

Appendix B

Process Benchmarking Table

	CCCSD	EBMUD	KCDNR	MWRA	LA	CSDOC	PHOENIX	PBES	SRCSD	SAN JOSE
HUMAN RESOURCES										
1. How are staffing levels determined?	By workload.	Based upon workload and justified during annual budget process.	Based upon workload, new unit processes, plant expansion and project needs.	Established through annual budget process, but are essentially fixed.	Determined by workload and available resources	Determined by work patterns and/or staffing needs.	Determined through annual budget process.	Workload dependent and justified during annual budget process.	Determined by workload and available resources.	Determined by workload and staffing needs. Add" position justified during annual budget process.
2. How are recruitments conducted?	Internal and external posting. HR advertises, screens apps, top candidates interviewed and best applicant offered job.	Civil service system with four unions representing employees.	Review recall, layoff and ADA list. Advertise internally and externally. HR provides advertising and application support. Staff involved in all hiring processes. Final decision by hiring authority.	Personnel request submitted. Job is posted internally and externally; screening process; interviews and hiring decision made.	Conducted by City's Personnel Department.	Conducted by HR Department.	Civil service system. Formal request to hire; approval; to HR for vacancy notification; qualified applicants are put on list; supervisor selects candidates for interview; team interview and person hired.	All activities performed by Bureau of Personnel. City operates under civil service system.	Handled through county HR under civil service system.	Civil Service System. Int. & ext. posting by HR and/or Dept. HR screens, tests & establishes eligible list. Dept. interviews & selects new hire.
3. How is temporary staffing handled?	Special authorization required for non-capital projects. Capital projects have own budget.	Use is discouraged, however contract agency can be used if needed. Time limit is <6 months.	Used for non-routine projects or to cover workload for long-term leave. Utilize contract agencies or county list.	Used to increase capacity without increasing size of permanent staff. Includes contract employees and interns. Contracts over 1 year need approval by Board of Directors.	Civil Service system limits. City has contract to hire temporary clerical workers only. Hope to expand concept to lab work in the future.	Hire with Department Director's approval. Use infrequently.	Hired on workload basis through internal process. Hired from list of accepted applicants, contract agencies or local universities. Limit set for <90 days.	Used only to cover extended leaves (over 2 months). Prefer to use retired employees.	Hire temporary workers for <6 months. Also hire for limited term appointment.	Contractual agreements. Purchase order w/temporary agency. HRD's temporary employee program.

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4. How are student interns utilized?	Included as temporary staff. Arrangements with local university.	Manage special studies. Address programs for economically disadvantaged students. Work with UC-Berkeley.	Cover workload peaks and provide opportunities (particularly to minorities) to work in scientific field.	Perform routine testing, including sample collection, check-in, micro, TSS, settables and BOD.	No formal program, but utilize intern-type positions called "Student Professional Workers."	Number of interns is set as part of annual budget process.	Student interns not used in lab.	No.	Hire student engineers to gain work experience.	Depends on the program and student's skills/interest. Complete short-term special projects, prepare reports or field study related to class work.
5. Steps of the hiring process	Advertisement; screening; written test or rating apps; oral exam; best of top three candidates is hired.	File PE66 form; internal/external qualification list; screening; written or perf. exam; interviews; ranking; final selection.	Vacancy justified; job bulletin and supplemental questions drafter; HR checks recall, layoff and ADA list for candidates; advertisement; apps rec'd; screening; panel interviews; references checked; approval to hire; job offered.	Personnel req; approval; posting; screening; interviewed by team; hiring recommendation made.	Approval; request to Personnel Dept. for eligible candidate list; candidates notified; interviews; candidate selected and offered position.	Identify need; request approval; job description prepared; job posting; interview; offer made.	Civil service program process.	Justify position; received budget approval; personnel req; interviews; check references; rank candidates; make selection and offer.	Assess needs; submit request; HR develops test; establish hiring list; hiring list rec'd by lab; interview notifications mailed; interviews scheduled; top candidates selected; references checked and position offered.	Vacancy to be filled; class spec. reviewed if no existing list; Hr/Dept. posts; recruitment, screening, testing and list established; req. submitted; Dept. rec. top 10 candidates & # of vacancies; interviews, selects and makes offer. HRD processes selection documents.
6. How is career development handled?	If opening develops and internal candidates exist, follow steps in #5. We do have a job progression system.	Promotions through competition for vacancies or competitive assessment.	Job progression system developed and utilized.	Through internal courses or workshops. Tuition assistance provided.	No official program – left up to lab manager to encourage employees to prepare for promotional exams. Do have job professional system.	Handled annually by Individual Development Plan. Promotion doesn't exist. Employee must "bid" for openings.	Employees provided w/funds for training and memberships in professional organizations. Eligible for tuition reimbursement.	Limited promotional opportunities. Union obligation a factor.	Handled through outside training and OJT. Promoted thru Civil Service exam. Progression system is utilized.	Training available through HRD and Dept. Outside workshops and class available. Tuition reimb. Promotions through competition w/outside candidates when vacancies occur.

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7. Strategy to balance mix of technicians and professional staff	District has Chemist I and II series – no technicians. Chemists do all routing and sophisticated analyses, including GC/MS work.	Hires based on need and appropriate level/classification to get work done.	New employee hired at entry step. Staff expected to participate in all aspects of position in order to get job done.	Each lab person is on an inter-disciplinary team that is responsible for a range of tests. Everyone is expected to learn all team responsibilities.	No defined strategy. Ratio of technicians vs professional staff is 2:1. Biology lab is 1:1.	Strategy used is based on decision making authorization and skill set.	8 technicians and 17 chemists. Techs support chemists and do majority of sample prep – chemists make up difference.	All vacancies are filled at level appropriate for vacancy.	N/A	None. Vacancies filled at appropriate level.
8. Inter-sectional cross-training, rotation work opportunities	Yes. Rotation takes place every 3-6 months. GC/MS area exempted at this time.	No, however attempted at Lab Tech III level. Currently allowing staff at same level to “swap” positions on 6 month basis.	Cross-training encouraged by management as part of training plan or based on workplan needs.	Everyone is expected to learn tests performed on weekends/holiday s since they cover by rotation. A cross-training program is being piloted.	No formal programs. Cross-training occurs through promotion and lateral transfers.	No, although lab manager wants to develop.	Used with limited success. However, cross-training within analyses groups has been successful.	Yes, analyst areas only.	Non-professional staff rotated to difference sections of lab for cross-training. Professional staff remain in own section.	This subject has been discussed extensively. Technicians from each section have been cross-trained in toxicology field work.
9. Training plans and budget, latitude to pursue personal development	Employees can request training to attend courses. District/lab safety directives are mandatory.	Established for all as part of annual performance appraisal. Each employee is budgeted for 40 hours of training per year.	Established in performance eval process. 40 hours/year is budgeted for each employee.	Training plans established for employees as part of annual performance appraisal. Budget for outside travel/training is 0.25%.	Certain training required for all city employees. HRD handles training for all divisions. Special training requests must be approved. City offers in-house training and tuition reimbursement program.	Yes, through IDP process. Training budget is overall 2% of salaries. Tuition reimbursement program available.	Developed during annual performance review. Utilize cross-training, outside training and tuition reimbursement budget. Portion of training budget used for OSHA, Haz Mat, lab safety and ethics and QC training.	Employees receive OJT. Monies are budgeted for other training (software, safety, first aid, etc).	Professional training is budgeted. County provides reimbursement for tuition and book costs.	Tuition reimbursement amount depends on union MOA. Dept. has training allocation per employee. Employees request training, subject to sup, div mgr or director approval.

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10. How are performance appraisals conducted?	Every six months for probation completion and yearly for permanent employees. Step 5 raises are tied to a successful performance eval.	Written performance appraisals conducted annually with mid-year oral review. Probationary employees receive 3-4 appraisals.	Semi-annual narrative and numerical perf. appraisals conducted for every employee. Subordinate and supervisor input is included in eval. COLA and merit pay to non-represented employees. Gainsharing program (50-50 between employee and county).	Conducted annually with mid-year progress review. Annual step increases up to top step are automatic, unless rating "below."	Performance appraisals for probationary employees (3-bi-monthly during 6-month period) and regular employees (annually). Suggestion program available.	Performed annually. Different for exempt and non-exempt staff.	Conducted on annual basis. Fixed salary and COLA increases. Employee suggestion and merit award program.	New employee receives 3 written reviews over probation period; then receive annually. Union represented have structured raise schedule over 4-6 years. COA at start of each fiscal year. Non-represented receive merit pay annually.	Probationary employees only, until off probation. Beginning in July 1998, all perm. employees will have annual development evaluation.	New employees receive 1 st , 4 th & 6 th month appraisals. Perm. Employees receive annual appraisal. Sup prepares and meets w/employee. 5-step system for pay increases. Merit increases & mgnt bonuses may be given. COLA depends on union MOA.
11. Communication techniques within the lab and with customers	Verbal, memos and notes. Mandatory staff meetings 1x/week.	Weekly and monthly staff meetings. Monthly newsletter and Client Advisory committee in works.	Weekly meetings; e-mail; bimonthly newsletter; face-to-face communication.	Weekly meetings; monthly safety committee and lab-wide meetings; semi-annual client advisory meetings; extensive use of e-mail.	E-mail; memos; bulletin boards; bi-monthly newsletter. Sections and management have regular staff meetings	E-mail, memos, staff meetings.	Weekly and monthly meetings.	Sr. staff meet weekly. Staff meet monthly and on as-needed basis.	Lab bulletin boards; face-to-face communication; chalk messaging board; employee check-in board; weekly meetings and weekly newsletter.	E-mail & memos. Weekly sups and weekly or bi-weekly section staff meetings. Monthly safety & sr. staff meetings. Quarterly general lab meetings.
12. Disciplinary actions	Verbal warning; written reprimand; suspension; reduction in rank/pay; termination.	Formal process designed by District. Ranges from counseling letter to termination.	Follow formal county process. Informal meeting; verbal warning; letter of reprimand; suspension; termination.	Formal process. Verbal warning (written) ending with termination. Usually handled informally, if possible.	Progressive process including counseling, oral warning, written reprimands and recommendation for add'l personnel disciplinary action.	Verbal warning; letter of reprimand; HR then becomes involved and takes appropriate action.	Formal progressive process with City. Verbal reprimand, written reprimand, minor suspension, major suspension, demotion and termination.	Formal process by Bureau of Personnel. Initiated by lab manager and ranges from oral reprimand to termination.	Progressive process includes verbal warning; letter of conversation; letter of counseling; written reprimand; recommendation for add'l action (e.g., leave w/o pay, demotion or termination).	Progressive process: oral counseling, documented oral counseling, written reprimand, suspension, step reduction, demotion, termination. Appeal rights depend on action taken.

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SUPPORT SYSTEMS										
13. How is sample receiving handled, including chain-of-custody?	Centralized. Responsibility is spread throughout organization. COC utilized.	Centralized in the client and analytical section. Lab requires COC forms to be submitted with every sample.	Centralized. Sample manager responsible for sample receipt, physical and electronic login and sample delivery to lab areas. COC process utilized.	All sample containers have bar-coded label. LIMS is used to record samples and internal custody transfers.	Not centralized. Each individual lab handles own sample receiving. Centralized sample receiving system is planned for year 2000.	Combination system. Each section has a login system and person to receive and distribute samples.	Centralized. LIMS is used to login samples. Utilize COC.	Centralized and handled by sample custodian. COC developed.	Not entirely centralized due to physical barriers. Assigned staff receives samples and performs analytical tasks. COC system in place.	Centralized and handled by sample custodian. COC stored in sample receiving. Worklists being developed in LIMS.
14. How is project/program management handled?	Sr. Chemist interfaces between customer and lab and reviews all data prior to distribution.	Program managers work with clients to ensure lab works within limitations.	Project managers and chief process analysts are responsible for overseeing the coordination of lab services to customer.	Lab manager and client services coordinator are responsible. Clients receive quarterly "informational invoice" to account for work submitted.	Each section deals with clients. For major projects, a project manager is selected to oversee.	Lab supervisor provides this role.	Client services supervisor works as interface between customers and lab. System is currently under review.	Info and Management Services handles this function.	Lab "program coordinator" acts as liaison with program managers to assure project/program needs are met.	Assisted to lab chemist & microbiologists to give customers access to technical expertise.
15. How is sample collection handled and what is lab's role in sampling (e.g., training)?	Solids analyst is responsible for analyzing samples for certain portion of tests.	No dedicated staff for sampling. Occasionally collect for special projects.	Environmental specialist, lab specialists and operations staff collect samples. Also receive from customers who collect own samples.	Violet Team collects for testing under NPDES permit. Otherwise, clients collect own samples. Lab provides containers and pre-printed COC forms/sample labels.	Samples collected and delivered by lab and non-lab staff. Lab provides on-the-job training to ensure collections are done properly.	Most collected by lab staff. Supervisors responsible for scheduling collection activities within daily activities.	Division does not have sampling responsibilities except for Crytosporidium and CIR. Process control lab staff collect as needed.	Samples collected by Field Operation Division.	Samples collected by lab and non-lab staff.	No dedicated staff for sampling. Lead biologist or chemist recruits staff for collection of special projects.

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16. How is purchasing handled at the lab?	One staff member orders items for lab. Items <\$35 come out of petty cash fund. Items under <\$5K purchased with lab manager approval. Items >\$5K must be requested in lab budget.	Handled by senior clerk and submitted to purchasing for items <\$20K. For purchases >\$20K, requires competitive bidding and board's approval.	On-line purchasing handled by staff. Petty cash available for items <\$100. Blanket purchase orders are available.	Purchase requests are initiated by analyst on each team. PO's issued in emergencies. Most items purchased off blanket contracts.	Most sections designate individuals to coordinate purchasing needs. Use petty cash, PO's, blanket purchases and annual contracts.	Each section purchases supplies. Utilize blanket PO's and standard purchasing request order system. Over \$1000 requires bid. Sealed bids required for >\$25K.	Purchasing responsibilities are spread throughout lab and funneled through specific individuals as required by City. Most supplies available on contract, through PO's or by a bid process.	Storekeeper (who works for Bureau of Purchasing and Stores) purchases supplies for lab.	Fixed asset items <\$5K purchased through annual budget process. Lab manager has signature authorization for >\$10K. Sups have authorization for purchases up to \$2500.	Generated at benches in standard format, approved by sups. Clerical does rest w/assistance of sample receiving.
17. What is the system for receiving and distributing deliveries?	Received by Materials Control and distributed to lab.	CASS section is responsible for stockroom management and inventory control. Samples rec'd 24 hours/day.	Designated area for delivery of packages, which are then delivered to staff member who ordered.	Handled by Warehouse Department and delivered to purchaser. Team monitors own inventory. Utilize purchasing software to streamline re-ordering.	Centralized. Warehouse system at largest treatment plant for plant equipment and supplies. Lab supplies and equipment are completed by purchasing staff & driver.	Warehouse receives and distributes shipments.	Shipments received by central warehouse. CS supervisor notified when items rec'd and coordinates pickup.	N/A	Centralized warehouse system for receiving and disbursing equipment and supplies.	Shipments rec'd at warehouse, delivered to lab. Clerical inventories shipments & records status of purchase requests & account balances.
18. How is sample disposal managed?	Each section coordinates with Sr. Chemist who approves data.	Non-haz waste dumped down drain. Contaminated bacteriological samples and sludge are autoclaved and disposed. Haz waste packed, labeled and stored in haz materials storage facility outside lab.	Utilize system for tracking and disposal of samples after analyses completed.	Non-haz waste is dumped down drain. Contaminated bacteriologicals are autoclaved and disposed. Chemical haz waste are packed and transferred to drums. Accumulated waste is removed each quarter.	No official system. Usually sample disposal after analysis and result accepted by supervisor.	Once holding time is exceeded, samples are disposed.	Occurs no earlier than 30 days after data report has been issued to customer or when holding time has expired.	No.	Lab staff are designated to handle sample disposal activities, when all testing has been completed or holding time has expired.	Chemist in lab designated haz waste custodian. Haz samples ret'd to customer when possible. Non-haz waste to treatment plant influent.

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19. Involvement in storm sampling programs, including systems for collecting and analyzing	Handled through district's collection system department. Have dealt with biosolids, ground water monitoring and waste characterization.	Regional board required implementation of \$500 million wet weather program to prevent CSOs. Lab monitors discharge according to NPDES requirements.	Support agency storm, biosolids, waste characterization and emergency respond programs.	Collect and test when sizable rain. First storm of month - priority pollutant parameters are collected. Other storms test for total and fecal coliform, TSS, settleable solids and BODs.	Divisino supports the monitoring of GISWP. Samples collected manually by plant personnel and analyzed by lab staff. Weekend and after hours work requires advance coordination. OT offered to employees at time and 1/2.	No, although significant intrusion into system during storms. Weekend, holiday and after hours staff available.	Not involved in storm water sampling and analysis. Do conduct analyses of biosolids and provides emergency analyses services.	We receive after hours and work is compensated with OT.	Yes – On-site stormwater monitoring program. Samples collected and analyzed by staff. Stand-by pay available for off-hours work. Also large CMP for storm water monitoring for Sacramento Metro area.	Program managed by Environmental Enforcement – Non-Point Source inspectors. Lab performed analysis, metals, wet lab, organics.
20. Types of non-analytical positions at the lab	(1) secretarial staff (75%)	(5) Section Supervisors; (3) Sr. Chemists; (1) QA/Safety Officer; (1) Info Systems Support Analyst; (1) Sr. Administrative Clerk; (1) Administrative Clerk	(1) Administrative Assistant; (1) Budget Analyst; (1) Building Maintenance Specialist; (1) QA Officer; (1) Statistician; (4.5) Laboratory Assistant	(6) Team Supervisors; (2) Section Managers; (1) QA Manager; (1) QA Specialist; (1) Client Services Coordinator; (1) Administrative Coordinator; (1) Secretary; (1) Information Specialist; (1) Receptionist; (1) Superintendent	Bureau of Sanitation includes number of divisions. Functions include administration, clerical, budget, information systems, training and source control. Add'l personnel and accounting support from Public Works Department.	Secretary and Clerk	(1) Secretary; (1) Administrative Aide; (1) CHO; (1) LIMS Manager; (1) QA/QC Officer	(1) P/T Clerical position	(2) clerical positions.	(1) Lab supervisor; (4) Section supervisors; (1) Clerical; (1) QA Chemist; (2) Sample receiving staff; (2) special project staff; (1) Special project contract worker.

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PLANNING										
21. What is the planning process to identify and prepare for future work?	Accomplish extra work with existing staff levels. If needed, hire add'l help or send samples out.	Strategic planning, budgetary planning and workload projection and cost allocation/recovery.	Contact customer for workplans. LPMs handle new work requests.	Strategic and budgetary planning handled by Black Team. Support team handles tactical planning. Ad hoc teams formed for special planning. CSS manager handles new work requests.	Meet with customers to review existing programs and identify new projects.	Identify projects requiring 80+ hours per year from other work groups during budget process.	Customers surveyed annually to identify projected workloads. Customers complete form to request special projects.	Future work requests handled by IMS at budget time.	Workload changes drive staffing. New work is handled through RFLS forms.	Strategic planning performed by Dept. senior staff annually. Lab staff then rectify budget & workload to accommodate executive staff directives.
22. Comparison of planned vs. unscheduled work, percent and criteria for rush work	Regular 80%; Rush 25%. If cannot do, send out.	<i>Water:</i> Scheduled 90% Unscheduled 10% <i>Wastewater:</i> Scheduled 70% Unscheduled 30% 5-10% of lab's work is "rush".	<i>Lab:</i> Sched: 80-85% Unsched: 15-20% <3% Rush <i>Treatment Plants:</i> Sched: 95% Unsched: 5% Rush accepted on basis of priority	80-90% planned. Process control TAT is 10 days; 14 days for NPDES; 21 days for industrial samples. Contract out 4%, mostly for tests we don't perform.	<5% unscheduled. <1% rush. No criteria for accepting rush jobs.	90% planned. Less than 5% are rush basis. Accept all work and use OT if necessary. Back-charge customers.	90% planned; 10% unscheduled and repeat sampling. Process control samples require 24-48 hour TAT.	80-90% planned. 10-15% unplanned. <5% is rushed. No criteria for rush tests.	Less than 5% is unplanned and <1% is rush. No criteria for rush work.	60% scheduled; 40% unscheduled; 1% rush
23. Contingency planning for unforeseen circumstances (e.g., power outages, earthquake)	District has plan. However, no plan to address chemical collection system response for unforeseen circumstances.	Contingency plans and SOPs for emergency situations. Collection system, chemical spill containment and response are part of source control.	Emergency response plans and emergency operation center. Also address in county-wide plan. "Survival kits" are available for each staff member at work station.	Covered in safety plan and training, but no extensive plans or SOPs. Expanded effort on planning for hurricanes and snow storms.	Bureau has several plans and teams in place to handle emergencies.	District has team dealing with integrated emergency response.	Part of City and Department overall emergency response program. Plans are incorporated into CHP.	No.	Yes - Business Resumption Plan for disasters. Also incident response plan, emergency response, sampling procedures and equipment strategically placed at process areas.	Plant & lab have emergency response plans for chemical spills & chlorine leaks, etc. Plant has some ability to restore power during unforeseen emergencies, but lab does not.

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24. Planning and budget for future equipment needs and equipment replacement.	Analyst or Service Tech determines need and it becomes part of annual equipment budget. If not in budget, equipment is purchased from contingency account.	New equipment purchases are justified during annual budget prep.	Needs developed during capital budgeting process. Equipment tracked through capital assets database.	New equipment are justified in annual budget prep. Try to cover through operating budget.	Section managers responsible for anticipating future equipment needs and replacements. provide input to annual budget request process.	Separate budget for capital items that are not part of operating fund. Lab manager presents need to general manager and finance committee for approval.	Capital equipment eligible for replacement after 6 years. Funds are budgeted one year in advance of anticipated replacement. Add'l or new equipment requested through supplemental budget process and is ranked by need.	Budget for normal replacement and new work requests.	Fiscal year budget planning process. Funding is requested for fixed asset items (>\$5K). Requests are processed through PO and funding out of general funds.	New equipment purchases are justified during annual budget preparation process and during 5-year Capital Improvement Program (CIP) budget negotiations.

DATA MANAGEMENT

25. Type of LIMS, commercial or in-house and extent of modification	Commercial system. On-going modification and improvements programmed in-house.	LIMS from ACS. Owned and operated by lab.	LIMS from ACS and modified in-house. Part of capital assets.	Beckman LIMS since 1992. Highly customized to needs.	Commercial system purchased from Lab Vantage Solutions. Modified and customized. Hardware part of capital assets.	Commercial system by LabWare and modified slightly.	Commercial LIMS called Lab Maestro, which has undergone internal customization.	Off the shelf product and customized forms used. Owned by lab.	Commercial LIMS (Beckman "Lab Manager"). Customized to fit needs. Owned and maintained by lab group.	Perkin Elmer SQL*LIMS; On-going improvements and modifications programmed in-house.
26. LAN or WAN, accessibility of Internet access, training for LIMS and other software	WAN system. Internet access available to all staff but restricted to certain nodes on network. LIMS training by in-house system administrator.	Operate a LAN. Every employee has access to Internet and District Intranet. Training by lab staff.	Both. Internet accessible to all employees. Data Management staff train staff.	Extensive WAN tied to Authority's WAN. Employees can apply for Internet and e-mail. OJT for LIMS. MIS provides other training.	LAN. LIMS interfaced w/VAX-based WISARD. Internet available to most employees. Training by core staff w/in division.	Part of District-wide Micro Windows NT. Currently developing Internet and Intranet.	LAN connected to a WAN. Internet access granted to certain employees. LIMS training from LIMS administrator.	Both. Limited Internet access. LIMS training provided by LIMS vendor.	VAX system part of WAN. Internet access available to staff. LIMS training through LIMS section.	Open VMS system part of LAN. No Internet access. Training so far done by MIS.

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27. Support for LIMS and computer network, analysts of information systems professionals	Support by network administrator. Database and LIMS by Sr. Chemist and network administrator.	LIMS and LAN by lab staff; WAN by ISD. LIMS/LAN managers are analytical staff who have been trained to manage system.	LIMS/LAN by Data Management section. WAN by Information & Telecom section	LIMS, LAN and Mainframe supported by MIS. LAN, PCs and software packages supported by IS group. MIS has 2 staff assigned to LIMS and full-time LIMS Analyst in lab.	Provided by LIMS team, a specially trained group from EMD and ICSD. Computer and system support also provided by ICSD staff. LIMS team comprised of chemists and system analysts.	Project Assistant for LIMS and QA person who spends 50% of time on LIMS. Tech heavily invested in LIMS.	LIMS Administrator supports. Is an analytical staff member specifically trained to perform associated duties in lieu of lab work.	Support by Bureau's Information Systems group. Lab manager provides LIMS support.	Support contracted with vendor via modem, site visits or phone/fax. LIMS Administrator trained to support locally and came from chemistry section.	All support done by MIS team. No formal LIMS administrator, however, one MIS person assigned to LIMS.
28. System for reporting data to regulatory agencies, other customers	Hardcopy reports. Electronic submittal is in development state. Data is maintained for at least 5 years.	Daily reports and several "on demand" reports. Reports retained for 10 years in hard copy and electronically archived.	Electronically and hard copy reports. Archived to data storage facility for minimum of 7 years.	Data exported to client databases when approved. Only issue hard copy if requested. Hard copy records stored in records retention center and maintained for 10 years.	Hard copy format. Saved for at least 5 years.	Reports generated via hard copy and electronically. Data and reports are kept for minimum of 5 years.	Electronic and hard copy reports to customer, depending on needs.	LIMS provides all data transfers. We keep all electronic and paper records forever!	Not automated. Customer receives data through e-mail, disk or hardcopy. Hardcopy reports are maintained and available for 5 years (wastewater samples) and 7 years (drinking water).	Electronic and hard copy reports to customer, depending on needs.
29. Do you have a historical database and do customers have access?	Yes - customers will be given access to data through new customer menu query system. LIMS security by Sr. Chemist.	Yes. Retained in active or archived files accessible for client queries. Only lab staff can modify database.	Yes. Data available back to 1965. Staff and county customers have access. Archive system in place.	Yes. Retained in LIMS indefinitely and accessible to clients. Only lab staff can modify database.	No.	No. Customers have access if requested.	Yes. Can be accessed by other City employees. Do not keep data segregated by customer. Access by customers is read only and performed through internally written program.	Bureau maintains historical database of all data. Bureau employees have access. Several lab customers have limited LIMS access.	Electronic data on-line and available for samples under 10 years. Files over 10 years are stored on magnetic tape. Customers have read-only access on LIMS.	Yes, but for process data only. Approximately 10 year history. Non-process data currently only available to lab for past 3 years. No customer access.

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ANALYTICAL WORK										
30. How is sample prep handled (centralized or decentralized, communication /feedback loops)?	Decentralized – done by analysts who performs work. Extraction and sample prep info recorded on data sheet and sample prep log books.	Centralized and decentralized. Data reviewed at several levels.	Decentralized. Done within each analytical section (with exception of organics).	Decentralized w/in teams. Sample prep communication via LIMS. Data review performed at several levels.	Lab technicians do most sample prep, however, chemists take over when shortage of technicians. Not centralized.	Decentralized in each section and shared by all staff members. Communication is “across the bench top”.	Sample prep performed by technicians and chemists.	N/A	Prepared by tech or analyst, depending on type of analysis, level of effort or availability of staff.	Decentralized – done by analysts who performs work. Extraction and sample prep info recorded on lab data sheet.
31. QA/QC system and who has responsibility for QA	Decentralized and responsibility of each analyst. QA Coordinator is part-time position and also does analytical work.	Centralized and decentralized. Responsibility of each employee. Have QA Officer.	Centralized. Day-to-day compliance is responsibility of staff. Have QA Officer who reports to lab manager.	Test QC is monitored by analyst and batch QC. QC team responsible for larger QA system.	Decentralized. QA Officer is lab manager. Assisted by 2 full-time professionals.	Centralized. Have QA Officer.	Centralized and comprised of QA/QC Officer and chemist.	Centralized. QA/QC Officer performs limited analytical work. Quality at bench level is responsibility of each employee.	Centralized. Staff member is assigned as QA/QC Officer.	Centralized and decentralized. Responsibility of each employee. Have QA Officer.
32. Criteria and documentation for corrective actions	Event report is filled out and plan developed by analyst, QA Coordinator and lab supervisor, if necessary.	Corrective action documented through changes to database and requires form to be completed.	Two levels of corrective action: bench and management. Corrective action forms are available for documentation.	Documented by Correction Action Initiation (CAI) form, consisting of initiation, correction action plan and corrective acting results.	Control Charts used to determine when correction actions needed.	Specified in each analytical procedure. Criteria determined by lab management, section management and QA Officer.	Corrective action taken whenever QC criteria not met or problems identified during data or bench level audits. Documented on “Out of Control Event” form.	All corrective actions are noted in QA/QC Plan and individual method SOPs.	Corrective action determined from accreditation requirement, lab management, supervisor and QA/QC Officer and described in lab QA program plan.	Corrective action taken whenever QC criteria not met or problems identified during data or bench-level audits. Documented on corrective action report forms.

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33. What is your policy for the level of QC and how is the appropriate level of QC determined?	Determined by DOHs ELAP certification requirements.	No set policy. Lab has goal of 10%.	Determined by requirements of reference method or program. Minimum level of QC is 5%.	QC performed with each batch of 20 samples. Minimum is 5% QC.	Can vary from 10-30%. Division standard set at minimum of what is required by methods employed.	Level determined by official method. 15% of workload is upper limit of what is enough.	Standard level is 10%. Freq. & type determined from method requirements, license requirements and customers requests.	QC/QC requirements are method-specific and covered in each SOP. Lab average is 15-20%.	Minimum QC performed is 10% of testing or one per analytical procedure run.	Determined by analytical method and DOHs ELAP certification requirements.
34. Do you have a QA manual, who is responsible for writing/maintaining and procedures for modifications?	Yes. Written by QA Coordinator w/input from staff. Revised every other year. SOPs written by QA Coordinator and reviewed by staff. SOPs reviewed every other year.	Yes. Written and maintained by QA Officer, however, analytical sections provide technical input. Updated every 2 years. SOPs maintained by QAO, written and revised by sups or staff and updated as needed.	Yes. Written by QA Officer and updated annually. Sections write SOPs and update an annual basis.	Yes. Written and maintained by QA Team. Recently completed year long revision of manual and will update as needed. QA SOPs maintained by QA team; Analytical SOPs by analytical teams and safety SOPs are written by lab safety committee.	Yes. Division manager and two staff prepared in 1993. Revised in 1995 & 1997 by QA/QC officer. SOPs written by manager and staff in individual labs. Updated when method updated, significantly modified or changed.	Yes. Originally written by all sections, including QA. Updated when substantive change. Lab staff write SOPs and are updated as needed.	Yes. QA Officer is responsible for updating on an annual basis. Analytical staff and sups write SOPs and undergo annual review.	Yes. Updates vary timewise but are done by QA/QC Officer.	Yes. Lab manager wrote original and it's reviewed annually. SOPs written by analysts and reviewed annually or when changes needed.	Yes. Written & maintained by QA Officer. Analytical sections provide technical input. Updated 1-2 years or as necessary. SOPs maintained by QAO, written & revised by sups or staff and updated as needed.
35. What analyses are conducted, for what matrices, with which methods? How are modifications made?	Microbiology, bioassay, metals conventionals	Standard Methods (attached methods and matrix not found)	EPA Approved Methods or Standard Methods. Microbiology, bioassay, metals, organics, drinking water	EPA Approved Methods or Standard Methods. Oceanographic methods used for seawater nutrients. In-house methods for petroleum by GC/FID.	Principle matrix is wastewater. Drinking water, groundwater, air and solids are involved. Standard Methods, SW-846 and EPA 600 series used for water, wastewater and solids. EPA Methods 18 and SCAQMD Methods used for air analysis.	Official methods, usually those promulgated by EPA.	EPA Methods or Standard Methods. Alternative or modified methods are used for specific studies, research or investigations.	Perform all normal environmental analyses on water, wastewater and some solids, soils and sludge. EPA or Standard Methods.	Bioassay, microbiology, metals, organics, conventionals. Matrices include water, wastewater, biosolids/soils, gases and potable water.	Perform all normal environmental analyses on water, wastewater and some solids, soils and sludge. EPA approved methods or Standard Methods.

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36. Do you have a system for certifying analysts?	Certified by DWEA Lab Technologist Program and Grade III certification.	Certification not required. Proficiency tracked and evaluated in annual employee performance plan.	New analysts work with staff and supervisors to demonstrate proficiency.	Certification documented by sups, reviewed by QA team and tracked in LIMS. General approach to training.	No official system. Each section conducts on OJT and reviews trainees' competency.	Yes. Require SOP read and understood and new analyst shadows experienced one. Data must compare within 10%.	Analyst is Acertified@ for every method he/she performs. A training file is in place for all employees.	All analysts are certified by QA/QC Officer and documented before allowed to perform analytical work.	Analysts demonstrate skills through training and performance evaluations.	New analysts work with staff and supervisors to demonstrate proficiency.
37. Which analyses are automated, which methods have been converted from bench to instrumental testing?	Autosamplers for AA including graphite furnace and AS-90 for flame analysis. Hg Analyzer and GC/MS units.	Autosamplers for GC; GC/MS; HPLC; IC; TOC Analysis; TOX Analysis; Colorimeter; AA; FLIAS; ICP; ICP/MS: Mercury Analyzers; Solid Phase Extractor; BOD Analyzer and Solids Extraction.	Autosamplers for total phosphorous; total organic carbon; sonication; GPC and ASE; cold vapor AA; ICP-OES; ICP/MS; dual head autotitrator system; TOC; BOD; flow solution III; auto analyzer; midi still system.	Procedures automated including GC, GC/MS; HPLC; IC; TOC Analyzer; BOD Analyzer; AA; ICP; Mercury Analyzer; Solid Phase Extraction; Auto-Titration.	GC; GC/MS; HPLC; ICP; ICP/MS: AA; AA/GF equipped w/autosamplers. Particle size analyzer, ammonia analyzer and BOD are equipped with autosamplers.	All organic analyses are automated. All instruments have autosamplers except GC, used for air analysis. Robot for BOD. AAs automated with autosamplers. Physical tests on wastewater are still done by bench analysis.	BOD, cyanide, mercury. Expect to automate analysis for ammonia, fluoride and alkalinity.	Automated all metals analysis, NH3, NO2/NO3, T-PO4, TKN, O-PO4, Cl; SO4, F; Br and Semi-volatile organics.	Nitrate; nitrite; ammonia; phosphate; chloride. Metals and organic analyses are all automated	Autosamplers for GC; GC/MS; EPLC; IC; TOC Analysis; AA; ICP; ICP/MS: Mercury Analyzers
38. Summary of major equipment	AA; Hg Analyzer; GC/MS (2); Spectrophotometers (4); TKN System	No attached list.	TOC (2); Salinometer; UV Visible; Spectrophotometer (2); Auto analyzer (2); Ion Chromatograph; Microwave Digester (2); ICP-OES; ICP-MS (2); CVAA; Microtox; MIDI GC; GC (4); GC/MS Iontrap	GC (5); GC/MS (4); HPLC; IC; TOC Analyzer; BOD Analyzer; AA (2); ICP; Mercury Analyzer; Solid Phase Extractor; Auto-titrator	Graphite Furnace AA; Flame AA (2); AA; ICP/ES; GC/MS: TOX analyzer; ICP; ICP/MS: GC/ECD; UW/VIS; HPLC; FTIR; BOD; GC.	Graphite Furnace AA; Flame AA; ICP/Mass Spectrometer; Auto Sampler (2); ICS; Mercury Adapter; ICP; FTIR; HPLC; GC; GC/MS: OI;	GC/MS; ITD; GC (7); HPLC; ICP; AA (4); Mercury Analyzer; Ion Chromatograph; FTIR; Cyanide Analyzer; BOD Analyzer; Automated Ion Analyzer; Auto-titrator;	Flow Solution Analyzer (2); IC; GC/MS (2); GC; ICP/MS: Hg Analyzer; UV/VIS; AA.	ICP/MS; FAA; GFAA; Microwave Digester MDS205, MDS2100; Segmented Flow Autoanalyzer; GC Autosystem; GC/MS; CN Analyzer.	GFAA; FLAA; ICP; ICP/MS: Mercury Analyzer; IC; HPCL; GC; GC/MS; TOC; UV/VIS

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SAFETY AND WASTE MANAGEMENT										
39. Do you have a CHP and how is CHO position staffed?	Yes. Superintendent serves as CHO.	Yes. In lieu of CHO, the QA/Safety Officer is responsible.	Have Chemical Hygiene Plan, but do not have CHO position staffed. Role is assigned to staff member annually.	Local safety plan. No CHP, but will be required in near future. Superintendent presently serves as CHO.	Yes. Chemical Hygiene Plan and safety officer.	Yes. CSDOC Safety Officer is also CHO.	Yes. Both full-time positions. Responsibilities include safety committee, waste disposal, safety inspections, training, monitoring and CHP compliance.	Yes - an assigned responsibility.	Yes. CHO is lab manager.	Yes. There is a full-time Dept./Plant Safety Officer. CHO for the lab is appointed on a yearly rotating basis from among laboratory staff.
40. How is safety training conducted for new employees? How are safety needs identified and prioritized?	RTK and safety training provided by plant safety specialist who is also Certified Industrial Hygienist.	Regulatory Compliance Office is responsible for training. Priorities developed by supervisor and employee.	RTK, chemical safety and overview of OSHA/WISHA provided by CHO and division safety office.	Staff member designated as RTK trainer. Major lab safety course presented every 2 years.	Supervisor of each section trains new employees and holds monthly safety tailgate meetings.	Safety procedure, safety brochure and series of lab safety videos.	RTK via City's programs (general safety, health, haz, etc.).	Part of OJT. Structural safety training.	Formal training by Plant Safety Officer. Tailgate Safety meeting every 2 weeks.	Dept. Safety Officer initiates plant's new employee safety orientation. CHO works w/management and plant safety committee to determine needs.
41. How is accident reporting handled, feedback system for accident debriefing?	District has standard accident report form and specific policies for reporting accidents. Safety committee reviews all accidents.	Job-related accidents must be reported within 24 hours and report filled out immediately.	Accidents and near-misses reported to supervisor and documented within 24 hours on Incident Report form. Info is reviewed monthly by safety committee.	Accident and incident reporting handled through treatment plant safety office.	City-wide system. Supervisors responsible for reporting all accidents on form.	Accident report form is sent to Safety office. Discuss near-miss incidents at staff meetings and chemical hygiene meetings.	Responsibility of individual supervisors. All accidents reported and investigated.	Accident report forms available. Accidents reported to lab manager and City Safety Office.	Reported immediately to supervisor who forward documents to Plant Safety Office. There is also a review process.	Injured party informs supervisor, who fills out required forms. Dept. safety officer reviews all reports and may consult with injured party or with safety committee.

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42. How is HW management and disposal handled, including system for hazardous samples?	Handled through Plant Safety specialist who contracts commercial firm or goes through District Household Haz Waste Collection facility.	Haz waste is packed, labeled and stored in haz materials storage facility outside the lab until 100kG are accumulated. Upon approaching max. for storage, arrangements are made for packaging, transport and disposal at an appropriate haz waste disposal site.	Common waste streams are combined and transferred to haz waste stored shed. Haz waste coordinator monitors and arranges pickup by licensed disposal company (every 3-6 months).	Haz waste and samples are packed or transferred to drums. A waste disposal company removes and disposes of the accumulated waste each quarter.	EMD sections collect haz waste in one-gallon containers. Regularly transferred to plant's satellite haz storage facility and is periodically hauled to off-site disposal and treatment site.	Staff member assigned to collect waste and deposit in haz waste storage area. Pickup handled by CSDOC Safety Officer.	Two employees coordinate disposal with City personnel, safety staff and contracted waste hauler.	Assisted duty. Wastes are collected, stored and disposed by licensed haz waste disposal service.	N/A	Lab staff specialist containerizes HW. It is stored in flameproof lockers away from work areas. Commercial haz waste company disposes of the accumulated waste each quarter.
QUALITY IMPROVEMENT										
43. TQM or other form of continuous quality improvement?	District has a work design program in place, but lab hasn't been selected for the redesign process.	No.	Yes. Cross-sectional quality improvement teams (QITs) implemented to analyze process improvement.	No formal TQM program. Try to ingrain quality in all work activities.	Used to. Bureau now supports join labor-management concept.	No, but have continuous improvement program.	Yes. Initiated by City with some success. Currently consists of task force from across Division.	No.	Yes, called "Agency Committed to Excellence (ACE). Programs developed and significant savings have been achieved.	City has QUEST (Quality Using Effective Services & Technology) partnership to program in place.
44. Do you conduct annual customer or staff surveys? How were they developed? Follow-up?	No.	Yes - client surveys.	Yes. Customer and staff surveys annually. Data reported back to staff and customers. Plan is developed by management team to respond to issues.	Conducted client surveys in past. Client Advisory Board meeting held 2x/year.	Not annually. However, did conduct one <1 year ago, but results were not published.	Yes - customer survey. No formal follow-up process.	Yes. Developed by Client Services. Data compiled in report.	Yes - customer survey. Developed by Bureau leadership and used internally.	Yes - annual customer survey developed and administered by lab manager. Results analyzed and reported to customers, section managers and lab staff.	Yes – have had customer surveys in the past. Ongoing staff survey conducted by outside (Chicago Survey) research group.

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45. What performance measures are routinely monitored?	Only appear in worker's annual eval. Sr. Chemist responsible for observing and documenting performance of employee.	Track workload, status reports (daily) and LIMS reports (weekly and monthly). Overtime use, salary and benefits, services and supplies, professional services and capital expenditures and training are also tracked.	Number of samples received and % of samples are tracked monthly. % of acceptable results on EPA performance samples are tracked and displayed in conference room for staff.	Monthly report includes: # of tests completed; # of tests rec'd, # of incomplete tests in-house; \$ value of months workload; % on time; % valid tests; tests completed per person. Client receives "informational invoice" by project.	Section supervisor keeps records of on-time work, amount of rework and % of errors in data computation and entry. Not published or displayed but reviewed by lab manager, supervisor and staff periodically.	On-time work; on-time completion of DMR; % of QA; # of analytical type and sample stream; compliance to NPDES sampling requirements. Info published in monthly report to management.	TAT is measured on weekly basis and accumulated YTD. Monthly summary is published. Unit costs calculated annually but monitored on semi-annual basis. Also monitor overtime, instrument downtime and # and type of samples sent to contract labs.	TAT, on-time completion; % errors in data; # of analyses; \$ value of monthly workload and tests/FTE. Most data is for internal use and not published.	TAT, corrective actions taken, samples and tests processed. Info reported monthly to lab staff and plant manager.	Method counts, # of samples; TAT, number of re-analyses and corrective action; primary and secondary costs per method (less frequently).

MISCELLANEOUS

46. Unique characteristics from which others may benefit	N/A	No.	Career progression system, customer training and involvement systems. LPM project planning and consulting. Lab specialists do not have Operator I certification but scheduled to complete June '98.	WEF paper on lab management philosophy discusses approach in more detail.		All login occurs in section of lab responsible for analysis. Micro collects and logs in own samples.	Development of real unit costs. Client Services group is new to lab.	N/A	Mixed liquor assessments. Ambient Monitoring program field work, continuous flow through acute toxicity fish bioassay system, digester gas analysis procedure.	Microbiological techniques for effective assessment of process & discharge streams; bi-weekly South San Francisco Bay monitoring of Cu, Ni, Se, Hg, TSS, TOC, DOC, TDS, conductivity and salinity; air quality monitoring; low-level Se & Hg analysis.
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47. Top three priorities if budget and authority were not an issue	N/A	1) Complete work and provide clients with easy, unrestricted access to data through a District Intranet connection. 2) Provide customers all analytical services they require at a competitive cost. 3) Survive until tomorrow.	1) More latitude to utilize creative staffing strategies. 2) Acquisition of more usable lab space. 3) Advanced on-line and automated instrumentation.	1) Restructure job titles and pay ranges to ensure promotion within title. 2) Meld best aspects of high-quality government service lab with high efficiency, cost-conscious commercial lab. 3) Market services outside our agency.	No comment.	No comment.	1) Reclassify positions and create flexible tech pool. 2) Create consulting group to provide customers with knowledgeable project managers familiar with treatment processes. 3) Change personnel rules to provide monetary incentives for on-time quality work and performance-based salary increases.	N/A	1) Convert two temp lab help positions to permanent status. 2) Complete new lab construction process. 3) Consolidate environmental lab services and facilities to avoid unnecessary costs and duplications.	1) 2) Revise job titles and description; restructure, if appropriate, to reflect evolving service requests. 3) Market services outside the city. 4) Embrace emerging information management technologies & strategies to increase service levels and cost efficiencies.