



FIGURE 3-1

Pennsylvania Department of Environmental Protection
WATER MANAGEMENT PROGRAM

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NPDES PERMIT NO. PA 0070351

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. (the "Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq.,

Amity Township
2004 Weavertown Road
Douglassville, PA 19518

is hereby authorized to discharge from a facility located in Amity Township, Berks County to Schuylkill River in Watershed 3-L in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts A, B, and C hereof.

THIS PERMIT SHALL BECOME EFFECTIVE ON JANUARY 1, 2003

AND EXPIRE AT MIDNIGHT, JANUARY 1, 2008

The authority granted by this permit is subject to the following further qualifications:

1. If there is a conflict between the application, its supporting documents and/or amendments and the terms and conditions of this permit, the terms and conditions shall apply.
2. Failure to comply with the terms or conditions of this permit is grounds for enforcement action; for permit termination, revocation and reissuance or modification; or for denial of a permit renewal application.
3. Application for renewal of this permit, or notification of intent to cease discharging by the expiration date, must be submitted to the Department at least 180 days prior to the above expiration date (unless permission has been granted by the Department for submission at a later date), using the appropriate NPDES Permit Application Form. In the event that a timely and complete application for renewal has been submitted and the Department is unable, through no fault of the permittee, to reissue the permit before the above expiration date, the terms and conditions to this permit will be automatically continued and will remain fully effective and enforceable pending the grant or denial of the application for permit renewal.
4. This permit does not constitute authorization to construct or make modifications to wastewater treatment facilities necessary to meet the terms and conditions of this permit.

PERMIT ISSUED: DEC 13 2002

BY Leon M. Oberdick
Leon M. Oberdick
Program Manager
Southcentral Regional Office

PERMIT AMENDED: _____



PART A

LAT: 40°15'5"

LONG: 75°43'37"

I. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Outfall 001, which receives wastewater from the sewage treatment plant. Samples are not to be taken during significant storm events.

1. Numbers in parentheses () refer to Footnotes/Additional Requirements/Information on page 4.
2. Samples taken in compliance with the monitoring requirements shall be taken at the following location(s):
 - a. Composite samples may be taken before or after disinfection.
 - b. Grab samples shall be taken after disinfection.

DISCHARGE LIMITATIONS ⁽¹⁾								MONITORING REQUIREMENTS	
Discharge ⁽²⁾ Parameter	Mass Units (lbs/day) ⁽³⁾			Concentrations (mg/l) ⁽⁴⁾				(5)	Sample Type
	Average Monthly	Average Weekly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Inst. Maximum		
Flow (mgd)	Monitor & Report	XXX	Monitor & Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	XXX	From 6.0 to 9.0 inclusive				1/day	Grab
D.O.	XXX	XXX	XXX	Minimum of 5.0 mg/l at all times				1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	XXX	1.6	1/day	Grab
Total Suspended Solids	400	600	XXX	30	45	XXX	60	2/week	24-hour comp
CBOD ₅	333	534	XXX	25	40	XXX	50	2/week	24-hour comp
NH ₃ -N	267	XXX	XXX	20	XXX	XXX	40	2/week	24-hour comp
Total Dissolved Solids	13,344	XXX	XXX	1,000	XXX	XXX	2,000	2/week	24-hour comp
S. Capricornutum ⁽⁸⁾	XXX	XXX	XXX	XXX	XXX	Monitor & Report	XXX	See Part C	See Part C
Fecal Coliform ⁽⁶⁾ (5/1 to 9/30)	XXX	XXX	XXX	200	XXX	XXX	XXX	2/week	Grab
Fecal Coliform ⁽⁶⁾ (10/1 to 4/30)	XXX	XXX	XXX	10,000	XXX	XXX	XXX	2/week	Grab

PART A

B. Storm Water Outfalls:

Outfalls 002 and 003 (listed below) serve as storm water outfalls. There are, at this time, no specific effluent or monitoring requirements for these outfalls. However, the Department may reopen the permit when regulations for storm water discharges are enacted.

Point Source	Name	Location	Receiving Stream
Wastewater Treatment Plant	002	Storm grate adjacent to chlorine contact tank	Schuylkill River
Wastewater Treatment Plant	003	Storm grate adjacent to flood pump tank	Schuylkill River

PART A

C. Footnotes/Additional Requirements/Information

1. The discharge limitations for Outfall 001 were determined using an effluent discharge rate of 1.6 million gallons per day.
2. In addition to the listed parameters, the discharge of floating solids, visible foam, or other substances that produce color, tastes, odors, and turbidity, or settle to form deposits shall be controlled to levels that will not be inimical or harmful to the water uses to be protected, or to human, animal, plant, or aquatic life.
3. When sampling to determine compliance with the mass discharge limitations, discharge flow at the time of sampling must be measured and recorded.
4. The instantaneous maximum discharge limitations are for compliance use by the Department only. Do not report instantaneous maximums on Discharge Monitoring Reports (DMRs) unless specifically required on those forms to do so.
5. This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events.
6. The permittee shall provide for effective disinfection of this discharge to control disease-producing organisms during the swimming season (May 1 through September 30) to achieve a fecal coliform concentration not greater than 200/100 ml as a geometric average, and not greater than 1,000/100 ml in more than 10 percent of the samples tested. During the period of October 1 through April 30 the fecal coliform concentration shall not exceed 10,000/100 ml as a geometric average.
7. Except as otherwise specified in this permit, the 30-day average percent removal for biochemical oxygen demand and total suspended solids shall not be less than 85 percent.
8. Whole Effluent Toxicity testing requirements and schedule are outlined in PART C II herein.

II. DEFINITIONS

- A. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
- B. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- C. "Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

3.0 EXISTING SEWAGE FACILITIES IN THE PLANNING AREA - IDENTIFYING THE EXISTING NEEDS

3.1 IDENTIFICATION OF SEWAGE SYSTEMS IN PLANNING AREA

3.1.1 Existing Facilities

The existing treatment plant is located in Amity Township, Berks County, and is owned and operated by the Township of Amity. It consists of a 1.6 MGD secondary treatment plant, approximately 70 miles of sewer line, and 6 pumping stations. The system drains the Manatawny Creek, Monocacy Creek and a small portion of the Schuylkill River basins. Effluent is discharged to the Schuylkill River. The plant operates under NPDES Permit No. PA 0070351 (effective January 1, 2003, and expiring January 1, 2008). Effluent discharge requirements of the permit are shown in **FIGURE 3-1**.

FIGURE 3-2 shows the location of the current treatment, collection and conveyance system.

A small number of private facilities, serving single-family residences have NPDES permits, as shown in the following table:

Table 3-1 NPDES PERMITS

Permit #	Name	Type
03410	McQuaite	Ext. Aeration/Sand filter
03313	Scheifley	Aeration/Sand Filter
04057	Thompson	Septic tank - Sand filter
04058	Thompson	Septic tank - Sand filter

FIGURE 3-2A depicts the “Sewer Service Area” for Amity Township for the next ten years.

3.1.2 Amity Township Sewage Treatment Plant

3.1.2.1 General

The existing Amity Township Sewage Treatment Plant is combined carbonaceous nitrogenous activated sludge process, rated at a capacity of 1.6 MGD. The facility consists of the following major components:

1. Headworks comminutor and diversion channel.
2. Equalization basin.
3. Primary clarifiers.
4. Oxidation- Nitrification ditch with rotor aeration.
5. Final clarifiers.

6. Return sludge pumping station and mechanical building.
7. Aerobic digesters for waste activated sludge.
8. Anaerobic digesters for primary sludge.
9. Chlorine contact tank and chlorination system.
10. Post aeration tank.
11. Outfall manhole and pinch valve.
12. Flood pump station.
13. Sludge thickening tanks.
14. Belt filter press.
15. Sludge drying beds (reed beds.)

A schematic of the plant's basic treatment process is shown in **FIGURE 3-3**.

3.1.2.2 Sewage Treatment Plant Performance

3.1.2.2.1 Design Basis

The following tabulation lists the basis of design for the current facility:

Design year	1990
Process design flow (Act 537 Plan)	1.6 mgd
Peak design flow (for process)	4.2 mgd
Peak instantaneous flow (for hydraulics)	7.0 mgd
Organic influent BOD concentration	200 mg/l
Suspended solids influent concentration	200 mg/l
Organic loading	2,670 lbs/day
Suspended solids loading	2,670 lbs/day
Receiving stream	Schuylkill River
Point of discharge	40°15' 01" W, 70°43' 33" N
Flood elevation (100 year storm)	153'

3.1.2.2.2 Removal Efficiencies

Per the current NPDES permit, the 30-day average percent removal for biochemical oxygen demand and total suspended solids shall not be less than 85%.

In 2002, the sewage treatment plant achieved a minimum monthly BOD removal rate of 95.3%, with an overall yearly average of 98% BOD removal.

In 2002, the sewage treatment plant achieved a minimum monthly suspended solids removal rate of 92.4%, with an overall yearly average of 97.5% total suspended solids removal.

3.1.2.2.3 Plant Condition

The wastewater treatment plant is in very good operating and physical condition. The plant personnel are diligent with perpetuating a high level of facility upkeep, and all equipment is maintained at or above manufacturer's expectations. The plant superintendent coordinates the purchasing and installation of most replacement equipment as it is needed.

3.1.2.2.4 Hydraulic Overloads

The sewage treatment plant is subject to high wet weather hydraulic loading rates, due primarily to collection system inflow and infiltration. The maximum daily flow recorded for 2002 was 5.33 mgd (November 17), and instantaneous peak flows in excess of 7.0 mgd occasionally occur after a significant storm event. High peak loading periods subject the plant to an elevated risk of mixed liquor suspended solids (MLSS) washout from the final clarifiers to the stream discharge, strain the facility's treatment capabilities, and limit the operator's control options.

Historical and projected hydraulic loading data appears in the annual Chapter 94 Wasteload Management Report. Examination of the 2003 report reveals that the plant starts exceeding the 1.6 mgd permit limit with maximum three-month average flow beginning in the year 2002 and continuing into the future. It can be concluded from this data that the plant is operating at or near capacity.

3.1.3 Sewage Collection/Conveyance System

3.1.3.1 System Background, Condition, and Expansion

The Amity Township sewage collection system consists of approximately 70 miles of gravity sewer line, ranging in size from 8" to 24". The original system was built in the mid 1970's to serve a development of several hundred lots known as Amity Gardens.

The portion of the sewage collection system serving Amity Gardens consists of approximately 12 miles of 8" and 10" sewer line, predominately constructed of vitrified clay pipe in five foot sections. This older portion of the sewage system has experienced deterioration over the years, and internal sewer line videotaping projects have revealed demolished pipes, cracked pipes, separated joints, deflected joints, and protruding lateral connections. Most of the system inflow and infiltration is believed to originate in this area.

One critical section of the sewerage system may require replacement due to capacity limitations. The 10" diameter sewer interceptor line along SR 662 has slopes as low as 0.005 ft./ft., and is at paper capacity based on reserved (purchased) capacity and planned developments. The capacity of this line is one million gallons per day.

Based on 334 gpd/EDU for 2002, the critical interceptor section is adequate for 2,994 EDU's.¹

As the amount of reserved and planned EDU's is approximately 1,400 for this line, capacity will become a problem when the subdivisions approach build-out. The township is prolonging the integrity of the interceptor by requiring new developments to connect to the system downstream of the critical section, where possible.

3.1.3.2 Repair and Replacement

The Township completed an internal television inspection of suspected leaking sewer lines in the Amity Gardens area in February 2001. The results of this inspection were used to target sewer lines for repair and replacement. Approximately 1,600 linear feet of 8 and 10 inch clay sewer line were replaced with PVC pipe in 2002. The Township has scheduled 1,500' of replacement for 2003.

3.1.3.3 Sewage Pumping Stations

There are seven pumping stations in the Amity Township sewerage system. All of the stations, with the exception of station No. 4, are in good physical condition and are operating satisfactorily. Station No. 4 was installed in 1976, and has experienced corrosion and deterioration of piping and components, along with decreased pump performance. Rehabilitation of this station has received DEP approval (Part II Water Quality Management Permit), and the work will be completed by the end of the year (2003). Station No. 3 was rehabilitated with new pumps in 2002.

3.1.4 Problems with Existing Facilities

The existing sewage treatment plant is subject to monthly maximum flows in excess of 4.0 mgd, and instantaneous peaks as high as 7.0 mgd. The operator has experienced difficulties in preventing mixed liquor washout in the final clarifiers during peak flow conditions, and has been forced to surcharge raw sewage into the collection system, after the equalization basin is filled, to prevent mixed liquor loss in the plant effluent.² An upgrade to the facility is needed to better accommodate wet weather flows, avoid permit violations, install maintenance-related equipment, and also provide capacity relief for proposed developments via future facility re-rate.

The sewage collection system is subject to the typical problem of wet weather inflow and infiltration, due largely to old and/or damaged sewer lines, illegal sump pump connections, and leaking house laterals.

¹ Based on an October 11, 1999 "Evaluation of 10 Inch Sanitary Sewer Interceptor" by Motley Engineering, for Amity Township.

² Also, as the quantity of organic loading has increased substantially in the past five years, the oxidation ditch has approached design capacity with respect to oxygen transfer.

3.1.5 Scheduled or In-Progress Upgrading of Facility

As the plant moves towards full capacity, the Township recognizes the need to limit new connections. Towards that end, the Township began allocating the remaining capacity to developments as they were approved. **TABLE 4-1** shows the allocation of the remaining EDU's through 2006.

Section 4.5 analyzes the expected population growth, and availability of capacity through 2013.

3.1.5.1 Sewage Treatment Plant Upgrade and Modifications Project

In 2002, the Amity Township Board of Supervisors authorized the Township Engineer, LTL Consultants, to proceed with the design phase of an upgrade and modifications project at the sewage treatment plant. The purpose of the project is three-fold: to build additional final clarification capacity to reduce the risk of wet weather MLSS loss; to add needed maintenance upgrades to improve plant performance and maintenance operations; and to enable the facility to be re-rated in the future at a higher permitted capacity.

The general scope of the project is summarized as follows:

HEADWORKS IMPROVEMENTS: Addition of rag and grit removal equipment, to be housed in a new headworks building. An influent pumping station is proposed after headworks to lift influent above existing flat hydraulic grade, to reduce risk of collection system wet weather surcharge and compensate for head loss through fine screen and grit chamber.

OXIDATION DITCH MODIFICATIONS: The existing motors for the rotor aerators will be replaced with larger units with heavy duty gear boxes for higher oxygen transfer capacity. Flow baffles will be added upstream and downstream at each rotor to reduce damaging wave action at rotor and minimize splashing. All corroded aluminum slide gates and weir gates will be replaced with new fiberglass gates.

NEW FINAL CLARIFIER: A new final clarifier will be constructed that will more than double the existing final clarification area, and greatly improve wet weather treatment performance. A new return and waste activated sludge pumping station will be built in conjunction with the new clarifier.

The upgrade project is scheduled to be bid in late Summer 2003, and begin construction in Fall 2003. The project is anticipated to take one year to complete.

3.1.6 Collection System Corrective Action Plan

Amity Township recognizes the need to reduce periodic hydraulic overloads at the plant due to wet weather inflow and infiltration.

3.2 NEEDS IDENTIFICATION

The sewered area of Amity Township is well delineated. The needs assessment survey focused on the area outside of the sewered area. The Amity Township Board of Supervisors mailed a letter to all residents who were identified as not having sewer (based on sewer bills). The letter informed residents that LTL Consultants, representing the Township, would be conducting a door-to-door survey (see **Appendix 3-2**, page 2, for a copy of the letter).

LTL Consultants' Sewage Enforcement Officers interviewed residents. During the period of November 25, 2002 to January 9, 2003, they interviewed 127 Amity Township residents, and obtained 125 drinking water samples, representing the required Tier I 20% of the sample population (see **APPENDIX 3-1** for a discussion of survey methodology). Survey results are summarized in **APPENDIX 3-3**, and tabulated in **APPENDIX 3-4**. A copy of the survey instrument is shown in **APPENDIX 3-2** (page 3). Residents who were surveyed were also asked to allow LTL to take a water sample for testing. Samples were tested for the presence of coliform, fecal coliform, and nitrate-nitrogen contamination. Results are summarized in **TABLE 3-4**.

In addition, a Tier II sample was done for the area know as Bel Air Estates, which preliminary studies identified as a "critical area" (the Tier II surveys were part of the 127 Tier I samples). Bel Air Estates is a privately owned mobile home park, with 34 home sites.

- The mobile home park operator owns 14 of the sites. Those 14 sites are served by 6 community wells. All 6 wells tested negative for coliform bacteria, and had nitrate levels below 5 ppm.
- The remaining 20 lots are in private ownership. We were able to survey 6 of those properties. All 6 tested negative for coliform bacteria. Two of the wells had nitrate levels greater than 5 ppm, but less than 10 ppm.
- During the initial survey, and in subsequent follow-ups, we were able to assess 25 of the OLDS, with the following results:

Confirmed	15	60%
Suspected	1	4%
Potential	7	28%
No Malfunction	2	8%

Overall, 92% of the systems examined were confirmed, suspected or potential malfunctions.

See **TABLE 3-3** for definitions of "malfunctions."

3.2.1 Types of Systems in Use

Virtually all systems identified in the survey had modern septic systems for sewage disposal, characterized by a septic tank, and some form of drain field (most commonly an in-ground bed, in-ground trench, or elevated sand mound).

Graywater disposal closely followed the sewage disposal method, although there were a small number of properties that had "pipe to ditch" (5), "pipe to surface" (5) or "other" (4) disposal systems.

The average age of an OLDS was 23 years. A high percentage (80+%) of those surveyed had their septic systems pumped. Some had it done on a regular schedule, while others had it done on an "as needed" basis. Many respondents were unable to identify when their system was last pumped, but for those who responded, the average frequency was 3.2 years.

3.2.2 Sanitary Survey

The Sanitary Survey included a visual inspection of on-lot sewage disposal systems by Sewage Enforcement Officers (SEO's). The SEO's also interviewed the resident and completed a questionnaire (See APPENDIX 3-2). Results of the Sanitary Survey are shown graphically in FIGURES 3-4, a-c. Test locations and results are shown graphically on a map in FIGURE 3-6 (in pocket).

3.2.3 Comparison of OLDS with Systems Appropriate for Soil, Geologic and Topographic Conditions

Overall, 48% of the properties surveyed had properly functioning OLDS. Twenty-four percent (24%) had "confirmed" malfunctions; 4% "suspected"; and 25% "potential" malfunctions. The "potential" malfunctions were generally based either on the age of the system (installed before permitting) or distance from well (less than 100 feet). Those numbers are somewhat skewed by the inclusion of the "Tier II" samples. Without the Tier II samples, the results are: 57% properly functioning; 16% "confirmed"; 4% "suspected"; and 23% "potential." These results are shown graphically in FIGURE 3-4, a - c.

The incidence of problems is scattered; with the exception of the Tier II area, the malfunctions seem to be randomly distributed across the Township. Malfunctions seemed to be caused as much by the age, design or maintenance of the system as by the soil, geologic or topographic factors.

The Tier II area consists of various sized lots located in a mobile home park. The property is bordered by the Limekiln Creek, a tributary of the Monocacy Creek. The OLDS on the sites owned by the mobile home park were well maintained; there was less control over the lots in private ownership, although 4 of 6 had their systems pumped and inspected. Despite those efforts, 75% of the systems tested were "confirmed" malfunctions, and another 17% were "potential" malfunctions. The problems in this area are:

- Soils are hydric, or in the 100-year flood plain (see Figure 2-2)
- The Soil Capability map (Figure 2-3) shows "severe limitations" due to flooding and high water table
- small lots (many under an acre)

3.2.4 Water Supply Survey

Results of the survey are shown graphically in **FIGURE 3-5**. Test locations and results are shown on maps **APPENDIX 3-7** (Coliform) and **APPENDIX 3-8** (Nitrates). As expected from the geological and soils maps, there were elevated nitrate levels in the northern portion of the Township, where the soils are predominately limestone derived. There were numerous wells with coliform bacteria contamination, but only six with fecal coliform. There was no pattern to the coliform bacteria contamination; much of the non-fecal contamination can be attributed to poor well head protection by the property owner.

To comply with DEP regulations, Title 25, Section 71.62(c)(2)(iii), **APPENDIX 3-8** shows a 1/4 mile circle around all wells with nitrate levels greater than 5 ppm. Developments requesting on-lot sewage disposal that are within those circles will be required to conduct preliminary hydrogeologic studies prior to plan approval. Requests for exemptions from sewage facilities planning, as per Section 71.51(b)(1)(ii) will not be permitted. Exceptions to the requirement to revise the official plan for new land development will not be permitted, as per Section 71.55(b).

3.2.5 Individual and Small Volume Community On-lot Systems

At this time, Amity Township's involvement in regulating individual and community systems is limited to participating in the permitting process, and having the Sewage Enforcement Officer (SEO) respond to complaints (at this time, there are no community systems). With adoption of this plan, the Township will implement a Sewage Management Program, which will assure that systems are regularly inspected and pumped.

3.3 WASTEWATER SLUDGE AND SEPTAGE GENERATION, TRANSPORT AND DISPOSAL METHODS

3.3.1 Location of Sources of Wastewater Sludge and Septage

Amity Township currently accepts a limited amount of septage from individual septic tanks. Septage is hauled to the plant in tank trucks, and discharged into the aerated equalization basin, then sent to the treatment plant in a regulated flow. The proposed upgrades to the plant's headworks include grit and rag removal equipment to better enable the plant to accept increased amounts of septage, including septage collected as part of the On-Lot Sewage Management plan.

Amity Township also accepts leachate from the Delaware County Solid Waste Authority's (DCSWA) Colebrookdale Landfill and from the Western Berks Refuse Authority. The plant can accept up to 100,000 gallons per day. The average flow per day from Western Berks Refuse Authority was 1,767 gallons in 2002 (total of 645,084 gallons for the year). The average flow per day from the Colebrookdale Landfill was 1,696 gallons in 2002 (total of 618,977 gallons for the year). DCSWA is in the process of expanding its leachate treatment facility, and this amount is expected to decrease. Leachate is hauled to the plant in tank trucks, and is discharged into the aerated equalization basin and sent to the treatment plant in a regulated flow.

3.3.2 Quantities of Sludges and Septages Generated

Sewage sludge generated by the Plant is dried at the plant, and hauled by truck to the Western Berks Refuse Authority's sanitary landfill for disposal. Approximately 150 tons of sludge are generated annually. This is the only source of sewage sludge generated in Amity Township.

3.3.3 Present Disposal Methods, Locations, Capacities and Transportation Methods

See Section 3-3.2.

TABLE 3-3

IDENTIFICATION OF SEWAGE ASSOCIATED MALFUNCTIONS AND ENVIRONMENTAL CONTAMINATION

Public health needs are considered to be those health hazards and water pollution problems that involve discharging untreated or inadequately treated sewage to the surface of the ground or to the waters of the Commonwealth (including groundwater). Most commonly, these needs are found to be malfunctioning on-lot disposal systems (OLDS) and malfunctioning community on-lot disposal systems (COLDS). On-lot disposal system malfunctions are classified into three categories: confirmed, suspected and potential. Properly functioning on-lot systems are added to these groups forming a fourth category. When determining the public health needs of an area using OLDS/COLDS, all systems inventoried, mapped and analyzed must be placed into one of these four categories:

Confirmed Malfunctions: Those malfunctions documented by dye testing, laboratory test results, observation by a certified Sewage Enforcement Officer or a professional with experience in OLDS, "Best Technical Guidance" repair permits, and seasonally wet absorption areas. Also included are piped discharges from a single structure with direct evidence of sewage (i.e. direct observation of soap suds, food residue, solids, odors, etc.), reported system backups, malfunctions with photographic documentation or other similar evidence.

Suspected Malfunctions: Those systems exhibiting some malfunction characteristics such as abnormally green grass in the vicinity of an absorption area, piped discharges from one (or more than one) dwelling without direct evidence of sewage (i.e. no observation of soap suds, food residue, solids, odors, etc.), absorption areas located in known unsuitable soils (observed wetlands, rock outcropping, etc.), cesspools (in high density development) and pit (not vault) privies.

Potential Malfunctions: Those systems that appear to be operating satisfactorily but were constructed prior to system permitting requirements (i.e. preregulatory systems), systems located in areas extremely unlikely to receive permitting by current standards, systems constructed in areas having soils mapped as unsuitable or with severe limitations for OLDS and systems located on exceptionally steep slopes greater than 25 percent. Included as potential malfunctions are permits issued for OLDS repairs that meet Chapter 73 standards. While this needs category does not represent "stand alone" existing needs, the information may be utilized in a needs analysis to locate areas affected by poorly defined adverse circumstances. For example, clusters of legitimate repairs will often indicate areas requiring closer scrutiny.

No Malfunction: Those systems that appear to be operating satisfactorily, were constructed since the implementation of system permitting requirements, and appear to have been constructed in accordance with the permitting requirements in effect at the time of construction. For the purpose of needs identification, OLDS permitting under Act 537 became effective on May 15, 1972.

TABLE 3-4

SANITARY SURVEY RESULTS

Survey Number	Date	Address	Fecal			Malfunctions
			Coliform	Coliform	Nitrates	
1	11/25/02	5 Agata Dr	P	N	<1.00	C
2	11/25/02	6 Agata Dr	P	N	<1.00	N
3	11/25/02	7 Agata Dr	N	N	4.87	N
4	11/25/02	8 Agata Dr	N	N	4.14	N
5	11/25/02	9 Agata Dr	Not Tested			N
6	11/25/02	11 Miller Dr	N	N	3.76	N
7	11/25/02	8 Colergo Dr	Not Tested			N
8	11/25/02	9 Colergo Dr	N	N	7.73	N
9	11/25/02	400 Amity Park Dr	N	N	11.44	N
10	11/25/02	108 Arrowhead Dr	N	N	4.07	N
11	11/25/02	1 Colergo Dr	N	N	4.29	N
12	11/25/02	404 Amity Park Dr	N	N	11.55	P
13	11/26/02	343 Amity Park Dr	N	N	15.15	N
14	11/26/02	176 Amity Park Dr	P	N	3.62	C
15	11/26/02	148 Amity Park Dr	P	N	4.23	N
16	11/26/02	64 Amity Park Dr	N	N	2.96	C
17	11/26/02	83 Amity Park Dr	P	N	3.24	S
18	11/26/02	147 Valley Rd	P	N	2.36	C
19	11/26/02	389 Ben Franklin Hwy W	P	N	1.30	C
20	11/26/02	80 Brown's Mill Rd	N	N	3.91	P
21	11/26/02	131 Valley Rd	P	N	4.84	N
22	12/11/02	167 Worman Rd	N	N	1.32	P
23	11/26/02	35 Brown's Mill Rd	N	N	2.66	P
24	11/27/02	133 Worman Rd	N	N	14.40	N
25	12/10/02	141 Worman Rd	N	N	7.57	N
26	12/10/02	44 Worman Rd	N	N	6.03	S
27	12/10/02	125 Worman Rd	N	N	14.38	N
28	12/10/02	227 Levengood Rd	P	N	3.40	N
29	12/10/02	66 Worman Rd	N	N	9.65	N
30	12/10/02	279 Levengood Rd	P	N	4.80	P
31	12/10/02	227 Levengood Rd	P	N	4.13	P
32	12/10/02	353 Geiger Rd	N	N	9.76	S
33	12/10/02	195 Levengood Rd	P	P	2.08	S
34	12/12/02	211 Geiger Rd	N	N	4.14	S
35	12/10/02	568 Levengood Rd	N	N	9.18	N
36	12/12/02	35 Geiger Rd	N	N	3.34	C
37	12/10/02	1611 Old Swede Rd	N	N	5.56	P
38	12/12/02	548 Monocacy Hill Rd	P	N	3.31	N
39	12/12/02	267 Geiger Rd	N	N	5.70	C
40	12/12/02	95 Weavertown La	P	N	8.31	C
41	12/12/02	195 Geiger Rd	N	N	4.32	N
42	12/12/02	110 Indian Run Dr	N	N	8.95	N
43	12/12/02	43 Geiger Rd	N	N	<1.00	P
44	12/12/02	2187 Limekiln Rd	N	N	6.79	N
45	12/12/02	560 Monocacy Hill Rd	N	N	<1.00	N
46	12/16/02	515 Monocacy Hill Rd	N	N	5.82	P
47	12/12/02	111 Weavertown La	N	N	6.65	P
48	12/16/02	3011 Limekiln Rd	P	P	2.33	C
49	12/12/02	1471 Weavertown Rd	N	N	5.21	N

Survey Number	Date	Address	Fecal			Malfunctions
			Coliform	Coliform	Nitrates	
50	12/16/02	2834 Limekiln Rd	N	N	<1.00	N
51	12/12/02	2183 Limekiln Rd	N	N	4.11	N
52	12/16/02	2811 Limekiln Rd	P	N	4.28	N
53	12/12/02	1415 Weavertown Rd	N	N	4.73	P
54	12/17/02	1455 Weavertown Rd	N	N	6.43	N
55	12/12/02	1439 Weavertown Rd	N	N	6.40	P
56	12/17/02	1464 Weavertown Rd	P	N	6.41	N
57	12/17/02	1515 Weavertown Rd	N	N	6.08	N
58	12/17/02	1503 Weavertown Rd	N	N	8.69	P
59	12/16/02	517 Monocacy Hill Rd	P	N	5.03	N
60	12/17/02	1599 Weavertown Rd	P	N	2.26	N
61	12/16/02	531 Monocacy Hill Rd	P	N	1.67	P
62	12/17/02	1623 Weavertown Rd	P	P	7.87	P
63	12/16/02	107 Monocacy Hill Rd	P	N	3.66	N
64	12/17/02	876 Old Airport Rd	N	N	4.54	C
65	12/16/02	192 Monocacy Hill Rd	N	N	1.05	P
66	12/17/02	90 Morlattan Rd	N	N	2.82	N
67	12/16/02	2928 Limekiln Rd	N	N	4.15	P
68	12/18/02	5 Country La	N	N	2.17	N
69	12/17/02	1539 Weavertown Rd	N	N	8.15	N
70	12/18/02	11 Country La	P	N	2.86	N
71	12/17/02	1584 Weavertown Rd	N	N	6.63	P
72	12/18/02	8 Country La	N	N	5.04	N
73	12/17/02	1604 Weavertown Rd	P	N	7.56	P
74	12/18/02	6 Country La	N	N	5.34	N
75	12/17/02	Arrowhead Golf Course	N	N	10.92	N
76	12/18/02	1483 Old Swede Rd	N	N	6.91	N
77	12/17/02	1615 Weavertown Rd	P	N	6.30	N
78	12/18/02	19 Pine Forge Rd	N	N	5.54	P
79	12/18/02	92 Toll Gate Rd	N	N	3.80	N
80	12/18/02	324 Township Line Rd	N	N	3.86	C
81	12/18/02	332 Township Line Rd	N	N	4.49	P
82	12/18/02	384 Township Line Rd	N	N	2.96	C
83	12/18/02	75 Pine Lane Rd	P	N	3.19	N
84	12/18/02	225 Stephen's Way	P	N	3.05	N
85	12/18/02	208 Stephen's Way	N	N	4.26	N
86	12/18/02	1704 Weavertown Rd	N	N	11.68	P
87	12/19/02	6731 Boyertown Pike	N	N	11.92	C
88	12/19/02	6735 Boyertown Pike	P	P	10.66	C
89	12/19/02	6734 Boyertown Pike	P	P	<1.00	P
90	12/19/02	7 Pine Lane Ct	N	N	2.94	N
91	12/19/02	2 Pine Lane Ct	N	N	3.02	N
92	12/19/02	79 Pine Forge Rd	N	N	3.53	C
93	12/19/02	810 Gollub Dr	N	N	<1.00	N
94	12/19/02	241 Gollub Dr	N	N	1.30	N
95	12/19/02	220 Gollub Dr	N	N	2.05	P
96	12/19/02	615 Old Airport Rd	P	N	4.17	C
97	12/19/02	623 Old Airport Rd	N	N	4.91	N
98	1/2/03	8 Rosemary La - Well #1	N	N	3.17	C
99	1/2/03	9 Rosemary La - Well #2	N	N	1.57	C
100	1/2/03	Clearview Dr - Well #3	N	N	1.37	C
101	1/2/03	Sunset Dr - Well #4	N	N	<1.00	C
102	1/2/03	40 Longview Dr - Well #5	N	N	3.20	C
103	1/2/03	Longview Dr - Well #6	N	N	1.31	C

Survey Number	Date	Address	Fecal			Malfunctions
			Coliform	Coliform	Nitrates	
104	1/2/03	227 Valley Rd	P	N	3.31	N
105	1/2/03	491 Hill Rd	P	P	<1.00	P
106	1/2/03	455 Hill Rd	N	N	<1.00	N
107	1/2/03	443 Hill Rd	P	N	<1.00	N
108	1/2/03	432 Hill Rd	N	N	4.72	N
109	1/2/03	416 Hill Rd	P	N	1.93	N
110	1/2/03	160 Hill Rd	N	N	5.24	N
111	1/8/03	11 Longview Dr	N	N	1.91	N
112	1/8/03	29 Longview Dr	N	N	7.59	C
113	1/8/03	83 Sunset Dr	N	N	1.24	P
114	1/8/03	86 & 76 Clearview Dr	N	N	7.58	C
115	1/8/03	55 Clearview Dr	N	N	1.53	P
116	1/8/03	Clearview Dr	N	N	1.26	C
117	1/8/03	2404 Limekiln Rd	P	N	9.37	P
118	1/8/03	2380 Limekiln Rd	N	N	9.89	C
119	1/8/03	2316 Limekiln Rd	N	N	4.04	P
120	1/8/03	233 Blacksmith Rd	N	N	2.94	N
121	1/8/03	236 Blacksmith Rd	N	N	6.12	C
122	1/8/03	230 Blacksmith Rd	P	N	9.07	N
123	1/8/03	105 Sharon Dr	N	N	4.20	N
124	1/9/03	1284 Old Airport Rd	N	N	13.21	N
125	1/9/03	Old Airport Rd	N	N	4.22	N
126	1/9/03	6867 Boyertown Pike	P	N	5.37	N
127	1/9/03	6867 Boyertown Pike	N	N	3.53	N
128	2/14/03	199 Valley Rd	N	N	<1.00	Not tested*
129	4/18/03	Rosemary La	Not tested			P
130	4/18/03	Rosemary La	Not tested			P
131	4/18/03	Buttercup	Not tested			C
132	4/18/03	Buttercup	Not tested			N
133	4/18/03	Longview Dr	Not tested			C
134	4/18/03	Longview Dr	Not tested			C
135	4/18/03	Longview Dr	Not tested			C
136	4/18/03	Longview Dr	Not tested			P
137	4/18/03	Longview Dr	Not tested			P
138	4/18/03	Clearview Dr	Not tested			P
139	4/18/03	Clearview Dr	Not tested			P
140	4/18/03	Clearview Dr	Not tested			C
141	4/18/03	Clearview Dr	Not tested			C

* Water sample provided by resident

<u>Malfunction Codes</u>	<u>Well Test Codes</u>
C - Confirmed	P - Present
S - Suspected	N - Not Present
P - Potential	
N - No Malfunction	

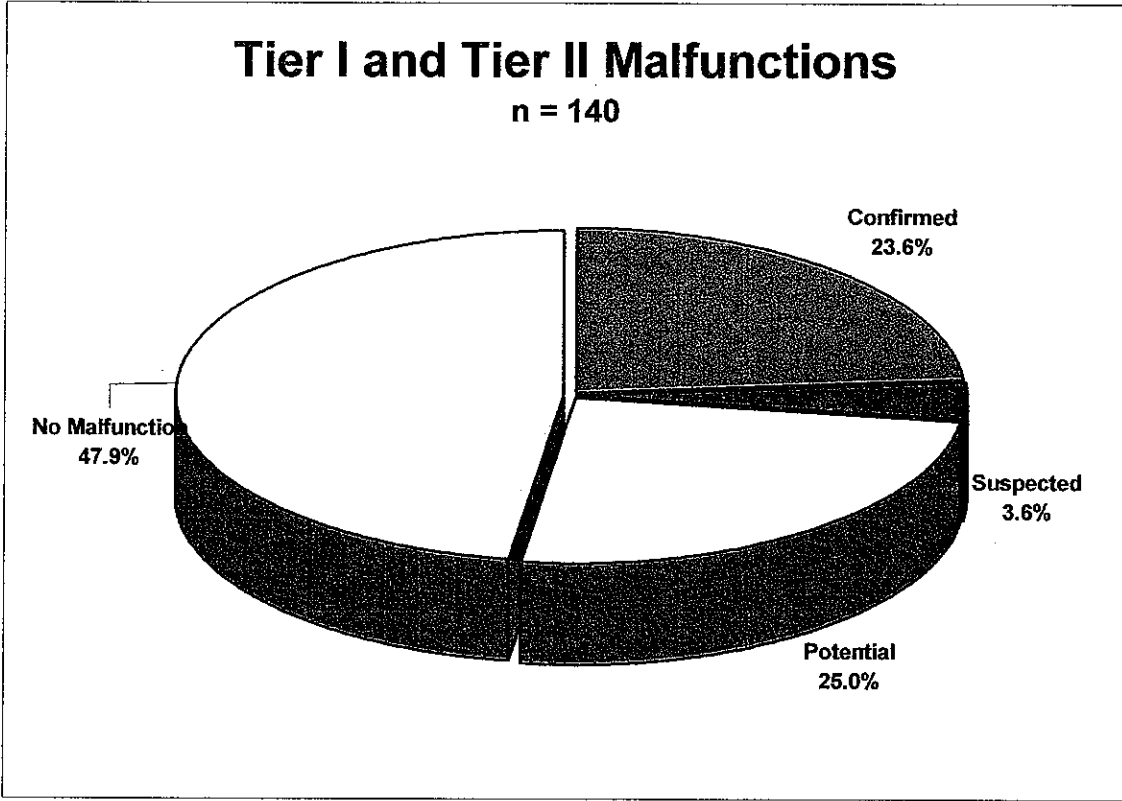
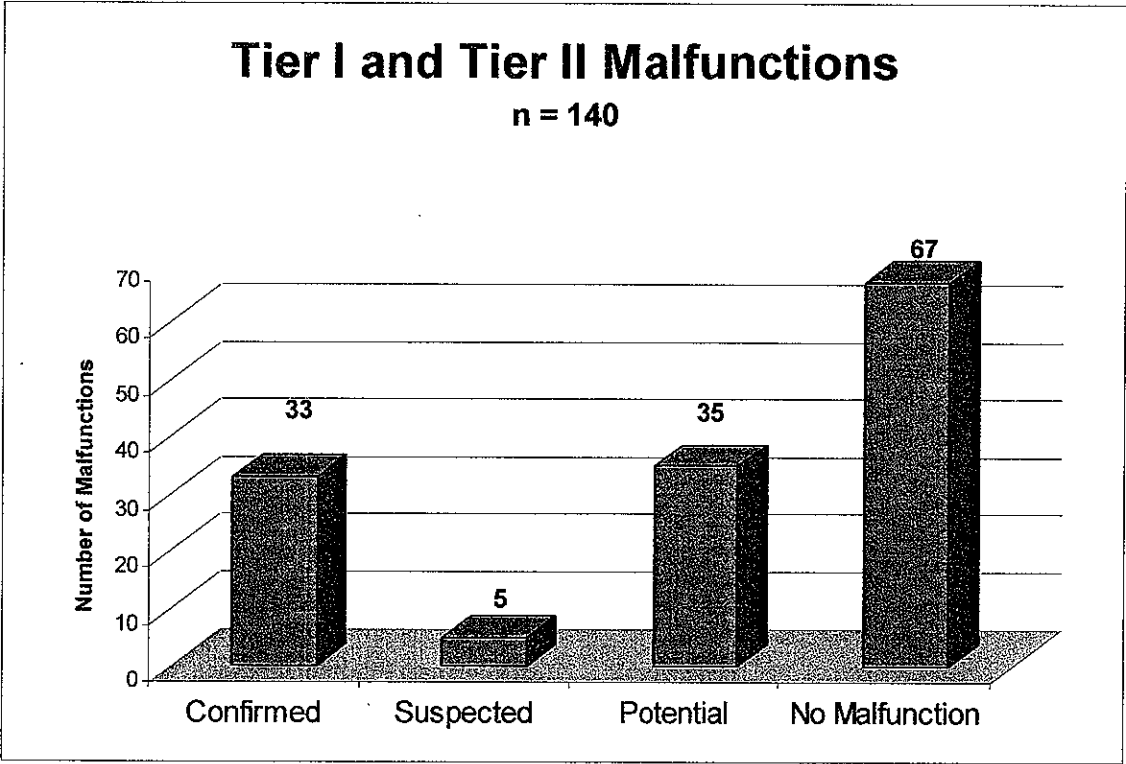
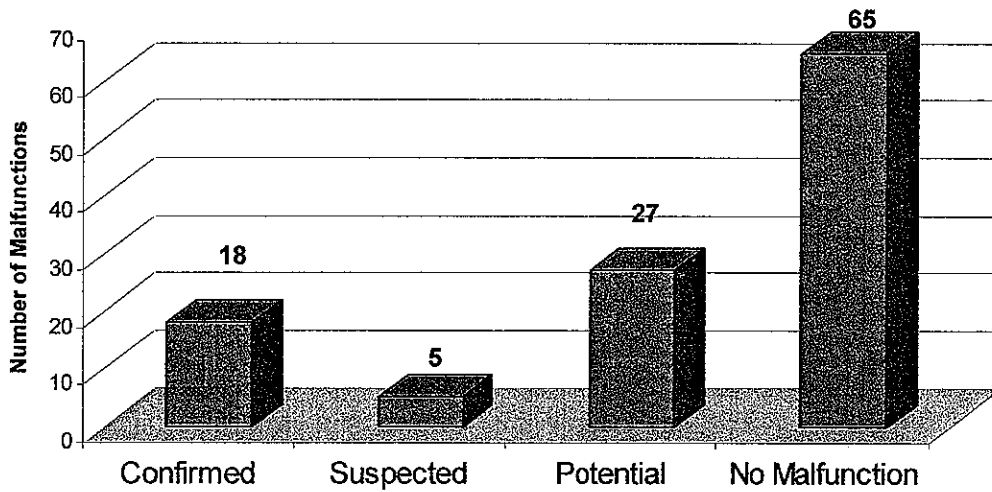


FIGURE 3-4a

Tier I Only Malfunctions

n = 115



Tier I Only Malfunctions

n = 115

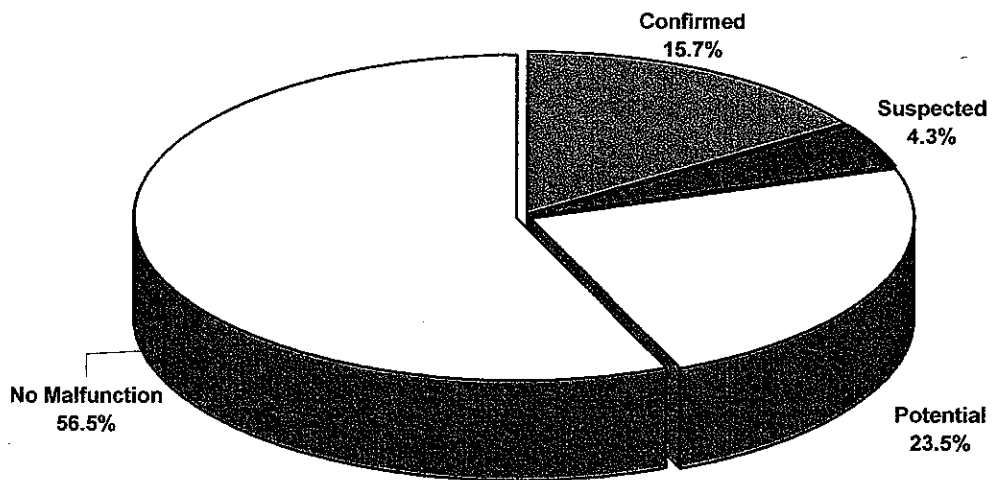
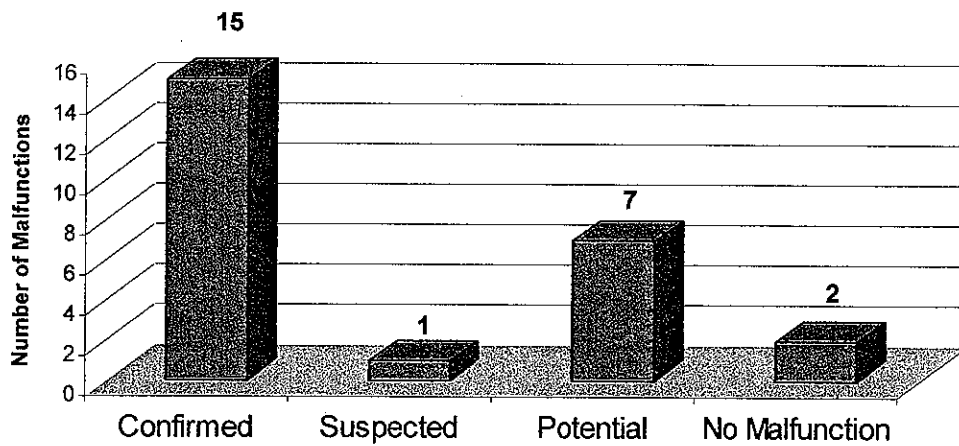


FIGURE 3-4b

Tier II Only Malfunctions

n = 25



Tier II Only Malfunctions

n = 25

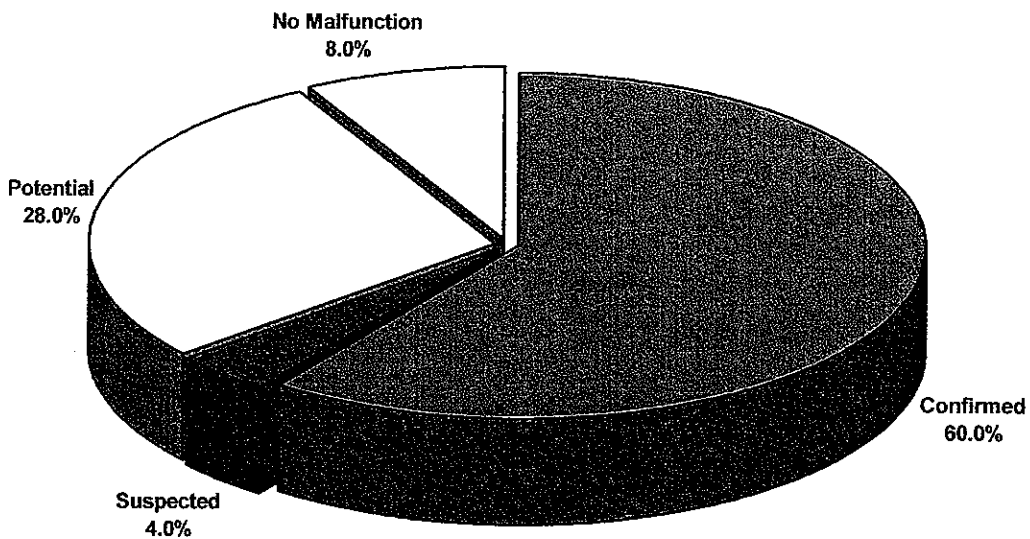
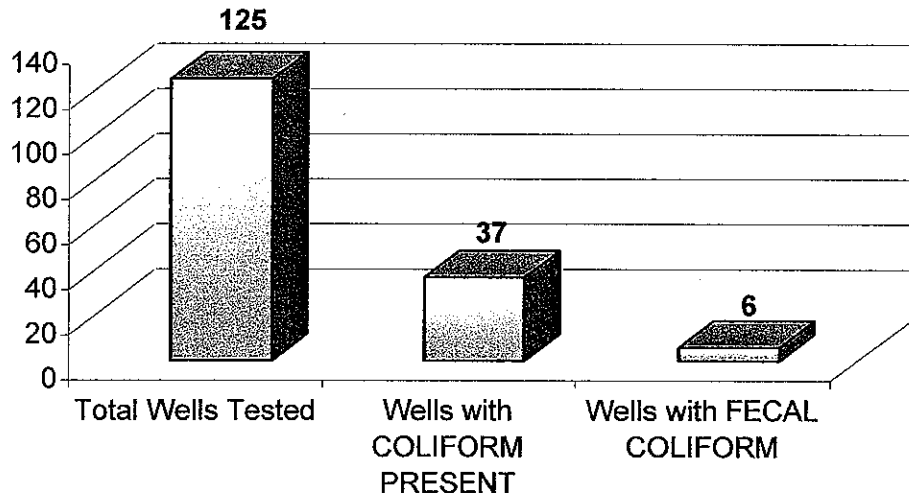


FIGURE 3-4c

**FIGURE 3-5
DRINKING WATER TEST RESULTS**

Coliform Bacteria Test Results



Nitrate Test Results

