

APPENDIX B

RAW SEWAGE LIFT STATIONS

(1) MINIMUM REQUIREMENTS FOR RAW SEWAGE LIFT STATIONS

(a) Capacity:

Stations shall pass peak hourly flow including domestic, industrial and infiltration/inflow allowance.

(b) Solids Handling:

Pumping equipment shall pass at least 2-1/2 inch spheres. Valves, fittings etc., shall be capable of passing at least 3 inch spheres. Minimum force main size shall be 3 inches.

(c) Reliability:

- (A) Mechanical reliability shall be achieved by redundant lift units such that the peak hourly flow can be passed with the largest unit out of service. Redundancy shall include check and gate valves and other 'common mode' failure sensitive items such as vacuum pumps or compressors on control systems.

- (B)(i) Power outages shall result in no raw sewage discharges or bypasses to waters of the state based upon a predictable maximum period of power outage which will occur from year-to-year. Where such reliability does not exist, facilities and/or procedures shall be provided to prevent the discharge or bypass.

(2) GUIDELINES FOR RAW SEWAGE LIFT STATIONS

(a) Capacity:

Lift stations should be sized for the immediate flow requirement and expandable to the longrange (ultimate) requirement. Alternatively interim lift stations may be proposed if the date of expansion is unknowable or beyond the useful life of the lift station.

(b) Solids Handling:

All equipment should be sized to handle at least a 3-inch spheres. Force mains should be at least 4 inches in diameter.

(c) Reliability:

- (A) Where no specific records exist, a four (4) hour minimum electrical power outage should be assumed.
- (B) Events which should be excluded from design considerations are those which are rare, unusual, and cataclysmic in nature.

Means to prevent discharge or by pass include, but are not limited to, the following:

(i) Electric generator:

- Stationary or portable.
- Automatically or manually started.

(ii) Auxiliary fuel fired pump:

- Stationary or portable.

(C) Failure of prudent Operation and maintenance shall not be considered a valid reason for a station failure and resultant discharge or bypass.

(D) (i) Alarms shall be provided to all stations to announce at least high wet well conditions.

(ii) Telemetry to location with a 24-hour attendant shall be required in sensitive areas.

(d) Operation and Maintenance:

(A) Lift equipment shall be easily removable. Screwed fittings shall not be used for equipment removal. Lifting eyes or hoists shall be provided for equipment removal as appropriate.

(B) (i) A means to wash down wet wells shall be provided for all stations.

(ii) Potable water piped into wells or dry wells shall be equipped with a reduced pressure backflow prevention device.

(C) Wet wells shall have 'hopper

(iii) Storage:

- Sewer lines and manholes.
- Wet well.
- External basin.

(iv) Water supply reduction.

(C) (Future)

(D) (i) Alarms signals should be relayed to the sewer system owner in an effective manner.

(ii) Alarm should be actuated independently of the station control system. Example: Pumps are controlled by pneumatic system and separate float actuated alarm is provided.

(iii) Alarm power should have a battery powered backup electrical source.

(d) Operation and Maintenance:

(A) Flanged or bolted compressions fittings should be used for pump removal.

(B) Frequent wet well washdown should be assumed for all stations. A source of high volume wash water through a nozzle should be provided for this purpose at or on finish grade.

bottoms' at a slope of no flatter than one to one (1: 1), and flat bottom area shall be minimized to prevent deposition of solids.

(e) Safety:

- (A) Wet and dry wells of all lift stations shall be considered manholes which will be entered by the owner's personnel.
- (B) Each dry well shall have permanently installed ladder, lights, and forced fresh (out-side) air supply to the bottom of the well. Air supply shall be activated with light switch and intermittently operated with a timer.
- (C) Wet wells including single well lift stations, shall have either installed or portable equipment for access, lighting, ventilation, etc., to be used when entered.

(e) Safety:

- (A) No amount of safety equipment should replace basic safety procedures, knowledge, training and precautions.
- (B)
 - (i) Designers should follow appropriate safety codes.
 - (ii) Air supply should be sized for a least 30 air changes per hour where installed.
- (C)
 - (i) Frequently entered wet wells should have permanently installed equipment for access, lighting and ventilation, etc.
 - (ii) Infrequently entered wet wells may be served with portable equipment.

