for those chemicals.*
- Hearing Conservation, #206** (12 min. video) – *Awareness of noise as a hazards.*
- Hearing Conservation, #B131** (6 min. video) – *Preventing hearing loss through a hearing protection program.*
- Housekeeping and Accidental Prevention, #272** (12 min. video) – *General safety and hazardous substance labels.*
- Housekeeping on the Job Site, #332** (10 min. video) – *Stresses each individual’s obligation for job site housekeeping, team work and responsibility.*
- Housekeeping Responsibilities in Manufacturing, #B118** (5 min. video) – *Maintaining an orderly, clean and safe workplace.*
- How to Use Compressed Gas Cylinders, #B116** (7 min. video) – *Using gas cylinders in a safe manner.*
- Human Behavior – Unsafe Acts, #B109** (6 min. video) – *Reducing unsafe acts y changing human behavior.*
- Human Behavior – Reducing Unsafe Acts, #149** (10 min. video) – *Motivational video on following rules and procedures, exercising good judgment and associate potential hazards to the job.*
- Job Safety Hazards, #B121** (5 min. video) – *Safety hazards in the workplace.*
- Ladder Safety, #B112** (5 min. video) – *The safe use of ladders.*
- Ladder Safety in Construction, #290** (9 min. video) – *Encourages employees to pick the right ladder for the job and use it safely and as intended.*
- Ladder Safety in Construction, #B139** (5 min. video) – *Choosing the correct ladder.*
- Ladders** (9 min. slide set w/audio cassette) – *A discussion of ladder safety based upon the Occupational Safety and Health Administration rules, regulations and standards.*
- Lock-Out/Tag-Out, #B115** (7 min. video) – *Lock-out/Tag-out procedures.*
- Machine Guarding, #B132** (6 min. video) – *Machine guarding for safety.*
- Machine Guarding Responsibility, #252** (9 min. video) – *Emphasis on individual responsibility on or around machines and equipment.*

Motor Fleet Maintenance Safety, #335 (12 min. video) – *Motivate your fleet repair personnel to see safety as part of their job as a professional! This video reviews the basic safety tips and also covers industry-specific safety items.*

Personal Protective Equipment, #207 (16 min. video) – *This video discusses the full spectrum of hazards and protective wear.*

Personal Protective Equipment, #B110 (6 min. video) – *Using appropriate protective wear.*

Powder Actuated Tools, #317 (12 min. video) – *Reminds employees of the rules for safe storage, handling and use of powder actuated tools.*

Respirators and How to Use Them, #204 (12 min. video) – *If your employees are exposed to breathing hazards, train them about the respirator protection they must use. This video explains the basics of respiratory system functioning and exposure effects.*

Respirator Protection, #B102 (7 min. video) – *The use of appropriate respirators.*

Safe Handling of Compressed Gas Cylinders, #B133 (6 min. video) – *Handling gas cylinders safely.*

Scaffold Safety, #288 (30 min. CD) – *Train workers – in English or Spanish – on how to safely build, use, and dismantle the most common types of scaffolding. This video highlights OSHA’s general requirements for scaffolding and identifies the key safe work practices that address the most common scaffold hazards.*

Scaffold Safety, #289 (9 min. video) – *Increases safety awareness while covering the basic safety procedures.*

Slips, Trips and Falls, #266 (11 min. video) – *Being aware of common hazards in the workplace and understanding the physical forces behind slips and falls.*

Stanbo – Crusader For Safety (15 min. video) – *How to safely use a pneumatic nail gun. The video was developed by manufacturer, Stanley-Bostitch.*

Walking and Working Surfaces (12 min. slide set with audio cassette) – *Common dangers encountered in the workplace. It reviews the safety principles for floors, stairways, and other walking and working surfaces.*

Recreation Safety

McGruff on Gun Safety, #30-30 (15 min. video) – *Children learn the dangers of guns and what to do if they see a child with a gun.*

Tractor Safety

Agricultural Tractor Safety (Converted to video by Breaking New Ground, Purdue University, West Lafayette, IN).



If you would like to use any of the audio visuals, please contact:

Corporate Loss Control
Grinnell Mutual Reinsurance Company
4215 Highway 146
PO Box 790
Grinnell, IA 50112-0790
Phone: (800) 362-2041

Audiovisuals are available on a free loan basis.

Please be sure to indicate the desired audiovisual by title and/or number. The audiovisual should be reserved at least two weeks in advance to assure availability. Please return promptly when finished. If returning more than one video, please add an additional \$100 in UPS insurance for each video.

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RESOURCES FOR SAFETY AND HEALTH INFORMATION

Safety & Secure TV Channel, LLC

1616 Severn Drive
Annapolis, MD 21409
(443) 949-0456

ILLINOIS

RESOURCES FOR SAFETY AND HEALTH INFORMATION

Iowa/Illinois Safety Council

8013 Douglas Avenue
Urbandale, IA 50322-4724
(515) 276-4724
www.iisc.org

Construction Safety Council of Illinois

4100 Madison St.
Hillside, IL 60162
(708) 544-2082
www.buildsafe.org

Professor & Extension Safety Specialist

Dr. Robert Aherin
University of Illinois Chicago
Agricultural Engineering Sciences Building
360R AESB, MC-644
1304 W. Pennsylvania Avenue
Urbana, IL 61801
Ph: (217) 333-9417
Fax: (217) 244-0323
http://abe.illinois.edu/faculty/R_Aherin

Illinois Dept. of Commerce & Economic Opportunity

Industrial Services Division
100 West Randolph St. – Suite 3-400
Chicago, IL 60601
(312) 814-2337
(Provides free OSHA safety & health consultation)
www.illinoisosha.com
(Click on “Resources”)

Illinois Manufacturers’ Association Headquarters

1301 W 22nd St, Suite 610
Oak Brook, IL 60523
(630) 368-5300
(800) 482-0462
(Regulatory & Compliance Information)
www.ima-net.org

Illinois Network for Agriculture Safety & Health

Chip Petrea
University of Illinois
Agr & Bio Engineering
1304 W Pennsylvania Ave.
Urbana, IL 61801
(217) 333-5035
<http://web.extension.uiuc.edu/agsafety/inash/>

Illinois Occupational & Environmental Health & Safety Education & Research Center

The University of Illinois at Chicago
2121 W. Taylor
Chicago, IL 60612
(312) 996-7887
www.uic.edu/sph/glakes/ce

National Safety Council

1121 Spring Lake Drive
Itasca, IL 60143-3201
(630) 285-1121
(800) 621-7619
www.nsc.org

Safety & Health Policy Center

National Safety Council
1025 Connecticut Ave., NW, Suite 1200
Washington, DC 20036
(202) 293-2270
www.nsc.org

OSHA

www.osha.gov

Regional Office

230 Dearborn Street
Room 3244
Chicago, IL 60604
(312) 353-2220

State Offices

OSHA – Calumet City Area Office

1600 167th Street – Suite 12
Calumet, IL 60409
(708) 891-3800

OSHA – Chicago Area Office

701 Lee Street – Suite 950
Des Plaines, IL 60016
(847) 803-4800

OSHA – North Aurora Area Office

365 SMOKE TREE PLAZA
North Aurora, IL 60542
(630) 896-8700

OSHA – Peoria Area Office

2918 West Willow Knolls Rd.
Peoria, IL 61614-1223
(309) 671-7033

INDIANA

RESOURCES FOR SAFETY AND HEALTH INFORMATION

Agricultural Safety and Health Program

Purdue University
Department of Agricultural & Biological Engineering
225 South University Street
West Lafayette, IN 47907-2093
Phone: (765) 494-1191
Fax: (765) 496-1356
<http://pasture.ecn.purdue.edu/~agsafety/ASH/index.html>

Indiana Division of Labor

Bureau of Safety, Education, and Training (INSafe)
402 West Washington
Room W195
Indianapolis, IN 46204-2287
(317) 232-2688
(Provides free OSHA safety & health consultation)
www.in.gov/labor/insafe/index.html

Indiana Rural Safety & Health Council

Purdue University
Agricultural Engineering Department
1146 ABE Building
W. Lafayette, IN 47907-1146
(765) 494-1191
www.farmsafety.org
(Go to safetylinks.html)

Extension Safety Specialist

William E. Field, Professor
Purdue University
Department of Agricultural & Biological Engineering
225 South University Street
West Lafayette, IN 47907-2093
Phone: (765) 494-1191
Fax: (765) 496-1356
<http://pasture.ecn.purdue.edu/~agsafety/ASH/staff.html>

OSHA

www.osha.gov

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Room 3244
Chicago, IL 60604
(312) 353-2220

State Office

Indianapolis Area Office

46 East Ohio Street, Room 423
Indianapolis, Indiana 46204
(317) 226-7290

Central/Southern IN Served by National Safety Council, KY Office

3176 Richmond Rd, Suite 236
Lexington, KY 40509
(859) 294-4242
www.nsc.org

Northwestern IN Served by National Safety Council, Chicago Chapter

1121 Spring Lake Dr. Suite 100
Itasca, IL 60143-3201
(800) 621-2855
(630) 775-2213
www.chicago.nsc.org

National Safety Council

1121 Spring Lake Drive
Itasca, IL 60143-3201
(630) 285-1121
(800) 621-7619
www.nsc.org

IOWA

RESOURCES FOR SAFETY AND HEALTH INFORMATION

Iowa State University

College of Agriculture
138 Curtiss Hall
Ames, IA 50011-1051
(515)294-4111
www.abe.iastate.edu/safety

I-CASH

100 Oakdale Campus,
124 IREH
Iowa City, IA 52242-5000
Phone: 319-335-4438
www.public-health.uiowa.edu/ICASH/index.html

Iowa AgrAbility

92 LeBaron Hall
Iowa State University
Ames, IA 50014
515-294-8520
www.extension.iastate.edu/agrability/

Extension Safety Specialist

Charles Schwab, Ph.D.
Associate Professor
Iowa State University
214 D Davidson Hall
Ames, IA 50014-3080
(515) 294-4131
www.abe.iastate.edu/safety

Iowa Workforce Development

Steve Slater, Program Manager
Bureau of Consultation and Education
100 E. Grand Avenue
Des Moines, IA 50319
(515) 281-7629
(Provides free OSHA safety & health consultation)
www.iowaworkforce.org/labor/iosh/consultation

Iowa-Illinois Safety Council

8013 Douglas Avenue
Urbandale, Iowa 50322-2453
Phone: (515) 276-4724
www.iisc.org

National Safety Council

1121 Spring Lake Drive
Itasca, IL 60143-3201
(630) 285-1121
(800) 621-7619
www.nsc.org

OSHA

www.osha.gov

Regional Office

City Center Square
1100 Main Street, Suite 800
Kansas City, MO 64105
(816) 426-5861

State Office

Des Moines Area Office
210 Walnut Street, Room 815
Des Moines, IA 50309
(515) 284-4794

MINNESOTA

RESOURCES FOR SAFETY AND HEALTH INFORMATION

MNOSHA AREA OFFICES

St Paul Area Office

443 Lafayette Road North
St. Paul, MN 55155-4307
(651) 284-5050
(877) 470-6742

Duluth Area Office

5 North 3rd Ave. West, Suite 402
Duluth, MN 55802-1611
(218) 733-7830

Mankato Area Office

Nichols Office Center, Suite 520
410 Jackson Street
Mankato, MN 56001
(507) 389-6507

Minnesota Department of Labor and Industry

Occupational Safety & Health Division
443 Lafayette Road North
St. Paul, MN 55155-4307
(651) 284-5060
(800) 657-3776
<http://www.doli.state.mn.us/mnosha.html>

Minnesota Safety Council, Inc.

474 Concordia Avenue
St. Paul, MN 55103-2430
(651) 291-9150
(800) 444-9150
www.mnsafetycouncil.org

Minnesota Department of Labor and Industry

James Collins, Program Director
Consultation Division
443 Lafayette Road North
St. Paul, MN 55155
(651) 284-5060
(Provides free OSHA safety & health consultation)
www.doli.state.mn.us/wsc.html

University of Minnesota Duluth

Environmental Health & Safety Office
31-32 Durland Admin. Building
1049 University Drive
Duluth, MN 55812
(218) 726-7273 or (218) 726-7139
www.d.umn.edu

National Safety Council

1121 Spring Lake Drive
Itasca, IL 60143-3201
(630) 285-1121
(800) 621-7619
www.nsc.org

OSHA

www.osha.gov

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230 South Dearborn Street, Room 3244
Chicago, IL 60604
(312) 353-2220

State Offices

Eau Claire Area Office

1310 W. Clairemont Avenue
Eau Claire, WI 54701
(715) 832-9019

Extension Safety Specialist

John Shutske
University of Minnesota
1390 Eckles Avenue
St. Paul, MN 55108
(612) 626-1250

MISSOURI

RESOURCES FOR SAFETY AND HEALTH INFORMATION

Extension Safety Specialist/Safety Specialist

David Baker
University of Missouri
2-28 Ag Building
Columbia, Missouri 65211
(573) 882-6385
WWW.CAFNR.MISSOURI.EDU

Missouri Department of Labor & Industrial Relations

3315 W. Truman Boulevard, Room 213
Jefferson City, Missouri 65102
(573) 751-4091
www.dolir.mo.gov

Missouri On Site Consultation Program

Robert Simmons, Program Mgr. –
Department of Labor & Standards
P.O. Box 449
Jefferson City, MO 65102
(573) 751-3403
(Provides free OSHA safety & health consultation)
<http://www.dolir.mo.gov/ls/safetyconsultation/>

OSHA

www.osha.gov

Regional Office

1100 Main St, Suite 800
Kansas City, MO 64105
(816) 426-5861

State Offices

Kansas City Area Office

6200 Connecticut Ave., Suite 100
Kansas City, Missouri 64106
(816) 483-9531
Toll Free {Missouri Residents Only}:
(800) 892-2674

St. Louis Area Office

911 Washington Ave, Room 420
St. Louis, MO 63101
(314) 425-4249
Toll Free {Missouri Residents Only}:
(800) 392-7743

National Safety Council

1121 Spring Lake Drive
Itasca, IL 60143-3201
(630) 285-1121
(800) 621-7619
www.nsc.org

Safety & Health Council of Western Missouri & Kansas

5829 Troost Ave.
Kansas City, MO 64110
(816) 842-5223
www.safetycouncilmoks.com

Safety Council of the Ozarks

1111 South Glenstone
Springfield, MO 65804
(417) 869-2121
WWW.NSCOZARKS.ORG

St. Joseph Safety Council

118 S. 5th, Lower Level
St. Joseph, MO 64501
(816) 233-3330

Safety Council of Greater St. Louis

1015 Locust Street, Suite 902
St. Louis, MO 63101
(314) 621-9200
www.stlsafety.org

NEBRASKA

RESOURCES FOR SAFETY AND HEALTH INFORMATION

University of Nebraska – Lincoln

Environmental Health & Safety
Lincoln, NE 68588
(402) 472-7211
<http://ehs.unl.edu>

OSHA 21(d) Consultation Program

Eldon Diedrichs, Program Mgr.
301 Centennial Mall South
Lincoln, NE 68509
(402) 471-4717
www.dol.state.ne.us
Staff also available in Omaha
(402) 595-3168
and
North Platte
(308) 535-8165

(Provides free OSHA safety & health consultation)

National Safety Council

1121 Spring Lake Drive
Itasca, IL 60143-3201
(630) 285-1121
(800) 621-7619
www.nsc.org

Nebraska Safety Council, Inc

4600 Valley Road – Suite 300
Lincoln, NE 68501
(402) 483-2581
www.nesafetycouncil.org

National Safety Council, Greater Omaha Chapter

11620 M Circle
Omaha, NE 68137-2231
(402) 896-0454
(800) 592-9004
www.safenebraska.org

OSHA

www.osha.gov

Regional Office

1100 Main St., Suite 800
Kansas City, MO 64105
(816) 426-5861

State Office

Omaha Area Office

Overland-Wolf Building
6910 Pacific Street, Room 100
Omaha, Nebraska 68106
(402) 221-3182
Toll Free {Nebraska Residents Only}:
(800) 642-8963

Extension Safety Specialist

William Campbell
Biological Systems Engineering
204 L.W. Chase Hall
Lincoln, NE 68583
(402) 472-6714

NORTH DAKOTA

RESOURCES FOR SAFETY AND HEALTH INFORMATION

Safety & Environmental Health

University of North Dakota
3851 Campus Road
Auxiliary Services Bldg
Grand Forks, ND 58202
(701) 777-3341

Workforce Safety & Insurance

1600 E. Century Avenue, Suite 1
Bismarck, ND 58506
(701) 328-3800
(800) 777-5033
www.WorkforceSafety.com

North Dakota Department of Health

Injury Prevention & Control
2nd Floor – Judicial Wing
600 E. Blvd. Avenue, Dept 301
Bismarck, ND 58505-02200
(701) 328-4536

North Dakota Safety Council

111 North 6th Street
Bismarck, ND 58501
(701) 223-6372
(800) 932-8890
www.ndsc.org

North Dakota Occupational Safety & Health

Albert Koch
Consultation – Bismarck State College
Corporate & Continuing Education
1815 Shater St.
Bismarck, ND 58501
(701) 224-5778
(Provides free OSHA safety & health consultation)
www.bismarckstate.edu/ndsafety/

National Safety Council

1121 Spring Lake Drive
Itasca, IL 60143-3201
(630) 285-1121
(800) 621-7619
www.nsc.org

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1999 Broadway, Suite 1690
PO Box 46550
Denver, CO 80201-6550
(720) 264-6550

State Office

Bismarck Area Office

Federal Office Building
1640 East Capitol Avenue
Bismarck, ND 58501
(701) 250-4521

OHIO

RESOURCES FOR SAFETY AND HEALTH INFORMATION

Ohio State University

Dr. Tom Bean, Director
Great Lakes Center for Agricultural Safety & Health
590 Woody Hayes Drive
(614) 292-9455
<http://www.ag.ohio-state.edu/~agsafety/glc>

Ohio State University Extension Center at Lima

1219 West Main Cross Street
Findlay, OH 45840
Phone: (419) 422-6106
www.limacenter.osu.edu

Ohio State University Extension Center at Piketon

1864 Shyville Road
Piketon, OH 45661-9749
Phone: (740) 289-2071
Columbus Number: (614) 292-4900
www.southcenters.osu.edu

Ohio State University Extension Center at Wooster

1680 Madison Ave.
Wooster, OH 44691-4096
Phone: (330) 263-3799
Voice Mail: (330) 202-3555
www.woostercenter.osu.edu

[Public Employment Risk Reduction Program \(PERRP\)](#) [OSHA On-Site Consultation Program](#)

[Ohio BWC Division of Safety & Hygiene](#)
The customer contact center is open from
[7:30 a.m. to 5:30 p.m. EST.](#)
[Toll-free: 1-800-OHIOBWC \(1-800-644-6292\)](#)
[TTY: 1-800-BWC-4-TDD \(1-800-292-4833\)](#)
[Fax: 1-877-520-OHIO \(6446\)](#)
[Mailing address: BWC 30 W. Spring St.](#)
[Columbus, OH 43215-2256](#)
<http://www.ohiobwc.com/employer/programs/safety/San dHOSHAandPERRP.asp>

Extension Safety Specialist

Dr. Tom Bean
Food, Ag & Biological Engineering Department
590 Woody Hayes Dr.
Columbus, OH 43210
(614) 292-9455

National Safety Council

1121 Spring Lake Drive
Itasca, IL 60143-3201
(630) 285-1121
(800) 621-7619
www.nsc.org

National Safety Council, Central OH Chapter

919 Old Henderson Rd.
Columbus, OH 43220
(614) 324-5934
www.nsc-centralohio.org

National Safety Council, Northern OH Chapter

Ohio One Building – Room 338
25 East Boardman St.
Youngstown, OH 44503
(330) 747-8657
(800) 715-0358
www.nscnohio.org

OSHA

www.osha.gov

Regional Office

230 Dearborn Street, Room 3244
Chicago, IL 60604
(312) 353-2220

State Offices

Cincinnati Area Office

36 Triangle Park Drive
Cincinnati, Ohio 45246
(513) 841-4132

Cleveland Area Office

Federal Office Building
1240 East 9th Street, Room 899
Cleveland, Ohio 44199
(216) 522-3818

Columbus Area Office

Federal Office Building
200 North High Street, Room 620
Columbus, Ohio 43215 (614) 469-5582

Toledo Area Office

Ohio Building
420 Madison Avenue, Suite 600
Toledo, Ohio 43604
(419) 259-7542

SOUTH DAKOTA

RESOURCES FOR SAFETY AND HEALTH INFORMATION

South Dakota Safety Council

1108 NW Avenue
Sioux Falls, SD 57104
605-361-7785 or 1-800-952-5539
www.southdakotasafetycouncil.org

South Dakota Division of Labor & Management

Kneip Building
700 Governors Drive
Pierre, SD 57501-2291
(605) 773-3681

South Dakota State University

Engineering Extension
James Manning, Department Head
West Hull 118, Box 510
907 Harvey Dunn St.
Brookings, SD 57007
(605) 688-4101
(Provides free OSHA safety & health consultation)

National Safety Council

1121 Spring Lake Drive
Itasca, IL 60143-3201
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(800) 621-7619
www.nsc.org

OSHA

www.osha.gov

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1999 Broadway, Suite 1690
PO Box 46550
Denver, CO 80201-6550
(720) 264-6550

NO Area office in South Dakota

Contact Regional Office

WISCONSIN

RESOURCES FOR SAFETY AND HEALTH INFORMATION

University of Wisconsin

Center for Agricultural Safety & Health
Dept. of Biological Systems Engineering
Cheryl Sdjolaas
Sr. Outreach Specialist
460 Henry Mall
Madison, WI 53706
(608) 262-6330
www.wiscash.uwex.edu

Wisconsin Council of Safety

501 E. Washington Avenue
Madison, WI 53703-2944
(608) 258-3400
(800) 236-3400
www.wmc.org

Wisconsin OSHA Consultation Program (Health)

University of WI State Laboratory of Hygiene
Environmental Health Division
2601 Agricultural Drive
Madison, WI 53707
(608) 226-5240
(Provides free OSHA safety & health consultation)
www.slh.wisc.edu

Wisconsin Department of Commerce (Safety)

Division of Marketing, Advocacy & Tech Development
144 NW Barstow Street
Waukesha, WI 53188
(262) 512-5198 or (800) 947-0553
(Provides free OSHA safety & health consultation)
www.commerce.state.wi.us

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Cheryl Skjolaas
University of Wisconsin
460 Henry Mall
Madison, WI 53706
(608) 265-0568

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(800) 621-7619
www.nsc.org

OSHA

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1100 Main Street, Suite 800
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(816) 426-5861

State Offices

Appleton Area Office

1648 Tri Park Way
Appleton, WI 54914
(920) 734-4521

Eau Claire Area Office

1310 W. Clairemont Avenue
Eau Claire, WI 54701
(715) 832-9019

Madison Area Office

4802 E. Broadway
Madison, WI 53716
(608) 441-5388

Milwaukee Area Office

Henry S. Reuss Building, Suite 1180
310 West Wisconsin Avenue
Milwaukee, WI 53203
(414) 297-3315

For more information, contact:

GRINNELL MUTUAL
REINSURANCE **SINCE 1909**
gmrc.com

4215 Highway 146, Grinnell, IA 50112-0790

Phone: 800-362-2041

IMP: Insect Activity for Suffolk County												
	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sept</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>
Annual Bluegrass Weevil				Yellow	Red	Grey	Grey	Grey				
Ants				Yellow	Red	Grey	Red	Grey	Yellow	Yellow		
Black Cutworm					Grey	Red	Red	Grey	Yellow			
Hairy Chinchbug				Yellow	Grey	Red	Red	Red	Grey	Yellow		
Bluegrass Sod Worm				Grey	Red	Grey	Grey	Red	Grey	Yellow	Yellow	
Asiatic Garden Beetle				Yellow	Yellow	Grey	Grey	Red	Red	Red	Yellow	
Large Sod Worm				Grey	Red	Grey	Red	Red	Grey	Grey	Yellow	
Black Turfgrass Ataenius				Yellow	Grey	Red	Grey	Red	Red	Grey	Grey	
Japanese Beetle				Yellow	Yellow	Grey	Grey	Red	Red	Red	Yellow	
June Bug				Yellow	Yellow	Grey	Grey	Yellow	Yellow	Yellow	Yellow	
Northern Masked Chafer				Yellow	Yellow	Grey	Grey	Red	Red	Red	Yellow	
Oriental Beetle				Yellow	Yellow	Grey	Grey	Red	Red	Red	Yellow	
Winter Grain Mite		Red	Red	Grey	Grey	Grey	Yellow	Yellow	Yellow	Grey	Grey	Red
Bluegrasss Billbug					Yellow	Red	Red	Red	Grey			
Possible Occurance												
Probable Occurance												
Common Occurance												

Source: Golf at the Bridge DEIS

Emergency Response Plan for Fire

INDIAN HILLS COUNTRY CLUB MAINTENANCE FACILITY Claymore Road Fort Salonga, New York

Purpose:

The Emergency Response Plan (ERP) is a system designed to inform employees of communications and actions in response to a fire emergency. The ERP is specific to fires at the maintenance facility and offers information on how employees can safely and effectively handle the emergency.

Please READ carefully and UNDERSTAND fully the following procedures so that every employee knows how he or she must participate and react in the event of a fire at the facility.

Communication:

1. Immediately ALERT all nearby personnel. Call out "FIRE" and/or REPEATEDLY BLOW the hand held AIR HORN if one is near you to get everyone's attention.
2. Press the Fire Alarm Blue Button on the Security System Alarm if accessible.
3. Evacuate
4. Use your cell phone and DIAL 911 and report the fire- provide the operator with our location: Indian Hills Country Club Maintenance Facility: end of Claymore Road- cross street Fresh Pond Road- on Claymore Road
5. Call the Superintendent: 631
6. Call the Pro Shop: 631
7. Fire Department: 631
East Northport Fire Station Clay Pitts Road and Kings Park
8. Fire Emergency Meeting Place: east of maintenance barn.
9. Head Count: All employees shall be accounted for by highest ranking supervisor.

Emergency Response Responsibilities:

1. FIRST RESPONDER: Anyone can act as a First Responder. Your safety comes first, and if you cannot assist in the emergency then you are to escape carefully and calmly. It is an employee's responsibility to assist when possible.
2. CLEAR THE AREA OF PEOPLE: Alert anyone in the vicinity there is a Fire Emergency. Clear the area, including evacuating the building of everyone. Account for everyone and locate them to CLAYMORE ROAD away from the fire and upwind of all smoke.
3. The FIRST RESPONDER shall APPOINT TWO PEOPLE to initiate the Emergency Response System. Require the TWO PEOPLE TO REPORT in person to the PRO SHOP. ONE shall CALL and VERIFY that the FIRE DEPARTMENT has been notified and remain at the Pro Shop until the Fire Department has arrived at the site. The SECOND

RESPONDER shall CONVEY THE STATUS of the Fire Department response TO THE FIRST RESPONDER.

4. After the verification has been confirmed, if the conditions permit, attempts can be made to extinguish the fire. The FIRE EXTINGUISHERS are located at EVERY DOORWAY and each GARAGE BAY DOOR. Use DRY FIRE EXTINGUISHERS. These are suitable for chemical fires, electrical fires, gas fires and general fires. See Diagram 1.
5. DO NOT APPLY WATER.
6. DO NOT attempt to control the fire if:
 - a. You have NO ESCAPE ROUTE.
 - b. You are overcome by SMOKE or obnoxious ODORS.
 - c. You are PHYSICALLY UNABLE to perform.
7. If the Maintenance Facility fire becomes out of control, IMMEDIATELY ESCAPE and try to CLOSE all DOORS. Closing doors will help smother the fire and reduce the possibility of the fire from spreading to other areas. Do not lock the doors.
8. ALL maintenance staff employees are responsible to REPORT to the PRACTICE RANGE and remain until the supervisor arrives. TAKE a HEAD COUNT. Verify where each employee is and account for everyone. The highest ranking staff member shall take a head count and be responsible for an accurate determination of all personnel.
9. Once the FIRE DEPARTMENT arrives at the scene communicate with them and advise them of any known conditions such as:
 - a. Where you saw the fire.
 - b. Where the fuel storage, equipment area and building entryways are located.
 - c. Where the chemical storage area is located.
 - d. Provide your name and contact information.
 - e. ONLY ASSIST if requested to do so. Allow the trained personnel to perform their tasks without interruption. There will be time for discussions once the fire is out and the area is secure.

Evacuation Plans/Procedures:

Evacuation of the Maintenance Facility is required if:

1. The fire becomes out of control
2. Smoke is dense and visibility impaired.
3. There are obnoxious odors.
4. There is risk to personal safety.

Leave the building as quickly and orderly as possible. Remain calm and assist anyone who requires help or appears to require help. Exit the facility through one of the three overhead doors or the main door. All staff shall report to the practice range located immediately north of the facility. This will assure all staff is accounted for. The highest ranking staff member shall take a head count and be responsible for an accurate determination of all personnel. The staff will be advised as to the next course of action(s).

Conclusion:

This Emergency Response Plan has been developed to inform and educate you, the employee, on the best approach to help in the event of a fire emergency at the maintenance facility. The plan was prepared to address employee safety and what responsibilities you have. Questions on the plan must be directed to the superintendent.

Additional Emergency Plan Contacts:**Huntington Hospital**

270 Park Avenue
Huntington, NY 11743
631-351-2000
Emergency Room: 24 hours/7 days

Walk in Medical Care

Medicenter
399 Fort Salonga Road (NYS 25 A)
Northport, NY 11768
631-757-5400
M-Th: 8:00 AM-8:00 PM
F: 8:00 AM- 7:30 PM
Sat & Sun: 9:00 AM-5:00 PM

Poison Control Center

1 800 222 1222

CHEMTREC

1 800 424 9300

Center for Disease Control

1 800 232 4636

New York State Environmental Conservation-Region 1

SUNY Campus at Stony Brook, NY
Spill Response Unit: 631 444 0320 or 1 800 457 7362
General Number: 631 444 0375

SAMPLE FORM

Fertilizer
Record

Date	Time	Hole & Section (circle)	Material & Brand	N-P-K	Rate	Area	Source: Irrigation	Source: Supplemental	Notes
		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 PG Tee Fwy Green							

Weather

Temp:
Humidity:

Cloud:
Sun:

Rainfall:
ET:

Preparer:

Jeffrey L. Seeman, CGCS, CEP

East Quogue Golf Corporation

PO Box 130 East Quogue, NY 11942: jlscoast@optonline.net

Education

- Penn State University, University Park, PA, College of Agricultural Sciences, MS Turfgrass Management
Turf Management and Nutrient Programs to Minimize or Avoid Impact to Ground and Surface Water within Long Island, NY, Master's Thesis
- NYIT, Graduate School of Engineering, Westbury, NY, MS Environmental Technology
- SUNY Stony Brook, NY, BS Earth and Space Sciences/BA Marine Sciences

Scholarship Awards

- Melrose Leadership Academy Award: GCSAA & EIFG 2013
- Bayer Crop Sciences Grant Award, Healthy Plant Academy: GCSAA & EIFG 2013-14

Active Registrations

- Certified Golf Course Superintendent, GCSAA- Class A # 512491
- Certified Environmental Professional # 93034404
- NYSDEC Pesticide Commercial Applicator 3A: C-1877565
- NJDEP Pesticide Commercial Applicator # 5646-B
- Member: GCSAA and LICGSA
- Grassroots Ambassador- representative for the GCSAA and the First Congressional District and coordinator for federal legislation impacting golf turf management

Environmental Training and Certifications

- Registered Environmental Manager, National Registry of Environmental Professionals
- Certified Qualified Environmental Professional, Institute of Professional Environmental Practice
- Certified Environmental Inspector, Environmental Assessment Association
- Registered Environmental Assessor, California Environmental Protection Agency
- Certified Master Naturalist, Cornell Cooperative Extension, Southold, NY
- NYS Supreme Court Expert Witness for Testimony on Environmental Sciences and Impact Assessment
- OSHA (CFR 1910.1210) 40-Hour Hazardous Waste Operations/Emergency Response
- Con Ed, Health and Safety Programs

Mr. Seeman is an environmental professional with more than twenty years of experience in environmental science, planning, engineering, permitting, regulatory compliance, and multi-media environmental investigations. His work includes investigations and assessments on soil, surface and ground water quality, land use, ecological impacts, environmental regulatory compliance and hazardous and non-hazardous waste site remediation. He is recognized as qualified for SEQRA and NEPA impact assessments, tidal and freshwater wetland delineations, wetland assessments and natural resource restorations.

As a Class-A Certified Golf Course Superintendent, and member of the Golf Course Superintendents Association of America, Mr. Seeman has more than 20 years of experience in all facets of daily turf operations and general management of private and public golf course operations, golf course construction and renovation, turf and ornamental plant management, preparation of annual operational budgets, short and long term capital planning and budgets, staffing assessments, employee performance evaluations, equipment purchase and lease agreements, construction management, master plan preparation and implementation, and tournament conditioning. He has authored publications with the USGA and Rutgers.

Professional Highlights

Director of Agronomy

Cherry Creek Golf Links/The Woods, Riverhead, NY

Provide oversight of two 18-hole privately owned/daily fee golf courses. Provide management and operations reports to the owners.

Consulting Agronomist

Paako Ridge, Sandia Park, NM

Provide oversight for the renovation of 27-hole golf facilities including corrective actions, management plan for improvements, overseeding of fairways and greens with new varieties of turf cultivars.

Golf Course Superintendent

Poxabogue Golf Center, Sagaponack, NY.

(Alfred Tull) The only public golf course and driving range in Southampton, NY, owned by Southampton Town. Rated ninth in America's 2014 Top Ten Short Courses by The Golf Channel. Poa/bent grass push up greens. Responsible for all annual budgets, capital improvements, daily turf operations, pesticide, nutrient, and irrigation applications, mowing schedules, equipment service, and staff hiring and performance reviews. Reduced inputs through a 2013 fairway renovation program from rye grass to colonial bentgrass and chewing fescue. Coordinated new irrigation pump installations for existing single row irrigation system. Completed Audubon International Recertification 2006. Improved overall turf quality and bunkering.

Golf Course Consulting Superintendent/Agronomist

The Hills Golf Course Development, East Quogue, NY

(Fazio Design) Preparer for the Integrated Turf Health Management Program (ITHMP) and environmental design aspects required for environmental impact evaluations, municipal approvals and constructability for a new private 18-hole private golf club. The project is proposed for location in a sensitive environmental area of Long Island.

Golf Course Superintendent

Calverton Links, Riverhead, NY

(Kelly Blake Moran) Public, 18 hole-6400 yards (172 acres) privately owned daily fee course. Poa/bentgrass greens (nine push up and nine USGA), bentgrass tees, Poa-rye/bluegrass fairways. Located in the Compatible Growth Area of the Long Island Central Pine Barrens. Prepared original environmental studies and native plant planting plans for secondary roughs. Responsible for:

- Annual turf operating budgets and monitored and coordinated monthly tracking for cash flow projections
- Reduction in turf operating and payroll costs in excess of \$100,000, while improving playing conditions
- Improved inventory controls methods and cash flow
- Staff hiring and performance reviews, payroll, and personnel records
- Capital equipment selection, financing/lease agreements for owners
- Scouting, monitoring, and pesticide applications
- Irrigation improvements at two pump stations (400 GPM and 600 GPM)
- Fertilization and micro-nutrient schedules, soil analysis program
- Bunker, fairway, and tee rebuilding program
- No-mow/fescue areas for reduced labor, chemical and water inputs

Construction Manager/Turf Manager

Olde Vine Golf Club, Riverhead, NY

(William Johnson) Private, 18-hole-6100 yards (107 acres) Bentgrass tees, fairways and (USGA) greens; fescue roughs, 103 bunkers. Prepared environmental permits, impact assessments (SEQRA-EIS) and secondary rough native planting plans. Responsible for:

- Record keeping and daily oversight during construction of the entire 18-hole golf course
- Oversight and inspection during grow-in
- Weekly summary progress and cost reports for the owner representatives
- Tracking materials, labor, quality control of root zone mixes
- Managing the grow-in and post-grown superintendent and staff
- Construction and operating budgets and controls and processed payment requisitions
- NYSDEC supply well permits and installation of 120 foot deep 12-inch diameter well
- Monitoring excavation and shaping, drainage, bunker, tee and green construction, and construction and 5000 SF turf maintenance center
- Selection of post grow-in turf equipment

Turf Manager

Tall Grass Country Club, Shoreham, NY

(Gil Hanse) Public, 18-hole-6500 yard, (130 acres) high end daily fee, Poa bentgrass USGA greens, low mow bluegrass-poa fairways and tees. Tall Grass is considered among the Top Ten Public Courses in New York State and does about 25,000 rounds per year.

- Responsible for golf course operations, with direct oversight of superintendent and staff
- Annual operating and capital improvement budgets
- Managing expenses and budget controls

President/Board Member

Southward Ho Country Club, Bay Shore, NY

(A.W. Tillinghast) Private, 18-hole-6500 yards (160 acres) Poa/bentgrass push up greens and fairways. Private equity club, Met-MGA host for annual Havemeyer Invitational Championship; full service country club: clubhouse, pool house, pool, 12 tennis courts.

President & Chairman of Executive Board: responsible for entire Club assets and operations with the general manager and board of directors.

Green Committee Chairman: Responsible for

- Golf course turf operations,
- Course Master Plan with McDonald & Sons
- McDonald's re-construction of 45 green side bunkers and 23 fairway bunkers as part of a long term sensitive restoration of this classic, 1924 course
- Engineering plans, specifications and construction of the new Turf Center
- Design and construction coordination of new irrigation supply pond and pump station
- USGA Tree Management Program.
- Search for new hire superintendent.

Golf Course Consulting Projects

Long Island National, an 18 hole championship golf course (Robert Trent Jones, Jr., design) and support facility on 150 acres of existing farmland in Riverhead, New York. Assessed impacts on land use/zoning, pesticide and herbicide fate in an unconfined aquifer, irrigation and water supply using constructed wetland ponds with storage capacity for 43 acre feet of water, integrated pest management and best management golf course maintenance programs and traffic.

Calverton Links II (Kelly Blake Moran design) 18 Hole Golf Course: water supply calculations, storm water run-off controls, wetlands protection plans, Integrated Pest Management Plan; project is adjacent to the Long Island Pine Barrens.

The Woods at Cherry Creek (Jurgens-Sasso design) 18 Hole Golf Course, Riverhead, New York. Water use calculations, nitrogen and pesticide application loads and protection of groundwater.

National Guidelines for Municipal Planners-Golf Course Development. Advisory Board, contributing author for, Rutgers and USGA, prepared national criteria for municipal planners to reference during the planning review and approvals for golf course developments and for local municipal zoning/land use boards to use for writing land use codes.

Gardiners Bay Country Club, Shelter Island, New York. Prepared designs and NYSDEC permit modification to enhance and improve the wetland and playing conditions, selected plants resistant to deer, saved the Club approximately \$30,000 in capital improvement costs through the design and construction modifications.

USEPA/USGA: Peconic Estuary Golf Course Nitrogen Reduction Management Program. As Technical Working Group (TWG) member for golf course owners and superintendents of Eastern Long Island and as an environmental professional, worked with USEPA-Region 2 and USGA to reduce potential nitrogen loads generated at courses and discharged to the Peconic Estuary watershed. Part of our charge was to educate the community outside the golf industry on the turf management practices used by superintendents to reduce golf course chemical inputs.

Professional Highlights

Environmental Science

Since 1990, Mr. Seeman has provided professional consulting services involving environmental sciences, engineering and land planning. He has worked with leading engineering firms on environmental projects for the FAA, FHA, City of New York, NJDOT, NYSDOT, local municipalities and private clients.

Environmental Consulting

- *Environmental Planner, Town of Riverhead, NY*, Responsible for professional environmental and planning recommendation to multiple municipal boards and departments. Manage land use plan reviews pursuant to SEQRA, tidal and freshwater wetland legislation and permitting and administer local coastal erosion protection program.
- *Con Edison Remedial Action Report at the former Amoco Oil Terminal, Long Island City, NY* Remediation report for submission to the NYSDEC for cleanup of upland petroleum contaminated soils at a Con Edison site along the East River.
- *Con Edison-Amoco Oil Terminal East River Sediment Investigation Work Plan*. Prepared NYSDEC approved shorefront investigations and East River bottom sediment core sampling and analytical programs. Provided onsite supervision of the East River Sediment Investigation using vibra-core sample collection, geological descriptions, PID and visual observations. Reviewed laboratory analytical results conducted in compliance with TOGS required toxicity assessments based on sample analysis (grain size, TOC, SVOCs, VOCs, PCBs, and Dioxin) and prepared the *Summary Report and the Remedial Action Work Plan*. Developed design plans and specifications for onshore and off shore cleanup program with civil engineers.
- *Remedial Action Work Plan for Groundwater and Soil Remediation at a Fuel Dispensing Facility, Bronx, NY*. The work plan involved approval by USEPA for using Oxygen Release Compound (ORC) to remediate volatile organic compounds. The design included location of inject points, oversight during installation and post application groundwater monitoring.
- *Wharf Expansion of Global Marine Terminal, Port Jersey Channel, Jersey City, NJ*. Conducted tidal wetland delineations, field investigations and sampling supervision for the sediment cores and report summary of the analytical results (percent solids, grain size, TOC, SVOCs, VOCs, PCBs, and Dioxin). Sediments were analyzed for environmental quality evaluations and dredged sediment disposal options, and for compliance with NJDEP Coastal Wetland Permit and US Army Corps of Engineers Permit requirements. The facility is major maritime terminal located in Jersey City, NJ. The project required filling of a tidal wetland and dredging of approximately 160,000 cubic yards of sediment. The work included wetland and upland impact assessments and impact mitigation plans.
- *NYSDEC Groundwater Investigation at Big E Farm, Riverhead, NY*. Prepared NYSDEC approved site investigation and remediation work plan for groundwater contaminated by petroleum release at a 200 acre vineyard, dependent on groundwater for irrigation needs. Developed and managed the remediation which required removal of free product by extraction pumps, air sparging and field evaluations of activated carbon filtration treatment technology.
- *Fire Hydrant Flow and Pressure Testing*: Private community fire service systems, Suffolk County, NY. Prepared protocols and conducted field testing of hydrants in compliance with a new law in Suffolk County for annual hydrant flow and pressure field testing and reporting. Provided testimony and comments to the County with recommendations for improving the protocols and requirements for filing the results.
- *Con Edison Kent Avenue Ash Pit Remediation, Brooklyn, NY*. Prepared specifications for the remediation of a former power plant's ash pit remediation in accordance with Con Ed and NYSDEC engineering requirements.

- *Solid Waste Management Facility Registration*, Calverton, NY. Prepared site plans and registrations for two 9,000 cubic yard/year leaf and yard waste processing facilities on Long Island as required by NYSDEC.
- *SPDES Permit Modifications and Air Resources Registrations for Wilbur Place LLC*, Bohemia, NY. Prepared the NYSDEC required SPDES and air registrations for a major cell phone recycling and remanufacturing facility on Long Island.
- *Phase I and Phase II Site Assessments at former Grumman Building*, Bohemia, NY. Prepared a review of historical Phase I investigations and collected waste water samples for analysis at a private Long Island manufacturing company.

Wetland Delineations, Assessments & Wetland Permits

- *Mill Basin Bridge and Gerritsen Inlet Bridge Replacements, Belt Parkway*. Tidal wetland delineations and assessments including sections of the Jamaica Bay Wildlife Refuge area, Brooklyn, NY for NYCDOT
- *Tidal Wetland delineations and Permits for Bergen County Tide Gates Reconstruction* for NJDEP, Hackensack Meadowlands Commission and Ridgfield Park
- *Freshwater Wetland Delineation and Stream Encroachment Permits for Replacement of Lafayette Avenue Bridge at Goffels Brook*, a NJDOT-NJDEP stream encroachment and freshwater wetlands. Permits
- *NJDEP Permits for Stream Encroachment and Freshwater Wetlands*: replacement of Nine Bridges in Morris County, NJ.
- *Design Consultation and Wetland Permits, Trout Pond*. NYSDEC freshwater wetland, Southampton, NY
- Design, construction supervision and wetland permits for constructed stormwater and non-point pollution control system at Southward Ho Country Club 16th Hole Pond, a NYSDEC regulated freshwater wetland, Bay Shore, NY
- *South Shore Mall and Penataquit Freshwater Wetland System*, Bay Shore, NY. Design, construction supervision and wetland permits for constructed freshwater wetland for stormwater and non-point source pollution control
- *East Creek Stormwater Control (bio-filter) Design*. Engineering design consultation, construction inspection and wetland permits for constructed freshwater wetland-bio-filter for stormwater and non-point source pollution control at East Creek and the Peconic Estuary drainage basin. Riverhead, NY. USEPA/NYSDEC grant funded project
- *Freshwater Wetland Delineation, Assessment and Mitigation Program for NJDOT I-287*. 10-mile widening project; more than 100 wetlands and assessment of impacts from roadway drainage, potential hazardous waste spills, noise walls and fill
- *Freshwater Wetland Delineation and Mapping for NYSDOT I-287*. 12-mile roadway improvements project, Westchester County, NY
- *Freshwater Wetland Delineation and Mapping* at 145 acre parcel in Southhold, NY.
- *Freshwater Wetland Delineation and Mapping* for Transfer of Development Rights at 160 acre parcel in Riverhead, NY
- *Freshwater Wetland Delineation and NYSDEC Mapping*. Northfork Preserve, a 140 acre, privately stocked hunting preserve in Riverhead, NY
- *Freshwater Wetland Delineation and Mapping: Ontiontown Road/NYS Route 22*. NYSDOT roadway improvement design, Dutchess County, NY
- *Tidal Wetland Delineation, Mapping and Impact Assessment, Groton-New London Airport Master Plan*, Groton, CT

- *Tidal Wetland Delineation, Mapping and Permit Applications*. U.S. Army Corps and NJDEP permits for the Woodbridge Police Pistol Firing Range, Woodbridge, NJ.
- *Design, Construction Supervision and Permits for Constructed Wetland Restoration*. Gardiners Bay Country Club, Shelter Island, NY.
- *Tidal and Freshwater Wetland Delineation, Mapping and Impact Report, NYSDOT*. 50-mile (multiple route study) Bikeway Project from Townline Road, Southampton, NY to Montauk Point, East Hampton, NY
- *Pond Management Plan for Control of Curly Leaf Pondweed (Potamogeton crispus)*. Bay Shore, NY. Developed a program to control the non-native aquatic plant and restore 5.1 acre ponds to a diversified ecology. The project involves a variety of control methods including hand removal, chemical control, pond aeration to increase oxygen and restoration of shoreline-emergent wetland vegetation.

Environmental Assessments

SEQRA, NEPA & Ecological Studies

- *SEQRA: Air Quality NYSDEC Permits*. 400 ton per day capacity counter flow asphalt plant used in a landfill clean up action, Riverhead, NY
- *Land Use Feasibility Study at Greentree*, a private 500 acre estate, Manhasset, NY. Investigated on-site infrastructure and assessed environmental impacts of development options for master plans
- *SEQRA: Environmental Assessment Report for East End Bikeway Project*, NYSDOT: potential impacts on sensitive habitats, mitigation planning and coordination with Towns of East Hampton and Southampton, NY
- *SEQRA: DEIS/FEIS Island Water Park*, 50 acre water ski facility at former Grumman Site (EPCAL) Calverton, NY: Tiger salamanders, wetlands, water use, groundwater, and zoning issues.
- *SEQRA: DEIS/FEIS Indian Shores*, a 100 acre residential and agricultural subdivision in Southold, NY. Assessed impacts on estuarine and terrestrial ecologies, groundwater withdrawal, nitrogen loads and cultural resources
- *SEQRA: Environmental Assessment for Peconic Landing*, a 300 unit lifecare and retirement community on 145 acres of undeveloped land in Southold, NY. Assessed impacts on upland woodland, successional shrublands, forested and scrub-shrub freshwater wetlands and wildlife habitats, bluff line along Long Island Sound, traffic, land use/zoning, cultural resources and municipal water and wastewater services
- *SEQRA: Supplemental DEIS/FEIS Maidstone Landing*. Condominium project, with 82 unit residential development, Scenic Easements, wetlands and coastal bluff erosion concerns, Riverhead, NY
- *SEQRA: Environmental Assessment for National Golf Links*. 18-hole championship golf course and support facilities on 150 acres of existing farmland in Riverhead, NY. Assessed impacts on land/zoning, pesticide and herbicide fate in an unconfined aquifer, irrigation and water supply using constructed wetland ponds with storage capacity for 43 acre feet of water, integrated pest management and best management golf course maintenance programs and traffic
- *SEQRA: Environmental Assessment, Calverton Links II*. 18-Hole Golf Course, detailed water supply calculations, stormwater runoff controls, wetland protection plans, Integrated Pest Management Plan; project is adjacent to the Long Island Pine Barrens
- *SEQRA: DEIS/FEIS for Reeves Golf, LLC*, a 75-unit residential-cluster subdivision and 18-hole golf course, Riverhead, NY. Issues included land use and open space, nitrogen loads, preservation of agricultural soils and transfer of development rights
- *SEQRA: Supplemental DEIS/FEIS for Spring Meadow*. 165 unit cluster subdivision, Brookhaven, NY. Issues included preservation of open space, sensitive ecological habitats, traffic, nitrogen loading to groundwater, site is adjacent to the Long Island Central Pine Barrens, Non-Core Area.

- *SEQRA Environmental Assessment: Lear Ruig Partners, LLC.* A 36 acre equestrian facility, Shelter Island, NY. Issues included manure management plans, ground and surface water protection, odor control, stormwater management and land use and open space preservation
- *SEQRA: Environmental Assessment, WR Development at Wading River.* A 150 lot residential subdivision on 176 acres, Riverhead, NY. Issues included open space, community impacts, groundwater protection, nitrogen loading from sanitary and fertilizers. Site is contiguous with the Long Island Central Pine Barrens Non-Core Area
- *SEQRA: Environmental Assessment for Mid Road Properties.* 126 unit residential retirement facility, Riverhead, NY. Issues included land use, traffic, potential for impact from an adjacent landfill closure plan. Community character and need for senior housing
- *SEQRA: Environmental Assessment for Schembri Homes.* 55 – lot residential subdivision on 77 acres fronting Long Island Sound, Riverhead, NY. Issues included land clearing-preservation of upland habitats, slope stability and erosion hazard, loss of farmland
- *SEQRA:DEIS/FEIS for The River Club.* 220 unit condominium adjacent to the Peconic River, Riverhead, NY-issues included open space, tiger salamanders, impact to the estuary
- *SEQRA: DEIS /FEIS Aquebogue Golf Resorts.* A165 acre subdivision with 70% of the land preserved as farmland, Riverhead, NY
- *SEQRA: Environmental Assessment Report, Woods at Cherry Creek.* 18-Hole Golf Course, Riverhead, NY. Issues included water use, nitrogen and pesticide application and potential for groundwater contamination, loss of upland habitats, stormwater control and traffic
- *NEPA Environmental Assessment, Groton-New London Airport Master Plan.* Airport planning, Groton, CT
- *NEPA Environmental Assessment Stewart Airport Master Plan, Newburgh, NY.*
- *DEIS/FEIS for Sea Avenue Stormwater Control Facility and Ocean Outfall.* Assessed impacts on regional drainage basin and collection system, water quality, New Jersey Department of Environmental Protection (NJDEP) SPDES permit limitations. NJ State Coastal Zone Management policies. Procured federal, state and local permits Toms River, NJ
- *CEQR GEIS Natural Resources Inventory and Assessments.* Reconstruction of nine (9) bridges along the Belt Parkway located adjacent to the Jamaica Bay Wildlife Refuge. Assessed impacts on estuarine and terrestrial upland ecological communities.
- *Mitigation Plan for Wetland and Upland Habitats.* Required habitat restorations for the nine bridges along the Belt Parkway. Coordinated with NYCDOT, Army Corps, NYSDEC, NYCDEP, NYC Parks and USF&WS
- *Advisory Board National Guidelines for Municipal Planners-Golf Course Development,* Rutgers Cook College and United States Golf Association prepared criteria for municipal planners to reference during the review of golf course development
- *Tree Inventory Sisters of Mercy.* 44 Acre parcel inventory of trees, common and scientific names, DBH, and condition of species measuring 20 inch and above (tagged 300 trees), as part of a SEQRA mandated FEIS response, Oyster Bay, NY

Water, Sanitary & Stormwater

- *Port Newark Sanitary and Stormwater Sewer Study and Design.* Managed projects conducted for the PA of New York & New Jersey. Conducted CCTV field investigations to assess physical condition of the port's 60,000 linear feet of sewer collection system; conducted flow tests at eight pump stations and analyzed industrial wastewater for discharge compliance; prepared plans and specifications for upgrades and improvements including four new pump stations
- *Port Newark/Port Elizabeth Marine Terminal Water Supply Study and Design.* Managed the project for the PA of New York & New Jersey. Investigated the condition of 260,000 linear feet of water mains, 1100 valves and 600 hydrants, conducted C-valve and hydrant flow tests, conducted booster pump and fire pump station flow tests on eleven pumps, prepared KY pipe model, prepared

evaluation and rehabilitation report. Managed the design for system upgrade including water mains, a new pump station and two one million gallon storage tanks

- *Inwood Sanitary District Sewer Inspection and Corrosion Study and Design.* Prepared project for the Nassau County Department of Public Works, Mineola, NY. Investigated 150,000 linear feet of sewer pipe using CCTV, 780 manhole inspections, and identified hydrogen sulfide corrosion provided GIS and AutoCAD 13 mapping, prepared construction documents for collection system rehabilitation

Waste Management

- *Municipal Landfill Closure Report.* Prepared protocols and procedures for groundwater soil and landfill gas investigations in compliance with NYSDEC regulations. Conducted on-site hydrogeological investigations (well installations/soil logs and oversight of groundwater sample collections/chain of custody). Conducted landfill gas investigations (well-probe installation and sample collection) in conjunction with 6NYCRR Part 360 Solid Waste regulations closure investigation reports at a 40 acre landfill. Riverhead, NY
- *Municipal Landfill Reclamation Feasibility Study.* Conducted an analysis to determine the feasibility of mining and or capping a 40 acre landfill in accordance with 6NYCRR Part 360 Waste regulations. Riverhead, NY
- *Riverhead Landfill Closure Construction Project.* Prepared protocols and procedures for landfill soil samples and analytical tests for groundwater, surface water and soils, required for on-going closure activity. Tests included “Expanded Parameters” (RCRA metals, pesticides, VOCs Semi-VOCs), and test result reviews with NYSDEC and comparisons to NYS MCLs and TAGM standards. Approximately 200 water and soil samples were collected and analyzed
- *Solid Waste Management Plan for the Town of Riverhead.* Prepared SWMP for the Town (population: 24,000) in accordance with 6NYCRR Part 360 Waste regulations.
- *Recycling Collection Department Restructuring and Management Study.* Prepared the study for the Burlington County Occupational Training Center, Mt. Holly, NJ
- *Site Improvement Analyses and Site Plans.* Prepared for Burlington County Recycling Facility, Mt. Holly, NJ
- *Landfill Reclamation Work Plan and Construction Planning.* The work plan addressed requirements of Part 360 State regulations for scientific and engineering approach for forty-acre landfill mining project. Riverhead, NY
- *Beneficial Use Determination (NYDEC-BUD).* The BUD was prepared for reclaimed soils (700,000 cubic yards) from the Riverhead Landfill to produce NYSDOT specifications of asphalt
- *Beneficial Use Determination (NYSDEC-BUD).* The BUD was prepared for use of glass cullet as replacement for sand and gravel in the gas venting layer for a final cover system of landfill closures.
- *Riverhead Landfill Reclamation Project Phase II 2003-2007.* Site Manager, Riverhead, NJ.

